Series 1962, No. 7

Issued November 1965

SOIL SURVEY

Marlboro County South Carolina

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

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Marlboro County will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodland; serve as a reference for students and teachers; and add to our knowledge of soils.

Locating the soils

Use the index to map sheets at the back of this report to locate areas on the detailed soil map. The index is a small map of the county, on which numbered rectangles have been drawn to show what part of the county is represented on each sheet of the detailed soil map. When the correct sheet of the large map has been found, it will be seen that the soil areas are outlined and that each soil is designated by a symbol. All areas marked with the same symbol are the same kind of soil. Suppose, for example, an area on the map has the symbol NoA. The legend for the detailed map shows that this symbol identifies Norfolk loamy sand, 0 to 2 percent slopes. This soil and all others mapped in the county are described in the section "Descriptions of the Soils." The "Guide to Mapping Units," at the back of the report, gives the map symbol for each soil, the name of the soil, and the capability unit, woodland group, and wildlife group in which it has been placed.

Finding information

Different sections of this report will be of special interest to different groups of readers.

Farmers and those who work with farmers can learn about the soils on a particular farm in the section "Descriptions of the Soils," and then turn to the section "Use and Management of the Soils" to find how these soils can be managed and what yields can be expected.

Engineers and builders will find useful information in the subsection "Engineering Uses of the Soils." Tables in that subsection show soil characteristics that affect engineering. For those who want to locate homesites, the tables also provide information on suitability of the soils for use as sewage disposal fields or as reservoir areas.

Foresters and those interested in woodland and wildlife can refer to the subsections "Woodland" and "Management of the Soils for Wildlife and Fish." In the first, the soils of the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained. In the second, the soils are grouped on the basis of their suitability as habitats for specified kinds of wildlife, and the use of the soils for growing food for wildlife is discussed.

Soil scientists and others interested in the nature of soils will find information about how the soils were formed and how they are classified in the section "Formation, Classification, and Morphology of the Soils."

Students, teachers, and other users will find various parts of the report useful, depending on their particular interests.

Newcomers to Marlboro County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County," which gives additional information about the county.

* * * * *

This soil survey was made as part of the technical assistance furnished by the Soil Conservation Service to the Marlboro Soil Conservation District. Fieldwork for this survey was completed in 1962. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time.

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SOIL SURVEY OF MARLBORO COUNTY, SOUTH CAROLINA

BY RICHARD W. CRAFT, JR., SOIL CONSERVATION SERVICE

FIELDWORK BY RICHARD W. CRAFT, JR., W. L. COLBURN, F. L. GREEN, C. B. LAWRENCE, J. J. PITTS, T. R. GERALD, AND W. J. CAMP, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

MARLBORO COUNTY is in the northeastern part of South Carolina, in the Atlantic Coastal Plain (fig. 1). It has a total area of 482 square miles, or 308,480 acres.

Agriculture has been important to the growth and development of Marlboro County. Cotton is the chief crop. Other major crops are soybeans, tobacco, corn, and small grain. Dairy cattle, beef cattle, and poultry also contribute to the economy of the county. About 49 percent of the county (150,600 acres) is in woods, and forest products form an important secondary source of income.

Most of this county is a nearly level to gently sloping plain, but some of it is rolling and hilly. There are four general landscapes in the county. The Sand Hills in the north have nearly level to moderately steep topography and are well drained. Below the Sand Hills are nearly level to sloping uplands that are mostly well drained. The Great Pee Dee River forms the entire western boundary of the county. The broad, nearly level stream terraces are poorly drained to moderately well drained. The valley floors, stream bottoms, and low terraces are drained mostly by intermittent, sluggish streams.

Marlboro County has a warm, humid, continental type of climate. The soils generally are strongly weathered, leached, acid, and low in fertility.

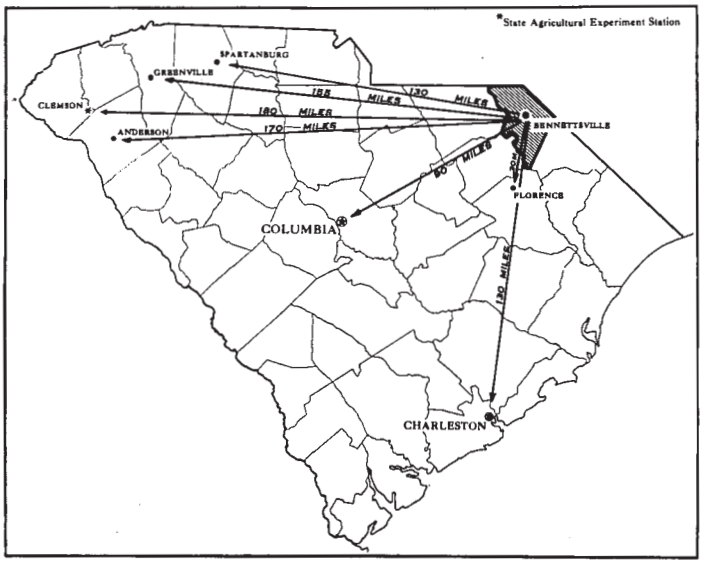

Figure 1.—Location of Marlboro County in South Carolina.

How Soils Are Named, Mapped, and Classified

Soil scientists made this survey to learn what kinds of soils are in Marlboro County, where they are located, and how they can be used.

They 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 steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored 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 to the rock material that has not been changed much by leaching or by roots of plants.

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. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series 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. Dunbar and Marlboro, for example, are the names of two soil series in Marlboro County. All the soils in the United States having the same series name are essentially alike in natural characteristics. Soils of one series can differ somewhat in texture of the surface

soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in the texture of their surface layer. According to these differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Dunbar fine sandy loam and Dunbar sandy loam are two soil types in the Dunbar series. The difference in the texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Marlboro loamy sand, 2 to 6 percent slopes, is one of several phases of Marlboro loamy sand, a soil type that has a slope range of 0 to 12 percent.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries 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 report 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 management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. 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 type or soil phase.

Two or more recognized soils that are not regularly associated geographically may be mapped together as an undifferentiated mapping unit, if the condition of the landscape is such as to make separating them impractical. Portsmouth and Okenee loams is the only undifferentiated mapping unit in Marlboro County. In most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on the soil map, but they are called land types rather than soils and are given descriptive names, such as Local alluvial land.

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 a way that it is readily useful to different groups of readers, among them farmers, ranchers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey reports. 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.

General Soil Map

After study of the soils in a locality and the way they are arranged, it is possible to make a general map that shows several main patterns of soils, called soil associations. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic although not strictly uniform.

The soils within any one association are likely to differ in some properties; for example, slope, depth, stoniness, or natural drainage. Thus, the general soil map shows, not the kind of soil at any particular place, but patterns in which there are several different kinds of soils.

Each soil association is named for the major soil series in it, but as already noted, soils of other series may also be present. The major soils of one soil association may also be present in another association, but in a different pattern.

The general soil map is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use. It shows nine associations: One that is mainly on flood plains, two that are on stream terraces, one in the low flatwoods, four that consist of sandy soils of the Middle or Upper Coastal Plain, and one in the Sand Hills.

The soil associations shown on the general soil map at the back of this report are described in the following pages.

1. Wehadkee-Congaree-Chewacla association

Nearly level soils on the flood plain of the Great Pee Dee River

This association is flooded several times a year. The areas range from a few feet to about 6 miles in width. They are mostly low and flat, but in some places next to the river a natural levee about 5 feet high has formed.

Wehadkee soils make up about 67 percent of this association, Congaree soils about 15 percent, Chewacla soils about 13 percent, and the Flint soils and the terrace phases of Eustis and Lakeland soils about 5 percent. All of these soils developed from sediments washed from the Piedmont Plateau.

The poorly drained Wehadkee soils are at the lowest elevations on the flood plain. Their gray, silty surface layer is underlain by mottled silty clay loam sediments. The Chewacla soils are at slightly higher elevations than the Wehadkee soils. They are somewhat poorly drained to moderately well drained, silty soils that have a dark-brown surface layer and a mottled subsoil. The Congaree soils are on the natural levees. They are well-drained soils that have a surface layer of brown fine sandy loam and a stratified, yellowish-brown subsoil. Figure 2 shows the general location of each of the major soils in this association.

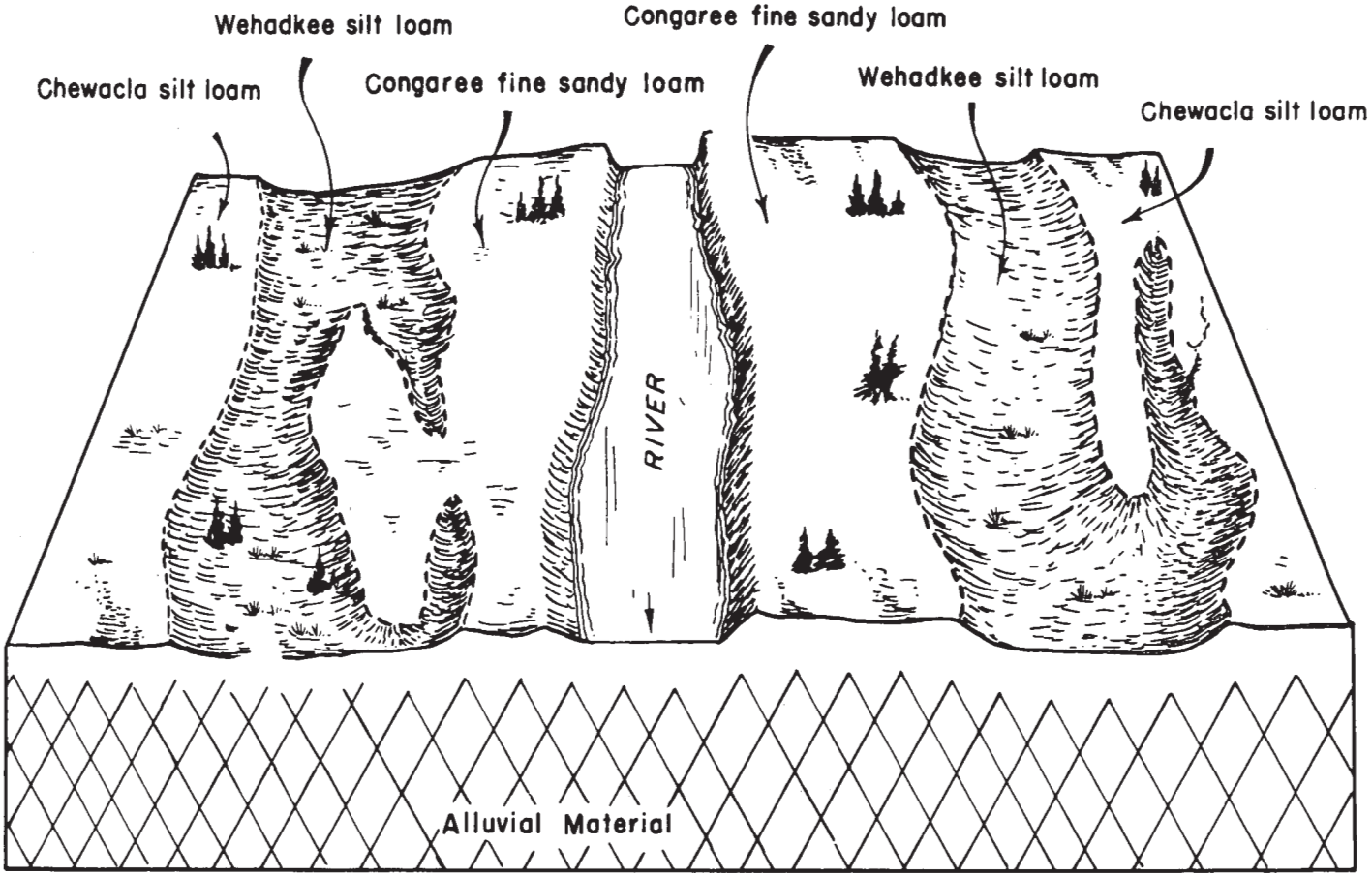

Figure 2.—**Major soils in association 1 and their general location on the landscape.**

About 90 percent of the acreage is in hardwood and pine trees. The remaining acreage is cultivated, mainly to corn, or is used as pasture. Most of this association is in large private and commercial holdings. Some of the acreage is owned or leased by paper companies and is used for the production of pulpwood and timber. Food and cover for wildlife are ample, and the areas are well stocked with deer. Several hunt clubs are located here. The lagoons provide excellent fishing.

2. *Wahee-Leaf-Flint association*

Nearly level to strongly sloping, poorly drained to moderately well drained soils on stream terraces

This association occurs on and along the edges of the terraces of the Little Pee Dee River and the Great Pee Dee River. Most areas along the Great Pee Dee River are between a mile or less and 5 miles wide. The areas along the Little Pee Dee River are less extensive and are about three-fourths of a mile wide.

Wahee soils make up about 35 percent of this association, Leaf soils about 30 percent, Flint soils about 25 percent, and Kalmia, Cahaba, Okenee, Portsmouth, and Izagora soils and the terrace phases of Lakeland and Eustis soils, about 10 percent. All of these soils developed from sediments washed from the Piedmont Plateau and the Coastal Plain. They are subject to occasional flooding late in winter and early in spring.

The nearly level, moderately well drained to somewhat poorly drained Wahee soils occur at intermediate elevations between the Flint and Leaf soils. They have a surface layer of gray very fine sandy loam and a yellowish subsoil mottled with brown and gray. The poorly drained, nearly level Leaf soils occur at the lowest elevations and receive runoff from the higher lying soils. They have a surface layer of gray fine sandy loam and a subsoil of gray sandy clay and clay mottled with brown and red. The nearly level to strongly sloping, moderately well drained Flint soils occupy the highest part of the terrace and are adjacent to small streams or drainageways. They have a brownish, sandy surface layer and a brownish to reddish-yellow, clayey subsoil. Figure 3 shows the general location of each of the major soils in this association.

This association is well suited to forest products. Approximately 60 percent of the acreage is in hardwood and pine trees. The remaining 40 percent is in crops or pasture. The cultivated areas are used primarily for the production of cotton, corn, soybeans, and small grain. The greater part of the acreage is in absentee ownership and is used principally for pulpwood production. The owner operated farms are commonly 150 acres in size and are general farms. Some farms extend into the flood plains.

Some parts of this association are stocked with deer. Food and cover for other wildlife are abundant. The streams furnish good fishing.

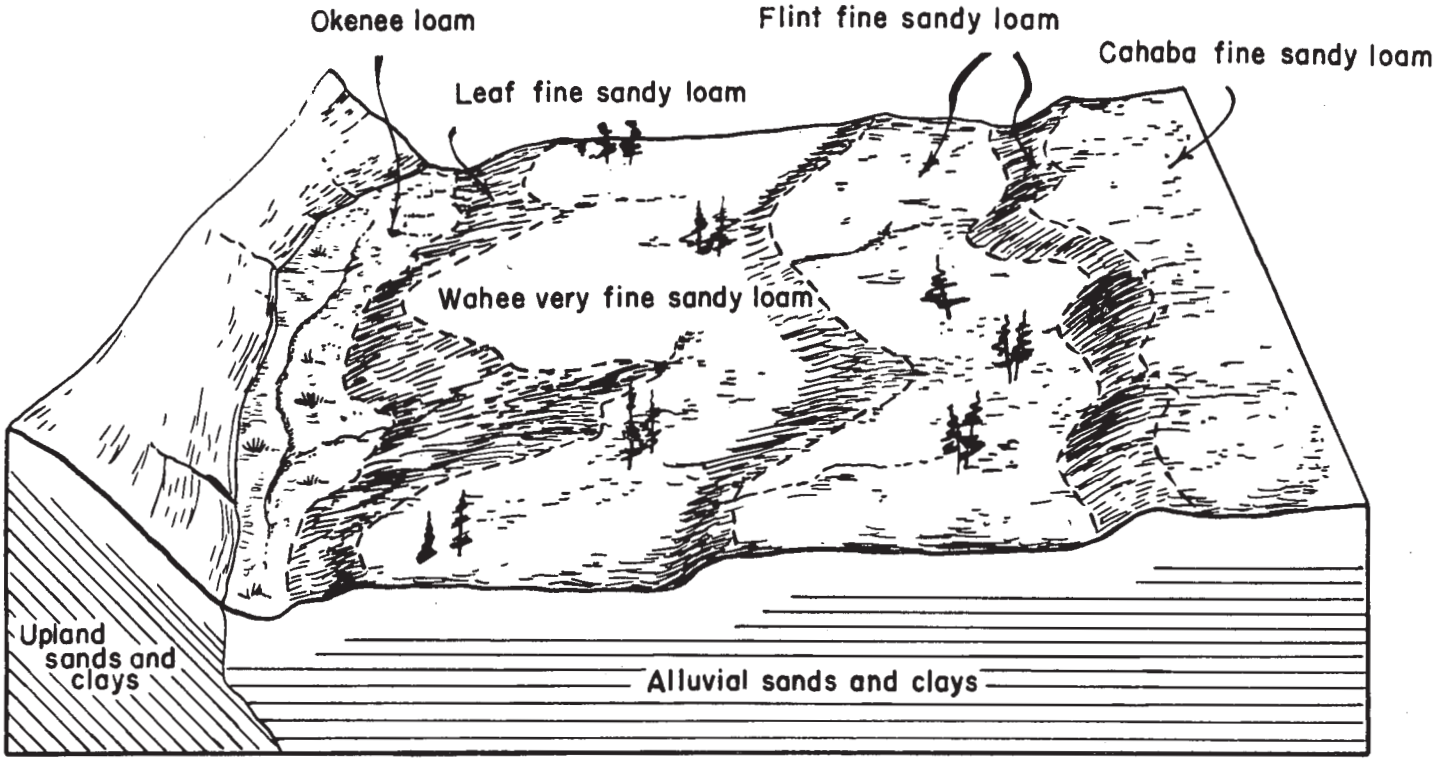

Figure 3.—**Major soils in association 2 and their general location on the landscape.**

The soils in this association are responsive to good management, and yields of suitable crops are fair. Erosion is likely to occur in the sloping areas, but it can be effectively controlled with contour cultivation, close-growing crops, terraces, vegetated waterways, and other conservation practices.

3. Coxville-Dunbar-Lenoir association

Nearly level, poorly drained and somewhat poorly drained soils of the flatwoods

This association is in the southeastern part of the county and is at a lower elevation than the associations to the north and to the west.

Coxville soils make up about 40 percent of this association, Dunbar soils about 35 percent, Lenoir soils about 15 percent, and Craven, Marlboro, and Goldsboro soils about 10 percent. All of these soils developed from unconsolidated sands and clays.

The thin-surface phase of Coxville fine sandy loam occurs along drainageways and at the lowest elevations in the association. It is a poorly drained or very poorly drained soil. Its surface layer is grayer and thinner than that of the other Coxville soils, and its subsoil is less permeable. Water is at or near the surface most of the time. Internal drainage is very slow. The other Coxville soils occur at slightly higher elevations. They have a gray surface layer that ranges from 6 to 10 inches in thickness. Their subsoil is gray silty clay or fine sandy clay loam mottled with strong brown, red, and brownish yellow.

Dunbar soils occupy the highest positions in this association. They have a surface layer of dark-gray sandy loam or fine sandy loam and a subsoil of light yellowish-brown to light olive-brown sandy clay loam and fine sandy clay mottled with gray in the lower part. Dunbar soils are somewhat poorly drained but are more permeable than either Coxville or Lenoir soils. The somewhat poorly drained Lenoir soils occupy intermediate positions between Coxville and Dunbar soils. Their surface layer is dark-gray to yellowish-brown loam. Their subsoil is light olive brown to light brownish gray in color, and in some places it is mottled with red. Figure 4 shows the general location of each of the major soils in this association.

About 85 percent of this association is in timber. Most of this acreage is in absentee ownership and is used for the production of pulpwood and other wood products. The remaining 15 percent of the acreage is cultivated or is used as pasture. The principal crops are cotton, corn, soybeans, small grain, and tobacco. Most of the owner operated farms are of the general type and are less than 200 acres in size.

If adequately drained, the soils in this association are well suited to wood products and to pasture plants. All except Coxville fine sandy loam, thin surface, are suited to cultivated crops. Food and cover for wildlife are abundant, and the streams are well stocked with fish.

4. Norfolk-Ruston-Marlboro association

Nearly level to sloping, mostly well-drained soils with yellowish-brown or yellowish-red subsoil

This association consists of broad, nearly level to sloping areas in which there are many shallow drainageways, several well-defined streams, and many oval depressions (Carolina bays).

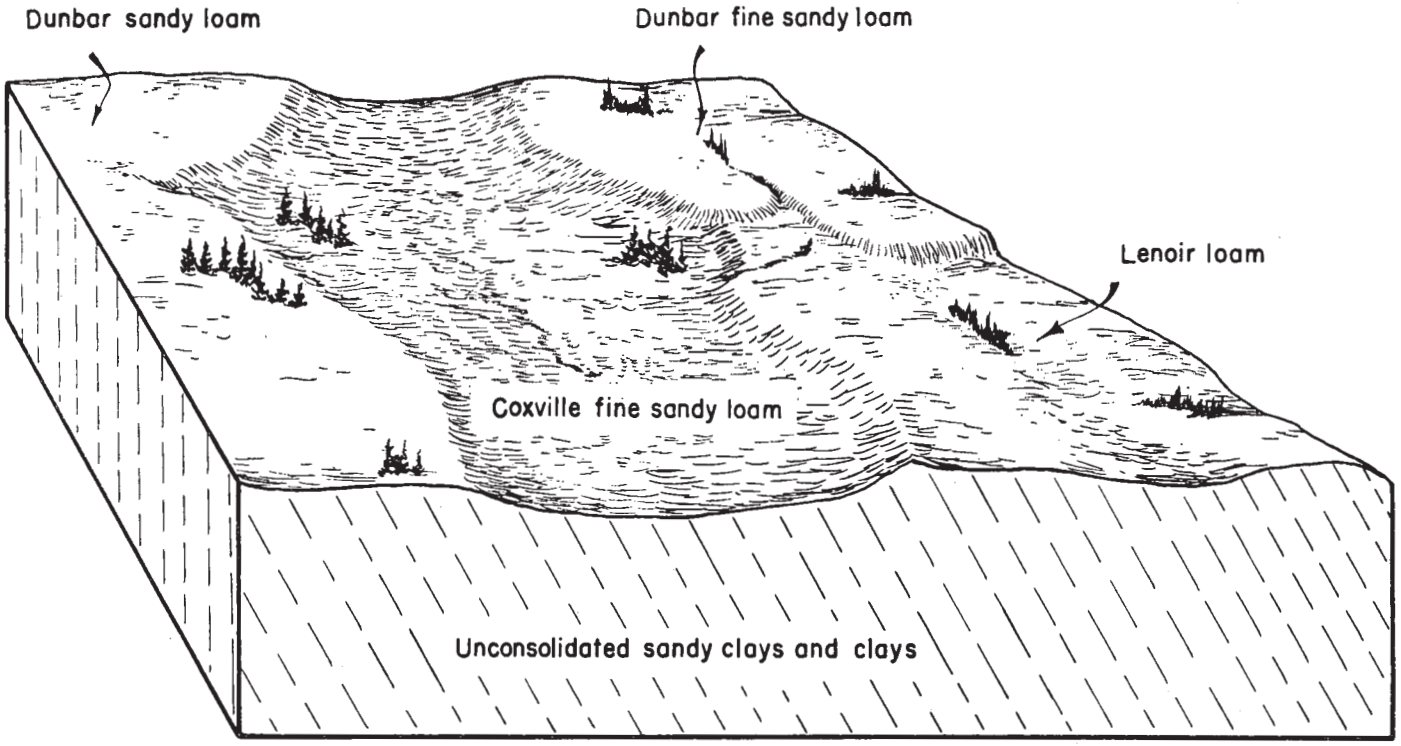

Figure 4.—**Major soils in association 3 and their general location on the landscape.**

Norfolk soils make up about 55 percent of this association, Ruston soils about 20 percent, Marlboro soils about 10 percent, and Grady, McColl, and Dunbar soils and Local alluvial land about 15 percent. The major soils developed from unconsolidated sands and clays.

Norfolk soils are on broad, nearly level to gently sloping plains and in sloping areas bordering drainageways. They are well-drained soils that have a surface layer of grayish-brown loamy sand and a subsoil of yellowish-brown sandy clay loam. Ruston soils occupy nearly level plains in the uplands and gently sloping to sloping areas adjacent to drainageways and slight depressions. They are well-drained soils that have a surface layer of grayish-brown to brown loamy sand and a subsoil of yellowish-red sandy loam and sandy clay loam. Marlboro soils generally are on nearly level to gently sloping plains in the uplands, but they also occur on slopes next to drainageways. Their surface layer is dark-gray to light brownish-gray loamy sand. Their subsoil is yellowish-brown sandy clay.

Grady and McColl soils are in the oval depressions. These depressions range from 5 to 50 acres in size but most commonly are 10 to 20 acres. Many lack drainage outlets. The very poorly drained or poorly drained Grady soils have a surface layer of dark-gray loam and a subsoil of mottled sandy clay or clay. The poorly drained or somewhat poorly drained McColl soils have a surface layer of black or dark grayish-brown loam and a subsoil of gray to strong-brown, mottled, heavy clay loam to sandy clay loam. Figure 5 shows the general location of each of the major soils in this association.

This is the most extensive association in Marlboro County. About 80 percent of the acreage is cultivated or is used as pasture. The soils are suited to most crops commonly grown in the county. The principal crops are cotton, corn, soybeans, small grain, and tobacco. Yields generally are high. Farms average about 300 acres in size, and most are operated by the owners. Heavy machinery can be used, and farming is highly mechanized. Most farming is of the general type, but there are several dairies and some sizable herds of beef cattle. The remaining 20 percent of the acreage is woodland. Hardwoods are dominant along the streams, hardwoods and pines in the depressions, and pines in the uplands. Streams provide opportunities for fishing, swimming, boating, and hunting.

The soils in this association are responsive to good management. The gently sloping and sloping areas are subject to erosion. Close-growing crops, vegetated waterways, contour tillage, terraces, and other water-control measures help to control erosion.

5. *Molena-Wickham association*

Nearly level to sloping, well drained to excessively drained soils on stream terraces of the Great Pee Dee River

This association is in the northwestern part of the county. It occurs mostly as a narrow band that is approximately 1½ miles wide at the widest point and is about 3 miles long. The northern part of the association is generally at a higher elevation than the southern part and is nearly level to sloping. The southern part is chiefly gently sloping. Some of the lower lying areas extend into the flood plain of the Great Pee Dee River and are occasionally flooded for short periods.

Molena soils make up about 50 percent of this association, Wickham soils about 45 percent, and Congaree soils and Local alluvial land about 5 percent. All of these soils developed from alluvial material washed from the Piedmont Plateau.

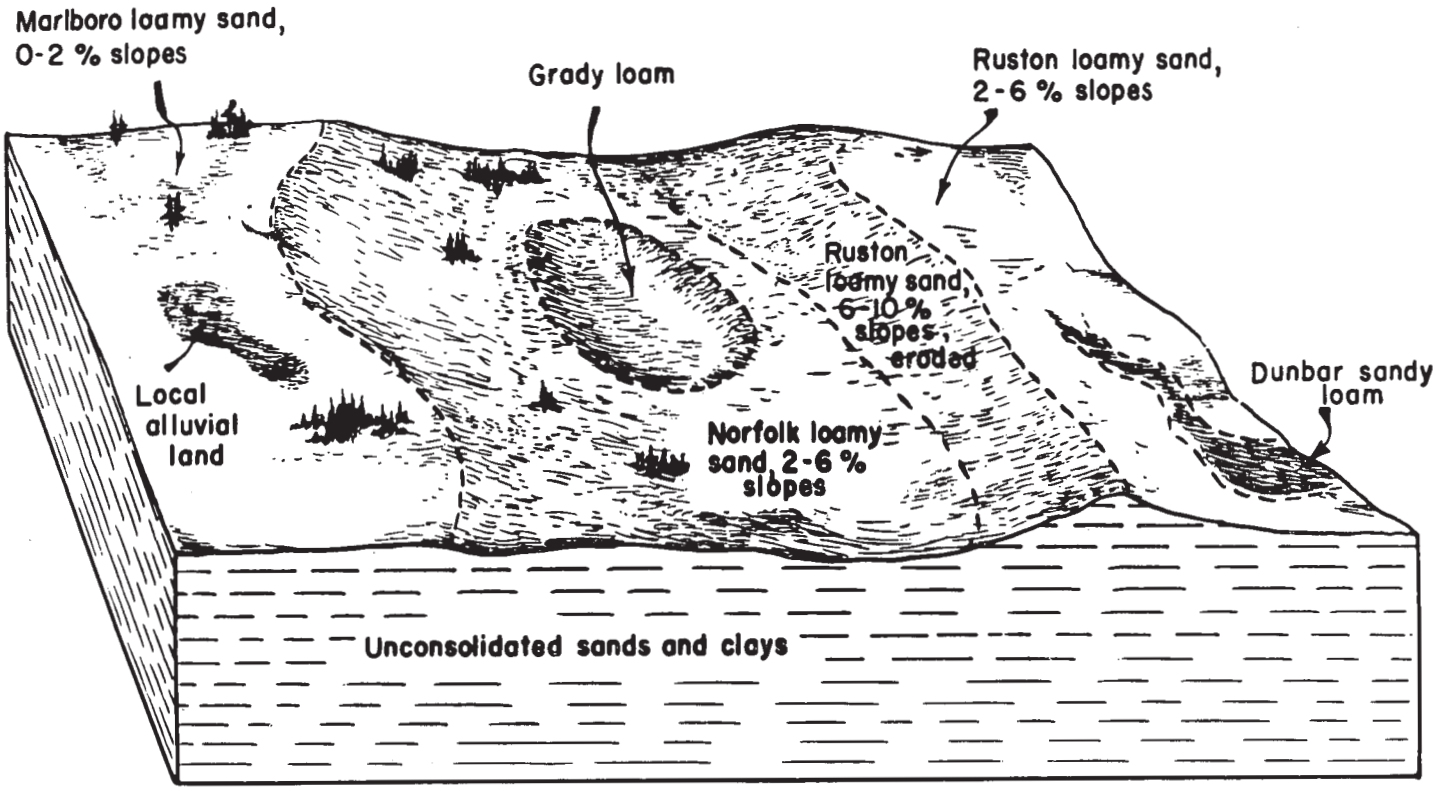

Figure 5.—**Major soils in association 4 and their general location on the landscape.**

The excessively drained Molena soils are at the highest elevations and are nearly level to sloping. Their brownish loamy sand surface layer is underlain by a reddish-brown and yellowish-red loamy sand subsoil. The Wickham soils are at the lower elevations. They are well-drained, gently sloping soils that have a surface layer of reddish-brown or brown sandy loam and a subsoil of red to yellowish-red sandy clay loam. Figure 6 shows the general location of each of the major soils in the association.

Approximately 80 percent of the acreage is cultivated or is used as pasture. The fields range from about 30 to 150 acres in size. Cotton, corn, soybeans, and small grain are the principal crops grown. Most farms are of the general type and are owner operated. This association provides good fishing and other recreational activities, including hunting, boating, and hiking.

The soils in this association are responsive to good management, and yields are fairly high. The gently sloping and sloping areas are subject to water erosion. Wind erosion is likely in the larger fields. Close-growing crops, contour cultivation, vegetated waterways, and stripcropping help to control erosion.

6. *Lakeland-Vaucluse-Gilead association*

Gently sloping to moderately steep soils of the Sand Hills

The topography of this association ranges from broadly undulating to rolling and hilly with moderately wide divides. In some places the elevation is more than 300 feet. Numerous drains and several streams originate here.

Lakeland soils make up about 55 percent of this association, Vaucluse soils about 20 percent, Gilead soils about 15 percent, and Plummer and Rutlege soils and Local alluvial land about 10 percent. The major soils developed from unconsolidated sands, loamy sands, and clays.

Lakeland soils are the most extensive soils in the Sand Hills. They are on gently sloping ridgetops and broad, undulating flats or divides. They have a surface layer of grayish-brown to light brownish-gray sand and a subsoil of yellowish-brown to brownish-yellow sand. Vaucluse soils are mostly on steep hillsides leading to drainageways and streams. Their surface layer is dark grayish-brown to light-gray sand, and their subsoil is reddish-brown to yellowish-red, mottled, compact, weakly cemented sandy clay loam. Gilead soils are primarily at the base of gentle slopes, but they also occupy small areas on ridgetops and short side slopes. Their surface layer is dark grayish-brown or grayish-brown sand, and their subsoil is yellowish-brown to reddish-yellow, compact, weakly cemented sandy clay loam to sandy clay.

Rutlege and Plummer soils generally are at the head of small streams and drainageways. The very poorly drained Rutlege soils have a thick, black, organic surface layer that is underlain by gray sand or loamy sand. The very poorly drained or poorly drained Plummer soils have a dark-colored surface layer that is thinner than that of the Rutlege soils. Their subsoil is gray and sandy. Local alluvial land is at the base of slopes and in gently sloping areas throughout this association. It receives runoff from surrounding higher lying soils and is somewhat poorly drained to moderately well drained. It has a dark-gray to grayish-brown sandy surface layer and a sandy subsoil. Figure 7 shows the general location of each of the major soils in the association.

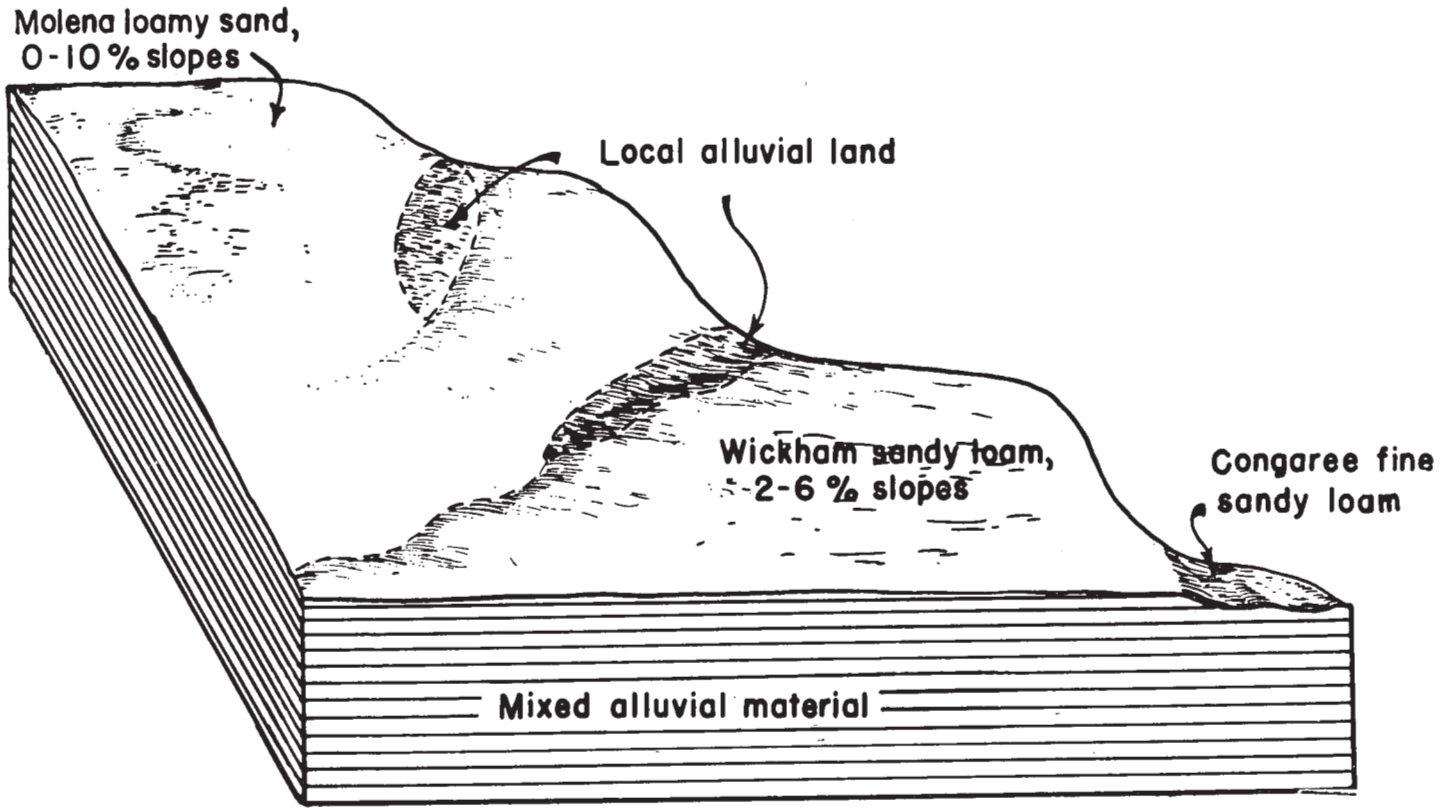

Figure 6.—**Major soils in association 5 and their general location on the landscape.**

Approximately 85 percent of the acreage is in scrub oak, cutover loblolly pine, longleaf pine, and hardwood. In the last few years, a large acreage has been cleared of scrub oak and planted to slash pine. Several lumber companies own or lease large tracts of land in this association. The remaining 15 percent of the acreage is cultivated or is used as pasture. Small, owner operated, general farms predominate. Cotton, corn, small grain, and soybeans are commonly grown, but yields are generally below the average for the county. Food and cover for wildlife are ample, and ponds and large streams provide excellent fishing. Other recreational activities include swimming, boating, hunting, and hiking.

Erosion is a problem on the steeper slopes and in cultivated areas, but it can be controlled by means of terraces, vegetated waterways, contour tillage, stripcropping, and other conservation measures.

7. *Lakeland-Rutlege-Klej association*

Nearly level to gently sloping, very poorly drained to excessively drained, sandy soils

The two areas of this association are in the east-central and southern parts of the county. These areas are broken by many shallow drains, several small streams, and many oval depressions (Carolina bays). The depressions generally are from 10 to 50 acres in size, but some are between 150 and 200. A narrow band, or rim, of sand partly surrounds most of the depressions.

Lakeland soils make up about 55 percent of this association, Rutlege soils about 20 percent, Klej soils about 15 percent, and Norfolk, Goldsboro, Lakewood, and Plummer soils about 10 percent. All of these soils developed from unconsolidated sands, loamy sands, and clays.

The excessively drained Lakeland soils are at the highest elevations in this association. They have a surface layer of grayish-brown to light brownish-gray sand and a subsoil of yellowish-brown to brownish-yellow sand. The poorly drained Rutlege soils are in the oval depressions. Their surface layer is thick, dark-gray or black, loamy sand high in organic-matter content. The grayish, sandy subsoil is mottled in the lower part. The moderately well drained Klej soils are at intermediate positions between Lakeland and Rutlege soils. Their surface layer is black to very dark grayish-brown loamy sand, and their subsoil is brown to yellowish-brown loamy sand mottled with gray. Figure 8 shows the general location of each of the major soils in the association.

About 75 percent of the acreage is cultivated or is used as pasture. Cotton, corn, soybeans, and small grain are the main crops. A few small areas have been planted to pine. The farms are mostly owner operated general farms between 150 and 200 acres in size. On some farms are small herds of beef and dairy cattle. The remaining acreage is woodland. Hardwoods, predominate along the streams, a mixture of hardwoods and pines in the oval depressions, and pines in the uplands. Farm ponds and streams provide good fishing. Hunting, swimming, and hiking facilities are also available.

Rutlege and Klej soils must be drained before they can be used for crops or pasture. Drainage is a problem in the oval depressions, few of which have adequate drainage outlets. In some places sloughing of the subsoil makes

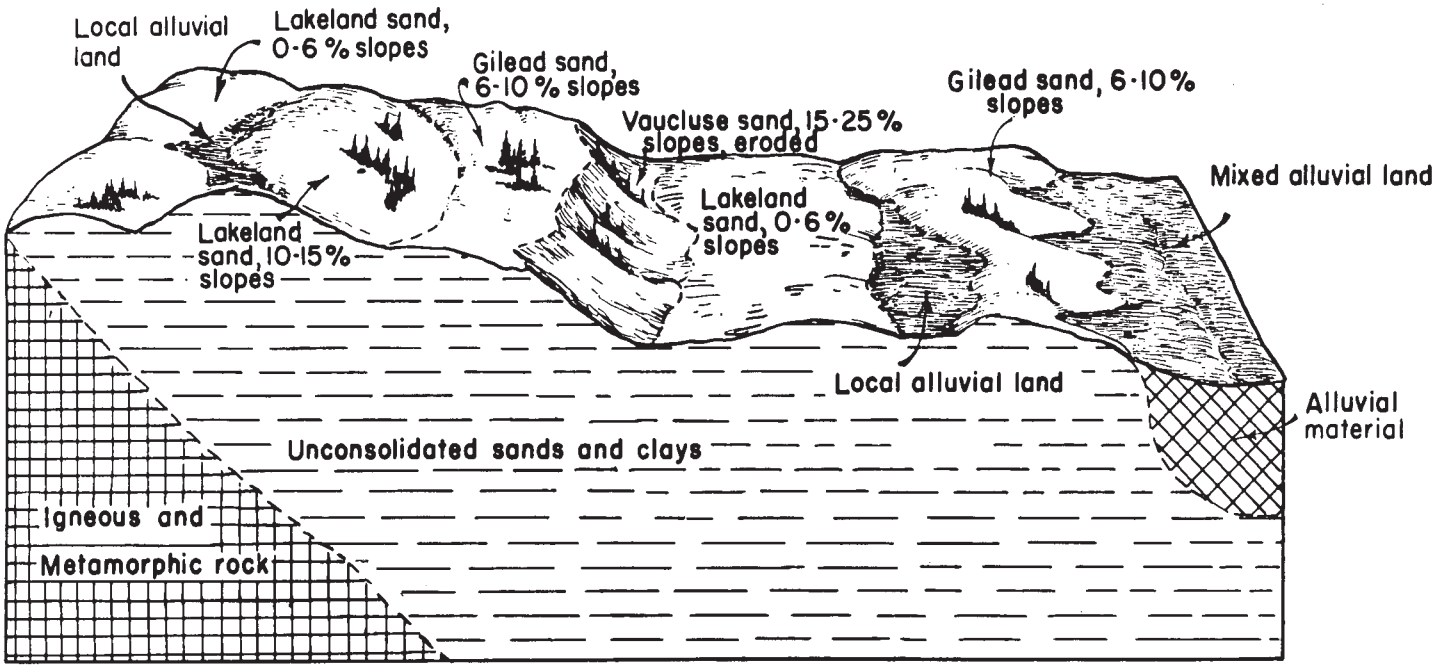

Figure 7.—Major soils in association 6 and their general location on the landscape.

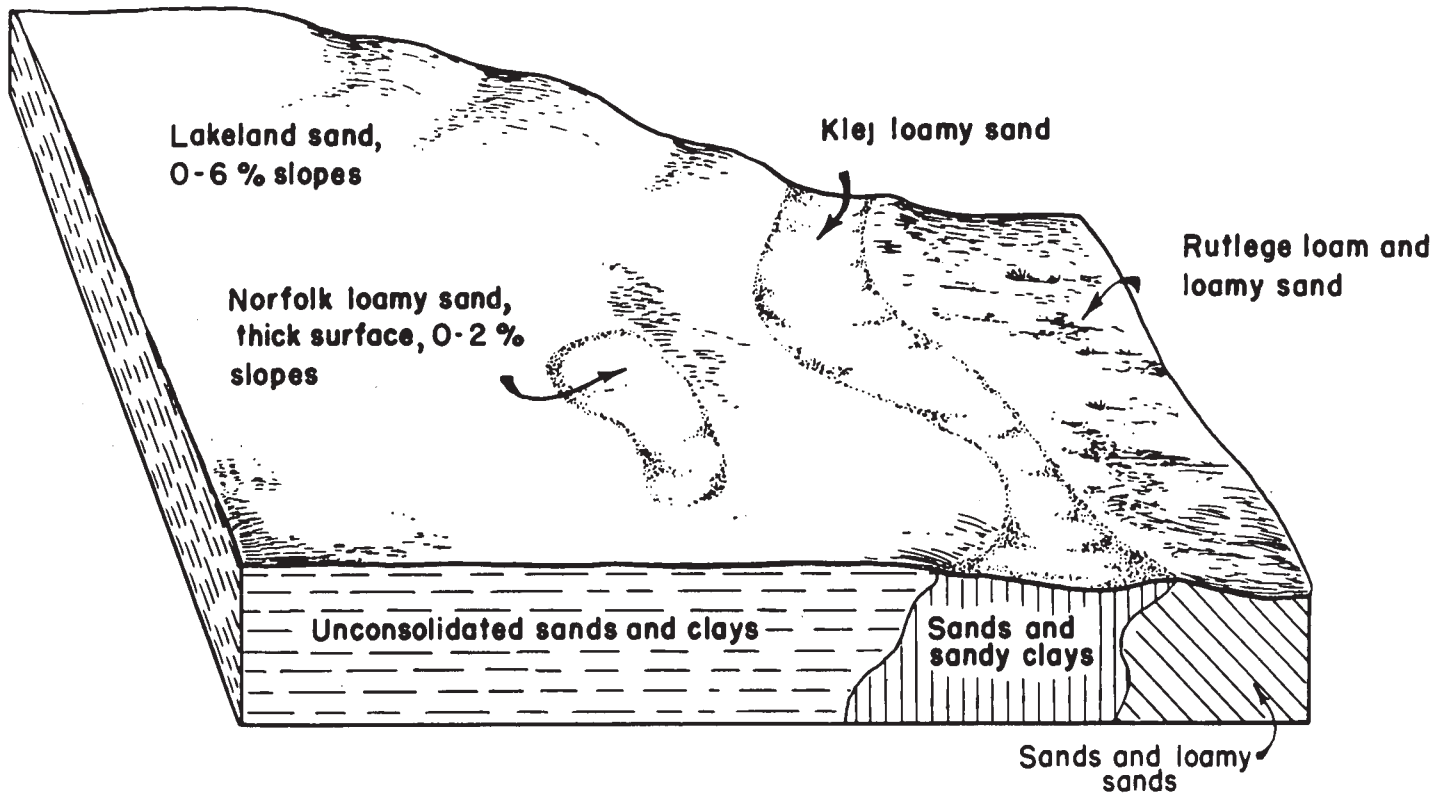

Figure 8.—Major soils in association 7 and their general location on the landscape.

it difficult to maintain open ditches. Water erosion is not a major problem, but large fields are likely to be eroded by the wind early in spring. Good management practices, such as utilizing crop residues and planting close-growing crops and windbreaks, help to control wind erosion.

8. *Craven-Lenoir-Caroline association*

Nearly level to gently sloping, somewhat poorly drained to well drained soils

One area of this association is in the south-central part of the county, and one is in the southeastern part. Both are dissected by several small streams and many drainageways. Cottingham Creek and Hagins Prong Creek are the major drainageways. Except for slopes leading to drainageways and streams, most of the area is nearly level.

Craven soils make up about 45 percent of this association, Lenoir soils about 30 percent, Caroline soils about 15 percent, and Coxville, Dunbar, Marlboro, and Norfolk soils about 10 percent. All of these soils developed from unconsolidated sands and clays.

The moderately well drained Craven soils are in nearly level areas between the Caroline and the Lenoir soils. Their gray fine sandy loam surface layer is underlain by yellowish-brown, mottled sandy clay and clay. The somewhat poorly drained Lenoir soils are at the lowest elevations. They have a surface layer of dark-gray to olive-brown loam and a subsoil of light olive-brown to light brownish-gray, mottled sandy clay to clay. The well-drained Caroline soils are at the highest elevations. They have a surface layer of pale-brown to gray fine sandy loam and a subsoil of strong-brown to yellowish-red, heavy fine sandy clay loam to clay. Figure 9 shows the general location of each of the major soils in this association.

About 70 percent of the acreage is cultivated or is used as pasture. Cotton, corn, small grain, soybeans, and tobacco are the chief crops. Most farms are owner operated general farms between 100 and 150 acres in size. In recent years a few fairly large areas have been planted to pines. On a few farms are small herds of beef or dairy cattle. The remaining 30 percent of the acreage is woodland. Hardwoods predominate along the streams, a mixture of hardwoods and pines in the lower areas, and pines in the uplands. A few small areas are leased or owned by timber companies and are used primarily for the production of pulpwood. Food and cover for wildlife are ample. Farm ponds and streams provide good fishing, swimming, and boating. Other recreational activities include hunting and hiking.

Drainage is required before the Craven and Lenoir soils and the nearly level areas of Caroline soils can be used for crops or pasture. Because of the moderately slow to slow permeability of the subsoil, the gently sloping areas of these soils are likely to erode. In large fields, wind erosion is a hazard early in spring. Close-growing crops, windbreaks, stripcropping, vegetated waterways, and contour tillage are effective in helping to control erosion.

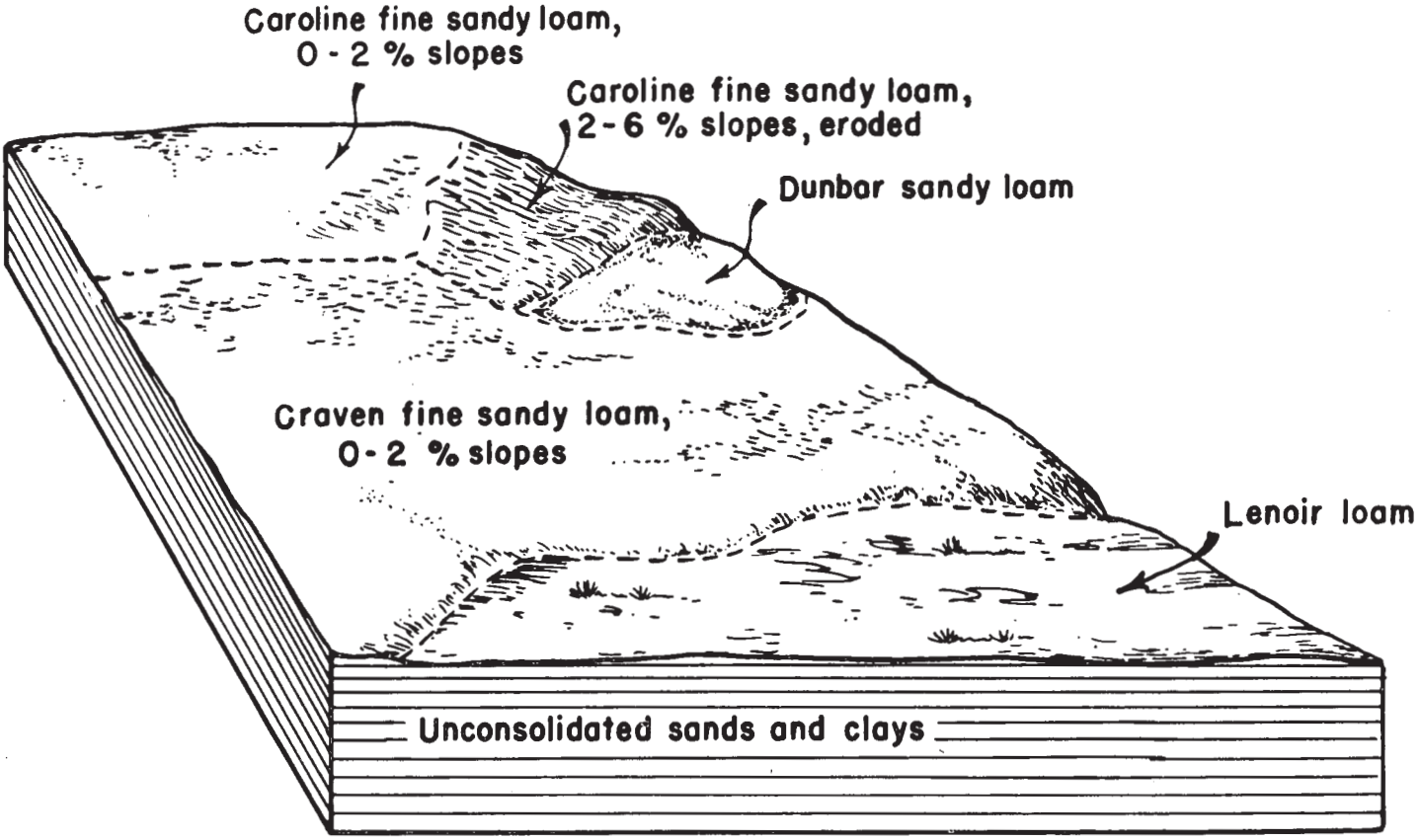

Figure 9.—**Major soils in association 8 and their general location on the landscape.**

9. Marlboro-Faceville–Magnolia association

Nearly level to sloping, well-drained soils with red or yellow subsoil

This association is in the central part of the county. It consists of broad areas broken by many shallow drains, several well-defined drainageways, and a few oval depressions (Carolina bays). Cottingham Creek is the major drainageway.

Marlboro soils make up about 50 percent of this association, Faceville soils about 25 percent, Magnolia soils about 15 percent, and Grady, McColl, Norfolk, and Ruston soils and Local alluvial land about 10 percent. All of these soils developed from unconsolidated sands and clays.

The well-drained Marlboro soils are principally on nearly level plains but occur also on the side slopes of depressions and drainageways. They have a surface layer of dark-gray to light brownish-gray loamy sand and a subsoil of yellowish-brown sandy clay. The well-drained Faceville and Magnolia soils are on nearly level plains and on gentle slopes adjacent to depressions and drainageways. Faceville soils have a surface layer of dark-gray to grayish-brown loamy sand and a subsoil of yellowish-red sandy clay. Magnolia soils have a surface layer of dark-brown to grayish-brown loamy sand and a subsoil of red sandy clay. The oval depressions are occupied mainly by Grady and McColl soils. The very poorly drained or poorly drained Grady soils have a surface layer of dark-gray loam and a subsoil of mottled sandy clay or clay. The poorly drained or somewhat poorly drained McColl soils have a surface layer of black or dark grayish-brown loam underlain by gray to strong-brown, mottled heavy clay loam to sandy clay loam. The depressions in this association range from 5 to 50 acres in size. Some of these depressions have no drainage outlets, and water stands in them for long periods. Figure 10 shows the general location of each of the major soils in the association.

The soils of this association are among the most productive in the county. About 85 percent of the acreage is in crops or is used as pasture. Cotton, corn, soybeans, small grain, and tobacco are the main cultivated crops. The farms are about 175 to 250 acres in size. Heavy farm machinery can be used, and farming is highly mechanized. Most farms are of the general type, and most are owner operated. Some support sizable herds of livestock. Several small areas have been planted to pines in recent years. The remaining 15 percent of this association is woodland. Hardwoods are dominant along the streams, a mixture of hardwoods and pines in the depressions, and pines in the uplands. Farm ponds and streams provide excellent fishing.

Other recreational activities include swimming, boating, hunting, and hiking. Wooded areas provide most of the food and cover for wildlife; crop residues provide some.

The soils in this association are responsive to good management, and yields are high. The sloping areas are subject to water erosion, and wind erosion is a hazard in the large fields. Erosion can be controlled effectively with close-growing crops, vegetated waterways, contour tillage, terraces, windbreaks, and other conservation measures.

Descriptions of the Soils

In this section the soils of Marlboro County are described. Descriptions of the soil series, arranged in alphabetic order, give the characteristics that are common to all the soils in each series. Descriptions of the mapping

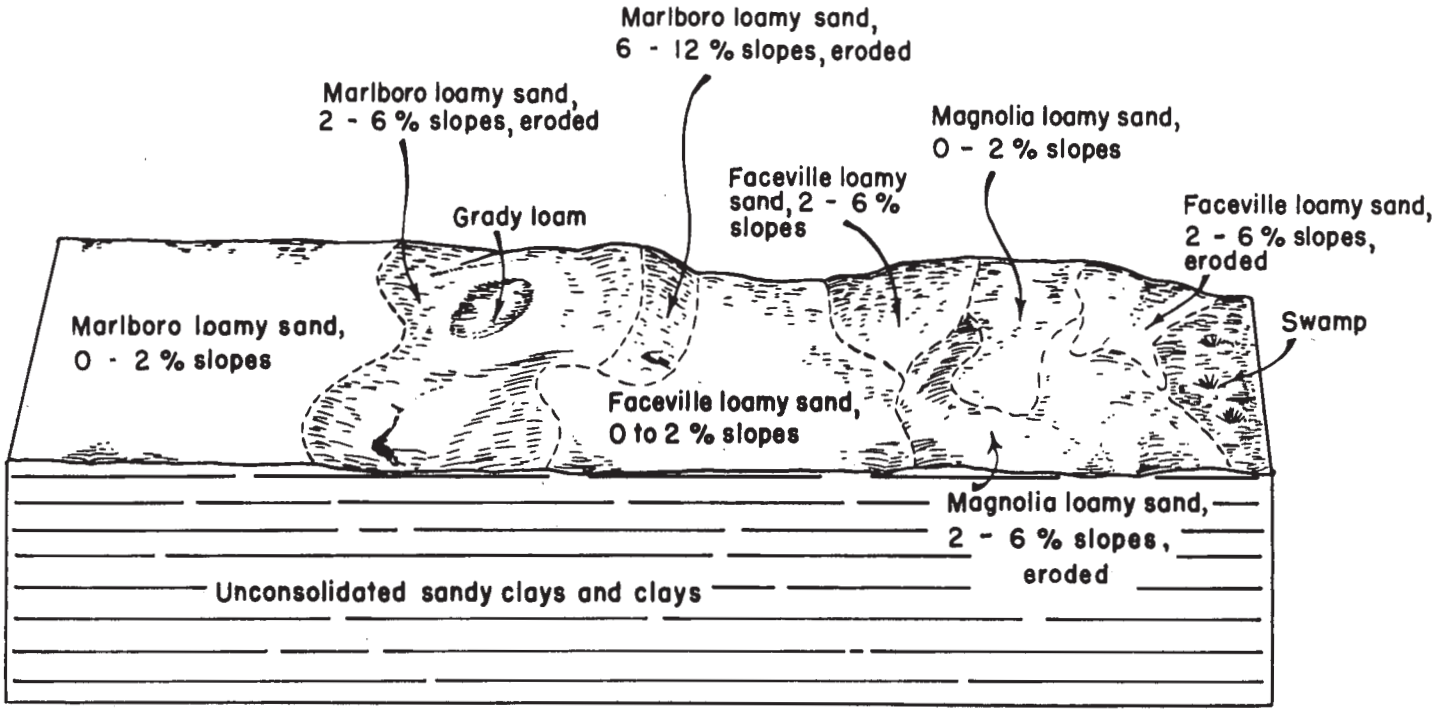

Figure 10.—Major soils in association 9 and their general location on the landscape.

units give the characteristics that differentiate types and phases within each series.

An important part of the soil descriptions is the soil profile, which is included in the description of the first mapping unit of each series. The profile is a record of what the soil scientist observed when he studied the particular soil in the field. All the soils of one series have essentially the same profile. Differences in surface texture, in slope, and in degree of erosion are usually evident from the names of the mapping units. A more complete and technical description of a modal profile of each soil series is given in the section "Formation, Classification, and Morphology of the Soils." Information on the use and management of each soil is given in the section "Use and Management of the Soils."

In describing the soils, some technical terms have been used, because there seems to be no other practical way to describe soils accurately and briefly. Such terms used in this report are defined in the Glossary.

The location and distribution of the individual soils are shown on the detailed map at the back of this report. The approximate acreage and proportionate extent of the soils are given in table 1.

Bayboro Series

The soils of the Bayboro series are nearly level and very poorly drained. They formed in acid clay and sandy clay. The surface layer is black, friable loam high in organic-matter content. It is about 11 inches thick. The subsoil is dark-gray, plastic clay mottled with yellowish brown.

These soils commonly occur with Caroline, Coxville, Craven, and Lenoir soils. They are at lower elevations and are more poorly drained than any of the associated soils, and they have a denser and finer textured subsoil. They have a darker colored surface layer and subsoil than Lenoir soils.

Bayboro soils are mostly in the southern half of the county. They are in low, flat areas and in the oval depressions that are known locally as Carolina bays. The natural vegetation consists of water-tolerant hardwoods and an understory of gallberry, grasses, and shrubs.

Bayboro loam (Ba).—This is a very poorly drained soil in low, flat areas. It is flooded late in winter and in spring. The main layers of a representative profile are—

0 to 11 inches, black, friable loam.
11 to 30 inches, very dark gray, plastic clay; distinct, yellowish-brown mottles.
30 to 42 inches, very dark gray, dense, plastic clay; yellowish-brown and strong-brown mottles.

The surface layer ranges from very dark gray to black. The subsoil ranges from clay to silty clay in texture and from 19 to 26 inches in thickness. Included in the areas mapped are a few small areas of Lenoir and Coxville soils.

This soil is acid. Natural fertility is medium, the organic-matter content is medium to high, and the response to fertilizer and lime is good. Permeability is very slow, and the available moisture capacity is moderate.

Drainage is needed before this soil can be used for crops or pasture. Much of the acreage is in woods. A few areas have been cleared and drained and are used for pasture and a few suitable crops. (Capability unit IIIw–2; woodland group 16; wildlife group D)

Cahaba Series

The soils of the Cahaba series are nearly level to gently sloping. They are deep soils that formed in materials washed from soils of the Coastal Plain uplands. Where not eroded, they have a surface layer of dark-brown, very friable fine sandy loam. The subsoil is yellowish-red, heavy sandy clay loam to heavy sandy loam.

These soils commonly adjoin Kalmia, Flint, and Wahee soils and the terrace phases of Lakeland and Eustis soils. They are on the highest part of the stream terraces and are better drained than any of the adjoining soils. They are similar to Kalmia soils in subsoil texture but are redder than those soils. Cahaba soils have a darker colored surface layer than Lakeland sand, terrace, and are finer textured throughout. They are less fine textured than Flint and Wahee soils, which are in lower positions.

Cahaba soils occur mostly on the terrace of the Great Pee Dee River. The natural vegetation is composed of pines and hardwoods and an understory of grasses and shrubs.

Cahaba fine sandy loam, 0 to 2 percent slopes (CaA).—This is a well-drained soil mainly on the higher parts of the terraces along the Great Pee Dee River. The main layers of a representative profile are—

0 to 8 inches, dark-brown, very friable fine sandy loam.
8 to 35 inches, yellowish-red, friable sandy clay loam.
35 to 55 inches, yellowish-red, friable sandy loam; strong-brown and red mottles; very friable and mottled with brownish yellow below a depth of 46 inches.

The surface layer ranges from dark brown to yellowish brown in color and from 8 to 18 inches in depth. The subsoil ranges from heavy sandy clay loam to heavy sandy loam in texture and from yellowish red to red in color. Included in the areas mapped are a few small areas of Kalmia and Flint soils.

This soil is low in organic-matter content and is slightly acid to very strongly acid. It has a deep root zone, and the available moisture capacity is moderate. Natural fertility is medium, and the response to fertilizer and lime is good. Permeability and infiltration are moderate. Except in small eroded areas, tilth is good.

A small part of this soil is in woods, but the greater part has been cleared and is used for pasture and crops. A wide variety of crops can be grown, including cotton, corn, soybeans, tobacco, small grain, and pasture plants. (Capability unit I–1; woodland group 3; wildlife group A)

Cahaba fine sandy loam, 2 to 6 percent slopes (CaB).—This soil occurs as broad, gently sloping areas and as narrow bands parallel to drainageways. The surface layer is more variable in texture and is generally 1 or 2 inches thinner than that of Cahaba fine sandy loam, 0 to 2 percent slopes. Rapid surface runoff in cultivated fields creates an erosion hazard.

This soil is suited to the same crops as Cahaba fine sandy loam, 0 to 2 percent slopes, and the yields from these two soils are the same.

A complete water-disposal system, including terraces and vegetated outlets or other suitable waterways, is required to ensure high yields and to conserve both soil and water. A rotation that keeps at least half the acreage in close-growing crops is needed to control erosion. (Capability unit IIe–1; woodland group 3; wildlife group A)

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

Soil	Acres	Percent
Bayboro loam	1,275	0.4
Cahaba fine sandy loam, 0 to 2 percent slopes	1,179	.4
Cahaba fine sandy loam, 2 to 6 percent slopes	459	.1
Caroline fine sandy loam, 0 to 2 percent slopes	410	.1
Caroline fine sandy loam, 2 to 6 percent slopes	1,781	.6
Caroline fine sandy loam, 2 to 6 percent slopes, eroded	994	.3
Chewacla silt loam	4,112	1.3
Congaree fine sandy loam	4,440	1.4
Coxville fine sandy loam	7,418	2.4
Coxville fine sandy loam, thin surface	5,059	1.6
Coxville sandy loam	9,080	2.9
Craven fine sandy loam, 0 to 2 percent slopes	7,542	2.4
Dunbar fine sandy loam	960	.3
Dunbar sandy loam	4,946	1.6
Eustis loamy sand, terrace, 0 to 6 percent slopes	566	.2
Eustis sand, 0 to 6 percent slopes	1,053	.3
Eustis sand, moderately shallow, 0 to 2 percent slopes	1,189	.4
Eustis sand, moderately shallow, 2 to 6 percent slopes	670	.2
Eustis sand, moderately shallow, 6 to 10 percent slopes	248	.1
Faceville loamy sand, 0 to 2 percent slopes	701	.2
Faceville loamy sand, 2 to 6 percent slopes	1,322	.4
Faceville loamy sand, 2 to 6 percent slopes, eroded	460	.1
Flint fine sandy loam, 0 to 2 percent slopes	4,114	1.3
Flint fine sandy loam, 2 to 6 percent slopes	1,637	.5
Flint fine sandy loam, 2 to 6 percent slopes, eroded	1,096	.4
Flint fine sandy loam, 6 to 12 percent slopes	237	.1
Gilead sand, 0 to 2 percent slopes	296	.1
Gilead sand, 2 to 6 percent slopes	1,468	.5
Gilead sand, 6 to 10 percent slopes	477	.2
Gilead sand, thick surface, 0 to 2 percent slopes	744	.2
Gilead sand, thick surface, 2 to 6 percent slopes	1,579	.5
Gilead sand, thick surface, 6 to 10 percent slopes	1,882	.6
Goldsboro loamy sand, 0 to 2 percent slopes	2,064	.7
Grady loam	7,526	2.4
Izagora fine sandy loam	2,320	.8
Kalmia loamy fine sand, 0 to 2 percent slopes	1,287	.4
Kalmia loamy fine sand, 2 to 6 percent slopes	449	.1
Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes	652	.2
Klej loamy sand	1,424	.5
Lakeland sand, 0 to 6 percent slopes	27,485	8.9
Lakeland sand, 6 to 10 percent slopes	6,858	2.2
Lakeland sand, 10 to 15 percent slopes	1,549	.5
Lakeland sand, gravelly variant, 0 to 10 percent slopes	1,922	.6
Lakeland sand, gravelly variant, 10 to 15 percent slopes	1,363	.4
Lakeland sand, moderately shallow, 0 to 2 percent slopes	3,723	1.2
Lakeland sand, moderately shallow, 2 to 6 percent slopes	3,902	1.3
Lakeland sand, moderately shallow, 6 to 10 percent slopes	353	.1
Lakeland sand, terrace, 0 to 6 percent slopes	1,320	.4
Lakewood sand	91	(1)
Leaf fine sandy loam	8,532	2.8
Lenoir loam	5,959	1.9
Local alluvial land	1,529	.5
Lynchburg loamy sand	407	.1
Magnolia loamy sand, 0 to 2 percent slopes	138	(1)
Magnolia loamy sand, 2 to 6 percent slopes, eroded	182	0.1
Marlboro loamy sand, 0 to 2 percent slopes	6,069	2.0
Marlboro loamy sand, 2 to 6 percent slopes	1,745	.6
Marlboro loamy sand, 2 to 6 percent slopes, eroded	716	.2
Marlboro loamy sand, 6 to 12 percent slopes, eroded	150	(1)
McColl loam	2,933	1.0
Mine pits and dumps	1,065	.3
Mixed alluvial land	4,353	1.4
Molena loamy sand, 0 to 10 percent slopes	734	.2
Myatt sandy loam	1,865	.6
Norfolk loamy sand, 0 to 2 percent slopes	16,364	5.3
Norfolk loamy sand, 2 to 6 percent slopes	14,508	4.7
Norfolk loamy sand, 2 to 6 percent slopes, eroded	1,113	.4
Norfolk loamy sand, 6 to 10 percent slopes	490	.2
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	6,350	2.1
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	11,095	3.6
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	723	.2
Plummer loamy sand	2,206	.7
Portsmouth and Okenee loams	2,590	.8
Rains sandy loam	3,265	1.1
Ruston loamy sand, 0 to 2 percent slopes	2,099	.7
Ruston loamy sand, 2 to 6 percent slopes	3,008	1.0
Ruston loamy sand, 2 to 6 percent slopes, eroded	752	.2
Ruston loamy sand, 6 to 10 percent slopes, eroded	360	.1
Ruston loamy sand, thick surface, 0 to 2 percent slopes	622	.2
Ruston loamy sand, thick surface, 2 to 6 percent slopes	1,186	.4
Ruston loamy sand, thick surface, 6 to 10 percent slopes	168	.1
Rutlege loam	2,629	.9
Rutlege loamy sand	7,836	2.5
Swamp	23,042	7.5
Vaucluse sand, 2 to 6 percent slopes	214	.1
Vaucluse sand, 6 to 10 percent slopes	465	.2
Vaucluse sand, 6 to 10 percent slopes, eroded	342	.1
Vaucluse sand, 10 to 15 percent slopes	947	.3
Vaucluse sand, 10 to 15 percent slopes, eroded	1,019	.3
Vaucluse sand, 15 to 25 percent slopes, eroded	1,781	.6
Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded	172	.1
Vaucluse sand, thick surface, 2 to 6 percent slopes	295	.1
Vaucluse sand, thick surface, 6 to 10 percent slopes	592	.2
Vaucluse sand, thick surface, 10 to 15 percent slopes	1,412	.5
Wahee very fine sandy loam	10,046	3.3
Wehadkee silt loam	20,105	6.5
Wickham sandy loam, 2 to 6 percent slopes	373	.1
Wickham sandy loam, 2 to 6 percent slopes, eroded	252	.1
Total land area	308,480	99.7
Water	1,280	
Total	309,760	

[1] Less than 0.05 percent.

Caroline Series

The soils of the Caroline series are nearly level to gently sloping, moderately deep, and well drained. They formed in beds of unconsolidated sands and clays. The surface layer consists of pale-brown to gray, very friable fine sandy loam and is about 9 inches thick. The subsoil is strong-brown fine sandy clay and clay mottled with yellowish red and brownish yellow.

These soils commonly adjoin Craven, Marlboro, Norfolk, Ruston, and Lenoir soils. They are similar to Marlboro soils in subsoil texture but have slower internal drainage. They are finer textured throughout than Norfolk and Ruston soils and are less well drained. Caroline soils are at higher elevations than Craven and Lenoir soils and are better drained.

Caroline soils are mostly in the southern part of the county, in an area centered largely around Blenheim and extending southward to the Dillon County line. The natural vegetation consists of a mixture of pines and hardwoods and an understory of gallberry bushes, grasses, and shrubs.

Caroline fine sandy loam, 2 to 6 percent slopes (CfB).—This is a moderately deep, well-drained, gently sloping soil of the Coastal Plain uplands. The main layers of a representative profile are—

0 to 9 inches, pale-brown to gray, very friable fine sandy loam.
9 to 19 inches, strong-brown, slightly plastic fine sandy clay loam; yellowish-red mottles.
19 to 40 inches, strong-brown and brownish-yellow, firm, plastic and sticky fine sandy clay or sandy clay mottled with red and brownish yellow; strong-brown and gray mottles below a depth of 32 inches.

The surface layer ranges from pale brown to gray in color. The subsoil ranges from heavy fine sandy clay to clay in texture and from strong brown to yellowish red in color. Included in the areas mapped are a few small areas of Norfolk, Ruston, and Marlboro soils.

This soil is slightly acid to strongly acid. The organic-matter content is medium. Permeability is moderately slow, and the available moisture capacity is moderate. Natural fertility is medium, and the response to fertilizer and lime is good. Because water moves moderately slowly through the subsoil, this soil cannot be tilled so soon after rains as can some of the surrounding, more permeable soils.

A large part of this soil is used for crops and pasture. Some of the suitable crops are soybeans, cotton, and corn. Bahiagrass, bermudagrass, and sericea lespedeza are commonly used for pasture and hay. If limed and fertilized liberally and otherwise well managed, this soil produces satisfactory yields. (Capability unit IIe–3; woodland group 3; wildlife group A)

Caroline fine sandy loam, 0 to 2 percent slopes (CfA).—This soil is on nearly level uplands. The surface layer is generally 1 to 3 inches thicker and slightly higher in organic-matter content than that of Caroline fine sandy loam, 2 to 6 percent slopes. Surface runoff is slow. Water tends to puddle in some places after heavy rains because of moderately slow permeability in the subsoil.

This soil is suited to the same crops as Caroline fine sandy loam, 2 to 6 percent slopes, and the yields from these two soils are about the same. Artificial drainage is needed for good yields. (Capability unit IIw–5; woodland group 3; wildlife group A)

Caroline fine sandy loam, 2 to 6 percent slopes, eroded (CfB2).—The surface layer of this soil is more variable and is generally 2 to 4 inches thinner than that of Caroline fine sandy loam, 2 to 6 percent slopes. The plow layer consists of a mixture of the original surface layer and the original subsoil. Surface runoff in cultivated fields creates an erosion hazard because of the slope and the moderately slow movement of water through the subsoil. Small patches are eroded, and in these places the strong-brown clayey subsoil is exposed, infiltration is slower, tilth is poorer, and cultivation is more difficult.

This soil is fairly well suited to pasture and to most crops grown in the county, but yields are low. (Capability unit IIe–3; woodland group 3; wildlife group A)

Chewacla Series

The soils of the Chewacla series are nearly level and are somewhat poorly drained or moderately well drained. They formed in alluvium washed from the Piedmont uplands and deposited on flood plains. The surface layer is dark-brown, very friable silt loam. It is underlain by grayish-brown and light yellowish-brown silty clay loam mottled with yellowish brown and pale brown.

These soils commonly adjoin Congaree and Wehadkee soils and are in intermediate positions between the two. They are better drained than Wehadkee soils but are less well drained than Congaree soils.

Chewacla soils are on the flood plain of the Great Pee Dee River, which forms the western boundary of the county. The natural vegetation consists of water-tolerant hardwoods, extensive areas of loblolly pine, and an understory of grasses, shrubs, and bushes.

Chewacla silt loam (Ch).—This is a somewhat poorly drained or moderately well drained soil on the flood plain of the Great Pee Dee River. It is flooded frequently, late in winter and in spring, when the river overflows. The main layers of a representative profile are—

0 to 3 inches, dark-brown, very friable silt loam; numerous fine mica flakes.
3 to 12 inches, dark yellowish-brown, friable silty clay loam; a few fine mica flakes.
12 to 42 inches, grayish-brown and light yellowish-brown, friable to firm silty clay loam; yellowish-brown mottles; pale-brown mottles below a depth of 23 inches.

The surface layer ranges from dark brown to pale brown in color. In some places the texture of the surface layer is silty clay loam. The underlying soil material is stratified in many places and ranges from silt loam to silty clay loam in texture. The quantity of micaceous material varies from one locality to another and within one profile. Included in the areas mapped are a few small areas of Congaree and Wehadkee soils.

This soil is slightly acid to extremely acid. The organic-matter content is moderately high. The available moisture capacity is moderate. Natural fertility is medium, and the response to fertilizer and lime is good.

Drainage is required before this soil can be used for either pasture or crops. A large part of the acreage is in woods, but a few areas have been cleared and drained and are now used for pasture and a few suitable crops. (Capability unit IIIw–3; woodland group 8; wildlife group D)

Congaree Series

The soils of the Congaree series are deep, nearly level, and well drained. They formed in alluvium washed from Carolina slate and basic rocks of the Piedmont uplands. The surface layer consists of dark grayish-brown, very friable fine sandy loam and is about 9 inches thick. The subsoil is dark yellowish-brown, friable silty clay loam.

These soils commonly adjoin Chewacla and Wehadkee soils and are better drained than either. They are on the highest part of the flood plain. The lower part of the subsoil is less fine textured than that of Chewacla or Wehadkee soils, and it is generally free of mottles to a depth of 20 inches or more.

Congaree soils are on the flood plain of the Great Pee Dee River, which forms the western boundary of the county. The natural vegetation consists of a mixture of hardwoods and loblolly pine and an understory of grasses, shrubs, and bushes.

Congaree fine sandy loam (Co).—This is a well-drained soil on the flood plain of the Great Pee Dee River. It is flooded occasionally by overflow from the river, most commonly late in winter and in spring. The main layers of a representative profile are—

0 to 9 inches, dark grayish-brown, very friable fine sandy loam.
9 to 20 inches, dark yellowish-brown, friable silty clay loam.
20 to 42 inches, yellowish-brown, friable silt loam; dark-brown mottles.

The surface layer ranges from dark grayish brown to dark brown in color, and in a few places the texture is silt loam. The substratum is weakly developed, is stratified in many places, and varies in texture. The quantity of micaceous material varies from one locality to another and also within one profile. Included in the areas mapped are a few small areas of Chewacla soils.

This soil is slightly acid to strongly acid. The organic-matter content is high, and natural fertility is high. Surface runoff is slow, permeability is moderate, and the available moisture capacity is high. The response to fertilizer and lime is good.

About half of the acreage has been cleared and is used for pasture and suitable crops (fig. 11). The rest is in woods. (Capability unit IIw–4; woodland group 5; wildlife group A)

Figure 11.—Pasture on Congaree fine sandy loam, near Wallace, S.C.

Coxville Series

The soils of the Coxville series are nearly level, moderately deep to deep, and poorly drained. They formed in beds of unconsolidated sands and clays. The surface layer consists of very dark gray, very friable fine sandy loam and is about 8 inches thick. The subsoil is gray, plastic silty clay to fine sandy clay loam mottled with strong brown and brownish yellow.

Coxville soils are commonly near or next to Norfolk, Marlboro, Dunbar, Goldsboro, Lenoir, McColl, and Grady soils. They are at lower elevations and are less well drained than Norfolk, Marlboro, Dunbar, or Goldsboro soils. They are more poorly drained than Lenoir soils and have a grayer subsoil. Coxville soils are better drained than Grady soils and have more red mottles in the subsoil. They lack the sand lenses that generally occur in the lower part of the subsoil of Grady soils, and they lack the yellowish-brown color and the medium-sized, soft concretions that occur in the lower part of the subsoil of the McColl soils.

Coxville soils generally are at the lower elevations in the Sand Hills. They occupy drainageways, low, flat areas, and the oval depressions known as Carolina bays. The natural vegetation consists of water-tolerant hardwoods, pines, and an understory of grasses and shrubs.

Coxville fine sandy loam (Cs).—This poorly drained soil is in drainageways, low, flat areas, and oval depressions. Some areas are flooded late in winter and early in spring. The main layers of a representative profile are—

0 to 8 inches, very dark gray, very friable fine sandy loam.
8 to 13 inches, gray, plastic and sticky fine sandy clay loam; distinct, yellowish-brown and strong-brown mottles.
13 to 36 inches, gray, dense, plastic and sticky silty clay; prominent mottles of strong brown and brownish yellow.
36 to 42 inches, gray, massive, plastic fine sandy clay; prominent, brownish-yellow, strong-brown, and red mottles.

The surface layer ranges from very dark gray to black in color and from fine sandy loam to sandy loam in texture. The subsoil ranges from silty clay to fine sandy clay loam. Included in the areas mapped are a few small areas of Lenoir and Dunbar soils.

This soil is acid. The organic-matter content is medium. Permeability is very slow in the subsoil. The available moisture capacity is moderate. Natural fertility is medium, and the response to fertilizer and lime is good.

About half the acreage has been cleared and drained and is now used for pasture and crops. The rest is in woods. (Capability unit IIIw–2; woodland group 10; wildlife group D)

Coxville fine sandy loam, thin surface (Ct).—The surface layer of this soil is about 5 inches thick. The texture of the subsoil ranges from fine sandy clay to clay.

This soil is in the southern half of the county, mostly in the flatwoods east of Blenheim. It adjoins Coxville fine sandy loam and Lenoir loam, both of which are at higher elevations, and it receives runoff from these and other higher lying soils.

Internal movement of water is slow, and water stands on or near the surface most of the time. As a result, this soil is not generally suitable for cultivation. Some small areas can be used for pasture if adequately drained. (Capability unit VIw–1; woodland group 10; wildlife group D)

Coxville sandy loam (Cu).—This soil differs from Coxville fine sandy loam in having a surface layer of sandy loam, a subsoil of sandy clay, a slightly greater rate of infiltration, and slightly better internal drainage. The two soils are suited to the same crops and are about equally productive. (Capability unit IIIw–2; woodland group 10; wildlife group D)

Craven Series

The soils of the Craven series are nearly level and moderately well drained. They formed in thick, unconsolidated beds of sandy clays and clays. The surface layer is very dark gray, friable fine sandy loam. The subsoil is yellowish-brown, plastic sandy clay loam to clay that is mottled at a depth of about 14 inches.

These soils commonly adjoin Norfolk, Marlboro, Faceville, Dunbar, Coxville, and Lenoir soils. They are at lower elevations and are less well drained than Norfolk, Marlboro, and Faceville soils and have a more dense and compact subsoil. They are at slightly higher elevations and are better drained than Dunbar, Coxville, and Lenoir soils. Craven soils have a more slowly permeable subsoil than Dunbar soils.

Craven soils occur mostly in the south-central part of the county, in low, flat areas near Blenheim. The natural vegetation consists of loblolly pine, longleaf pine, hardwoods, and an understory of grasses, shrubs, and bushes.

Craven fine sandy loam, 0 to 2 percent slopes (CvA).—This is a moderately well drained soil in low, flat areas. The main layers of a representative profile are—

0 to 8 inches, very dark gray to light olive-brown, friable fine sandy loam.
8 to 14 inches, yellowish-brown, friable sandy clay loam.
14 to 29 inches, yellowish-brown, firm, sticky and plastic clay loam to clay; red, yellowish-red, and grayish-brown mottles.
29 to 42 inches +, mottled olive-brown, red and yellowish-brown, firm to very firm, sticky clay.

Areas that are cultivated have a light-gray plow layer 5 to 10 inches thick. The subsoil ranges from sandy clay loam to clay in texture and from 26 to 42 inches in thickness. Included with this soil on the map are a few small areas of Lenoir and Dunbar soils.

This soil is medium acid to strongly acid. It is low in natural fertility and contains little organic matter, but the response to lime and fertilizer is good. The available moisture capacity is moderate, infiltration is slow, and permeability is slow.

This soil can be cultivated only within a narrow range of moisture content. If cultivated when too wet, it sticks to the plow and then becomes hard and cloddy. The slowly permeable subsoil is sticky and plastic when wet, and it restricts the movement of water and roots.

If adequately drained and otherwise well managed, this soil is fairly well suited to cultivated crops and to pasture. (Capability unit IIw–5; woodland group 7; wildlife group A)

Dunbar Series

The soils of the Dunbar series are nearly level and somewhat poorly drained. They formed in beds of unconsolidated sands and clays. These soils have a surface layer of dark-gray, very friable sandy loam or fine sandy loam and a subsoil of light yellowish-brown to light olive-brown, sticky sandy clay loam to fine sandy clay.

These soils adjoin Norfolk, Ruston, Marlboro, Goldsboro, Lynchburg, and Coxville soils. They occur at lower elevations than Norfolk, Ruston, Marlboro, and Goldsboro soils and are less well drained. They are comparable to Lynchburg soils in drainage but are finer textured throughout. They are at higher elevations than Coxville soils and are less poorly drained.

Dunbar soils occur mostly in the central and southeastern parts of the county. The natural vegetation is a mixture of hardwoods and pines and an understory of gallberry bushes, grasses, and shrubs.

Dunbar sandy loam (Dd).—This is a somewhat poorly drained soil that is between the moderately well drained Goldsboro soils and the poorly drained Coxville soils. The main layers of a representative profile are—

0 to 11 inches, dark-gray to grayish-brown, very friable sandy loam.
11 to 14 inches, light yellowish-brown, friable to firm sandy clay loam.
14 to 36 inches, light olive-brown, firm fine sandy clay to clay; distinct mottles of strong brown, light yellowish brown, and brownish yellow; distinct mottles of red and yellowish brown below a depth of 28 inches.
36 to 42 inches +, gray, firm sandy clay; sticky when wet; prominent mottles of red, strong brown, and brownish yellow.

The surface layer ranges from dark gray to grayish brown in color and from sandy loam to fine sandy loam in texture. The subsoil ranges from sandy clay loam to fine sandy clay. In some places the upper part of the subsoil is grayish brown in color and is mottled. Included in the areas mapped are a few small areas of Goldsboro and Lynchburg soils.

This soil is acid. Natural fertility is high, and the organic-matter content is medium. Surface runoff and internal drainage are slow, permeability is moderately slow, infiltration is moderate, and the available moisture capacity is moderate. The response to lime and fertilizer is good. This soil cannot be tilled so soon after a rain as can some of the surrounding better drained soils.

If adequately drained, this soil can be used for most crops commonly grown in the county. Most of the acreage has been cleared and drained and is used for pasture and crops. (Capability unit IIw–2; woodland group 7; wildlife group C)

Dunbar fine sandy loam (Db).—This soil occurs at a slightly lower elevation than Dunbar sandy loam, and it has a somewhat slower rate of infiltration and slower permeability. In some places it has a finer textured subsoil. Most of the acreage is in the southeastern part of the county near Dunbar.

This soil is suited to the same crops and requires about the same management as Dunbar sandy loam. The two soils are equally productive. (Capability unit IIw–2; woodland group 7; wildlife group C)

Eustis Series

The soils of the Eustis series are nearly level to sloping and are somewhat excessively drained. They formed in thick beds of unconsolidated sands. The surface layer is about 12 inches of dark-brown to yellowish-red, very friable sand. It is underlain by yellowish-red to red, structureless sand.

These soils commonly adjoin Ruston, Norfolk, Vaucluse, Gilead, Plummer, and Rutlege soils. They are coarser textured throughout than any of these adjoining soils. They lack the compact layer that commonly occurs in the Gilead and Vaucluse soils. In comparison with Plummer and Rutlege soils, they are better drained and contain less organic matter.

Eustis soils occur on the terrace of the Great Pee Dee River and on the adjacent uplands along the western border of the county. They also occur in the Sand Hills and to a lesser extent in other parts of the county. The natural vegetation is composed of longleaf pine, loblolly pine, and an understory of blackjack oak, turkey oak, dogwood, and persimmon.

Eustis sand, 0 to 6 percent slopes (EdB).—This somewhat excessively drained soil is not subject to water erosion. The main layers of a representative profile are—

0 to 12 inches, dark-brown to yellowish-red, very friable sand.
12 to 24 inches, yellowish-red, very friable to loose sand.
24 to 42 inches, red, structureless, loose sand.

The surface layer ranges from dark brown to grayish brown in color, depending on management and the intensity of cultivation. Along the stream terrace, the surface texture generally is loamy sand. The subsoil ranges from yellowish red to red in color and from loamy sand to sand in texture. Included in mapping were a few small areas of Local alluvial land.

This soil is acid. Natural fertility is low, and the organic-matter content is low. Surface runoff is slow, internal drainage is rapid, and permeability is rapid. The available moisture capacity is low. The response to fertilizer and lime is good.

Most of this soil is wooded. A few areas next to the Great Pee Dee River have been cleared and are used for pasture and crops. The risk of wind erosion in large fields is severe during dry periods early in spring. Lime and fertilizer leach out rapidly. (Capability unit IVs–1; woodland group 1; wildlife group B)

Eustis loamy sand, terrace, 0 to 6 percent slopes (EbB).—This soil is on the terrace of the Great Pee Dee River and is flooded occasionally. It is low in content of organic matter and plant nutrients and low in available moisture capacity.

This soil is fairly well suited to most crops grown in the county and is fair for hay and pasture. It becomes loose and dry during the occasional long periods without rain, and consequently wind erosion is a hazard in large fields. The response to lime and fertilizer is good, but lime and fertilizer are leached out rapidly. (Capability unit IIIs–1; woodland group 1; wildlife group B)

Eustis sand, moderately shallow, 0 to 2 percent slopes (EmA).—This soil occurs as small areas throughout the county but is most extensive in the northwestern part. It has a thinner surface layer than Eustis sand, 0 to 6 percent slopes. The surface layer is 30 to 42 inches of sand or loamy sand, and the subsoil is sandy loam or sandy clay loam. Permeability is less rapid than in Eustis sand, 0 to 6 percent slopes, and the available moisture capacity is greater.

Yields of suitable crops are fair if large amounts of fertilizer are applied. (Capability unit IIIs–1; woodland group 2; wildlife group B)

Eustis sand, moderately shallow, 2 to 6 percent slopes (EmB).—This soil is similar to Eustis sand, 0 to 6 percent slopes. The soil material at a depth of 30 to 42 inches is sandy loam or sandy clay loam.

This soil is less droughty and less rapidly permeable than Eustis sand, 0 to 6 percent slopes. The two soils are suited to the same crops and can be managed in the same way, but yields are somewhat higher on this soil. Wind erosion is a severe hazard in large fields. (Capability unit IIIs–1; woodland group 2; wildlife group B)

Eustis sand, moderately shallow, 6 to 10 percent slopes (EmC).—This soil has a thinner surface layer than Eustis sand, 0 to 6 percent slopes. Because of its stronger slope, it is more likely to erode. The soil material at a depth of 30 to 42 inches is sandy loam or sandy clay loam.

This soil is suited to only a few cultivated crops. It is fairly well suited to pasture grasses. It is low in productivity, and crops need to be fertilized frequently. All cover crops should be turned under to help conserve moisture and to increase the organic-matter content. (Capability unit IVs–1; woodland group 2; wildlife group B)

Faceville Series

The soils of the Faceville series are deep, well drained, and nearly level to gently sloping. They formed in thick beds of unconsolidated sandy clays and clays. Where not eroded, they have a surface layer of grayish-brown, friable loamy sand. The subsoil is strong-brown to yellowish-red sandy clay. A few small, dark-brown concretions are distributed throughout the profile.

Faceville soils are adjacent to Marlboro, Magnolia, Ruston, Norfolk, Dunbar, Grady, and Coxville soils. They differ from Marlboro and Norfolk soils in having a strong-brown to yellowish-red, rather than a yellow to yellowish-brown, subsoil. They have a thinner surface layer and a finer textured subsoil than either Norfolk or Ruston soils. They are similar to Magnolia soils in drainage, but they have a less red subsoil. They are at a higher elevation and are better drained than Dunbar, Grady, or Coxville soils.

Faceville soils are mostly in the central part of this county, but there are small areas in the eastern and southeastern parts. The natural vegetation consists of hardwoods, pines, and an understory of grasses and shrubs.

Faceville loamy sand, 0 to 2 percent slopes (FaA).—This is a well-drained soil on uneroded upland plains. The main layers of a representative profile are—

0 to 6 inches, grayish-brown, friable loamy sand.
6 to 9 inches, strong-brown, friable sandy clay; slightly sticky when wet.
9 to 42 inches +, yellowish-red sandy clay; friable or firm when moist, sticky when wet; distinct, red and brownish-yellow mottles; prominent, brownish-yellow mottles below a depth of 27 inches; few, small, dark-brown concretions.

The surface layer ranges from grayish brown to dark gray in color and from 6 to 12 inches in thickness. The subsoil ranges from sandy clay to heavy sandy clay loam in texture and from strong brown to yellowish red in color. The concretions vary in number and size, and in some places there are none. The depth to the underlying material ranges from 31 inches to more than 42 inches. Included in mapping were a few small areas of Local alluvial land and of Marlboro soils.

This soil is acid, is high in natural fertility, and contains a moderate amount of organic matter. The available

moisture capacity is moderate, and the rate of infiltration is medium. Tilth is good.

This soil is well suited to mechanized farming, and it responds well to good management, including the application of fertilizer and lime. It is well suited to the crops commonly grown in the county. Under good management crop yields are high. Most of the acreage is cultivated. (Capability unit I–2; woodland group 3; wildlife group A)

Faceville loamy sand, 2 to 6 percent slopes (FaB).—Except for stronger slope and a moderate rate of surface runoff, this soil is like Faceville loamy sand, 0 to 2 percent slopes. Water erosion is a slight hazard.

This soil is well suited to the crops commonly grown in the county. Yields are the same as on Faceville loamy sand, 0 to 2 percent slopes. Large fields permit the use of heavy farm machinery.

Tillage operations should be on the contour to help control erosion. All crop residues should be turned under to increase the organic-matter content and to conserve moisture. (Capability unit IIe–2; woodland group 3; wildlife group A)

Faceville loamy sand, 2 to 6 percent slopes, eroded (FaB2).—The surface layer of this soil contains some of the original subsoil. It is 3 to 5 inches thinner than the surface layer of Faceville loamy sand, 0 to 2 percent slopes. Runoff is more rapid than on the nearly level soil, and this soil is therefore likely to erode.

This soil gets hard during long dry periods. Establishing a crop in galled areas is difficult, and plants are usually stunted. A complete water-disposal system is needed. Contour tillage helps to control erosion. All crop residues should be turned under to conserve moisture and to increase the organic-matter content.

This soil is suited to the crops commonly grown in the county. Yields are lower than on Faceville loamy sand, 0 to 2 percent slopes. (Capability unit IIe–2; woodland group 3; wildlife group A)

Flint Series

The soils of the Flint series are moderately deep, nearly level to strongly sloping, and moderately well drained. They formed in a mixture of materials washed from soils of the Coastal Plain and the Piedmont Plateau. The surface layer is about 6 inches of grayish-brown, very friable fine sandy loam. The subsoil is reddish-yellow, slightly plastic clay loam and clay that is mottled with reddish yellow, red, and strong brown.

These soils commonly are adjacent to Cahaba, Kalmia, Leaf, Myatt, and Wahee soils. They are between the higher lying Cahaba and Kalmia soils and the lower lying Leaf and Myatt soils. They are more poorly drained than Cahaba and Kalmia soils and have a finer textured subsoil. They are better drained than Leaf, Myatt, and Wahee soils. Flint soils differ from Wahee soils in having a reddish-yellow subsoil. In some places Flint soils resemble Wahee soils in color and texture, but they lack the gray mottles that occur near the surface of Wahee soils.

Flint soils are on terraces of the larger streams in Marlboro County but are most extensive in the western part of the county along the Great Pee Dee River. The natural vegetation consists of loblolly pine, longleaf pine, hardwoods, and an understory of grasses, bushes, and shrubs.

Flint fine sandy loam, 0 to 2 percent slopes (FfA).—This is a moderately deep, moderately well drained soil on the terrace of the Great Pee Dee River. The main layers of a representative profile area—

0 to 6 inches, grayish-brown, very friable fine sandy loam.
6 to 12 inches, reddish-yellow, slightly plastic clay loam.
12 to 28 inches, reddish-yellow clay; firm when moist, sticky and slightly plastic when wet; faint, reddish-yellow mottles, and distinct, red, brownish-yellow, and light-gray mottles; few small, dark-brown, hard concretions.
28 to 50 inches +, mottled clay; very firm when moist, plastic when wet; strong-brown, yellowish-brown, light-gray, and yellowish-red mottles; few, small, dark-brown, hard concretions.

The surface layer ranges from dark brown to grayish brown in color and from 6 to 8 inches in thickness. The subsoil ranges from 22 to 42 inches in thickness and from light yellowish brown to reddish yellow or, in a few places, yellowish red in color. Included with this soil in mapping were a few small areas of Wahee soils.

This soil is acid. It is medium in natural fertility and medium in organic-matter content. The response to fertilizer and lime is good. The available moisture capacity is moderate. The range of moisture content within which this soil can be worked is not so wide as for the better drained associated soils. Water moves into and through this soil slowly, and after a heavy rain, water is likely to accumulate on the surface. During dry periods the soil becomes hard and compact and is difficult to work.

A fairly large acreage has been cleared and drained and is now used for pasture and crops. The remaining acreage is wooded. Under good management that includes adequate drainage, this soil produces fair yields of most crops commonly known in the county. (Capability unit IIw–5; woodland group 6; wildlife group A)

Flint fine sandy loam, 2 to 6 percent slopes (FfB).—This soil is suited to the same crops and produces about the same yields of these crops as Flint fine sandy loam, 0 to 2 percent slopes. It is fairly productive, but because of its gentle slopes it is subject to erosion. To control erosion, close-growing crops should be grown every other year, and tillage should be on the contour. All crop residues should be turned under to increase the organic-matter content, improve tilth, and conserve moisture. Grassed waterways and other means of water control are needed. (Capability unit IIe–3; woodland group 6; wildlife group A)

Flint fine sandy loam, 2 to 6 percent slopes, eroded (FfB2).—This gently sloping soil commonly has a thinner surface layer than Flint fine sandy loam, 0 to 2 percent slopes. Generally the plow layer is a mixture of the original surface layer and the subsoil. In many places the subsoil is exposed.

This soil is suited to the same crops as Flint fine sandy loam, 0 to 2 percent slopes, but it does not produce as high yields of these crops. It should be kept in close-growing crops half the time and should be tilled on the contour. All crop residues should be turned under to increase the organic-matter content, improve tilth, and conserve moisture. Grassed waterways and other means of water control are needed.

During periods when little or no rain falls, this soil becomes hard and compact. Establishing a stand of crops on the more eroded areas is difficult. (Capability unit IIe–3; woodland group 6; wildlife group A)

Flint fine sandy loam, 6 to 12 percent slopes (FfC).—This soil occurs as long, narrow bands parallel to or sloping toward drainageways. Its surface layer is generally about 4 inches thick, while that of Flint fine sandy loam, 0 to 2 percent slopes, is 6 to 8 inches thick.

This soil is likely to erode and is best kept in trees. The less sloping areas can be used to a limited extent for pasture or crops. To control erosion, close-growing crops should be grown 2 years out of 3, and tillage should be on the contour. Grassed waterways and other water-control measures are needed. (Capability unit IIIe–3; woodland group 6; wildlife group A)

Gilead Series

The soils of the Gilead series are nearly level to sloping, moderately deep, and well drained. They formed in beds of unconsolidated sands and clays. The surface layer is grayish-brown, very friable sand and is about 8 inches thick. The subsoil is yellowish-brown, friable to firm and somewhat compact sandy clay loam or sandy clay mottled with strong brown and yellowish red.

These soils generally are adjacent to Norfolk, Ruston, Lakeland, Eustis, and Vaucluse soils. Their subsoil contains a compact layer that is lacking in the subsoil of Norfolk and Ruston soils. Furthermore, their subsoil generally is paler in color than the subsoil of Norfolk soils, and it contrasts with the reddish Ruston soils. Gilead soils are finer textured than the excessively drained Lakeland and Eustis soils. They are similar to Vaucluse soils in drainage and subsoil texture, but their subsoil is yellowish brown rather than yellowish red.

Gilead soils are distributed throughout Marlboro County, but they are mostly on the more gentle side slopes in the Sand Hills. The natural vegetation consists of hardwoods, pines, and an understory of scrub oak, grasses, bushes, and shrubs.

Gilead sand, 2 to 6 percent slopes (GaB).—This is a well-drained, gently sloping soil that is subject to water erosion. The main layers of a representative profile are—

0 to 8 inches, grayish-brown, very friable sand.
8 to 15 inches, light yellowish-brown, very friable loamy sand.
15 to 28 inches, yellowish-brown sandy clay and sandy clay loam; friable or firm and somewhat compact; distinct mottles of strong brown and yellowish red below a depth of 20 inches.
28 to 36 inches +, firm and compact sandy clay; distinct mottles of pale brown, yellowish brown, light gray, and red; red and gray mottling increases with depth.

The surface layer is 8 to 18 inches thick. It ranges in color from grayish brown to dark grayish brown or, in eroded areas, yellowish brown. Ordinarily, the texture is sand, but in a few places it is loamy sand. The subsoil ranges from sandy clay loam to sandy clay in texture and from yellowish brown to reddish yellow in color. The depth at which the subsoil is compact ranges from 20 to 36 inches. Included with this soil in mapping were a few small areas of Local alluvial land and Norfolk soils.

This soil is low in organic-matter content and low in natural fertility. It is acid. The available moisture capacity is low. Surface runoff is high, and the rate of infiltration is moderately slow. In many places the compact layer restricts the movement of water and thereby limits the development of roots. In some places, especially on the side slopes, there are wet, seepy areas. The response to fertilizer and lime is good.

About half the acreage is in cultivated crops or pasture, and the rest is wooded. This soil is fairly well suited to the crops commonly grown in the county. Yields are fair. A complete water-disposal system is needed to control runoff and erosion. All crop residues should be turned under to increase the organic-matter content and to improve tilth. (Capability unit IIe–4; woodland group 14; wildlife group A)

Gilead sand, 0 to 2 percent slopes (GaA).—This soil occurs mostly as small areas in the Sand Hills. It is suited to the same crops as Gilead sand, 2 to 6 percent slopes, and produces about the same yields of these crops. Water erosion is not a serious hazard, but there is a risk of wind erosion in the larger fields. Windbreaks of trees and shrubs help to control wind erosion. All crop residues should be turned under to increase the organic-matter content and to improve tilth. (Capability unit IIs–2; woodland group 14; wildlife group A)

Gilead sand, 6 to 10 percent slopes (GaC).—This soil is on stronger slopes and is more droughty than Gilead sand, 2 to 6 percent slopes. It occurs as broad, sloping areas and as narrow bands parallel to drainageways. Most of the acreage is in the Sand Hills, but smaller areas are scattered throughout the county.

This soil is suited to the same crops as Gilead sand, 2 to 6 percent slopes, but it yields less than the more gently sloping soil. It is subject to water erosion. A complete water-disposal system should be established, close-growing crops should be grown two-thirds of the time, tillage should be on the contour, and crop residues should be turned under. (Capability unit IIIe–4; woodland group 14; wildlife group A)

Gilead sand, thick surface, 0 to 2 percent slopes (GbA).—This soil is in the Sand Hills. Its surface layer is 18 to 30 inches thick. It contains less organic matter than Gilead sand, 2 to 6 percent slopes, and is more droughty. Fertilizer is leached out rapidly. Wind erosion is a hazard in large fields. The two soils are suited to the same crops, but the thick-surface phase is the less productive. (Capability unit IIs–2; woodland group 14; wildlife group A)

Gilead sand, thick surface, 2 to 6 percent slopes (GbB).—This soil is in the Sand Hills. Its surface layer is 18 to 30 inches thick. It contains less organic matter than Gilead sand, 2 to 6 percent slopes, and is more droughty. Fertilizer is leached out rapidly. Wind erosion is a hazard in the larger fields. Infiltration is more rapid than in Gilead sand, 2 to 6 percent slopes, but permeability in the subsoil is slow. The two soils are suited to the same crops, but the thick-surface phase is the less productive. (Capability unit IIe–4; woodland group 14; wildlife group A)

Gilead sand, thick surface, 6 to 10 percent slopes (GbC).—This soil is along drainageways and small streams in the Sand Hills. The surface layer is 18 to 30 inches thick. Surface runoff is slow, but infiltration is moderately rapid.

This soil is suited to the same crops as Gilead sand, 2 to 6 percent slopes, but is not so productive. It is droughty, and if cultivated it requires frequent applications of fertilizer and lime. If close-growing crops are grown 2 years

out of 3, a row crop can be grown the third year. Tillage should be on the contour. Crop residues should be turned under to increase the organic-matter content, conserve moisture, and improve tilth. A large part of the acreage has been planted to pine trees. (Capability unit IIIe–4; woodland group 14; wildlife group A)

Goldsboro Series

The soils of the Goldsboro series are nearly level and moderately well drained. They formed in thick beds of unconsolidated sands and clays. The surface layer is dark grayish-brown, very friable loamy sand. The subsoil is yellowish-brown and light yellowish-brown, friable, heavy sandy loam and sandy clay loam mottled with strong brown, yellowish brown, light gray, and red.

Goldsboro soils occur at intermediate elevations between the Norfolk, Ruston, and Marlboro soils and the Dunbar, Lynchburg, and Rains soils. They are less well drained than Norfolk, Ruston, and Marlboro soils, and they have more mottles in the subsoil. Their subsoil is less fine textured than that of Marlboro soils, and it is less brown in color. Goldsboro soils are better drained than Dunbar, Lynchburg, or Rains soils. They are comparable to Rains soils in subsoil texture.

Goldsboro soils are mostly in the southern half of the county. The natural vegetation consists of longleaf pine, loblolly pine, hardwoods, and an understory of dogwood, grasses, and shrubs.

Goldsboro loamy sand, 0 to 2 percent slopes (GoA).—This soil occurs throughout the southern part of Marlboro County, but most of the acreage is in the east central part and the southeastern part near Clio. The main layers of a representative profile are—

0 to 12 inches, dark grayish-brown, very friable loamy sand.
12 to 42 inches, yellowish-brown and light yellowish-brown, friable, heavy sandy loam to sandy clay loam; distinct mottles of strong brown, yellowish brown, light gray, and red below a depth of 16 inches.
42 to 54 inches +, pale-brown, friable or firm sandy clay loam; slightly sticky when wet; prominent mottles of gray, brownish yellow, reddish brown, and red.

The surface layer ranges from dark grayish brown to grayish brown in color and from 6 to 18 inches in thickness. The subsoil ranges from heavy sandy loam to sandy clay loam in texture and from light yellowish brown to yellowish brown in color. Included with this soil in mapping were a few small areas of Norfolk and Dunbar soils.

This soil is acid. It is high in natural fertility and medium in organic-matter content. The available moisture capacity is moderate. Surface runoff and internal drainage are medium, and the infiltration rate is rapid. The subsoil is slowly permeable. The response to fertilizer and lime is good. This soil cannot be cultivated so soon after a rain as can the associated Norfolk, Ruston, and Marlboro soils.

Most of the acreage has been cleared and drained and is now used for row crops or pasture. This soil is productive. If it is adequately drained and otherwise well managed it will produce high yields of a wide variety of crops commonly grown in the county. (Capability unit IIw–2; woodland group 3; wildlife group C)

Grady Series

These are deep, nearly level, very poorly drained or poorly drained soils that formed in unconsolidated beds of sands and clays. The surface layer consists of very dark gray, friable loam and is about 8 inches thick. The subsoil is gray, firm, sticky and plastic clay mottled with yellowish brown and brownish yellow.

Grady soils commonly adjoin or are near Norfolk, Ruston, Marlboro, Faceville, and Magnolia soils, all of which are at higher elevations and are better drained. They also adjoin Coxville soils, from which they differ in having a less well-developed profile, in having fewer red mottles in the subsoil, and in having sand strata or lenses in the lower part of the profile. The surface layer of the Grady soils is much darker colored and finer textured than that of the associated soils. The subsoil is gray, rather than yellowish brown, yellowish red, or red.

These soils occur throughout the county, but mostly in the northern half. They are in the nearly level, oval depressions commonly known as Carolina bays. The natural vegetation consists of water-tolerant hardwoods, thick stands of loblolly pine and pond pine, and an understory of grasses, bushes, and shrubs.

Grady loam (Gr).—This is a very poorly drained or poorly drained soil in oval depressions. It is flooded late in winter and in spring. The following profile description gives some of its major characteristics—

0 to 8 inches, very dark gray, friable loam.
8 to 28 inches, gray clay; sticky and plastic; distinct, yellowish-brown and brownish-yellow mottles.
28 to 35 inches, gray, firm sandy clay; brownish-yellow and yellowish-brown mottles; lenses and pockets of sand.

The surface layer ranges from very dark gray to black in color and from 5 to 12 inches in thickness. In some places its texture is sandy loam. The subsoil ranges from sandy clay loam to clay in texture. In many places beds of sand and loamy sand occur at a depth of 3 to 4 feet. Included in the areas mapped are a few small areas of Coxville soils.

This soil is acid. The organic-matter content and natural fertility are medium. The available moisture capacity is moderate. Surface runoff is slow, and the rate of infiltration is moderate to slow. Permeability is slow in the subsoil. The response to fertilizer and lime is good.

Much of the acreage is wooded. A few areas have been cleared and drained and are used for pasture and a few suitable crops. Drainage is required before this soil can be used for crops or for pasture. (Capability unit IIIw–2; woodland group 10; wildlife group D)

Izagora Series

The soils of the Izagora series are deep, nearly level, and somewhat poorly drained or moderately well drained. They formed in beds of unconsolidated sands and clays washed from soils of the Coastal Plain and Piedmont Plateau. The surface layer is about 8 inches of dark-gray, very friable fine sandy loam. The subsoil is yellowish-brown, friable sandy clay loam mottled with yellowish red, yellowish brown, and light brownish gray.

Izagora soils commonly adjoin Kalmia, Cahaba, Flint, Wahee, and Leaf soils. They are less well drained than Kalmia or Cahaba soils. In drainage they are similar to

Wahee soils, but they have a more friable and coarser textured subsoil. Izagora soils are at a higher elevation and are better drained than Leaf soils, and they have a less gray and coarser textured subsoil. They are more poorly drained than Flint soils and have a yellowish, rather than a reddish-yellow or strong-brown, subsoil.

In this county, Izagora soils are mainly along the Great Pee Dee River and to a lesser extent along the Little Pee Dee River. The natural vegetation consists of longleaf pine, loblolly pine, a mixture of red oak, white oak, blackgum, sweetgum, and maple, and an understory of grasses, shrubs, and bushes.

Izagora fine sandy loam (Iz).—This is a somewhat poorly drained or moderately well drained soil on the terraces of the Great Pee Dee and Little Pee Dee Rivers. The main layers of a representative profile are—

0 to 8 inches, dark-gray, very friable fine sandy loam.
8 to 17 inches, light yellowish-brown, friable sandy loam.
17 to 32 inches, yellowish-brown, friable sandy clay loam; distinct mottles of yellowish red and light brownish gray, and faint mottles of yellowish brown.
32 to 42 inches, light-gray, firm sandy clay; prominent mottles of red and brownish yellow.

The surface layer ranges from dark gray to grayish brown in color and from 8 to 15 inches in thickness. Its texture is sandy loam in some places. The subsoil ranges from yellowish brown to light olive brown in color. Its texture is heavy sandy loam in some places. Included with this soil in mapping were a few areas of Wahee and Leaf soils.

This soil is acid. Natural fertility and the organic-matter content are medium. Surface runoff is slow to moderate, and the available moisture capacity is moderate. The infiltration rate is slow to moderate, and permeability is moderately slow. The response to lime and fertilizer is good. This soil cannot be tilled so soon after a rain as can the better drained Kalmia and Cahaba soils. It is flooded occasionally.

This soil requires drainage. If properly drained, it is fairly well suited to the crops commonly grown in the county. Yields are fair. Approximately half the acreage has been cleared and drained and is now used for pasture and crops. (Capability unit IIw–2; woodland group 7; wildlife group C)

Kalmia Series

The soils of the Kalmia series are nearly level to gently sloping and moderately well drained. They are deep soils that formed in alluvium washed principally from the Coastal Plain but mixed with some material washed from the Piedmont uplands. The surface layer consists of grayish-brown, very friable loamy fine sand and is about 8 inches thick. The subsoil is yellowish-brown, friable sandy clay loam mottled with brownish yellow and strong brown.

These soils commonly adjoin Cahaba, Flint, Wahee, and Myatt soils, and the terrace phases of Lakeland sand and Eustis loamy sand. The subsoil is comparable to that of Cahaba soils in texture but is yellowish, rather than reddish. Kalmia soils are less fine textured in the subsoil and have slightly better internal drainage than Flint soils. They are at higher elevations than the Wahee and Myatt soils and are better drained. They are finer textured than the excessively drained Lakeland sand, terrace, and Eustis loamy sand, terrace.

Kalmia soils are mostly on the terrace of the Great Pee Dee River and to a lesser extent on that of the Little Pee Dee River. The natural vegetation is a mixture of longleaf pine, loblolly pine, and hardwoods and an understory of grasses, bushes, and shrubs.

Kalmia loamy fine sand, 0 to 2 percent slopes (KaA).—This moderately well drained soil is at the higher elevations on the terraces of the Great Pee Dee and Little Pee Dee Rivers. The main layers of a representative profile are—

0 to 8 inches, grayish-brown, very friable loamy fine sand.
8 to 14 inches, pale-yellow, very friable fine sandy loam.
14 to 32 inches, yellowish-brown, friable sandy clay loam; brownish-yellow and strong-brown mottles below a depth of 26 inches.
32 to 42 inches, light yellowish-brown, friable or firm sandy clay and sandy clay loam; yellowish-brown, yellowish-red, and gray mottles.

The surface layer ranges from 8 to 30 inches in thickness and from dark gray to grayish brown in color. Its texture generally is loamy fine sand but is loamy sand in a few places. The subsoil ranges from sandy clay loam to sandy clay in texture and from yellowish brown to light yellowish brown in color. In some places mottles are nearer the surface than they are in the representative profile. Included in the areas mapped are a few small areas of Local alluvial land and Cahaba soils.

This soil is acid. It is medium in organic-matter content and natural fertility and is responsive to fertilizer and lime. The infiltration rate, permeability, and the available moisture capacity are all moderate. This soil is easily tilled, and it can be cultivated soon after a rain.

Most of the acreage has been cleared and is used for pasture and crops. A small acreage is wooded. This soil is suited to a wide variety of crops, including cotton, corn, soybeans, and tobacco. (Capability unit I–1; woodland group 3; wildlife group A)

Kalmia loamy fine sand, 2 to 6 percent slopes (KaB).—This soil occurs as broad, gently sloping areas and as narrow bands adjacent to drainageways. Its surface layer generally is more variable and 1 or 2 inches thinner than that of Kalmia loamy fine sand, 0 to 2 percent slopes. It has more rapid runoff than the nearly level soil and consequently is subject to erosion.

This soil is suited to the same crops as Kalmia loamy fine sand, 0 to 2 percent slopes, and produces about the same yields of those crops. A complete water-disposal system, including terraces and vegetated outlets or other suitable waterways, is needed to conserve soil and water and to ensure good yields. Tillage should be on the contour. A rotation that keeps at least half the acreage in close-growing crops is needed to help control erosion. (Capability unit IIe–1; woodland group 3; wildlife group A)

Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes (KbA).—The surface layer of this soil is 18 to 30 inches thick. This soil is more droughty than Kalmia loamy fine sand, 0 to 2 percent slopes; it is lower in organic-matter content, natural fertility, and available moisture capacity; and it is more readily leached of fertilizer. The two soils are suited to the same crops, but the thick-surface phase produces slightly lower yields. Applying large amounts of fertilizer and organic matter helps to maintain yields and to improve tilth. A close-growing crop should be grown every other year. The larger fields need to be

protected against wind erosion by stripcropping and by planting trees, shrubs, or other suitable vegetation. (Capability unit IIs–1; woodland group 4; wildlife group A)

Klej Series

The soils of the Klej series are deep, nearly level, and moderately well drained. They formed in beds of unconsolidated sands and sandy clays. The surface layer is very dark grayish-brown, very friable loamy sand. The subsoil is yellowish-brown, friable loamy sand mottled with yellowish red and light brownish gray.

Klej soils commonly adjoin Norfolk, Goldsboro, Lakeland, Coxville, and Rutlege soils. They are coarser textured and less well drained than either Norfolk or Goldsboro soils. They are finer textured and contain more mottles than the excessively drained Lakeland soils. Klej soils are less fine textured than Coxville soils and have a less gray subsoil. They are similar to Rutlege soils in texture, but Rutlege soils have a thicker, darker colored surface layer than Klej soils.

Klej soils occur mostly in the southern part of Marlboro County, but some areas are below the Sand Hills in the northern half of the county. The natural vegetation consists of hardwoods, pines, and an understory of grasses, bushes, and shrubs.

Klej loamy sand (Kd).—This is a deep, moderately well drained, nearly level soil. The main layers of a representative profile are—

0 to 8 inches, very dark grayish-brown, very friable loamy sand.
8 to 34 inches, yellowish-brown and light yellowish-brown, friable loamy sand; distinct, yellowish-red and brownish-gray mottles at a depth of more than 21 inches.
34 to 42 inches, grayish-brown, nearly loose loamy sand; faint, yellow mottles.

In wooded areas the surface layer is black to very dark gray. In cultivated areas it is grayish brown to very dark grayish brown. The subsoil generally is loamy sand, but in a few places it is sand. The subsoil ranges from brown to yellowish brown in color. The mottles are pale yellow to brownish gray. Included in the areas mapped are a few small areas of Lakeland and Goldsboro soils.

This soil is acid. The organic-matter content is medium, but natural fertility is low. Because of the high water table, internal drainage is slow. Permeability is very rapid. Surface runoff is slow, and the rate of infiltration is high. The available moisture capacity is medium to low. The response to fertilizer and lime is good.

Most of the acreage has been cleared and drained and is now used for pasture and crops. The remaining acreage is wooded. Drainage is required before this soil can be used either for cultivated crops or for pasture. Under good management, which includes adequate drainage, this soil is fairly well suited to most crops commonly grown in the county. Open ditches for drainage are difficult to maintain because of the sandy subsoil. (Capability unit IIIw–1; woodland group 7; wildlife group D)

Lakeland Series

The soils of the Lakeland series are nearly level to strongly sloping and are excessively drained. They formed in beds of unconsolidated sands and clays. The surface layer is about 7 inches of grayish-brown, very friable or loose sand. The subsoil is yellowish-brown, loose, structureless sand.

Lakeland soils commonly adjoin Eustis, Gilead, Vaucluse, Plummer, Rutlege, Ruston, and Norfolk soils. Lakeland soils are comparable to Eustis soils in texture, but they are yellowish, rather than reddish, in color. They are coarser textured than Norfolk, Ruston, Gilead, and Vaucluse soils. Lakeland soils lack the compact layer that is characteristic of the Gilead and Vaucluse soils. They lack the dark-colored organic surface layer of the poorly drained Plummer and Rutlege soils.

Lakeland soils are distributed throughout Marlboro County. The largest acreage is in the Sand Hills in the northern part of the county, and a smaller acreage is in the southern part of the county near Brownsville. These soils occur on the terraces of the Great Pee Dee and the Little Pee Dee Rivers and on terraces of other large streams. The natural vegetation consists of longleaf pine, loblolly pine, and an understory of scrub oak, dogwood, and persimmon.

Lakeland sand, 0 to 6 percent slopes (LaB).—This excessively drained soil is nearly level to gently sloping. The main layers of a representative profile are—

0 to 7 inches, grayish-brown, very friable to loose sand.
7 to 42 inches +, yellowish-brown and brownish-yellow, structureless, loose sand.

The surface layer ranges from grayish brown to light brownish gray in color. The subsoil ranges from yellow to yellowish brown in color and from 3 feet to more than 6 feet in thickness. The texture of this soil generally is sand, but in a few places it is loamy sand. Included in the areas mapped are a few areas of Lakeland sand, gravelly variant, of Lakeland sand, moderately shallow, and of Local alluvial land.

This soil is acid. The natural fertility and the organic-matter content are very low. The available moisture capacity is low, permeability is rapid, and the rate of infiltration is high. Surface runoff is slow. This soil is droughty, is low in productivity, loses fertilizer and lime rapidly by leaching, and is subject to wind erosion. It can be tilled soon after a rain, and it does not become hard and brittle when dry.

Much of this soil is woodland, but some areas have been cleared and are now in pasture and crops. Cotton, corn, and soybeans are the principal crops; peaches are a minor crop. (Capability unit IVs–1; woodland group 1; wildlife group B)

Lakeland sand, 6 to 10 percent slopes (LaC).—This soil is mostly in the Sand Hills, but it occurs as small areas in other parts of the county. It is more droughty than Lakeland sand, 0 to 6 percent slopes. It is suited to the same crops as Lakeland sand, 0 to 6 percent slopes, but it yields less than the more gently sloping soil. Tilling on the contour and turning under crop residues help to conserve moisture, increase the organic-matter content, and improve tilth. Wind erosion is a hazard in the larger fields. Windbreaks of trees, shrubs, or other suitable vegetation should be established. (Capability unit IVs–1; woodland group 1; wildlife group B)

Lakeland sand, 10 to 15 percent slopes (LaD).—This soil is along the streams that drain the Sand Hills. It is more droughty than Lakeland sand, 0 to 6 percent slopes. It contains little organic matter.

Most of this soil is in woods. It is not suitable for cultivation, but sericea lespedeza can be grown for hay. Timber is the best use. Control of scrub oak is needed. (Capability unit VIs–1; woodland group 1; wildlife group B)

Lakeland sand, gravelly variant, 0 to 10 percent slopes (LgC).—This soil is in the Sand Hills. Most of the areas are small, but some are 75 acres or more in size. The soil material is 30 to 50 percent, by volume, subrounded quartz gravel ¼ inch to 3 inches in diameter.

Because the gravel would interfere with tillage, this soil is not suitable for crops or pasture. The production of timber is its best use. (Capability unit IVs–1; woodland group 1; wildlife group B)

Lakeland sand, gravelly variant, 10 to 15 percent slopes (LgD).—This soil is in the Sand Hills and is parallel to drainageways and streams. Some areas are 75 acres or more in size, but most are between 5 and 15 acres. The content of subrounded quartz gravel ¼ inch to 3 inches in diameter ranges from 30 to 50 percent.

This soil is too steep and too gravelly to be suited to cultivated crops or to pasture (fig. 12). The production of timber is its best use. (Capability unit VIs–1; woodland group 1; wildlife group B)

Lakeland sand, moderately shallow, 0 to 2 percent slopes (LkA).—This soil occurs as small areas throughout the county. It has a thinner surface layer than Lakeland sand, 0 to 6 percent slopes. The sandy surface layer is underlain by sandy loam or sandy clay loam at a depth of 30 to 42 inches.

Figure 12.—Lakeland sand, gravelly variant, 10 to 15 percent slopes. This soil is too steep and gravelly to be cultivated or used as pasture.

This soil has a higher natural supply of plant nutrients than Lakeland sand, 0 to 6 percent slopes, and is generally more productive. It is suited to the same crops as Lakeland sand, 0 to 6 percent slopes. Large amounts of fertilizer are needed to maintain good yields. Water erosion is no problem, but there is a risk of wind erosion in the larger fields. (Capability unit IIIs–1; woodland group 2; wildlife group B)

Lakeland sand, moderately shallow, 2 to 6 percent slopes (LkB).—The surface layer of this soil is underlain at a depth of 30 to 42 inches by sandy loam or sandy clay loam. This soil is less permeable, less droughty, and more fertile than Lakeland sand, 0 to 6 percent slopes. The two soils are suitable for the same crops, and if well managed this moderately shallow phase is the more productive. Wind erosion is a hazard in the larger fields. (Capability unit IIIs–1; woodland group 2; wildlife group B)

Lakeland sand, moderately shallow, 6 to 10 percent slopes (LkC).—This soil has a layer of sandy loam or sandy clay loam at a depth of 30 to 42 inches. It is suited to the same crops as Lakeland sand, 0 to 6 percent slopes, but yields slightly less than that soil.

This soil is best suited to perennial vegetation or pine trees. If cultivated, it should be kept in close-growing crops for 3 years and can then be used for a row crop for 1 year. Tilling on the contour and turning under crop residues help to increase the supply of organic matter and to improve tilth. (Capability unit IVs–1; woodland group 2; wildlife group B)

Lakeland sand, terrace, 0 to 6 percent slopes (LnB).—This soil is on stream terraces and is flooded occasionally. It is droughty and excessively drained, but it contains more moisture than the Lakeland soils of the uplands.

Because it occurs at low elevations where there is a frost hazard, this soil is not suited to peaches. Otherwise, it can be used and managed in the same way as Lakeland sand, 0 to 6 percent slopes. Yields are about the same as on the upland soils. (Capability unit IVs–1; woodland group 1; wildlife group B)

Lakewood Series

The Lakewood series consists of nearly level, deep, excessively drained, loose, sandy soils that formed in beds of unconsolidated marine sands. The surface layer consists of gray, very friable to loose sand and is about 8 inches thick. The subsoil is white and strong-brown, loose, structureless sand that contains pockets of dark reddish-brown sand.

Lakewood soils commonly are near Rutlege, Plummer, Lakeland, and Okenee soils. They have less organic matter in the surface layer than Rutlege, Plummer, and Okenee soils and are better drained. They are more excessively drained than Lakeland soils and contain less organic matter.

Lakewood soils are mainly in the southern half of the county, on the rims of some of the larger Carolina bays and in a few places along the Little Pee Dee River. The natural vegetation consists of a mixture of longleaf pine and willow oak and an understory of scrub oak and bushes.

Lakewood sand (Lo).—This deep, excessively drained soil is around the rims of some of the large, oval-shaped depressions and along the Little Pee Dee River. The main layers of a representative profile are—

0 to 8 inches, gray, very friable or loose sand.
8 to 30 inches, white, structureless, loose sand.
30 to 42 inches +, strong-brown, structureless, loose sand; some pockets of dark reddish-brown sand high in organic-matter content.

The surface layer ranges from gray to very dark gray in color. The second layer (8 to 30 inches) ranges from 8 inches to 24 inches in thickness. In some places there is a cemented organic layer at a depth of 12 to 24 inches. Included in the areas mapped are a few small areas of Lakeland sand.

This soil has only enough organic matter in the surface layer to give it a salt-and-pepper appearance. It is droughty and is strongly acid to extremely acid. Surface runoff is slow to very slow, and permeability is rapid. The available moisture capacity is very low.

This soil is not suited to cultivation. Except for a few small areas, it has remained in native vegetation. Added fertilizer soon leaches out. (Capability unit VIs–1; woodland group 1; wildlife group B)

Leaf Series

The soils of the Leaf series are nearly level and poorly drained. They formed in alluvial material washed from soils of the Coastal Plain uplands. The surface layer consists of very dark gray, very friable fine sandy loam and is about 5 inches thick. The subsoil is light brownish-gray and gray, firm or very firm, plastic sandy clay and clay mottled with strong brown and yellowish brown.

These soils commonly adjoin Kalmia, Cahaba, Flint, Wahee, and Myatt soils. They are at a lower elevation and are more poorly drained than any of these soils except Myatt soils. They have a finer textured subsoil than Myatt soils but, except for slightly slower internal drainage, are similar to those soils in drainage characteristics.

Leaf soils are scattered along the Great Pee Dee River terrace from a point about 2 miles south of Wallace to the Dillon County line. They occur as broad, flat areas and in drainageways. The natural vegetation consists of loblolly pine, a mixture of water-tolerant hardwoods, and an understory of grasses, shrubs, and bushes.

Leaf fine sandy loam (lp).—This is a poorly drained soil in low, flat areas and drainageways along the Great Pee Dee River. The main layers of a representative profile are—

0 to 5 inches, very dark gray, very friable fine sandy loam.
5 to 12 inches, light brownish-gray sandy clay mottled with yellowish brown and strong brown; firm when moist, slightly plastic when wet.
12 to 36 inches +, gray clay mottled with yellowish brown; very firm when moist, sticky and plastic when wet.

In cultivated areas, the surface layer ranges from very dark gray to light gray in color and from 5 to 10 inches in thickness. The subsoil ranges from sandy clay to clay in texture and from light brownish gray to gray in color. The amount of mottling varies, and in some places there is none. Included with this soil in mapping were a few small areas of Myatt soils.

This soil is strongly acid or very strongly acid. The natural fertility and the organic-matter content are medium. Surface runoff is slow to very slow, and internal drainage is very slow. The available moisture capacity is moderate to low, and the infiltration rate is slow.

Drainage is required before this soil can be used for either crops or pasture. Much of the acreage is wooded, but a few areas have been cleared and drained and are used for pasture or for a few suitable crops. Because the soil becomes very hard in dry weather, tillage operations should be delayed until there is sufficient moisture. (Capability unit IVw–2; woodland group 9; wildlife group D)

Lenoir Series

The soils of the Lenoir series are nearly level and somewhat poorly drained. They formed in beds of unconsolidated sands and clays. The surface layer consists of dark-gray, friable loam and is about 6 inches thick. The subsoil is light olive-brown and grayish-brown, firm to very firm clay mottled with yellowish brown, red, and strong brown.

These soils commonly adjoin Craven, Coxville, and Dunbar soils. They have a finer textured subsoil than Dunbar soils but are comparable to these soils in drainage characteristics. They are better drained than Coxville soils, and they have a brownish, rather than a grayish, subsoil. They are less well drained than Craven soils and are at a lower elevation.

Lenoir soils occur in low, flat areas, mostly in the central and south-central parts of the county. The natural vegetation consists of hardwoods, such as white oak, post oak, hickory, and sweetgum, a little loblolly pine, and an understory of gallberry, grasses, and shrubs.

Lenoir loam (lr).—This soil is not extensive in the county, although it occurs as relatively large areas. It is flooded occasionally late in winter and in spring. The main layers of a representative profile are—

0 to 6 inches, dark-gray, friable loam.
6 to 22 inches, light olive-brown and grayish-brown, firm to very firm clay; yellowish-brown and red mottles.
22 to 32 inches, light brownish-gray clay; firm when moist, plastic when wet; strong-brown and red mottles.
32 to 42 inches +, coarsely mottled gray, strong-brown, and red clay; very firm when moist, sticky and plastic when wet.

The surface layer ranges from dark gray to yellowish brown or olive brown in color and from 4 to 6 inches in thickness. The intensity of mottling in the subsoil varies. Red mottles are more numerous in some places than in others. Included with this soil in mapping were a few small areas of Coxville and Craven soils.

This soil is acid. The organic-matter content is medium. Natural fertility and the available moisture capacity are moderate. Permeability, infiltration rate, and surface runoff are slow. Internal drainage is slow. The response to fertilizer and lime is good.

This soil needs to be drained. Much of the acreage is wooded, but a few areas have been cleared and drained and are used for pasture and suitable crops, such as corn, soybeans, small grain, and lespedeza. (Capability unit IIIw–6; woodland group 10; wildlife group D)

Local Alluvial Land (Lv)

This nearly level land type consists of alluvial and colluvial materials washed from Norfolk, Ruston, Marlboro, Gilead, Eustis, and Lakeland soils, which are on the sur-

rounding Coastal Plain uplands. It occurs in slight depressions and at the head of drainageways throughout Marlboro County. The surface layer consists of dark-gray to grayish-brown loam to loamy sand. Depth to the underlying material ranges from 14 to 40 inches.

These areas are somewhat poorly drained or moderately well drained, but are predominantly moderately well drained. The natural fertility is high, and the organic-matter content is medium. The rate of infiltration is rapid, and permeability is moderate or moderately rapid. Surface runoff is slow. The available moisture capacity is moderate. The reaction is acid. The response to fertilizer and lime is good.

If adequately drained, this land type is well suited to pasture and to the crops commonly grown in the county. If insects and diseases are controlled, cotton yields are good. Open ditches and tile drains can be used to remove excess water. Terraces or diversion channels help to protect the areas against runoff from the adjacent higher areas. (Capability unit IIw–1; woodland group 5; wildlife group C)

Lynchburg Series

The soils of the Lynchburg series are nearly level and somewhat poorly drained. They formed in beds of unconsolidated sandy marine deposits. The surface layer consists of dark-gray, very friable loamy sand, and the subsoil of light yellowish-brown and light brownish-gray sandy loam and light sandy clay loam mottled with yellow, yellowish brown, strong brown, and gray.

These soils commonly adjoin Norfolk, Goldsboro, Dunbar, Klej, Rains, Plummer, and Coxville soils. They are less well drained than Norfolk soils and occur at lower elevations. They are comparable to Dunbar and Goldsboro soils in drainage. In subsoil texture they are similar to Rains, Norfolk, and Goldsboro soils, but they have more gray mottles in their subsoil than Norfolk and Goldsboro soils. They are finer textured than Klej soils and coarser textured than Coxville and Dunbar soils. Lynchburg soils are better drained than Rains, Plummer, and Coxville soils and are more mottled.

Lynchburg soils are not extensive in Marlboro County. They are mostly in the central and south-central parts of the county. The natural vegetation is a mixture of hardwoods and pines and an understory of grasses, bushes, and shrubs.

Lynchburg loamy sand (Ly).—This is a deep, friable, and somewhat poorly drained soil in nearly level areas. The following layers are in a representative profile—

0 to 14 inches, dark-gray and light brownish-gray, very friable loamy sand.
14 to 20 inches, light yellowish-brown, friable sandy loam; yellow and yellowish-brown mottles.
20 to 31 inches, light brownish-gray, friable, light sandy clay loam; strong-brown and gray mottles.
31 to 42 inches +, gray, friable sandy clay loam; yellowish-brown, brownish-yellow, and red mottles.

The surface layer ranges from 6 to 18 inches in thickness and from black to light brownish gray in color. The color depends on the intensity of cultivation and the content of organic matter. The texture of the subsoil ranges from sandy loam to sandy clay loam. The number and size of mottles in the subsoil vary, and the color of the mottles ranges from yellow to red. Included in the areas mapped are a few small areas of Klej and Rains soils.

This soil is acid. The natural fertility and available moisture capacity are low to moderate. Permeability is moderate, and the infiltration rate is moderate to rapid. Surface runoff is moderately slow. The response to fertilizer and lime is good.

This soil must be drained before it can be used for crops or pasture. If drained and otherwise well managed, it is suited to the crops commonly grown in the county. Most of the acreage has been cleared and drained and is now used for pasture and cultivated crops. (Capability unit IIw–2; woodland group 7; wildlife group C)

Magnolia Series

The soils of the Magnolia series are deep, nearly level to gently sloping, and well drained. They formed in thick beds of unconsolidated sandy clays and clays. The surface layer consists of dark-brown, friable loamy sand and is about 7 inches thick. The subsoil is red, friable, slightly sticky and plastic sandy clay loam and sandy clay. It contains a few hard, dark-brown concretions.

These soils commonly adjoin Faceville, Norfolk, Ruston, and Marlboro soils. They are comparable to all these soils in drainage. They are similar to Faceville and Marlboro soils in subsoil texture, but their subsoil is red rather than yellowish brown or yellowish red in color. Magnolia soils have a thinner surface layer and a finer textured subsoil than either Norfolk or Ruston soils.

Magnolia soils are among the most productive soils in the county, but their total acreage is small. They occur as broad areas on uplands, mostly in the central and east-central parts of the county. The natural vegetation consists of hardwoods, pines, and an understory of grasses, bushes, and shrubs.

Magnolia loamy sand, 0 to 2 percent slopes (MaA).—This is a deep, well-drained soil of the uplands. The main layers of a representative profile are—

0 to 7 inches, dark-brown, friable loamy sand.
7 to 12 inches, red, friable, sandy clay loam; slightly sticky when wet.
12 to 63 inches+, red, friable sandy clay; sticky and plastic when wet; few, dark-brown, hard concretions.

The surface layer ranges from 7 to 12 inches in thickness. Its color varies from dark brown to grayish brown, depending on the content of organic matter. The subsoil ranges from sandy clay loam to sandy clay in texture and from 3 feet to 5 feet or more in thickness. The number of concretions in the subsoil varies from place to place, and in some profiles there are none. Included with this soil in mapping were a few small areas of Local alluvial land.

This soil is acid. It is high in natural fertility and low to medium in organic-matter content. Surface runoff, permeability, and the rate of infiltration are moderate. The available moisture capacity is moderate. The response to fertilizer and lime is good.

Most of the acreage is now in cultivation. A wide variety of crops can be grown, and yields are high. (Capability unit I–2; woodland group 3; wildlife group A)

Magnolia loamy sand, 2 to 6 percent slopes, eroded (MaB2).—This soil is on broad, gently sloping areas in the uplands. It occurs as narrow bands parallel to drainageways. Its surface layer is generally 3 to 5 inches thinner

than that of Magnolia loamy sand, 0 to 2 percent slopes. In some places the surface layer is a mixture of the original surface layer and material from the subsoil and is reddish in color.

This soil is suited to the same crops as Magnolia loamy sand, 0 to 2 percent slopes, but it yields slightly less than the nearly level soil. It becomes hard and dry after a long period in which little or no rain falls. Establishing a stand of crops in galled areas is difficult, and the plants generally are stunted and susceptible to damage by disease and insects.

In cultivated fields, surface runoff is moderately rapid and erosion is a definite hazard. A complete water-disposal system, including terraces and vegetated waterways and outlets, is needed to conserve soil and water. All tillage operations should be on the contour, and close-growing crops should be grown every other year. Crop residues should be turned under to maintain the organic-matter content and to improve tilth. (Capability unit IIe–2; woodland group 3; wildlife group A)

Marlboro Series

The soils of the Marlboro series are deep, nearly level to strongly sloping, and well drained. They formed in thick beds of unconsolidated sands and clays. The surface layer consists of dark grayish-brown, friable loamy sand and is about 9 inches thick. The subsoil is yellowish-brown, sticky and plastic sandy clay and clay. The lower part of the subsoil is mottled red and light yellowish brown, and it contains a few, soft, brown concretions.

These soils commonly adjoin Norfolk, Magnolia, Faceville, and Dunbar soils. They are at a higher elevation than Dunbar soils and are better drained. They are similar to Norfolk, Magnolia, and Faceville soils in drainage. Marlboro soils are finer textured than Norfolk soils and have a thinner surface layer.

Marlboro soils occur in all parts of the county except the Sand Hills, but they are mainly in the central and southeastern parts. Most of the areas are on broad plains in the uplands, but a few occur as narrow bands along drainageways. The natural vegetation consists of hardwoods, pines, and an understory of native shrubs and grasses.

Marlboro loamy sand, 0 to 2 percent slopes (MbA).—This is a deep, well-drained soil on large, level and nearly level plains. The main layers of a representative profile are—

0 to 9 inches, dark grayish-brown, friable loamy sand.
9 to 27 inches, yellowish-brown, friable sandy clay; sticky and plastic; few brown concretions at a depth of 18 inches.
27 to 38 inches +, yellowish-brown, friable clay; sticky and plastic; red and light yellowish-brown mottles.

The surface layer ranges from dark gray to light brownish gray in color, depending on the content of organic matter. It ranges from 8 to 12 inches in thickness. The subsoil ranges from sandy clay to clay in texture and from 31 to 42 inches in thickness. The concretions vary in quantity, and in some profiles there are none. Included with this soil in mapping were a few small areas of Norfolk soils.

This soil is acid. The natural fertility is high, and the organic-matter content is medium. The infiltration rate, permeability, and available moisture capacity are all moderate. The response to fertilizer and lime is good.

This soil is productive and is well suited to many of the locally grown crops. It has a deep root zone and favorable moisture conditions. Most of the acreage has been cleared and is now used for cultivated crops. (Capability unit I–2; woodland group 3; wildlife group A)

Marlboro loamy sand, 2 to 6 percent slopes (MbB).—Except for the stronger slope, this soil is similar to Marlboro loamy sand, 0 to 2 percent slopes. The surface layer is dark grayish brown in color, and the subsoil is yellowish-brown sandy clay. Runoff is moderate, and the erosion hazard is slight. This is a productive soil, and it is suited to a wide variety of locally grown crops. (Capability unit IIe–2; woodland group 3; wildlife group A)

Marlboro loamy sand, 2 to 6 percent slopes, eroded (MbB2).—The surface layer of this soil is grayish-brown loamy sand, and the subsoil is yellowish-brown sandy clay. Some of the original surface layer has been removed by erosion, and the present plow layer is a mixture of original surface material and a small part of the original subsoil. Small rills form after rains.

This soil is productive but slightly less so than Marlboro loamy sand, 0 to 2 percent slopes. (Capability unit IIe–2; woodland group 3; wildlife group A)

Marlboro loamy sand, 6 to 12 percent slopes, eroded (MbC2).—The surface layer of this soil is 3 to 5 inches thinner than that of Marlboro loamy sand, 0 to 2 percent slopes. Some of the original surface layer has been removed by erosion, and the present plow layer is a mixture of original surface material and part of the subsoil. Runoff is moderate, and there is an erosion hazard. Rills are common after rains. (Capability unit IIIe–2; woodland group 3; wildlife group A)

McColl Series

The soils of the McColl series are nearly level and poorly drained or somewhat poorly drained. They formed in unconsolidated sediments washed from the Coastal Plain. The surface layer is dark colored. The subsoil consists of heavy clay loam to sandy clay. It is gray in the upper part and yellowish brown, reddish yellow, and strong brown in the lower part.

These soils are near or next to Coxville, Rains, Grady, Dunbar, and Lenoir soils. They differ from these associated soils in subsoil color and in having soft, medium-sized concretions in the lower part of the subsoil.

McColl soils are mostly in the southern half of the county, in the oval depressions commonly known as Carolina bays. The natural vegetation consists of loblolly pine, longleaf pine, water oak, live oak, post oak, hickory, gum, a scattering of pond pine, and an understory of alders, gallberry bushes, briers, grasses, and shrubs.

McColl loam (Mc).—This is a poorly drained or somewhat poorly drained soil in oval depressions. The main layers of a representative profile are—

0 to 5 inches, black, very friable loam.
5 to 9 inches, gray, friable to slightly firm, heavy clay loam to sandy clay; pockets and streaks of gray extending into layer below.
9 to 14 inches, yellowish-brown, friable clay loam.
14 to 36 inches, strong-brown and reddish-yellow, firm sandy clay loam; vertical streaks of gray heavy clay loam and

sandy clay loam in channels and pores; iron concretions or nodules with red, dark-red, and yellowish-red interiors are common, but they decrease in number and become softer with increasing depth.
36 to 50 inches +, yellow and red, very friable sandy loam; light-gray mottles.

The surface layer is black to very dark gray in wooded areas and very dark gray, dark gray, or dark grayish brown in cultivated areas. The upper part of the subsoil generally is gray, but in places it is dark gray or light brownish gray. The size and number of mottles vary. In some places this soil is highly mottled. Concretions or iron nodules are few to common. Included with this soil in mapping were a few small areas of Grady and Coxville soils.

This soil is acid. Natural fertility is moderate, and the organic-matter content is medium. Permeability is moderately slow in the subsoil. The available moisture capacity is moderate. The water table fluctuates; sometimes it is at the surface, but in dry periods it is at a depth of 4 to 8 feet. The response to fertilizer and lime is good.

This soil must be drained before it can be used for pasture or crops, and some areas lack drainage outlets. Drained areas are fairly well suited to corn, soybeans, oats, and truck crops. Bahiagrass, bermudagrass, dallisgrass, and annual lespedeza can be grown for hay and pasture. About half the acreage has been cleared and drained and is used for pasture and crops. The rest is in cutover timber. (Capability unit IIIw–2; woodland group 10; wildlife group D)

Mine Pits and Dumps (Md)

This land type consists of open pits from which gravel and soil material have been removed and of areas where the soil material removed in mining operations has been dumped. A few areas have been reclaimed by spreading the spoil and planting either pine trees or Coastal bermudagrass and kudzu to be used for pasture or hay. In some areas there are a few scattered pine trees that have reseeded naturally. Some of the deeper pits contain water that can be used for irrigation, and some pits can be stocked with fish. Pine or other suitable vegetation should be planted in the bare areas. (Capability unit VIIs–2; woodland group 18; no wildlife suitability group)

Mixed Alluvial Land (Mn)

This nearly level, poorly drained land type occurs along the smaller streams of the county. It consists of local alluvial material that ranges from silty clay to sand and gravel in texture and from black to light gray in color. It is flooded frequently throughout the year.

Because of the frequent floods and the difficulty of providing drainage, these areas are best suited to the production of timber. Most of the acreage is in cutover hardwoods. Loblolly pine and slash pine grow in some of the better drained areas. A few areas have been cleared and drained and are planted to bahiagrass, dallisgrass, tall fescue, and white clover for hay and pasture. (Capability unit IVw–4; woodland group 18; wildlife group E)

Molena Series

The soils of the Molena series are deep, nearly level to sloping, and excessively drained. They formed in alluvium washed from the Piedmont uplands. The surface layer consists of dark-brown, very friable loamy sand and is about 10 inches thick. The subsoil is dark reddish-brown and yellowish-red, nearly loose, structureless loamy sand.

These soils are on stream terraces along with Wickham soils. The soils of these two series formed from similar parent material, but Molena soils are coarser textured than Wickham soils. Wickham soils are well drained rather than excessively drained, and they have a red or strong-brown subsoil.

Molena soils are not extensive in Marlboro County. They are in the northwestern part of the county and occur as broad, level and nearly level plains and as narrow bands parallel to drainageways. The natural vegetation consists of hardwoods, a few scattered areas of loblolly pine and longleaf pine, and an understory of scrub oak, grasses, bushes, and shrubs.

Molena loamy sand, 0 to 10 percent slopes (MoB).—This is a deep, excessively drained soil that occurs at the higher elevations on the terraces of the Great Pee Dee River. The main layers of a representative profile are—

0 to 10 inches, dark-brown, very friable loamy sand.
10 to 44 inches, dark reddish-brown and yellowish-red, nearly loose, structureless loamy sand.

The surface layer ranges from 8 to 12 inches in thickness. The color is dark brown to light brown, depending on the intensity of cultivation and the content of organic matter. Subrounded quartz gravel, in various amounts, occurs on the surface in many places. Included in the areas mapped are a few small areas of Local alluvial land.

This soil is acid. Surface runoff is moderately slow to slow, and the infiltration rate is high. Natural fertility, available moisture capacity, and the organic-matter content are all low. Permeability is rapid. The response to fertilizer and lime is good.

Practically all the acreage has been cleared and is used for cultivated crops. The remaining acreage is in pasture. Cotton, corn, small grain, soybeans, and tobacco are fairly well suited, but yields are below the average for the county. Coastal bermudagrass, bahiagrass, and sericea lespedeza can be grown for pasture and hay. This soil can be cultivated soon after rains, and it does not become hard or brittle when dry. Suitable vegetation should be established to control wind erosion. All crop residues should be turned under to increase the organic-matter content and improve tilth. Close-growing crops should be grown two-thirds of the time. (Capability unit IIIs–1; woodland group 1; wildlife group B)

Myatt Series

The soils of the Myatt series are deep, nearly level, and poorly drained. They formed on stream terraces in alluvial material washed from soils of the Coastal Plain uplands. The surface layer is very dark grayish-brown to gray, very friable sandy loam and is about 10 inches thick. The subsoil is gray, firm, sticky sandy clay loam and heavy sandy clay loam mottled with yellowish brown, strong brown, and brownish yellow.

Myatt soils commonly adjoin Kalmia, Izagora, Flint, and Wahee soils, but they are in a lower position on the stream terraces and are more poorly drained than these soils. They are less poorly drained than the associated Okenee soils. Their subsoil is less fine textured than that of the Leaf soils.

In Marlboro County, Myatt soils occur mainly as scattered areas on the terrace of the Great Pee Dee River extending from 2 or 3 miles south of Wallace to the Dillon County line. The natural vegetation consists of water-tolerant hardwoods, a few scattered areas of pond pine and loblolly pine, and an understory of gallberry bushes, native grasses, and shrubs.

Myatt sandy loam (Mt).—This is a poorly drained soil on the terrace of the Great Pee Dee River. The main layers of a representative profile are—

0 to 10 inches, very dark grayish-brown and gray, very friable sandy loam.
10 to 26 inches, gray, firm and sticky sandy clay loam; yellowish-brown and strong-brown mottles.
26 to 42 inches, gray, firm and sticky, heavy sandy clay loam or clay loam; yellowish-brown and brownish-yellow mottles.
42 to 60 inches +, mottled gray and brownish-yellow, loose sand; many coarse sand grains; a little fine, waterworn quartz gravel.

The surface layer ranges from very dark grayish brown to grayish brown in color and from 3 to 10 inches in thickness. The subsoil varies from sandy clay loam to heavy sandy clay loam to clay loam in texture and is 20 to 36 inches thick. Included in the areas mapped are a few small areas of Leaf and Okenee soils.

This soil is strongly acid or very strongly acid. The organic-matter content and natural fertility are low. Surface runoff and internal drainage are slow to very slow. Permeability is slow, and the available moisture capacity is moderate. Floods occur occasionally late in winter and in spring as a result of overflow from the rivers, and the slowly permeable subsoil prevents rapid percolation.

Most of the acreage is wooded. A few small areas have been cleared and drained and are used for pasture and crops. Corn and soybeans are fairly well suited and are the principal crops grown. Bahiagrass, bermudagrass, dallisgrass, and tall fescue are fairly well suited. This soil must be drained before it can be used for cultivated crops or for pasture. It is difficult to drain because of a lack of suitable drainage outlets. Because of the sloughing action of the soil material, open drainage ditches are difficult to maintain. (Capability unit IVw–3; woodland group 13; wildlife group E)

Norfolk Series

The soils in the Norfolk series are nearly level to sloping and well drained. They formed in beds of unconsolidated sands and clays. The surface layer is about 14 inches of grayish-brown and light yellowish-brown, very friable loamy sand. The subsoil is yellowish-brown, friable sandy clay loam and is mottled with yellowish red in the lower part.

Norfolk soils commonly adjoin Ruston, Marlboro, Faceville, Dunbar, Goldsboro, McColl, and Grady soils. They are similar to Ruston soils in drainage and texture, but they are yellowish brown in color, whereas Ruston soils are yellowish red or red. They are more friable than Marlboro and Faceville soils and have a coarser textured subsoil. They occur at a higher elevation and are better drained than Dunbar, Goldsboro, McColl, and Grady soils.

Norfolk soils occur throughout Marlboro County but are most extensive in the southern half of the county. The natural vegetation consists of longleaf pine and loblolly pine, a little red oak, white oak, hickory, and dogwood, and an understory of grasses, bushes, and shrubs.

Norfolk loamy sand, 0 to 2 percent slopes (NoA).—This is a nearly level, productive soil that is used mostly for cultivated crops. The main layers of a representative profile are—

0 to 8 inches, grayish-brown, very friable loamy sand.
8 to 14 inches, light yellowish-brown, very friable loamy sand.
14 to 60 inches, yellowish-brown, friable sandy clay loam; few small concretions; yellowish-red mottles at a depth of 36 inches.
60 to 72 inches +, brownish-yellow heavy sandy loam; brownish-yellow, strong-brown, and yellowish-red mottles; few small concretions.

The surface layer ranges from light brownish gray to dark gray in color and from 12 to 18 inches in thickness. The subsoil ranges from sandy loam to sandy clay loam in texture and from yellow to yellowish brown in color. It is generally between 30 and 44 inches thick, but in places it is 5 feet or more thick. Included with this soil in mapping were a few small areas of Local alluvial land and Norfolk loamy sand, thick surface.

This soil contains little organic matter. It is acid in reaction. Permeability, the rate of infiltration, and the available moisture capacity are all moderate. Surface runoff is medium to slow, and internal drainage is medium. Tilth is good.

Most of the acreage has been cleared and is now used for crops and pasture. The remaining acreage is in cutover hardwoods and pines. This is a productive soil, and it is well suited to all crops commonly grown in the county. It is easily tilled and can be worked soon after a rain. If fertilized and limed and otherwise well managed, it produces high yields. All crop residues should be turned under to help increase the organic-matter content. (Capability unit I–1; woodland group 3; wildlife group A)

Norfolk loamy sand, 2 to 6 percent slopes (NoB).—This soil occurs on broad slopes and as narrow bands parallel to drainageways. The surface layer is grayish-brown loamy sand, and the subsoil is yellowish-brown sandy clay loam.

This soil is suited to the same crops as Norfolk loamy sand, 0 to 2 percent slopes, and is about as productive. Surface runoff in cultivated fields is more rapid than on the nearly level soil, and there is a slight hazard of erosion.

A complete water-disposal system, including terraces and vegetated outlets or other suitable waterways, is needed to conserve soil and water. All crop residues should be turned under to increase the organic-matter content. All tillage operations should be on the contour. (Capability unit IIe–1; woodland group 3; wildlife group A)

Norfolk loamy sand, 2 to 6 percent slopes, eroded (NoB2).—This soil occurs on broad plains in the uplands and as narrow bands parallel to drainageways. The surface layer is 3 to 5 inches thinner than that of Norfolk loamy sand, 0 to 2 percent slopes. In some places it is

yellowish brown in color and consists of a mixture of the original surface layer and material from the subsoil. There are also small areas in which the subsoil is exposed and surface runoff is more rapid.

This soil is suited to the same crops as Norfolk loamy sand, 0 to 2 percent slopes, but is not so productive. In the more eroded areas it is difficult to establish a stand of crops, and generally the plants are stunted. A complete water-disposal system, including terraces, vegetated outlets, or other suitable waterways, is needed. Tillage should be on the contour, and all crop residues should be turned under. (Capability unit IIe–1; woodland group 3; wildlife group A)

Norfolk loamy sand, 6 to 10 percent slopes (NoC).—The surface layer of this soil consists of grayish-brown, very friable loamy sand and is about 14 inches thick. The subsoil is yellowish-brown, friable sandy clay loam. It generally extends to a depth of 30 to 44 inches, but in some places it extends to a depth of 5 feet or more.

This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content without becoming hard and cloddy. It is low in organic-matter content and medium in natural fertility. The response to fertilizer and lime is good. The available water capacity is medium. Water moves into and through this soil at a moderate rate.

A large part of the acreage has been cleared and is used for crops and pasture. The rest is in cutover hardwoods and pines. This soil is productive and is fairly well suited to the crops commonly grown in the county. Intensive conservation practices are necessary to help control erosion. Tillage should be on the contour, and a complete water-disposal system is needed. All crop residues should be turned under to increase the organic-matter content. (Capability unit IIIe–1; woodland group 3; wildlife group A)

Norfolk loamy sand, thick surface, 0 to 2 percent slopes (NtA).—This soil is somewhat coarser textured than Norfolk loamy sand, 0 to 2 percent slopes, and consequently is more droughty and more susceptible to wind erosion.

The plow layer is easy to keep in good tilth, and it can be cultivated throughout a wide range of moisture content. The organic-matter content is low. Permeability and the rate of infiltration are somewhat faster than in Norfolk loamy sand, 0 to 2 percent slopes. The response to fertilizer and lime is good.

This soil is suited to the same crops as Norfolk loamy sand, 0 to 2 percent slopes, but is not so productive. The greater part of the acreage is used for crops or pasture. In the larger fields, windbreaks are needed for protection against wind erosion. Close-growing crops should be grown at least half the time. (Capability unit IIs–1; woodland group 4; wildlife group A)

Norfolk loamy sand, thick surface, 2 to 6 percent slopes (NtB).—The surface layer of this soil is 18 to 30 inches thick. It consists of grayish-brown, very friable loamy sand. The subsoil is yellowish-brown, friable sandy loam or sandy clay loam.

This soil is low in organic-matter content. It is more rapidly permeable and more droughty than Norfolk loamy sand, 0 to 2 percent slopes. The two soils are suited to the same crops, but the thick-surface phase is the less productive. The response to lime and fertilizer is good, but plant nutrients leach out readily.

The greater part of this soil is used for crops and pasture, but much of the acreage in the Sand Hills has been planted to pine. A cover of suitable vegetation is needed for protection against wind erosion. Cultivated areas should be in close-growing crops at least half the time. (Capability unit IIs–1; woodland group 4; wildlife group A)

Norfolk loamy sand, thick surface, 6 to 10 percent slopes (NtC).—The surface layer of this soil is 18 to 30 inches thick. It consists of grayish-brown, very friable loamy sand. The subsoil is yellowish-brown, friable sandy loam or sandy clay loam.

This soil is low in organic-matter content. It is more rapidly permeable than Norfolk loamy sand, 0 to 2 percent slopes. The two soils are suited to the same crops, but the thick-surface phase is the less productive. The response to lime and fertilizer is good, but plant nutrients leach out readily.

Most of this soil is wooded, but a few areas are used for crops and pasture. Much of the acreage in the Sand Hills has been planted to pine. A cover of suitable vegetation is needed for protection against wind erosion. Cultivated areas should be in close-growing crops 2 years out of 3. (Capability unit IIIe–5; woodland group 4; wildlife group A)

Okenee Series

The Okenee series consists of deep, nearly level, very poorly drained soils of the stream terraces. These soils formed in alluvial material washed from soils of the Coastal Plain uplands. The surface layer is black, very friable loam. It is more than 18 inches thick. The subsoil is gray, friable or firm sandy loam and sandy clay loam mottled with brownish yellow.

Okenee soils commonly adjoin Myatt and Leaf soils and the terrace phases of Eustis and Lakeland soils. They occur at a lower elevation and are more poorly drained than any of these soils. They are finer textured than the Eustis and Lakeland soils. Okenee soils are coarser textured than Leaf soils, and they have a higher organic-matter content and a darker colored surface layer.

Okenee soils are on the terraces of the Great Pee Dee River and the Little Pee Dee River. They also occur along some of the larger inland streams of this county. The natural vegetation consists of hardwoods, chiefly water oak, sweetgum, yellow-poplar, and cypress, a few scattered areas of loblolly pine and slash pine, and an understory of grasses, bushes, and shrubs.

In this county, Okenee soils are mapped only in an undifferentiated group with Portsmouth soils. The mapping unit is described under the heading "Portsmouth and Okenee loams."

Plummer Series

The soils of the Plummer series are deep, nearly level, and very poorly drained or poorly drained. They formed in beds of unconsolidated sand. The surface layer is very dark grayish-brown, very friable loamy sand. The subsoil is gray or grayish-brown, loose sand.

Plummer soils commonly adjoin Klej, Rains, Rutlege, and Lakeland soils. They are similar to Rains soils in drainage but are coarser textured. Plummer soils are at

a lower elevation than Klej and Lakeland soils, and they are more poorly drained. They are less poorly drained than Rutlege soils, and they have a thinner and lighter colored surface layer. Plummer soils are distributed throughout this county, but the largest acreage is in the Sand Hills. They are on broad, level flats, in depressions, at the head of drainageways, and along small streams. The natural vegetation consists of water-tolerant hardwoods and an understory of grasses, sedges, canes, and vines.

Plummer loamy sand (Pm).—This soil is in wet, seepy areas that are difficult to drain. The main layers of a representative profile are—

0 to 7 inches, very dark grayish-brown, very friable loamy sand.
7 to 12 inches, grayish-brown, very friable loamy sand; dark streaks from layer above.
12 to 42 inches +, gray and grayish-brown, loose sand; few coarse sand grains.

The color of the surface layer ranges from light gray to very dark grayish brown or black, depending on the organic-matter content. The texture generally is loamy sand, but in a few places it is sand. In some profiles finer textured material occurs at a depth of 3 to 4 feet, and in some places this finer material is mottled. Included in the areas mapped are a few small areas of Mixed alluvial land and Local alluvial land.

This soil is acid. Natural fertility is low, and, except in the surface layer, the organic-matter content is low. Surface runoff is slow, internal drainage is slow, and the water table is high. Permeability is rapid, and the available moisture capacity is moderate. Some areas are flooded for short periods in the rainy season.

Except for a few small areas, this soil is wooded. It is not suited to cultivated crops, but if adequately drained and otherwise properly managed, it is fairly well suited to bahiagrass and bermudagrass for hay and pasture. Most areas lack drainage outlets, and where outlets are available, the sloughing action of the subsoil makes drainage difficult. Fertilizer and lime leach out rapidly. (Capability unit Vw–2; woodland group 13; wildlife group E)

Portsmouth Series

The Portsmouth series consists of deep, nearly level, very poorly drained soils that have a black surface layer 8 to 18 inches thick. These soils are in depressions and along natural drains of the Coastal Plain. The native vegetation consists chiefly of water oak, sweetgum, yellow-poplar, and cypress; it includes a little pine and an understory of grasses, brushes, and shrubs.

In this county, Portsmouth soils are mapped only in an undifferentiated group with Okenee soils.

Portsmouth and Okenee loams (Po).—These soils are very poorly drained. They occur along the edges of the terraces of the Great Pee Dee and Little Pee Dee Rivers and along some of the larger inland streams in the county.

The main layers of a representative profile of Portsmouth loam are—

0 to 9 inches, black, very friable loam.
9 to 15 inches, very dark gray, very friable sandy loam.
15 to 48 inches, gray, friable to firm sandy loam and sandy clay loam; brownish-yellow mottles.
48 to 62 inches +, mottled white and light-gray, loose sand.

The surface layer ranges from 8 to 18 inches in thickness. It is black and contains a large amount of organic matter. The subsoil ranges from 15 inches to 36 inches in thickness and from sandy loam to sandy clay loam in texture. In some places the mottles are fewer in number, and in some places there are none. Included in the areas mapped are a few small areas of Myatt and Leaf soils.

The Okenee soil resembles the Portsmouth soil, but its black surface layer ranges from 18 to 22 inches in thickness.

These soils are strongly acid. The organic-matter content is high, and the supply of plant nutrients is moderate. Surface runoff is very slow, and in places water stands at or near the surface for long periods. The response to fertilizer and lime is good. The infiltration rate, permeability, and the available moisture capacity are all moderate.

Most of the acreage is wooded, but a few areas have been cleared and drained and are now used for pasture and crops. These soils are difficult to drain because of a lack of drainage outlets. If adequately drained and otherwise properly managed, they are fairly well suited to corn, soybeans, oats, bahiagrass, dallisgrass, white clover, and annual lespedeza. Timber management is difficult because of the high water table. (Capability unit IIIw–4; woodland group 12; wildlife group E)

Rains Series

The Rains series consists of deep, poorly drained, nearly level soils that formed in beds of unconsolidated sands and sandy clays. The surface layer consists of very dark gray, friable sandy loam and is about 8 inches thick. The subsoil is gray, friable sandy clay loam mottled with yellowish brown, strong brown, and yellowish red.

Rains soils commonly adjoin Gilead, Lakeland, Plummer, Klej, and Lynchburg soils. Their subsoil is similar in texture to that of Lynchburg soils, but it is finer textured than that of Plummer and Klej soils. Rains soils are similar to Plummer soils in drainage but are more poorly drained than Klej soils. They are at a lower elevation than Gilead, Lakeland, and Lynchburg soils and are more poorly drained.

Rains soils occur at the head of small streams and drainageways in the Sand Hills of Marlboro County. In other parts of the county, they are on nearly level, broad flats and in the depressions commonly known as Carolina bays. The natural vegetation consists of water oak, live oak, sweetgum, blackgum, cypress, a few scattered areas of loblolly pine and pond pine, and an understory of sedges, gallberry bushes, grasses, and briers.

Rains sandy loam (Ra).—This soil is widely distributed throughout the county, but the total acreage is small. The following description gives some of the major profile characteristics—

0 to 12 inches, very dark gray and gray, friable sandy loam.
12 to 34 inches, gray, friable sandy clay loam; yellowish-brown, strong-brown, and yellowish-red mottles.
34 to 42 inches +, gray, friable sandy clay loam; strong-brown and yellowish-red mottles; lenses and pockets of sand.

In a few places the surface layer is silt loam. It ranges from very dark gray to light gray in color and from 8 to 18 inches in thickness. The subsoil is sandy loam or sandy clay loam. Included with this soil in mapping were a few small areas of Klej soils and Mixed alluvial land.

This soil is acid. The organic-matter content and the natural supply of plant nutrients are low. Permeability is moderately slow, surface runoff is very slow, and internal drainage is slow. The available moisture capacity is low. Some of the depressions are flooded for short periods late in winter and in spring by seepage water from higher surrounding soils.

A large acreage is wooded, but a few areas have been cleared and drained and are now used for pasture and a few crops. This soil cannot be used for crops or pasture unless it is drained. Many areas cannot be drained, because they lack drainage outlets. (Capability unit IVw–3; woodland group 10; wildlife group E)

Ruston Series

The soils of the Ruston series are deep, nearly level to sloping, and well drained. They formed in beds of unconsolidated sands and clays. Where uneroded they have a surface layer of dark-brown, very friable loamy sand. The subsoil is strong-brown to yellowish-red, friable sandy loam to sandy clay loam mottled with yellowish red, red, and strong brown in the lower part.

Ruston soils commonly adjoin Norfolk, Gilead, Vaucluse, Lakeland, Eustis, Coxville, and Dunbar soils. They are at a higher elevation than Coxville and Dunbar soils and are better drained and less fine textured. They are finer textured than Lakeland and Eustis soils and are less excessively drained. Ruston soils are similar to Norfolk soils in drainage, but their subsoil is reddish rather than yellowish. They lack the compact, cemented subsoil that is characteristic of Gilead and Vaucluse soils.

Ruston soils occur throughout much of Marlboro County but are mostly in the central part. They are in the uplands, in areas adjacent to the terrace of the Great Pee Dee River. The natural vegetation consists of pines, hardwoods, and an understory of grasses, bushes, and shrubs.

Ruston loamy sand, 0 to 2 percent slopes (RsA).—This is a well-drained soil of the uplands. It has a friable, clayey, strong-brown to yellowish-red subsoil. The main layers of a representative profile are—

0 to 10 inches, dark-brown to yellowish-brown, very friable loamy sand.
10 to 15 inches, strong-brown, friable sandy loam.
15 to 62 inches +, yellowish-red, friable sandy clay loam; few small concretions; yellowish-red, red, and strong-brown mottles below a depth of 51 inches.

In some places the surface layer is loamy fine sand. It ranges from dark brown to grayish brown in color, depending on the organic-matter content. The subsoil is sandy loam to sandy clay loam and is 30 to 60 inches or more thick. Included in the areas mapped are a few small areas of Norfolk soils and Local alluvial land.

This soil is acid. It is low in natural fertility and low in organic-matter content. Surface runoff is moderate. The infiltration rate, permeability, and the available moisture capacity are all moderate. The response to lime and fertilizer is good.

Almost all the acreage has been cleared and is now used for cultivated crops and pasture. The rest of the acreage is wooded. The wooded areas have been cut over in the last few years. This is a productive soil; it is well suited to the crops commonly grown in the county. (Capability unit I–1; woodland group 3; wildlife group A)

Ruston loamy sand, 2 to 6 percent slopes (RsB).—This soil occurs on broad, gentle slopes and as narrow bands parallel to drainageways. The surface layer is dark-brown loamy sand, and the subsoil is strong-brown to yellowish-red sandy loam to sandy clay loam. Surface runoff is more rapid than on Ruston loamy sand, 0 to 2 percent slopes, and there is a slight erosion hazard.

All the crops commonly grown on the nearly level Ruston loamy sand can be grown on this soil, and yields are the same. A complete water-disposal system, including terraces and vegetated outlets or other suitable waterways, is needed to conserve soil and water. All crop residues should be turned under to help increase the organic-matter content. Tillage should be on the contour. (Capability unit IIe–1; woodland group 3; wildlife group A)

Ruston loamy sand, 2 to 6 percent slopes, eroded (RsB2).—This soil occurs on broad upland plains and as narrow bands parallel to drainageways. Its surface layer is 3 to 5 inches thinner than that of Ruston loamy sand, 0 to 2 percent slopes. In many places plowing has resulted in the mixing of some subsoil with what remains of the original surface soil, and in these places the plow layer is brownish in color. In places the subsoil is exposed, and surface runoff is more rapid.

This soil is suited to the crops generally grown on Ruston loamy sand, 0 to 2 percent slopes, but it yields less than the nearly level soil. A complete water-disposal system, including terraces and vegetated outlets or other suitable waterways, is necessary. Tillage should be on the contour, and all crop residues should be turned under. In the more eroded areas it is difficult to establish a stand of crops, and the plants generally are stunted. (Capability unit IIe–1; woodland group 3; wildlife group A)

Ruston loamy sand, 6 to 10 percent slopes, eroded (RsC2).—The surface layer of this soil is generally 3 to 5 inches thinner than that of Ruston loamy sand, 0 to 2 percent slopes. In small areas the strong-brown clayey subsoil is exposed. The present plow layer is a mixture of the original surface layer and subsoil and is brownish in color. The rate of infiltration is slower than in Ruston loamy sand, 0 to 2 percent slopes, and consequently, surface runoff is more rapid. Small rills are common after rains.

This soil is suited to most locally grown crops, but yields are lower than on the less sloping and uneroded Ruston soils. All of the acreage has been cultivated at some time, but many areas have reverted to pine or have been planted to pine. (Capability unit IIIe–1; woodland group 3; wildlife group A)

Ruston loamy sand, thick surface, 0 to 2 percent slopes (RtA).—The surface layer of this soil is 18 to 30 inches thick.

This soil is coarser textured throughout than Ruston loamy sand, 0 to 2 percent slopes, and consequently is more droughty and more susceptible to wind erosion. Infiltration and permeability are somewhat faster than in Ruston loamy sand, 0 to 2 percent slopes. The available moisture capacity is low, and the organic-matter content is low.

This soil is suited to the same crops as Ruston loamy sand, 0 to 2 percent slopes, but is not so productive. All of the acreage has been cultivated at some time, but in the last few years a large acreage has been planted to pine or has reseeded naturally to pine. Large fields need to be protected against wind erosion by means of windbreaks. Close-growing crops should be grown at least half of the

time. (Capability unit IIs–1; woodland group 4; wildlife group A)

Ruston loamy sand, thick surface, 2 to 6 percent slopes (RtB).—The surface layer of this soil is 18 to 30 inches thick. It is lighter colored than that of Ruston loamy sand, 0 to 2 percent slopes. The subsoil is strong-brown to yellowish-red sandy loam to sandy clay loam.

This soil is more droughty than Ruston loamy sand, 0 to 2 percent slopes, more susceptible to wind erosion, and more readily leached of plant nutrients. It absorbs water faster and is more rapidly permeable. The organic-matter content and the supply of plant nutrients are low. The response to fertilizer and lime is good.

This soil is suited to the same crops as Ruston loamy sand, 0 to 2 percent slopes, but is not so productive. All of the acreage has been cultivated, but in recent years a large part has been planted to or has reseeded naturally to pine. Close-growing crops should be grown at least half the time. (Capability unit IIs–1; woodland group 4; wildlife group A)

Ruston loamy sand, thick surface, 6 to 10 percent slopes (RtC).—The surface layer of this soil is 18 to 30 inches thick. It is lighter colored than that of Ruston loamy sand, 0 to 2 percent slopes. The subsoil is strong-brown to yellowish-red sandy loam to sandy clay loam.

This soil is droughtier than Ruston loamy sand, 0 to 2 percent slopes, more susceptible to erosion, and more readily leached of plant nutrients. It absorbs water faster and is more rapidly permeable. The organic-matter content and the supply of plant nutrients are low. The response to fertilizer and lime is good.

This soil is only fairly well suited to the crops commonly grown in the county. Yields are low. All of the acreage has been cultivated but is now being planted to pine or is reseeding naturally to pine. Windbreaks are needed as protection against wind erosion. Cultivated areas should be in close-growing crops 2 years out of 3. (Capability unit IIIe–5; woodland group 4; wildlife group A)

Rutlege Series

The soils of the Rutlege series are nearly level and very poorly drained. They formed in acid sands and loamy sands. The surface layer is black, very friable loamy sand and is about 11 inches thick. It has a high organic-matter content. The subsoil is gray or light-gray, very friable to loose loamy sand or sand.

These soils commonly adjoin Norfolk, Eustis, Lakeland, Lynchburg, Klej, and Plummer soils. They are more poorly drained than any of these soils. They have a thicker, darker colored surface layer than Plummer, Lynchburg, and Klej soils. They are comparable to Plummer soils in subsoil texture. Rutlege soils are at about the same elevation as Plummer soils, but they are at a lower elevation than Norfolk, Eustis, Lakeland, Lynchburg, and Klej soils.

Rutlege soils occur throughout Marlboro County but are chiefly in the southern half. They are in depressions known as Carolina bays, in low flats, and at the head of small streams and drainageways. The natural vegetation consists of a mixture of hardwoods and pond pine and an understory of grasses, bushes, and sedges.

Rutlege loamy sand (Rv).—This is a very poorly drained soil on low flats, in oval depressions, and at the head of small streams and drainageways. Water is at or near the surface for long periods late in winter and in spring. The main layers of a representative profile are—

0 to 11 inches, black, very friable loamy sand.
11 to 19 inches, very dark gray to gray, very friable loamy sand.
19 to 42 inches +, gray to light-gray, very friable to loose loamy sand or sand; a few dark stains along the root channels.

The surface layer ranges from 9 to 20 inches in thickness and from loamy sand to loam in texture. The subsoil is gray to light-gray loamy sand to sand. In some places it is mottled with yellowish brown and strong brown. Included in the areas mapped are a few small areas of Plummer soils and Mixed alluvial land.

This soil is strongly acid. Except for the surface layer, it is low in organic-matter content. Natural fertility is low. Permeability is rapid to very rapid, surface runoff is slow, the infiltration rate is moderate, and the available moisture capacity is moderate. The response to fertilizer and lime is good.

Most of the acreage is wooded, but a few areas have been cleared and drained and are used for pasture and a few crops. This soil must be drained before it can be used for either pasture or crops. It is easily drained, but many areas do not have suitable outlets. Drainage ditches may be difficult to maintain because of the sloughing action of the subsoil. (Capability unit Vw–2; woodland group 13; wildlife group E)

Rutlege loam (Ru).—This soil occurs in small, low areas. The surface layer is high in organic-matter content. The rate of infiltration is slower than in Rutlege loamy sand. The two soils can be used and managed in about the same way, but Rutlege loam generally is more difficult to drain.

If adequately drained, this soil can be cultivated to a limited extent. The production of timber is its best use. (Capability unit Vw–2; woodland group 13; wildlife group E)

Swamp (Sw)

This land type consists of nearly level areas that are flooded frequently. The texture of the surface layer ranges from sand to clay and the color from gray to brown or black. The content of organic matter varies. In some areas there is a thick, black organic layer that is underlain by light-gray sand or clay. Water stands on the surface most of the time.

The Swamp areas of Marlboro County occur along major streams. The natural vegetation consists of water-tolerant hardwoods and an understory of coarse grasses, sedges, and canes. In recent years much of the cypress and juniper has been removed, and the vegetation now consists mainly of cutover gum and oak.

Some areas of this land type can be used for pasture if they are protected by dikes and drained. The areas are best used, however, for the production of timber. (Capability unit VIIw–1; woodland group 18; wildlife group E)

Vaucluse Series

The soils of the Vaucluse series are shallow to moderately deep and well drained. They formed in beds of unconsolidated sands and clays. The surface layer is dark

grayish-brown, very friable or loose sand. The subsoil is yellowish-red, firm and compact, weakly cemented sandy clay loam.

Vaucluse soils adjoin Gilead, Ruston, and Norfolk soils. They are similar to Gilead soils in texture and in internal drainage. Vaucluse soils differ from Ruston and Norfolk soils in having a less fine-textured surface layer, a weakly developed, compact, weakly cemented subsoil, and slower internal drainage. They have a yellowish-red subsoil similar to that of Ruston soils, rather than a yellowish-brown subsoil like that of Norfolk and Gilead soils.

These soils are mostly in the Sand Hills part of the county, on the steeper slopes adjacent to streams. The natural vegetation consists primarily of longleaf pine, loblolly pine, some scrub oak, and an understory of grasses and low bushes.

Vaucluse sand, 2 to 6 percent slopes (VaB).—This is a well-drained soil that occurs mostly in the Sand Hills. The main layers of a representative profile are—

0 to 2 inches, dark grayish-brown, very friable sand.
2 to 12 inches, yellowish-brown, very friable loamy sand.
12 to 20 inches, yellowish-red, firm and compact sandy clay loam; few coarse quartz grains and a little gravel.

The surface layer ranges from dark grayish brown to light gray in color. Its texture generally is sand, but in a few places it is loamy sand. The compact subsoil ordinarily is 8 to 20 inches thick. In a few places there is no compact layer, and in these the surface layer rests directly on the substratum or parent material. The subsoil ranges from yellowish red to reddish brown in color, and in some places it is mottled. Included in the areas mapped are a few small areas of Gilead soils and Local alluvial land.

This soil is strongly acid. Natural fertility is low, and the organic-matter content is low. Permeability is moderate to slow, surface runoff is medium to rapid, and internal drainage is slow. The available moisture capacity is low. The response to fertilizer and lime is good.

This soil is fairly well suited to the crops commonly grown in the county. Yields are generally low. Most of the acreage is wooded. A few areas have been cleared and are used for pasture and crops. (Capability unit IIe–4; woodland group 15; wildlife group B)

Vaucluse sand, 6 to 10 percent slopes (VaC).—This soil has a thinner surface layer, more rapid runoff, and a somewhat slower rate of infiltration than Vaucluse sand, 2 to 6 percent slopes. The subsoil is yellowish-red, weakly cemented, compact sandy clay loam. Permeability is moderate to slow, and the available moisture capacity is low. This soil is subject to water erosion. Small rills and gullies form after a rain.

This soil is suited to the same crops as Vaucluse sand, 2 to 6 percent slopes. It should be kept in close-growing crops 2 years out of 3. A complete water-disposal system is needed. Tillage should be on the contour, and all crop residues should be turned under to conserve soil and to increase the organic-matter content. Yields are low. (Capability unit IIIe–4; woodland group 15; wildlife group B)

Vaucluse sand, 6 to 10 percent slopes, eroded (VaC2).—The surface layer of this soil is 4 to 6 inches thinner than that of Vaucluse sand, 2 to 6 percent slopes. The subsoil is yellowish-red, hard, compact sandy clay loam. In many places the subsoil is exposed. Permeability is moderate to slow, and the available moisture capacity is low. Surface runoff is more rapid and infiltration is slower than on Vaucluse sand, 2 to 6 percent slopes. The organic-matter content is low.

This soil is not suitable for continuous cultivation, because of the serious hazard of water erosion. It is best used for the production of timber, though in some places windthrow is a serious hazard. Row crops should be grown only in a contour-strip rotation with sericea lespedeza or bahiagrass. (Capability unit IVe–4; woodland group 15; wildlife group B)

Vaucluse sand, 10 to 15 percent slopes (VaD).—This soil has a thinner surface layer than Vaucluse sand, 2 to 6 percent slopes. The subsoil is yellowish-red, weakly cemented, hard, compact sandy clay loam. Most of the acreage is in the Sand Hills. The areas range from 5 to 75 acres or more in size and are covered by cutover pine and scrub oak.

This soil is droughty. Surface runoff is rapid, and the infiltration rate is moderately slow.

This soil is not suitable for cultivation. If it is cropped, no more than one-fourth should be planted to row crops each year. The rest should be in perennial vegetation. The production of timber is the best use, though in some places windthrow is a serious hazard. (Capability unit IVe–4; woodland group 15; wildlife group B)

Vaucluse sand, 10 to 15 percent slopes, eroded (VaD2).—The surface layer of this soil is only 4 to 6 inches thick, and it is underlain by yellowish-red, compact, hard sandy clay loam. In many places the yellowish-red, clayey subsoil is exposed. Most of this soil is in the Sand Hills. The areas range from 5 to 75 acres or more in size and are covered by cutover pine and scrub oak.

This soil is droughty. Surface runoff is rapid, the infiltration rate is slow, and permeability is moderate to slow. The available moisture capacity is low. The erosion hazard is severe.

This soil is not suited to cultivated crops. The production of timber is its best use. In some places windthrow is a serious hazard, and the timber should not be clear cut. (Capability unit VIe–2; woodland group 15; wildlife group B)

Vaucluse sand, 15 to 25 percent slopes, eroded (VaE2).—This soil is more droughty than Vaucluse sand, 2 to 6 percent slopes. It occurs in the Sand Hills on moderately steep, eroded breaks. The surface layer is only 3 to 5 inches thick, and in many large areas the subsoil is exposed.

Natural fertility is low, and the organic-matter content is low. Surface runoff is rapid, the rate of infiltration is slow, and permeability is moderate to slow. The available moisture capacity is low.

This soil is not suited to cultivated crops or pasture. It is best suited to trees. Windthrow is a serious problem in some places; consequently, a pulpwood rotation is better than a sawtimber rotation. The trees should not be clear cut. (Capability unit VIe–2; woodland group 15; wildlife group B)

Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded (VgD2).—This soil is, by volume, 25 to 50 percent subrounded quartz gravel ¼ inch to 3 inches in diameter (fig. 13). Its surface layer is 4 to 6 inches thick.

Figure 13.—**Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded. This soil is not suitable for pasture or crops.**

The subsoil is compact, hard, yellowish-red sandy clay loam and is about 8 to 20 inches thick. In severely eroded areas, the subsoil is exposed.

Natural fertility is low, and the organic-matter content is low. Permeability is moderate to slow, and the available moisture capacity is low. Because of rapid runoff and slow infiltration, this soil is droughty.

This soil is not suitable for pasture or crops. It is best suited to the production of timber. A few small areas are in pasture. A pulpwood rotation is preferable to a sawtimber rotation because there is a significant windthrow hazard. (Capability unit VIe–2; woodland group 15; wildlife group B)

Vaucluse sand, thick surface, 2 to 6 percent slopes (VkB).—The surface layer of this soil is 18 to 30 inches thick and is light gray or light brownish gray in color. The subsoil is weakly cemented, compact yellowish-red sand clay loam.

Natural fertility is low, and the organic-matter content is low. Surface runoff is moderately slow, and the infiltration rate is moderately rapid. Permeability is moderate, and the available moisture capacity is low. The response to fertilizer and lime is good.

This soil can be used and managed in about the same way as Vaucluse sand, 2 to 6 percent slopes. Yields are low. Wind erosion is a hazard in some of the larger fields. (Capability unit IIe–4; woodland group 15; wildlife group B)

Vaucluse sand, thick surface, 6 to 10 percent slopes (VkC).—The surface layer of this soil is 18 to 30 inches thick and is light gray or light brownish gray in color. The subsoil is compact, hard, yellowish-red sandy clay loam.

The natural fertility is low, and the organic-matter content is low. Surface runoff and the infiltration rate are moderately rapid, and permeability is moderate. The available moisture capacity is low. The response to large amounts of lime and fertilizer is good.

This soil has all been cultivated, but much of it has now been planted to or has reseeded naturally to pine. It is suited to the same crops as Vaucluse sand, 2 to 6 percent slopes. Yields are low. Wind erosion is a hazard in some of the larger fields. (Capability unit IIIe–4; woodland group 15; wildlife group B)

Vaucluse sand, thick surface, 10 to 15 percent slopes (VkD).—This soil is mostly in the Sand Hills, in strongly sloping areas and on sharp breaks along streams and drainageways. The surface layer is 18 to 30 inches thick and is light gray or light brownish gray in color. The subsoil is hard, weakly cemented, yellowish-red sandy clay loam.

The supply of plant nutrients is low, and the organic-matter content is low. Surface runoff is rapid, the infiltration rate is moderately slow, and permeability is moderate. The available moisture capacity is low.

This soil is not suited to cultivated crops. It is best suited to the production of timber. If it is cultivated, a close-growing crop should be grown three-fourths of the time. Most of the acreage is now in cutover pine and scrub oak. (Capability unit IVe–4; woodland group 15; wildlife group B)

Wahee Series

The soils of the Wahee series are nearly level, moderately deep, and somewhat poorly drained or moderately well drained. They formed in alluvium washed from soils of the Coastal Plain and the Piedmont. The surface layer is very dark gray, friable very fine sandy loam. The subsoil is light yellowish-brown, friable to firm sandy clay loam to clay mottled with yellowish brown, red, and gray.

Wahee soils commonly adjoin Kalmia, Cahaba, Flint, Leaf, and Izagora soils. They are at a lower elevation and are more poorly drained and finer textured throughout than Kalmia, Cahaba, and Izagora soils, and they have a mottled subsoil. Wahee soils are similar to Izagora soils in drainage. They are less well drained than Flint soils and have grayish mottles near the surface. They are in intermediate positions between the poorly drained Leaf soils and the moderately well drained Flint soils.

In Marlboro County, Wahee soils occur as broad, level areas on terraces of the Great Pee Dee River, from a point about 2 miles south of Wallace to the Florence County line. The natural vegetation consists of loblolly pine, longleaf pine, sweetgum, blackgum, yellow-poplar, live oak, and an understory of grasses, bushes, and shrubs.

Wahee very fine sandy loam (Wa).—This is a somewhat poorly drained or moderately well drained soil on the terraces of the Great Pee Dee River. The main layers of a representative profile are—

0 to 3 inches, very dark gray, friable, very fine sandy loam.
3 to 6 inches, grayish-brown, friable fine sandy loam; dark-gray and yellowish-brown mottles.
6 to 27 inches, light yellowish-brown, friable to firm sandy clay loam to clay; yellowish-brown, red, and gray mottles.
27 to 41 inches +, mottled yellowish-brown, red, and gray, sticky, plastic clay.

The surface layer ranges from very dark gray to gray in color. Its texture generally is very fine sandy loam, but in a few places it is fine sandy loam. The yellowish-brown subsoil ranges from sandy clay loam to clay in texture and from 18 to 30 inches in thickness. Included with this soil in mapping were a few small areas of Flint and Leaf soils.

This soil is acid. The organic-matter content is medium, and the natural fertility is medium. Surface runoff is medium to slow. The infiltration rate, permeability, and internal drainage are all slow. The available moisture capacity is moderate. The response to fertilizer and lime is good.

Most of the acreage is wooded. A few areas have been cleared and drained and are used for pasture and suitable crops. Drainage is required before this soil can be used for crops or pasture. (Capability unit IIIw–3; woodland group 6; wildlife group D)

Wehadkee Series

The soils of the Wehadkee series are nearly level and poorly drained. They formed in alluvium washed from soils of the Piedmont and the Coastal Plain. The surface layer is brown, friable silt loam and is about 8 inches thick. The subsoil is dark-gray to gray, plastic silty clay mottled with yellowish brown and strong brown.

Wehadkee soils commonly adjoin Chewacla and Congaree soils but are at a lower elevation and are less well drained. They have a grayer, finer textured subsoil than Chewacla and Congaree soils and are mottled nearer the surface.

Wehadkee soils are in nearly level areas and in slough channels on the flood plain of the Great Pee Dee River. The natural vegetation consists of water oak, yellow-poplar, hickory, blackgum, sweetgum, cypress, and a few scattered areas of loblolly pine.

Wehadkee silt loam (Wd).—This is a poorly drained soil on the flood plain of the Great Pee Dee River. It is flooded several times a year when the river overflows. The main layers of a representative profile are—

0 to 8 inches, brown, friable silt loam.
8 to 42 inches +, dark-gray to gray, firm to very firm, plastic silty clay; yellowish-brown and strong-brown mottles; a few mica flakes.

The surface layer ranges from brown to grayish brown in color. The subsoil is silty clay and ranges from dark gray to gray in color. The amount of mottling varies. Included in the areas mapped are a few small areas of Chewacla soils.

This soil is acid. The organic-matter content is medium, and the natural fertility is medium. Surface runoff is very slow. The infiltration rate and permeability are moderately slow. Internal drainage is slow, and the available moisture capacity is high.

This soil is not suitable for cultivation, and it must be drained before it can be used for pasture. Most of the acreage is wooded. A few areas have been cleared and drained and are used for pasture. (Capability unit IVw–1; woodland group 11; wildlife group E)

Wickham Series

The soils of the Wickham series are gently sloping, deep, and well drained. They formed in alluvium washed from soils of the Piedmont. The surface layer of reddish-brown, very friable sandy loam is about 8 to 14 inches thick. The subsoil is red to yellowish-red, friable sandy clay loam. A few small concretions occur in the lower part of the subsoil.

Wickham soils are redder and are finer textured throughout than the adjoining Molena soils, which are excessively drained. They are at a higher elevation and are better drained than the nearby Congaree and Chewacla soils, and they have a more strongly developed profile.

Wickham soils are in the northwestern part of Marlboro County in the vicinity of Wallace. The natural vegetation consists of white oak, post oak, red oak, hickory, gum, scattered areas of loblolly pine, and an understory of grasses, bushes, and shrubs.

Wickham sandy loam, 2 to 6 percent slopes, eroded (WkB2).—This is a deep, well-drained soil on the terrace of the Great Pee Dee River. The main layers of a representative profile are—

0 to 7 inches, reddish-brown, very friable sandy loam.
7 to 38 inches, red to yellowish-red, friable sandy clay loam; numerous fine mica flakes and few small concretions below a depth of 26 inches.
38 to 78 inches +, red, friable clay loam; brownish-yellow and dark-red mottles; numerous fine mica flakes.

The surface layer ranges from reddish brown to dark reddish brown in color and from 6 to 10 inches in thickness. The subsoil ranges from red to yellowish red in color and from 30 to 40 inches in thickness. Its texture generally is sandy clay loam, but in some places it is light sandy clay loam or heavy sandy loam. In the more eroded areas patches of red clayey subsoil are exposed. Rounded quartz gravel is on the surface in some places. Small rills and shallow gullies are common after rains. Included in the areas mapped are a few small areas of Local alluvial land.

This soil is acid. The natural fertility is medium to low, and the organic-matter content is medium. Surface runoff is moderately rapid. The infiltration rate, permeability, and the available moisture capacity are all moderate. The erosion hazard is moderate. The response to fertilizer and lime is good.

This soil is fairly well suited to the crops commonly grown in the county. Yields are fair. Most of the acreage has been cleared and is now used for cultivated crops and pasture. The rest is in cutover hardwoods and pines. (Capability unit IIe–1; woodland group 17; wildlife group A)

Wickham sandy loam, 2 to 6 percent slopes (WkB).—This soil is similar to Wickham sandy loam, 2 to 6 percent slopes, eroded. The surface layer is 8 to 14 inches thick and is dark reddish brown in color. The subsoil is red to yellowish-red sandy clay loam.

This soil is acid. Natural fertility is low to medium, and the organic-matter content is medium. Surface run-

off, the rate of infiltration, permeability, and the available moisture capacity are all moderate. There is a slight hazard of erosion. The response to fertilizer and lime is good.

This soil is well suited to the crops commonly grown in the county. Yields are high. Most of the acreage is in cultivated crops or pasture. The rest is in cutover hardwoods and pines. (Capability unit IIe–1; woodland group 17; wildlife group A)

Use and Management of the Soils [1]

This section discusses general management of cropland, describes the system of land capability classification used by the Soil Conservation Service, and gives the classification of the soils of Marlboro County according to that system. It describes general management practices for groups of soils that have similar potentialities and management requirements; it gives estimates of yields of the principal crops under two levels of management; and it rates each soil in the county according to its suitability for specified crops. It interprets the soil characteristics that are significant in road construction and other engineering uses; it groups the soils according to their suitability for use as woodland and gives information that is useful in the management of woodland; it groups the soils on the basis of their suitability as habitats for specified kinds of wildlife.

This section is a general guide to the management of the soils in the county. For more detailed information about managing the soils, consult the local staffs of the Agricultural Extension Service and the Soil Conservation Service and the staff of the South Carolina Agricultural Experiment Station at Clemson, S.C.

General Management Requirements

Some management practices are applicable to all the soils of Marlboro County. These include applying the proper soil amendments, maintaining the organic-matter content of the soils, tilling the soils properly, conserving soil and water, and improving drainage. These basic management practices are discussed in this subsection.

Soil Amendments.—Most of the soils in Marlboro County are acid, low in organic-matter content, low in available nitrogen and phosphorus, and medium to low in available potassium. The kind and amount of fertilizer to be applied should be determined by soil tests. Up-to-date information on soil sampling and testing and on fertilizer applications can be obtained from the county agricultural agent. The response to lime and fertilizer is good.

The soils of this county are low in organic-matter content. It is not economically practical to build up the organic-matter content to a high level, but it is important to maintain it at its original level. Organic matter returns some nitrogen and other plant nutrients to the soil, and it also improves the water-holding capacity and the tilth. Crop residues and manure are major sources of organic matter. Lime and fertilizer promote plant growth and the development of root systems and thereby help to maintain the organic-matter content.

[1] L. D. Eagles, conservation agronomist, Soil Conservation Service, assisted in the preparation of this section.

Tillage.—Tillage is necessary for preparation of seedbeds and control of weeds, but it tends to break down the structure of the soil. Consequently, tillage should be kept to a minimum. Increasing the organic-matter content and growing sod crops both help to restore good structure.

Some of the silty soils in the county tend to puddle during heavy rains. Puddling seals the surface and thereby reduces the rate of infiltration, increases runoff, and intensifies the erosion hazard. Sealing can be retarded by using tillage implements that leave crop residues on the surface as a mulch. The mulch helps in the absorption and retention of rainfall, slows down the rate of runoff, and reduces evaporation.

Clayey soils become cloddy unless cultivated within a narrow range of moisture content.

Some soils, if tilled repeatedly to the same depth, get a compacted layer, called a plowpan or plowsole, just below the plowed layer. Growing sod crops and varying the depth of tillage prevents the formation of a plowpan.

Controlling Erosion.—Most of the sloping cultivated soils in Marlboro County are susceptible to erosion. Some severely eroded areas are no longer suitable for crops. Sheet erosion causes the loss of surface soil, which generally contains the largest supply of organic matter and plant nutrients. Gully erosion forms ditches and gullies that advance up the slope.

Erosion can be controlled on most of the soils of the county by means of conservation structures and vegetation. Contour strips of close-growing crops generally provide adequate control of sheet erosion. Grass-based rotations are also effective. A water-control system that includes terraces and vegetated outlets is needed in areas where gullies are forming. Parallel terraces are used on broad slopes in some parts of the county.

Drainage.—Yields of most crops can be increased on the wet soils of this county by removing excess water. Excess moisture prevents the preparation of a seedbed at the correct time and thus delays planting; it prevents normal growth of plant roots; and it sometimes drowns out the plants.

Open ditches are the most common means of removing excess water. Tile drains are more expensive to install, but under certain conditions they are more satisfactory than open drains.

Soils that are underlain by a claypan or a fragipan generally are difficult to drain and do not respond well to management even after drainage. Tile drains are not effective in such soils, and open ditches are effective only if they intercept water moving laterally on top of the pan.

Wet soils that are deep and permeable generally are very productive after drainage, if they are limed and fertilized. Neither ditches nor tile can be installed unless suitable outlets are available.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. The eight capability classes in the broadest grouping are desig-

nated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, of forage, or of wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; *w* means 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 country, indicates 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 or no limitations. Class V can contain, at the most, only the subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no risk of erosion but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils 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. The capability units are convenient groupings for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIe–2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of permanent limitations, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil, and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows.

Class I: Soils that have few limitations that restrict their use.
- Unit I–1: Moderately well drained or well drained soils; surface layer 12 to 18 inches thick; subsoil of friable sandy loam to sandy clay loam.
- Unit I–2: Well-drained soils; surface layer 6 to 12 inches thick; subsoil of friable to firm, sticky sandy clay.

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

Subclass IIe: Soils subject to moderate erosion if they are not protected.
- Unit IIe–1: Deep, moderately well drained or well drained, gently sloping soils of the uplands and stream terraces; subsoil of friable sandy loam or sandy clay loam.
- Unit IIe–2: Well-drained, sloping soils; surface layer 6 to 12 inches thick; subsoil of friable to firm, sticky sandy clay.
- Unit IIe–3: Moderately deep, moderately well drained or well drained, gently sloping soils of the uplands and stream terraces; subsoil of fine sandy clay loam to clay.
- Unit IIe–4: Well-drained, gently sloping soils; surface layer 8 to 30 inches thick; subsoil of compact, weakly cemented sandy clay loam to sandy clay.

Subclass IIw: Soils that have moderate limitations because of excess water.
- Unit IIw–1: Deep, somewhat poorly drained or moderately well drained local alluvial soils in depressions and draws.
- Unit IIw–2: Deep, somewhat poorly drained or moderately well drained, nearly level soils of the uplands and stream terraces; subsoil of friable to firm sandy loam to fine sandy clay.
- Unit IIw–4: Deep, well-drained, nearly level soils on flood plains; subject to frequent overflow.
- Unit IIw–5: Moderately deep, moderately well drained or well drained soils of the uplands and stream terraces; slow or moderately slow permeability.

Subclass IIs: Soils that have moderate limitations of moisture capacity and fertility.
- Unit IIs–1: Moderately well drained or well drained, nearly level to gently sloping soils of the uplands and stream terraces; surface layer 18 to 30 inches thick; subsoil of friable fine sandy loam to sandy clay loam.
- Unit IIs–2: Well-drained, nearly level soils of the uplands; surface layer 8 to 30 inches thick; subsoil of compact, weakly cemented sandy clay loam to sandy clay.

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

Subclass IIIe: Soils subject to severe erosion if they are cultivated and not protected.
- Unit IIIe–1: Deep, well-drained, slightly eroded or moderately eroded, sloping soils of the uplands; subsoil of friable sandy loam or sandy clay loam.
- Unit IIIe–2: Well-drained, moderately eroded, sloping to strongly sloping soils; subsoil of sticky sandy clay.
- Unit IIIe–3: Moderately deep, moderately well drained, slightly eroded, sloping to strongly sloping soils of the stream terraces; subsoil of sticky, slightly plastic clay loam and clay; slow permeability.
- Unit IIIe–4: Well-drained, shallow to moderately deep, sloping soils of the uplands; subsoil of compact, weakly cemented sandy clay loam and sandy clay; moderate to slow permeability.
- Unit IIIe–5: Well-drained, sloping soils of the uplands; surface layer 18 to 30 inches thick; subsoil of friable sandy loam to sandy clay loam.

Subclass IIIw: Soils that have severe limitations because of excess water.
Unit IIIw–1: Deep, moderately well drained, nearly level soils; surface layer of loamy sand; subsoil of mottled, friable, loamy sand; very rapid permeability.
Unit IIIw–2: Deep, very poorly drained or somewhat poorly drained, nearly level soils; surface layer of sandy loam, fine sandy loam, and loam; subsoil of sandy clay loam to clay; moderately slow to very slow permeability.
Unit IIIw–3: Somewhat poorly drained or moderately well drained, nearly level soils of the flood plains and stream terraces; surface layer of very fine sandy loam or silt loam; subsoil of sandy clay loam to clay.
Unit IIIw–4: Very poorly drained, nearly level soils of the stream terraces; black loam surface layer 8 to 22 inches thick; subsoil of mottled sandy loam to sandy clay loam; moderate permeability.
Unit IIIw–6: Somewhat poorly drained, nearly level soils; surface layer of loam 4 to 6 inches thick; subsoil of mottled, sticky, plastic clay; slow permeability.
Subclass IIIs: Soils that have severe limitations of moisture capacity or tilth.
Unit IIIs–1: Somewhat excessively drained or excessively drained, nearly level to sloping soils of the uplands and stream terraces; surface layer 30 to 42 inches thick; subsoil of friable sandy loam or sandy clay loam.

Class IV: Soils that have very severe limitations that restrict the choice of plants, or require very careful management, or both.
Subclass IVe: Soils subject to very severe erosion if they are cultivated and not protected.
Unit IVe–4: Well-drained, shallow to moderately deep, sloping to strongly sloping soils of the uplands; surface layer 4 to 30 inches thick; subsoil of firm, compact, weakly cemented sandy clay loam or sandy clay; moderate to slow permeability.
Subclass IVw: Soils that have very severe limitations for cultivation because of excess water.
Unit IVw–1: Poorly drained, nearly level soils of the flood plains; subject to frequent overflow.
Unit IVw–2: Poorly drained, nearly level soils of the stream terraces; surface layer 5 to 10 inches thick; subsoil of firm or very firm, mottled sandy clay and clay; slow permeability.
Unit IVw–3: Deep, poorly drained, nearly level soils of the uplands and stream terraces; surface layer 3 to 18 inches thick; subsoil of mottled sandy loam to clay loam; slow to moderately slow permeability; subject to occasional overflow.
Unit IVw–4: Poorly drained, nearly level, local alluvial soils of the flood plains; varied in texture; high water table; subject to frequent overflow.
Subclass IVs: Soils that have very severe limitations of stones, low moisture capacity, or other soil features.
Unit IVs–1: Deep, somewhat excessively drained or excessively drained, nearly level to sloping soils of the uplands and stream terraces; rapid permeability; stony; subject to wind erosion and leaching.

Class V: Soils that are not likely to erode but have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture, woodland, or food and cover for wildlife.
Subclass Vw: Soils too wet for cultivation; drainage or protection not feasible.
Unit Vw–2: Deep, very poorly drained or poorly drained, nearly level soils in low-lying areas of the uplands.

Class VI: Soils that have severe limitations that make them generally unsuitable for cultivated crops and that limit their use primarily to pasture, woodland, or food and cover for wildlife.
Subclass VIe: Soils severely limited, primarily by risk of erosion if protective cover is not maintained.
Unit VIe–2: Shallow to moderately deep, strongly sloping to moderately steep soils of the uplands; subsoil is compact and weakly cemented; moderate to slow permeability.
Subclass VIw: Soils severely limited by excess water and generally unsuitable for cultivation.
Unit VIw–1: Moderately deep, poorly drained or very poorly drained, nearly level soils; surface layer about 5 inches thick; subsoil of heavy, plastic fine sandy clay loam to silty clay.
Subclass VIs: Soils generally unsuitable for cultivation and limited for other uses by their low moisture capacity, stones, or other features.
Unit VIs–1: Deep, excessively drained, nearly level to strongly sloping soils of the uplands; rapid permeability; very droughty, unproductive, and subject to leaching.

Class VII: Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation, and that restrict their use largely to grazing, woodland, or food and cover for wildlife.
Subclass VIIw: Soils very severely limited by excess water.
Unit VIIw–1: Swamp areas; covered with water most of the time.
Subclass VIIs: Soils very severely limited by moisture capacity, stones, or other soil features.
Unit VIIs–2: Excavated and gullied areas.

Class VIII: Soils and land types that have limitations that preclude their use, without major reclamation, for commercial production of plants, and that restrict their use to recreation, wildlife, water supply, or esthetic purposes. (There are no class VIII soils in Marlboro County.)

Management by Capability Units

In the following pages each of the 35 capability units in Marlboro County is described, the soils in each are listed, and some suggestions for use and management are given.

Capability unit I–1

This unit consists of deep, moderately well drained or well drained soils that have a subsoil of friable sandy loam to sandy clay loam. The surface layer is 12 to 18 inches thick. The soils are—

Cahaba fine sandy loam, 0 to 2 percent slopes.
Kalmia loamy fine sand, 0 to 2 percent slopes.
Norfolk loamy sand, 0 to 2 percent slopes.
Ruston loamy sand, 0 to 2 percent slopes.

These soils have good structure. They are low to medium in organic-matter content and in their supply of plant nutrients. They are acid. Surface runoff is slow to medium. The infiltration rate, permeability, and the available moisture capacity are all moderate.

The soils in this unit occupy about 7 percent of the county. They are suited to all the crops commonly grown. Under good management they produce good yields of oats, wheat, and barley; of row crops, mainly corn, cotton, tobacco, and soybeans; of peaches, pecans, and other tree crops; and of many truck crops. Sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are suitable grasses.

Row crops can be grown on these soils each year. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Plowing under legumes, grasses, or winter cover crops conserves moisture, increases the organic-matter content, and improves tilth. In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion.

These soils respond well to irrigation. Irrigation systems should be carefully designed so as to conserve soil and water

Capability unit I–2

This unit consists of nearly level, deep, well-drained soils that have a subsoil of friable to firm, red to yellowish-brown, sticky sandy clay. The surface layer is 6 to 12 inches thick and is dark brown to grayish brown. The soils are—

Faceville loamy sand, 0 to 2 percent slopes.
Magnolia loamy sand, 0 to 2 percent slopes.
Marlboro loamy sand, 0 to 2 percent slopes.

These soils have good structure. They are low to medium in organic-matter content, are high in natural fertility, and are acid. Plant nutrients are not leached out readily. Surface runoff is medium. The infiltration rate, the available moisture capacity, and permeability are all moderate.

The soils in this unit are among the most productive in the county. They occupy about 2 percent of the acreage. They are suited to all row crops commonly grown. Under good management they produce good yields of oats, wheat, and barley; of row crops, mainly corn, cotton, soybeans, and tobacco; of peaches, pecans, and other tree crops; and of many truck crops and nursery crops. Sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses.

Row crops can be grown each year. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Plowing under legumes, grasses, or winter cover crops conserves moisture, increases the organic-matter content, and improves tilth. In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion.

These soils respond well to irrigation, but irrigation systems should be designed carefully so as to conserve soil and water.

Capability unit IIe–1

This capability unit consists of deep, moderately well drained or well drained, slightly eroded or moderately eroded soils of the uplands and stream terraces. The surface layer is grayish brown to reddish brown in color. The subsoil is yellowish-red to yellowish-brown, friable sandy loam or sandy clay loam. The soils are—

Cahaba fine sandy loam, 2 to 6 percent slopes.
Kalmia loamy fine sand, 2 to 6 percent slopes.
Norfolk loamy sand, 2 to 6 percent slopes.
Norfolk loamy sand, 2 to 6 percent slopes, eroded.
Ruston loamy sand, 2 to 6 percent slopes.
Ruston loamy sand, 2 to 6 percent slopes, eroded.
Wickham sandy loam, 2 to 6 percent slopes.
Wickham sandy loam, 2 to 6 percent slopes, eroded.

These soils have good structure. They are low to medium in organic-matter content and in their supply of plant nutrients. They are acid. Surface runoff is slow to moderately rapid. The infiltration rate, permeability, and the available moisture capacity are all moderate.

The soils in this unit occupy about 7 percent of the county. They are suited to all crops commonly grown. Under good management they produce good yields of oats, wheat, and barley; of row crops, mainly corn, cotton, tobacco, and soybeans; of peaches, pecans, and other tree crops; and of truck crops and nursery crops. Sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses.

Because of the erosion hazard, close-growing crops should be grown at least half the time. The following are suitable cropping systems: (1) small grain and soybeans followed by cotton, with all crop residues left on the surface; (2) 2 years of bahiagrass and 2 years of row crops; (3) small grain overseeded with hairy indigo and followed by corn. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion. Contour tillage helps to control surface runoff. Turning crop residues under helps to maintain the organic-matter content and also improves tilth. A complete water-disposal system, including terraces and vegetated waterways, is needed (fig. 14).

A sprinkler irrigation system can be used, and the response to irrigation is favorable. The system should be carefully designed, so as to conserve soil and water.

Loblolly pine and slash pine grow well on these soils if protected from fire and grazing animals.

Figure 14.—**An area of Norfolk loamy sand, 2 to 6 percent slopes. A complete water-disposal system, including terraces and vegetated waterways, is needed on soils in capability unit IIe–1.**

Capability unit IIe–2

This unit consists of deep, well-drained, gently sloping soils that are slightly eroded or moderately eroded. The surface layer is 6 to 12 inches thick and is brown to grayish brown. The subsoil is red to yellowish-brown, friable to firm, sticky sandy clay. The soils are—

Faceville loamy sand, 2 to 6 percent slopes.
Faceville loamy sand, 2 to 6 percent slopes, eroded.
Magnolia loamy sand, 2 to 6 percent slopes, eroded.
Marlboro loamy sand, 2 to 6 percent slopes.
Marlboro loamy sand, 2 to 6 percent slopes, eroded.

These soils have good structure. They are low to medium in organic-matter content and high in natural fertility. They are acid. Surface runoff is moderate to moderately rapid. The infiltration rate, the available moisture capacity, and permeability are all moderate. Plant nutrients do not leach out readily.

The soils in this unit occupy about 1 percent of the county. They are suited to all crops commonly grown. Under good management they produce good yields of oats, wheat, and barley; of row crops, mainly corn, cotton, soybeans, and tobacco; of peaches, pecans, and other tree crops; and of many truck crops and nursery crops. Sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are suitable grasses.

Because of the erosion hazard, close-growing crops should be grown at least half the time. The following are suitable cropping systems: (1) small grain and soybeans followed by cotton, with all crop residues left on the surface; (2) 2 years of bahiagrass and 2 years of row crops; (3) small grain overseeded with hairy indigo and followed by corn. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of crops to be grown and the needs of the soils, as indicated by soil tests.

In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion. Contour tillage helps to control surface runoff. Except in the more severely eroded areas, tilth is easy to maintain. Turning crop residues under helps to maintain the organic-matter content and also improves tilth. A complete water-disposal system, including terraces and vegetated waterways, is needed.

These soils respond to irrigation. A sprinkler system can be used satisfactorily, but it should be designed carefully so as to conserve soil and water.

Loblolly pine and slash pine grow well on these soils if protected from fire and grazing animals.

Capability unit IIe–3

This unit consists of gently sloping, moderately deep, moderately well drained or well drained, slightly eroded or moderately eroded soils of the uplands and stream terraces. The surface layer is 5 to 8 inches thick and is pale brown to grayish brown. The subsoil is strong-brown to reddish-yellow, friable to firm, plastic fine sandy clay loam to clay. The soils are—

Caroline fine sandy loam, 2 to 6 percent slopes.
Caroline fine sandy loam, 2 to 6 percent slopes, eroded.
Flint fine sandy loam, 2 to 6 percent slopes.
Flint fine sandy loam, 2 to 6 percent slopes, eroded.

These soils are acid. The organic-matter content is medium, and natural fertility is medium. Plant nutrients do not leach out readily. Surface runoff is moderate or moderately rapid. The infiltration rate and permeability are moderately slow or slow.

The soils in this unit occupy about 2 percent of the county. They are fairly well suited to the crops commonly grown. Under good management they produce fair yields of oats, wheat, and barley, and of row crops, mainly corn, cotton, and soybeans. Sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, dallisgrass, and ryegrass are the chief suitable grasses. Yields are lower than on the soils in capability units IIe–1 and IIe–2.

Because of the erosion hazard, close-growing crops should be planted at least half the time. The following are suitable cropping systems: (1) oats and soybeans followed by corn or cotton, with all crop residues left on the surface; (2) 2 years of bahiagrass, 1 year of tobacco, and 1 year of cotton; (3) 2 years of sericea lespedeza and 2 years of corn, or 1 year of corn and 1 year of cotton. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion. Contour tillage helps to control surface runoff. Except in the more severely eroded areas, tilth is easy to maintain. Turning crop residues under helps to maintain the organic-matter content and improves tilth. A complete water-disposal system, including terraces and vegetated waterways, is required.

Loblolly pine grows well on these soils if protected from fire and grazing animals.

Capability unit IIe–4

This unit consists of shallow to moderately deep, gently sloping, well-drained soils that have a dark grayish-brown to light brownish-gray surface layer that is 8 to 30 inches thick. The subsoil is yellowish-brown to yellowish-red,

compact, weakly cemented sandy clay loam to sandy clay. The soils are—

Gilead sand, 2 to 6 percent slopes.
Gilead sand, thick surface, 2 to 6 percent slopes.
Vaucluse sand, 2 to 6 percent slopes.
Vaucluse sand, thick surface, 2 to 6 percent slopes.

These soils are low in organic-matter content and low in natural fertility. They are acid in reaction. Surface runoff is medium or rapid, the infiltration rate is slow to moderately rapid, and permeability is moderate to slow. The available moisture capacity is low.

The soils in this unit occupy about 1 percent of the county. They are less productive than those in capability units IIe–1 and IIe–2. They are, at best, fairly well suited to corn, cotton, soybeans, and tobacco. Under good management they produce fair yields of oats, wheat, and barley. Sericea lespedeza, annual lespedeza, crimson clover, white clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses.

Close-growing crops should be grown at least half the time to help control erosion and furnish organic matter. The following are suitable cropping systems: (1) 2 years of bahiagrass or sericea lespedeza or a mixture of the two, then 2 years of row crops; (2) 1 year of oats or soybeans and 1 year of corn, with all crop residues left on the surface. To maintain yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

In large fields strips of close-growing crops, shrubs, or pine trees planted at right angles to the prevailing winds help to control wind erosion. Contour tillage helps to control surface runoff. Turning crop residues under helps to maintain the organic-matter content and to improve tilth. A complete water-disposal system that includes terraces and vegetated waterways is needed.

Loblolly pine and longleaf pine grow well on these soils if protected from fire and grazing animals. Because of the compact, cemented subsoil, particularly in Vaucluse soils, there is some risk of windthrow.

Capability unit IIw–1

This unit consists of Local alluvial land, a land type that occurs in slight depressions and at the head of small drainageways. It is deep, nearly level, and somewhat poorly drained or moderately well drained. The areas range up to about 5 acres in size. The surface layer is dark-gray to grayish-brown loamy sand to loam. The depth to the underlying soil material ranges from 14 to 40 inches.

This land type is medium in organic-matter content and high in natural fertility. The infiltration rate is rapid, and permeability is moderate or moderately rapid. Surface runoff is slow, and the available moisture capacity is moderate.

This land type occupies about one-half of 1 percent of the county. It is suited to a wide variety of crops and produces good yields of row crops, mainly corn, cotton, soybeans, and tobacco; of oats, wheat, and barley; and of truck crops and nursery crops. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, millet, and ryegrass are suitable grasses, and bicolor lespedeza, crimson clover, white clover, annual lespedeza, and sericea lespedeza are the chief suitable legumes.

A suitable cropping system consists of 1 year of oats and soybeans and 1 or 2 years of row crops. To maintain good yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Seeding, cultivating, and harvesting are difficult on this land type because of its location and because of differences in moisture content from place to place. The use of these areas is largely dependent on the use of surrounding soils.

Ditches or tile drains can be used to remove excess water. Terraces or diversion channels provide protection against runoff from higher areas.

Loblolly pine and slash pine grow well on this land type.

Capability unit IIw–2

This unit consists of deep, nearly level, somewhat poorly drained or moderately well drained soils of the uplands and stream terraces. The surface layer is dark-gray to grayish-brown, friable to very friable sandy loam, fine sandy loam, and loamy sand. The subsoil is light yellowish-brown to light brownish-gray, friable to firm sandy loam to fine sandy clay. The soils are—

Dunbar fine sandy loam.
Dunbar sandy loam.
Goldsboro loamy sand, 0 to 2 percent slopes.
Izagora fine sandy loam.
Lynchburg loamy sand.

These soils are medium in organic-matter content and low to high in their supply of plant nutrients. They are acid. Surface runoff is slow to moderate. The infiltration rate is moderate to rapid, and permeability is slow to moderate. The available moisture capacity is low to moderate.

The soils in this unit occupy about 3 percent of the county. If adequately drained they are suited to a wide variety of crops. Under good management they produce high yields of row crops, mainly corn, cotton, soybeans, and tobacco; of oats, wheat, and barley; of pecans; and of truck crops and nursery crops. Annual lespedeza, white clover, and crimson clover are suitable legumes, and bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and ryegrass are the chief suitable grasses. If not drained, these soils are suited only to woodland (fig. 15). Good management includes maintaining the organic-matter content of the soils and applying fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

The following are suitable cropping systems: (1) row crops every year, with all crop residues turned under; (2) 1 year of small grain and soybeans and 1 year of row crops, with all crop residues turned under; (3) small grain followed by volunteer weeds, then 1 year of tobacco.

These soils are easily worked and can be kept in good tilth without much difficulty. Goldsboro soils generally require less drainage than Dunbar, Izagora, or Lynchburg soils. Tile drains, open ditches, or a combination of the two, can be used to remove excess water.

These soils respond to irrigation. They are well suited to sprinkler irrigation, but the system should be designed carefully so as to conserve soil and water.

Loblolly pine and slash pine grow well on these soils.

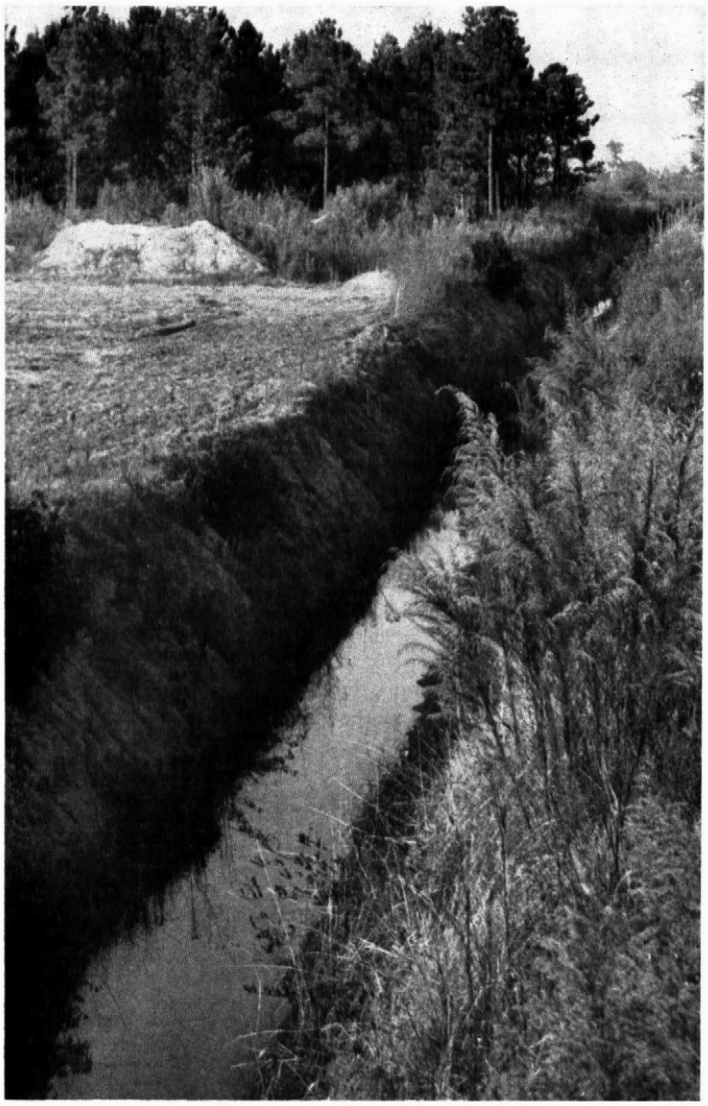

Figure 15.—**Drainage ditch on Dunbar sandy loam. Soils of capability unit IIw–2 must be drained before they can be cultivated or used as pasture.**

Capability unit IIw–4

The only soil in this unit is Congaree fine sandy loam, a deep, nearly level, well-drained soil on flood plains. It is flooded frequently late in winter and in spring. The surface layer is dark grayish brown to dark brown. The subsoil is dark yellowish-brown to reddish-brown silt loam to silty clay loam. It is weakly developed and is stratified in many places.

This soil is easy to till, and tilth is good. The organic-matter content and the natural supply of plant nutrients are high. Surface runoff is slow, and permeability is moderate. The available moisture capacity and the infiltration rate are high.

This soil occupies about 1½ percent of the county. It is best suited to crops that are not damaged by short periods of flooding or that are not grown at the time floods are at their peak. If well managed it produces high yields of row crops, mainly corn, cotton, and soybeans; of oats, wheat, and barley; and of truck crops and nursery crops. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and ryegrass are suitable grasses, and sericea lespedeza, annual lespedeza, white clover, crimson clover, and bicolor lespedeza are the chief suitable legumes.

The following are suitable cropping systems: (1) row crops grown each year, with all crop residues turned under; (2) 1 year of small grain and soybeans and 1 year of corn. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Dikes, if they can be built, help to protect crops from floodwaters.

Loblolly pine and slash pine are well suited to this soil.

Capability unit IIw–5

In this unit are nearly level, moderately deep, moderately well drained or well drained soils of the uplands and stream terraces. The soils on the stream terraces are flooded for short periods late in winter and in spring. The surface layer is very dark gray to pale brown and is 6 to 10 inches thick. The subsoil is reddish-yellow to yellowish-brown, plastic fine sandy clay loam to clay. The soils are—

Caroline fine sandy loam, 0 to 2 percent slopes.
Craven fine sandy loam, 0 to 2 percent slopes.
Flint fine sandy loam, 0 to 2 percent slopes.

These soils are low to medium in organic-matter content and in their supply of plant nutrients. The available moisture capacity is moderate. Permeability, the infiltration rate, and surface runoff are moderately slow or slow.

The soils in this unit occupy nearly 4 percent of the county. They generally are less productive than the soils in capability unit IIw–2. They are fairly well suited to corn, cotton, soybeans, and tobacco. They are also suited to truck crops and nursery crops. Oats and wheat are the small grains most commonly grown. Bahiagrass, Coastal bermudagrass, dallisgrass, and ryegrass are suitable grasses, and sericea lespedeza, annual lespedeza, bicolor lespedeza, and crimson clover are the principal suitable legumes.

The following are suitable cropping systems: (1) a small grain and soybeans followed by corn or cotton; (2) 2 years or more of bahiagrass and 2 years of row crops; (3) cotton followed by corn, with all crop residues turned under. To maintain yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Adding organic matter improves tilth.

Tile drains, open ditches, or a combination of the two can be used satisfactorily to drain these soils (fig. 16).

These soils respond to irrigation. A sprinkler system can be used, but it should be designed carefully so as to conserve soil and water.

Loblolly pine grows well on these soils.

Capability unit IIs–1

This unit consists of deep, nearly level to gently sloping, moderately well drained or well drained soils of the uplands and stream terraces. The surface layer is grayish-brown to brown loamy fine sand or loamy sand and is 18

Figure 16.—**An area of Craven fine sandy loam, 0 to 2 percent slopes, that has been drained and cultivated.**

to 30 inches thick. The subsoil is yellowish-red to yellowish-brown fine sandy loam to sandy clay loam. The soils are—

Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes.
Norfolk loamy sand, thick surface, 0 to 2 percent slopes.
Norfolk loamy sand, thick surface, 2 to 6 percent slopes.
Ruston loamy sand, thick surface, 0 to 2 percent slopes.
Ruston loamy sand, thick surface, 2 to 6 percent slopes.

These soils are low to medium in organic-matter content and in their natural supply of plant nutrients. The infiltration rate, permeability, and the available moisture capacity are all moderate. Surface runoff is moderate to slow. Because these soils have a thick, sandy surface layer, they are somewhat droughty, and they are more rapidly leached of fertilizer than the soils in capability units IIe–1 or IIe–2. They are easy to till, however, and can be cultivated soon after rains.

The soils in this unit occupy about 7 percent of the county. They are fairly well suited to corn, cotton, soybeans, tobacco, oats, wheat, and barley. They produce good yields of peaches, pecans, and nursery crops. Bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses, and sericea lespedeza, bicolor lespedeza, and crimson clover are suitable legumes.

The following are suitable cropping systems: (1) 1 or 2 years of bahiagrass followed by tobacco; (2) a small grain and soybeans followed by cotton; (3) bahiagrass or sericea lespedeza grown for pasture and followed by watermelons. Bahiagrass can be grown with sericea lespedeza for hay or pasture. Crimson clover can be seeded with bahiagrass or Coastal bermudagrass after the grass is well established.

Large amounts of organic matter and fertilizer are needed to maintain yields, improve tilth, decrease the rate of leaching, and help control wind erosion. It is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Close-growing crops should be grown at least half the time. In the larger fields alternate strips of a close-growing crop and a clean-tilled crop, at right angles to the prevailing winds, help to control soil blowing. Contour tillage and water-control measures, including terraces and vegetated waterways, are needed in the gently sloping areas.

Capability unit IIs–2

This unit consists of nearly level, moderately deep, well-drained soils of the uplands. The surface layer is grayish-brown and is 8 to 30 inches thick. The subsoil is yellowish-brown to reddish-yellow, compact, weakly cemented sandy clay loam to sandy clay. The soils are—

Gilead sand, 0 to 2 percent slopes.
Gilead sand, thick surface, 0 to 2 percent slopes.

These soils are low in organic-matter content and in their natural supply of plant nutrients. Surface runoff and permeability are moderate to slow, and the infiltration rate is moderately slow to moderately rapid. Because the subsoil is compact, internal drainage is slow and the growth of plant roots is restricted. These soils are acid. They are easy to till and can be worked soon after rains. The response to lime and fertilizer is good.

These soils occupy a small acreage in this county. They are suited to row crops, including corn, cotton, soybeans, and tobacco, and to barley, oats, and wheat. Bahiagrass, Coastal bermudagrass, and ryegrass are suitable grasses, and sericea lespedeza, bicolor lespedeza, and crimson clover are suitable legumes.

The following are suitable cropping systems: (1) 2 years of bahiagrass or Coastal bermudagrass and 2 years of row crops; (2) small grain overseeded with hairy indigo and followed by corn. Bahiagrass can be grown with sericea lespedeza for hay or pasture. Crimson clover can be seeded with bahiagrass or Coastal bermudagrass after the grass is well established. Generally, large amounts of organic matter and commercial fertilizer are needed. To maintain yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

In large fields alternate strips of close-growing crops and clean-tilled crops, at right angles to the prevailing winds, are effective against wind erosion. Even under good management, the organic matter is depleted at a moderately rapid rate. Growing and turning under a cover crop every other year helps to maintain the organic-matter content and improves tilth.

Capability unit IIIe–1

In this unit are deep, sloping, well-drained, slightly eroded or moderately eroded soils of the uplands. The surface layer is grayish-brown to brown loamy sand, and the subsoil is yellowish-brown to yellowish-red sandy loam or sandy clay loam. The soils are—

Norfolk loamy sand, 6 to 10 percent slopes.
Ruston loamy sand, 6 to 10 percent slopes, eroded.

These soils have good structure. They are acid. The organic-matter content is low, and the supply of plant nutrients is low to medium. Permeability, the rate of infiltration, and the available moisture capacity are all moderate. The Ruston soil has eroded to the extent that, in places, small areas of subsoil are exposed. In these spots, the organic-matter content, the natural supply of plant nutrients, and the available moisture supply are lower, and the subsoil is less permeable than in the surrounding slightly eroded soils.

These soils occupy less than 1 percent of the county. Under good management they produce fairly good yields of row crops, mainly corn, cotton, soybeans, and tobacco, and of oats, wheat, and barley. Bahiagrass, Coastal ber-

mudagrass, and ryegrass are the chief suitable grasses, and sericea lespedeza, crimson clover, and bicolor lespedeza are the principal suitable legumes.

The following are suitable cropping systems: (1) 3 years or more of bahiagrass and 2 years of row crops; (2) 1 year or more of Coastal bermudagrass and 1 year of corn or tobacco; (3) 2 years or more of sericea lespedeza and 1 or 2 years of corn; (4) small grain overseeded with hairy indigo and followed by corn, with all crop residues turned under. To maintain fairly good yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Adding large amounts of organic matter and keeping a close-growing crop on the soil two-thirds of the time help to control erosion and improve tilth. Contour tillage helps to control surface runoff. A complete water-disposal system, including terraces and vegetated waterways, is needed.

These soils can be grazed during wet periods without serious damage from trampling. Loblolly pine and slash pine grow well.

Capability unit IIIe–2

Marlboro loamy sand, 6 to 12 percent slopes, eroded, is the only soil in this unit. It is well drained and moderately eroded. The plow layer is grayish-brown loamy sand, and the subsoil is yellowish-brown, sticky sandy clay. In some places the original surface layer has been removed by erosion and the plow layer consists of a mixture of the original surface layer and the upper part of the subsoil.

This soil is acid. The organic-matter content and the natural fertility are low. Surface runoff is moderately rapid, and the infiltration rate is moderate to slow. The available moisture capacity and permeability are both moderate.

This soil occupies a very small acreage in the county. Under good management it produces fair yields of corn, cotton, soybeans, tobacco, oats, wheat, and barley. The chief suitable grasses are bahiagrass, Coastal bermudagrass, tall fescue, and ryegrass. Sericea lespedeza, annual lespedeza, white clover, crimson clover, and bicolor lespedeza are suitable legumes.

Keeping a close-growing crop on the soil for at least 2 years out of 3 helps to control erosion and to increase the organic-matter content. The following are suitable conservation rotations: (1) 1 year or more of Coastal bermudagrass and 1 year of corn or tobacco; (2) 3 years or more of bahiagrass and 2 years of row crops; (3) 2 years or more of sericea lespedeza and 1 or 2 years of corn; (4) a small grain overseeded with hairy indigo and followed by corn, with all crop residues turned under. To maintain fair yields, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Contour tillage helps to control surface runoff and to conserve soil and water. Except in the more severely eroded areas, good tilth is easy to maintain. In severely eroded spots the soil is difficult to till and can be worked only within a narrow range of moisture content. Turning all crop residues under increases the organic-matter content and improves tilth. A complete water-disposal system, including terraces and vegetated waterways, is needed.

Loblolly pine and slash pine grow well on these soils if protected from fire and grazing animals.

Capability unit IIIe–3

The only soil in this unit is Flint fine sandy loam, 6 to 12 percent slopes, a slightly eroded, moderately deep, moderately well drained soil of the stream terraces. The surface layer is grayish-brown fine sandy loam, and the subsoil is reddish-yellow, sticky, slightly plastic clay loam and clay.

This soil is acid. The organic-matter content is medium, and natural fertility is moderate. The available moisture capacity is moderate, surface runoff is moderately rapid, the infiltration rate is moderately slow, and permeability is slow.

This soil occupies a very small acreage in the county. It is fairly well suited to corn, cotton, soybeans, barley, wheat, and oats. Sericea lespedeza, annual lespedeza, white clover, crimson clover, and bicolor lespedeza are suitable legumes, and bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses.

Planting a close-growing crop at least 2 years out of 3 helps to control erosion and to increase the organic-matter content. The following are suitable cropping systems: (1) 3 years or more of bahiagrass and 1 or 2 years of row crops; (2) 3 years of sericea lespedeza, 1 year of corn, and 1 year of cotton; (3) 2 years of Coastal bermudagrass and 1 or 2 years of corn. To maintain yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soil, as indicated by soil tests.

Surface runoff is the chief hazard when this soil is cultivated. Contour tillage, terraces, and vegetated waterways provide effective control against erosion. Turning all crop residues under improves tilth. When bare, this soil tends to become crusty and hard after a rain.

Loblolly pine grows well on this soil.

Capability unit IIIe–4

In this unit are sloping, shallow to moderately deep, well-drained soils of the uplands. The surface layer is grayish-brown to light-gray sand, and the subsoil is yellowish-red to yellowish-brown, compact and weakly cemented sandy clay loam and sandy clay. The soils are—

Gilead sand, 6 to 10 percent slopes.
Gilead sand, thick surface, 6 to 10 percent slopes.
Vaucluse sand, 6 to 10 percent slopes.
Vaucluse sand, thick surface, 6 to 10 percent slopes.

These soils are low in organic-matter content and low in natural fertility. They are acid. The available moisture capacity is low, surface runoff is slow to moderately rapid, and the infiltration rate is moderately slow to moderately rapid. Permeability is moderate to slow. Because of the weakly cemented subsoil, internal drainage is slow.

The soils in this unit occupy about 1 percent of the county. They are fairly well suited to corn, cotton, soybeans, oats, wheat, and barley. Bahiagrass, Coastal bermudagrass, and ryegrass are the principal suitable grasses, and sericea lespedeza and bicolor lespedeza are suitable legumes.

Keeping close-growing crops on the soil two-thirds of the time increases the organic-matter content and improves

tilth. The following are suitable cropping systems: (1) 3 years or more of bahiagrass and 2 years of row crops; (2) 1 year or more of Coastal bermudagrass and 1 year of corn; (3) 2 years or more of sericea lespedeza and 1 or 2 years of corn; (4) small grain overseeded with hairy indigo and followed by corn, with all crop residues turned under. Planting crops on the contour in the interval strips between terraces will make the cropping systems more effective. Large amounts of organic matter and commercial fertilizer are required. To maintain good yields, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Contour tillage and a complete water-disposal system, including terraces and vegetated waterways, are needed.

Loblolly pine grows fairly well on these soils.

Capability unit IIIe-5

This unit consists of sloping, deep, well-drained soils of the uplands. The surface layer is grayish-brown to light brownish-gray loamy sand and is 18 to 30 inches thick. The subsoil is yellowish-brown to yellowish-red, friable sandy loam to sandy clay loam. The soils are—

Norfolk loamy sand, thick surface, 6 to 10 percent slopes.
Ruston loamy sand, thick surface, 6 to 10 percent slopes.

These soils are acid. The organic-matter content and the natural fertility are low. The available moisture capacity is low. Permeability is moderate. Surface runoff is moderately slow, and the infiltration rate is moderately rapid.

The soils in this unit occupy less than half of 1 percent of the county. They are fairly well suited to the crops commonly grown. They produce good yields of corn, cotton, soybeans, tobacco, oats, wheat, and barley. Bahiagrass, Coastal bermudagrass, and ryegrass are the chief suitable grasses, and sericea lespedeza, crimson clover, and bicolor lespedeza are suitable legumes.

Keeping close-growing crops on the soil at least 2 years out of 3 helps to maintain an adequate supply of organic matter. The following are suitable conservation rotations: (1) 3 years or more of bahiagrass and 2 years of row crops; (2) 1 or 2 years of Coastal bermudagrass and 1 year of corn or tobacco; (3) 2 years or more of sericea lespedeza and 1 or 2 years of corn; (4) small grain and hairy indigo followed by corn, with all crop residues turned under. Crimson clover can be grown with bahiagrass or Coastal bermudagrass for hay or pasture after the grass is well established. If legumes are not used in the rotations, large amounts of nitrogen are needed. To obtain good yields, it is necessary to apply fertilizer and lime according to the requirements of crops to be grown and the needs of the soils, as indicated by soil tests.

Contour tillage helps to conserve soil and water. Turning under crop residues and cover crops every other year improves tilth and increases the organic-matter content. Terraces, vegetated waterways, and other means of water control are needed.

Loblolly pine, slash pine, and longleaf pine grow well on these soils if protected from fire and grazing animals.

Capability unit IIIw-1

Klej loamy sand is the only soil in this unit. It is a deep, nearly level, moderately well drained soil that has a surface layer of very dark grayish-brown loamy sand and a subsoil of yellowish-brown, friable loamy sand mottled with yellowish red and brownish gray.

This soil is acid. The organic-matter content is medium, and the natural fertility is low. Surface runoff is slow, the infiltration rate is high, and the available moisture capacity is medium to low. Permeability is very rapid. Internal drainage is slow because of a high water table.

This soil occupies less than 1 percent of the county. It must be drained before it can be cultivated or used as pasture. If drained, it is fairly well suited to corn, cotton, soybeans, tobacco, oats, and wheat, and to many truck crops and nursery crops. Bahiagrass, Coastal bermudagrass, and ryegrass are suitable grasses, and sericea lespedeza, annual lespedeza, crimson clover, and bicolor lespedeza are the chief suitable legumes.

The following are suitable conservation rotations: (1) small grain and hairy indigo and 1 year of row crops; (2) oats and soybeans followed by row crops; (3) 2 years or more of bahiagrass, then 2 years of row crops, with all residues turned under. Fertilizer is readily leached from this soil, and large amounts of commercial fertilizer are needed. To maintain high yields, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Turning under all crop residues and cover crops for 1 or 2 years helps to maintain the organic-matter content and improves tilth. Tile drains, open ditches, or a combination of the two, can be used to remove excess water. Open ditches, however, are difficult to maintain because of the sloughing action of the subsoil.

This soil responds to irrigation. It is suited to sprinkler irrigation, but the system should be designed carefully so as to conserve soil and water.

Loblolly pine and slash pine grow fairly well on this soil if protected from fire and grazing animals.

Capability unit IIIw-2

In this unit are nearly level, deep, very poorly drained or somewhat poorly drained soils. The surface layer is black to very dark gray sandy loam, fine sandy loam, and loam. The subsoil is strong-brown and reddish-yellow to very dark gray, mottled sandy clay loam to clay. The soils are—

Bayboro loam.
Coxville fine sandy loam.
Coxville sandy loam.
Grady loam.
McColl loam.

These soils are medium in organic-matter content and natural fertility. They are acid. Permeability is moderately slow to very slow. Surface runoff is slow to very slow, the infiltration rate is moderate to very slow, and the available moisture capacity is moderate.

These soils occupy about 9 percent of the county. They require drainage before they can be cultivated or used for hay or pasture. Except for the Bayboro soil, areas that can be drained adequately are suited to corn, soybeans, cotton, oats, and wheat. Bayboro soils are not suited to cotton and wheat. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, millet, ryegrass, annual lespedeza, and white clover are suitable hay and pasture plants.

If enough fertilizer is used and large amounts of organic matter are turned under, row crops can be grown

each year. The following are suitable cropping systems: (1) 2 years or more of tall fescue or bahiagrass, then 2 or 3 years of corn; (2) small grain and soybeans followed by corn. Truck crops can be grown each year if they are followed by an intensive soil-improvement program. If it is necessary to grow tobacco on these soils, a suitable rotation is 2 or 3 years of bahiagrass, dallisgrass, or other perennial grass followed by tobacco. To maintain high yields, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Tile drains, open ditches, or a combination of both, can be used to remove excess water. In larger fields, both systems are necessary for adequate drainage. Because of the slowly permeable subsoil, these soils can be cultivated only within a narrow range of moisture content. They tend to puddle and pack if grazed when wet.

Capability unit IIIw–3

This unit consists of nearly level, somewhat poorly drained or moderately well drained soils of the flood plains and stream terraces. The surface layer is dark-brown to very dark gray very fine sandy loam or silt loam. The subsoil is grayish-brown to light yellowish-brown, mottled sandy clay loam to clay. The soils are—

Chewacla silt loam.
Wahee very fine sandy loam.

These soils are acid. They are medium to moderately high in organic-matter content and medium in natural fertility. The available moisture capacity is moderate to moderately high, surface runoff is moderate to slow, and the infiltration rate is slow. Permeability is moderate to slow.

The soils in this unit occupy about 5 percent of the county. Chewacla soils are on the flood plains and are frequently flooded late in winter and in spring. Wahee soils are on the stream terraces and are flooded occasionally. These soils require drainage before they can be used for cultivated crops or pasture, but many areas are difficult to drain because they lack suitable outlets. Diversion ditches can be used for protection against water that runs off higher areas. Dikes can be used to protect some areas from floods.

If adequately drained, these soils are fairly well suited to corn, soybeans, and oats. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and ryegrass are the chief suitable grasses, and crimson clover, white clover, and annual lespedeza are suitable legumes. The Wahee soil produces fair yields of cotton, tobacco, barley, wheat, sericea lespedeza, and bicolor lespedeza.

The following are suitable cropping systems: (1) 2 years or more of bahiagrass or Coastal bermudagrass and 2 years of row crops; (2) 2 years of a small grain or annual lespedeza grown for pasture and 2 years of corn or soybeans; (3) small grain and soybeans followed by corn. Large amounts of fertilizer, lime, and organic matter are needed. It is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

In dry weather, some of these soils are hard and crusty. If grazed when wet, they become packed. Loblolly pine grows well on these soils.

Capability unit IIIw–4

This unit consists of Portsmouth and Okenee loams, an undifferentiated group of deep, nearly level, very poorly drained soils of the stream terraces. Their surface layer is black and is 8 to 22 inches thick. The subsoil is gray to very dark gray, mottled sandy loam to sandy clay loam.

These soils are high in organic-matter content, moderate in natural fertility, and strongly acid. Surface runoff and internal drainage are very slow. The infiltration rate, permeability, and available moisture capacity are moderate.

These soils occupy less than 1 percent of the county. Before they can be used for cultivated crops, for hay, or for pasture, they must be drained. If adequately drained and otherwise properly managed, they are fairly well suited to corn, soybeans, and oats. Bahiagrass, dallisgrass, and ryegrass are the principal suitable grasses, and white clover and annual lespedeza are suitable legumes. Many areas are difficult to drain because they lack drainage outlets. Pasture or woodland is the best use for these areas.

The following are suitable cropping systems: (1) 2 years or more of bahiagrass or Coastal bermudagrass, then 2 years of corn or soybeans; (2) 1 year of grain and summer grazing, then 1 year of row crops. Truck crops can be grown each year if they are followed by an intensive soil-improvement program. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

If these soils are cultivated, the organic-matter content is reduced. Turning under all crop residues helps to maintain the organic-matter content and improves tilth. These soils are suited to sprinkler irrigation. Truck crops, in particular, respond to irrigation. The system should be designed carefully, so as to conserve soil and water.

Loblolly pine grows well on these soils.

Capability unit IIIw–6

The only soil in this unit is Lenoir loam, a nearly level, somewhat poorly drained soil that has a surface layer of dark-gray, friable loam. The subsoil is light olive-brown and light brownish-gray, mottled, sticky and plastic clay.

This soil is strongly acid. The organic-matter content is medium, and natural fertility is moderate. The available moisture capacity is moderate. Surface runoff, the infiltration rate, and permeability are slow. Internal drainage is slow to very slow.

This soil occupies almost 2 percent of the county. It must be drained before it can be used for cultivated crops, hay, or pasture. Some areas can be drained adequately by open ditches, but some areas are difficult to drain because they lack suitable outlets, and these are best used as woodland. If adequately drained and otherwise properly managed, this soil is fairly well suited to corn, soybeans, tobacco, and oats. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and ryegrass are the principal suitable grasses and annual lespedeza, white clover, and crimson clover are suitable legumes.

The following are suitable cropping systems: (1) 2 years or more of bahiagrass, Coastal bermudagrass, or other perennial grasses, then 2 years of corn or soybeans;

(2) 1 year of grain and summer grazing, then 1 year of row crops. Truck crops can be grown if they are followed by an intensive soil-improvement program. To maintain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soil, as indicated by soil tests.

Turning under row-crop residues and cover crops for 1 or 2 years helps to maintain the organic-matter content and improves tilth. This soil becomes hard, cloddy, and compact if grazed or cultivated too soon after rains. In some places water stands on the surface. Shallow ditches can be used to remove excess surface water.

Loblolly pine grows well on this soil.

Capability unit IIIs–1

This unit consists of somewhat excessively drained or excessively drained, nearly level to sloping soils of the uplands and stream terraces. The surface layer is 30 to 42 inches thick and is dark brown to light brownish gray. The subsoil is brownish-yellow to dark reddish-brown sandy loam or sandy clay loam. The soils are—

Eustis sand, moderately shallow, 0 to 2 percent slopes.
Eustis sand, moderately shallow, 2 to 6 percent slopes.
Eustis loamy sand, terrace, 0 to 6 percent slopes.
Lakeland sand, moderately shallow, 0 to 2 percent slopes.
Lakeland sand, moderately shallow, 2 to 6 percent slopes.
Molena loamy sand, 0 to 10 percent slopes.

These soils are acid. They are low to very low in organic-matter content and in natural fertility. Permeability and the infiltration rate are moderately rapid to rapid. Surface runoff is moderately slow to slow. The available moisture capacity is low.

These soils occupy nearly 3½ percent of the county. They are fairly well suited to corn, cotton, soybeans, and oats. Bahiagrass, Coastal bermudagrass, and ryegrass are the principal suitable grasses, and sericea lespedeza and bicolor lespedeza are suitable legumes. Hairy indigo is suitable as a soil-improving crop.

The following are suitable cropping systems: (1) 2 years of oats and hairy indigo, then 1 year of corn; (2) 3 years of sericea lespedeza, then 2 years of corn or 1 year of corn and 1 year of cotton; (3) 2 years or more of bahiagrass or Coastal bermudagrass, then 1 or 2 years of tobacco, cotton, or corn, with all crop residues turned under. To maintain good yields, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Turning under all crop residues and growing cover crops 2 years out of 3 help to maintain the organic-matter content and also improves tilth. Contour tillage and stripcropping help to control wind and water erosion. Because channels fill quickly, terracing generally is not practical. These soils can be cultivated and grazed without damage soon after rains.

Loblolly pine and longleaf pine grow well on these soils.

Capability unit IVe–4

In this unit are shallow to moderately deep, sloping to strongly sloping, well-drained soils of the uplands. The surface layer generally is sand, but in a few places it is loamy sand. It is dark grayish brown to light gray and is 4 to 30 inches thick. The subsoil is yellowish-red to reddish-brown, firm, compact sandy clay loam or sandy clay. Some areas are eroded to the extent that the subsoil is exposed. The soils are—

Vaucluse sand, 6 to 10 percent slopes, eroded.
Vaucluse sand, 10 to 15 percent slopes.
Vaucluse sand, thick surface, 10 to 15 percent slopes.

These soils are acid, low in organic-matter content, and low in natural fertility. The available moisture capacity is low, surface runoff is moderately rapid to rapid, and the infiltration rate is moderately slow. Permeability is moderate to slow. Because of the weakly cemented subsoil, internal drainage is slow.

These soils occupy a little less than 1 percent of the county. Because of the severe erosion hazard, they are not suited to continuous cultivation. If they are needed as cropland, they should be kept in close-growing crops three-fourths of the time, to supply organic matter and improve tilth. It is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

On Vaucluse sand, 6 to 10 percent slopes, eroded, row crops can be grown in a contour-strip rotation with sericea lespedeza, bahiagrass, or Coastal bermudagrass. After 3 or 4 years of one of these close-growing crops, one-fourth of the acreage can be planted to a row crop each year. If this cropping system is followed and large amounts of fertilizer are applied, yields are fair.

Contour tillage and stripcropping help to control surface runoff. A complete water-disposal system, including terraces and vegetated waterways, is needed.

The soils in this unit are best used for timber production, though in some places windthrow is a serious hazard.

Capability unit IVw–1

The only soil in this unit is Wehadkee silt loam, a nearly level, poorly drained soil that is on the flood plain of the Great Pee Dee River and is flooded frequently. The surface layer is brown to grayish-brown silt loam. The subsoil is dark-gray to gray, mottled silty clay. There is little evidence of profile development.

This soil is acid. The organic-matter content is medium, and the natural fertility is medium. Surface runoff is very slow, and internal drainage is slow. Permeability and the infiltration rate are both moderately slow. The available moisture capacity is high.

This soil occupies between 6 and 7 percent of the county. Its use is restricted because it has a permanently high water table and is difficult to drain. It is not suited to cultivated crops. It is best suited to the production of timber, and most of the acreage is in woodland. Cypress, blackgum, tupelo gum, and yellow-poplar are suitable trees. Bahiagrass, tall fescue, white clover, and annual lespedeza can be grown for hay or pasture in areas that have been cleared and drained.

Capability unit IVw–2

Leaf fine sandy loam is the only soil in this unit. It is a nearly level, poorly drained soil of the stream terraces. The surface layer is very dark gray to light-gray fine sandy loam and is 5 to 10 inches thick. The subsoil is light brownish-gray to gray, mottled sandy clay and clay.

This soil is strongly acid. The natural fertility and the organic-matter content are medium. Surface runoff is slow to very slow, internal drainage is very slow, and the

available moisture capacity is moderate. Permeability and the infiltration rate are both slow.

This soil occupies a little less than 3 percent of the county. It must be drained before it can be used for pasture or crops. Open ditches are needed because tile do not provide adequate drainage. In many places suitable drainage outlets are not available. Although row crops can be grown occasionally, this soil is best used for bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, ryegrass, or other perennial grasses. Areas that can be drained adequately are fairly well suited to corn, soybeans, and oats. Annual lespedeza and white clover are suitable legumes.

If row crops are grown, a suitable cropping system consists of perennial grasses mixed with annual lespedeza or white clover, then corn or soybeans for 2 years. Truck crops can be grown if they are followed by an intensive soil-improvement program. To obtain high yields, it is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. All crop residues should be turned under to supply organic matter.

This soil hardens if the organic-matter content is not maintained, and it puddles and packs if grazed when too wet. Many areas are used for pasture or woodland because of the difficulty of providing adequate drainage for cultivated crops. There are some sites that are suitable for dug ponds.

Capability unit IVw–3

This unit consists of deep, nearly level, poorly drained soils of the low-lying uplands and the stream terraces. They are flooded occasionally. The surface layer is 3 to 18 inches thick and is gray to very dark grayish brown or very dark gray. The texture ordinarily is sandy loam but is silt loam in a few places. The subsoil is gray, mottled sandy loam to clay loam. The soils are—

Myatt sandy loam.
Rains sandy loam.

These soils are acid. They are low in organic-matter content and in natural fertility. Permeability is slow to moderately slow; and the infiltration rate is moderate to moderately slow. The available moisture capacity is moderate to low. Surface runoff and internal drainage are very slow to slow.

These soils occupy less than 2 percent of the county. They must be drained before they can be used either for cultivated crops or pasture. Because suitable outlets are lacking, many areas are difficult to drain. Open ditches are required because tiles do not provide adequate drainage.

If adequately drained and otherwise properly managed, these soils are fairly well suited to corn, soybeans, and oats. Bahiagrass, Coastal bermudagrass, dallisgrass, and ryegrass are suitable grasses, and annual lespedeza and white clover are suitable legumes. Although these soils can be used for row crops occasionally, their best use is for perennial grasses.

If row crops are grown, a suitable cropping system consists of perennial grasses mixed with annual lespedeza or white clover, then corn or soybeans for 2 years. Truck crops can be grown if they are followed by an intensive soil-improvement program. Turning under all crop residues and growing cover crops for 1 or 2 years help to maintain the organic-matter content. To maintain good yields, it is necessary to apply lime and fertilizer according to the requirements of the crop to be grown and the needs of the soils, as indicated by soil tests.

Many areas are in pasture or are wooded because of the difficulty of providing adequate drainage for cultivated crops. Loblolly pine, pond pine, gum, and yellow-poplar grow well on these soils. There are some sites suitable for dug ponds.

Capability unit IVw–4

This unit consists of Mixed alluvial land, a nearly level, poorly drained land type of varied texture and color that occurs on the flood plains of the smaller streams in the county. This land type occupies between 1 and 2 percent of the county. It is not suited to cultivated crops, and it must be drained before it can be used for pasture or hay. If adequately drained and otherwise properly managed, it is fairly well suited to bahiagrass, dallisgrass, tall fescue, and white clover. Lime and fertilizer should be applied according to the requirements of the plants to be grown and the needs of the soil, as indicated by soil tests.

Most of the acreage has remained as woodland. Loblolly pine and slash pine grow well in some of the better drained areas.

Capability unit IVs–1

This unit consists of deep, nearly level to sloping, somewhat excessively drained or excessively drained soils of the uplands and stream terraces. Their surface layer is brownish-gray to dark-brown sand. In some places it contains subrounded quartz gravel ¼ inch to 3 inches in diameter. In other places it is underlain by sandy loam or sandy clay loam at a depth of 30 to 42 inches. The subsoil is yellow to red loamy sand to sandy clay loam. In some places the subsoil is, by volume, 30 to 50 percent subrounded quartz gravel ¼ inch to 3 inches in diameter. The soils are—

Eustis sand, 0 to 6 percent slopes.
Eustis sand, moderately shallow, 6 to 10 percent slopes.
Lakeland sand, 0 to 6 percent slopes.
Lakeland sand, 6 to 10 percent slopes.
Lakeland sand, gravelly variant, 0 to 10 percent slopes.
Lakeland sand, moderately shallow, 6 to 10 percent slopes.
Lakeland sand, terrace, 0 to 6 percent slopes.

These soils are acid. The organic-matter content and natural fertility are low to very low. Surface runoff is slow. Permeability and the infiltration rate are rapid. The available moisture capacity is low.

These soils occupy about 13 percent of the county. Except for Lakeland sand, gravelly variant, 0 to 10 percent slopes, they are fairly well suited to corn, cotton, soybeans, tobacco, and oats. Bahiagrass, Coastal bermudagrass, and ryegrass are the principal suitable grasses, and bicolor lespedeza and sericea lespedeza are suitable legumes. Hairy indigo can be grown as a soil-improving crop.

If these soils are cultivated, particular attention should be given to the maintenance of the organic-matter content and productivity. The following are suitable cropping systems: (1) 3 years of sericea lespedeza, then 1 year of corn; (2) 2 or 3 years of Coastal bermudagrass, then 1 or 2 years of corn or tobacco; (3) several years of sericea lespedeza, then 1 year of watermelons. It is necessary to

apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

Turning under all crop residues and cover crops helps to maintain the organic-matter content. In large fields windbreaks planted at right angles to the prevailing wind and contour strips of close-growing crops are needed to control wind erosion. Because of their weak structure and the risk of blowing, these soils are not suited to terracing.

Except for Lakeland sand, gravelly variant, 0 to 10 percent slopes, these soils can be used for pasture if protected from overgrazing. If scrub oak is controlled, loblolly pine and longleaf pine grow fairly well.

Capability unit Vw–2

In this unit are deep, nearly level, very poorly drained or poorly drained soils of the lower part of the uplands. Their surface layer ordinarily is black to light-gray loam or loamy sand, but in some places it is sand. The subsoil is grayish-brown to very dark gray loamy sand or sand. In some places finer textured material occurs at a depth of 3 to 4 feet. The soils are—

Plummer loamy sand.
Rutlege loam.
Rutlege loamy sand.

These soils are acid. The organic-matter content is fairly high in the surface layer. The natural fertility is low. Permeability is rapid to very rapid, and the infiltration rate is moderate. Surface runoff is slow. The available moisture capacity is moderate.

These soils occupy a little more than 4 percent of the county. They are generally not suited to crops, because they are difficult to drain. In most places drainage outlets are lacking. Open ditches are difficult to maintain because of the sloughing action of the sandy subsoil. Corn, soybeans, and oats can be grown fairly successfully in some of the better drained areas. Bahiagrass, Coastal bermudagrass, dallisgrass, and tall fescue are the chief suitable grasses, and crimson clover, white clover, and annual lespedeza are suitable legumes. To maintain high yields, it is necessary to apply fertilizer and lime according to the requirements of crops to be grown and the needs of the soils, as indicated by soil tests.

Most of the acreage is covered with pond pine and hardwoods.

Capability unit VIe–2

In this unit are shallow to moderately deep, strongly sloping to moderately steep soils of the uplands. The surface layer is 3 to 6 inches thick and is dark grayish brown to light gray. There are many eroded patches where the original subsoil is exposed and the present surface layer is yellowish red. In some places the texture is loamy sand. The subsoil ordinarily is 8 to 20 inches thick, but in a few places the surface layer rests directly on the substratum or parent material. The subsoil is yellowish-red to reddish-brown sandy clay loam to sandy clay. In some places it contains large quantities of subrounded quartz gravel ¼ inch to 3 inches in diameter. The soils are—

Vaucluse sand, 10 to 15 percent slopes, eroded.
Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded.
Vaucluse sand, 15 to 25 percent slopes, eroded.

These soils are low in organic-matter content and in natural fertility. They are acid. Permeability is moderate to slow, and surface runoff is rapid. Internal drainage is slow because of the compact or weakly cemented subsoil. The available moisture capacity is low.

These soils occupy about 1 percent of the county. They are not suited to cultivated crops. If they are used for forage crops, careful management is needed to maintain an effective ground cover for control of erosion. Sericea lespedeza and bahiagrass are the best suited plants. Loblolly pine grows fairly well on these soils, but there is a serious risk of windthrow. To avoid windthrow of larger trees, it is best to grow trees suitable for pulpwood.

Capability unit VIw–1

Coxville fine sandy loam, thin surface, is the only soil in this unit. It is nearly level, moderately deep, and poorly drained. The surface layer is very dark gray to gray fine sandy loam and is about 5 inches thick. The subsoil is gray fine sandy clay loam to silty clay.

Except in the surface layer, the organic-matter content is low. Natural fertility is low. Surface runoff is very slow. Permeability is very slow, and the infiltration rate is slow. The available moisture capacity is low. This soil tends to puddle and pack if grazed when too wet.

This soil occupies about 2 percent of the county. Because of the topography and the lack of suitable outlets, this soil is difficult to drain, and for this reason many areas have remained in woods. Tile do not provide adequate drainage, and open ditches are needed. Small areas can be drained well enough to be used as pasture. Bahiagrass, Coastal bermudagrass, dallisgrass, tall fescue, and ryegrass are suitable grasses, and white clover and annual lespedeza are suitable legumes. To maintain productivity, it is necessary to apply fertilizer and lime according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests. Large amounts are needed.

Capability unit VIs–1

This unit consists of deep, nearly level to strongly sloping, excessively drained soils of the uplands. Their surface layer is gray to light brownish gray. In some places it contains large quantities of subrounded quartz gravel ¼ inch to 3 inches in diameter. The subsoil is white to yellowish-brown sand or loamy sand. In some places it contains pockets of dark reddish-brown sand high in organic-matter content. In other places it is, by volume, 30 to 50 percent subrounded quartz gravel ¼ inch to 3 inches in diameter. The soils are—

Lakeland sand, 10 to 15 percent slopes.
Lakeland sand, gravelly variant, 10 to 15 percent slopes.
Lakewood sand.

These soils are acid. They are very low in organic-matter content and in natural fertility. The available moisture capacity is low to very low, the infiltration rate is rapid, and permeability is rapid. Surface runoff is slow to very slow.

These soils occupy less than 1 percent of the county. They are best suited to the production of timber. They are not suited to cultivated crops. Bahiagrass, sericea lespedeza, and Coastal bermudagrass can be grown fairly successfully for pasture.

Large quantities of organic matter and fertilizer are needed to maintain productivity. Turning under all crop residues helps to maintain the organic-matter content and improves tilth. It is necessary to apply lime and fertilizer according to the requirements of the crops to be grown and the needs of the soils, as indicated by soil tests.

If scrub oak is controlled, pines can be grown on this soil.

Capability unit VIIw-1

This unit consists of Swamp, a nearly level land type that occurs on the flood plains of the larger streams in the county. It is covered with water most of the time (fig. 17). Texture, color, and depth vary, and there is little evidence of profile development. The organic-matter content is variable. In some places there is a thick, dark-colored organic layer underlain by light-gray sand or clay.

This land type occupies more than 7 percent of the county. Because of its topographic position, it cannot be drained. The production of hardwoods is its best use. Blackgum, tupelo-gum, sweetgum, yellow-poplar, and cypress grow well.

Figure 17.—An area of Swamp. Hardwoods grow well in swampy areas.

Capability unit VIIs-2

This unit consists of Mine pits and dumps, a land type that occupies less than 1 percent of the county. It consists of areas from which gravel or soil material have been removed and used for building roads or for other construction projects. A few steep and gullied areas are included.

A few areas have been reclaimed by spreading the spoil and planting pine trees. In some unleveled areas pines have reseeded naturally. Some of the deeper pits contain water and can be stocked with fish, or the water can be used for irrigation.

Estimated Yields and Crop Suitability

The first part of this subsection shows the relative suitability of the soils for crops that are commonly grown or that are known to be suited to the soils and to the climate.

The second part gives the estimates of yields of principal crops on the different soils in the county.

Relative suitability of the soils for crops

In table 2 the degree of suitability of the soils in Marlboro County for certain crops is expressed by index numbers. Number 1 indicates that the soil is well suited; number 2, that it is fairly well suited; number 3, that it is less well suited; and number 4, that it is not at all suited.

Estimated yields

Estimates of yields of the principal crops on most soils in this county, under two levels of management, are shown in table 3. Mine pits and dumps and Swamp are not listed because they are not suitable for cultivation. Estimates of average yields under management practices commonly used in the county are listed in columns A, and estimates under improved management are listed in columns B. Dashes in a column, instead of a figure, indicate that the crop is not suited to the particular soil or is not commonly grown on it.

Engineering Uses of the Soils [2]

This subsection deals with soil as structural material and as foundation material upon which structures rest. To engineers, soil is a natural material that occurs in infinite variety over the earth and that may have widely different engineering properties within the space covered by a single project. Generally, soil must be used in the locality and in the condition in which it occurs.

Important steps in evaluating the engineering properties of soils are to differentiate between the various kinds of soil and to map their location, to determine their engineering properties, to correlate their properties with the requirements of the job, and to select the best material for each job.

This soil survey report contains information that engineers can use to—

1. Make soil- and land-use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.

[2] C. B. Derrick, agricultural engineer, Soil Conservation Service, assisted with this subsection.

TABLE 2.—*Relative suitability of the soils for specified crops*

[Number 1 means soil is well suited; 2, fairly well suited; 3, less well suited; 4, not suited]

Soil	Corn	Cotton	Soybeans	Tobacco	Tomatoes	Barley	Oats	Wheat	Bahiagrass	Coastal bermudagrass	Dallisgrass	Tall fescue	Millet	Ryegrass	Bicolor lespedeza	Crimson clover	White clover	Annual lespedeza	Sericea lespedeza
Bayboro loam	2	4	3	4	4	4	3	4	2	3	2	2	3	2	4	4	2	2	4
Cahaba fine sandy loam, 0 to 2 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	3	3	1
Cahaba fine sandy loam, 2 to 6 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	3	3	1
Caroline fine sandy loam, 0 to 2 percent slopes	2	2	2	3	3	3	3	3	2	2	3	4	2	3	2	3	4	3	2
Caroline fine sandy loam, 2 to 6 percent slopes	2	2	2	3	3	3	3	3	2	2	3	4	2	3	2	3	4	3	2
Caroline fine sandy loam, 2 to 6 percent slopes, eroded	3	3	3	4	4	4	3	4	2	3	4	4	3	3	2	3	4	3	3
Chewacla silt loam	2	4	2	4	3	4	2	4	2	2	1	2	1	2	4	2	1	1	4
Congaree fine sandy loam	1	2	2	4	1	2	2	2	1	1	1	1	1	1	2	2	1	1	2
Coxville sandy loam	2	3	2	3	4	4	2	3	2	2	2	3	2	2	4	3	2	1	4
Coxville fine sandy loam	2	3	2	3	4	4	2	3	2	2	2	3	2	2	4	3	2	1	4
Coxville fine sandy loam, thin surface	4	4	4	4	4	4	4	4	3	3	3	3	3	3	4	4	3	3	4
Craven fine sandy loam, 0 to 2 percent slopes	2	2	2	3	3	4	2	3	2	2	3	4	2	2	2	2	3	2	3
Dunbar fine sandy loam	1	2	1	2	3	3	1	2	2	2	2	3	2	2	3	3	1	1	3
Dunbar sandy loam	1	2	1	1	3	3	1	2	2	2	2	3	2	2	3	3	1	1	3
Eustis loamy sand, terrace, 0 to 6 percent slopes	3	2	3	3	3	3	3	4	2	2	4	4	3	3	2	4	4	4	2
Eustis sand, 0 to 6 percent slopes	3	3	3	3	3	4	3	4	2	2	4	4	3	3	2	4	4	4	2
Eustis sand, moderately shallow, 0 to 2 percent slopes	3	2	3	3	3	3	3	4	2	2	4	4	3	3	2	4	4	4	2
Eustis sand, moderately shallow, 2 to 6 percent slopes	3	2	3	3	3	3	3	4	2	2	4	4	3	3	2	4	4	4	2
Eustis sand, moderately shallow, 6 to 10 percent slopes	3	3	4	4	3	4	3	4	2	2	4	4	4	3	2	4	4	4	2
Faceville loamy sand, 0 to 2 percent slopes	1	1	1	2	2	1	1	1	1	1	3	3	1	1	1	1	3	3	1
Faceville loamy sand, 2 to 6 percent slopes	1	1	1	2	2	1	1	1	1	1	3	3	1	1	1	1	3	3	1
Faceville loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	2	2	2	2	1	1	3	3	2	2	1	2	3	3	1
Flint fine sandy loam, 0 to 2 percent slopes	2	2	2	3	3	3	2	3	2	2	3	3	2	2	2	2	3	2	2
Flint fine sandy loam, 2 to 6 percent slopes	2	2	2	3	3	3	2	3	2	2	3	3	2	2	2	2	3	2	2
Flint fine sandy loam, 2 to 6 percent slopes, eroded	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	3	2	2
Flint fine sandy loam, 6 to 12 percent slopes	3	3	3	4	3	3	3	3	2	2	4	4	3	3	2	2	3	2	2
Gilead sand, 0 to 2 percent slopes	2	2	2	3	3	2	2	2	2	2	4	4	2	2	2	3	3	3	2
Gilead sand, 2 to 6 percent slopes	2	2	2	3	3	2	2	2	2	2	4	4	2	2	2	3	3	3	2
Gilead sand, 6 to 10 percent slopes	3	3	3	4	4	3	3	3	2	2	4	4	3	2	2	4	4	3	2
Gilead sand, thick surface, 0 to 2 percent	3	2	3	3	3	3	3	3	2	2	4	4	3	3	2	3	4	4	2
Gilead sand, thick surface, 2 to 6 percent slopes	3	2	3	3	3	3	3	3	2	2	4	4	3	3	2	3	4	4	2
Gilead sand, thick surface, 6 to 10 per cent slopes	3	3	4	4	3	3	3	3	2	2	4	4	4	3	2	3	4	4	2
Goldsboro loamy sand, 0 to 2 percent slopes	1	1	1	1	2	1	1	2	1	1	3	3	1	1	2	2	2	2	2
Grady loam	2	3	2	4	4	4	2	3	2	2	2	3	2	2	4	3	2	1	4
Izagora fine sandy loam	2	2	2	3	3	3	2	3	2	2	3	3	2	2	2	2	3	3	2
Kalmia loamy fine sand, 0 to 2 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	4	4	1
Kalmia loamy fine sand, 2 to 6 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	4	4	1
Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes	2	2	2	2	3	3	2	3	1	1	4	4	2	2	1	3	4	4	1
Klej loamy sand	3	3	3	3	2	4	3	3	2	2	4	4	2	2	2	3	4	3	2
Lakeland sand, 0 to 6 percent slopes	3	3	3	3	3	4	3	4	2	2	4	4	3	3	2	4	4	4	2

TABLE 2.—*Relative suitability of the soils for specified crops*—Continued

Soil	Corn	Cotton	Soybeans	Tobacco	Tomatoes	Barley	Oats	Wheat	Bahiagrass	Coastal bermudagrass	Dallisgrass	Tall fescue	Millet	Ryegrass	Bicolor lespedeza	Crimson clover	White clover	Annual lespedeza	Sericea lespedeza
Lakeland sand, 6 to 10 percent slopes	4	4	4	4	3	4	3	4	2	2	4	4	4	4	2	4	4	4	2
Lakeland sand, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	3	3	4	4	4	4	2	4	4	4	2
Lakeland sand, terrace, 0 to 6 percent slopes	3	2	3	3	3	4	3	3	2	2	4	4	3	3	2	3	4	4	2
Lakeland sand, moderately shallow, 0 to 2 percent slopes	3	2	3	3	3	4	3	3	2	2	4	4	3	3	2	3	4	4	2
Lakeland sand, moderately shallow, 2 to 6 percent slopes	3	2	3	3	3	4	3	3	2	2	4	4	3	3	2	3	4	4	2
Lakeland sand, moderately shallow, 6 to 10 percent slopes	4	3	4	3	3	4	3	3	2	2	4	4	4	3	2	4	4	4	2
Lakeland sand, gravelly variant, 0 to 10 percent slopes	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Lakeland sand, gravelly variant, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Lakewood sand	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Leaf fine sandy loam	3	4	3	4	4	4	3	4	3	3	3	3	3	3	4	4	2	2	4
Lenoir loam	3	4	2	3	3	4	2	4	2	3	2	3	3	3	4	3	2	2	4
Local alluvial land	1	2	1	3	3	2	1	2	1	1	2	2	1	1	2	2	2	1	2
Lynchburg loamy sand	1	2	1	1	3	3	2	3	1	1	2	2	1	2	4	3	2	1	4
Magnolia loamy sand, 0 to 2 percent slopes	1	1	1	2	2	1	1	1	1	1	3	3	1	1	1	1	3	2	1
Magnolia loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	2	2	2	2	1	1	3	3	2	2	1	2	3	3	1
Marlboro loamy sand, 0 to 2 percent slopes	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	3	2	1
Marlboro loamy sand, 2 to 6 percent slopes	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	3	2	1
Marlboro loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	2	2	2	2	1	1	3	3	2	2	1	2	3	3	1
Marlboro loamy sand, 6 to 12 percent slopes, eroded	3	3	3	3	3	3	3	3	2	2	3	3	3	3	2	2	3	3	1
McColl loam	2	3	2	4	4	4	2	3	2	2	2	3	2	2	4	3	2	1	4
Mine pits and dumps	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Mixed alluvial land	4	4	4	4	4	4	4	4	3	4	3	3	4	4	4	4	3	4	4
Molena loamy sand, 0 to 10 percent slopes	3	2	3	3	3	3	3	4	2	2	4	4	3	3	2	4	4	4	2
Myatt sandy loam	3	4	3	4	4	4	3	4	3	3	3	3	3	3	4	4	3	3	4
Norfolk loamy sand, 0 to 2 percent slopes	1	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	4	3	1
Norfolk loamy sand, 2 to 6 percent slopes	1	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	4	3	1
Norfolk loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	2	2	2	2	1	1	3	4	2	2	1	2	4	3	1
Norfolk loamy sand, 6 to 10 percent slopes	2	2	2	2	2	2	2	2	1	1	3	4	2	2	1	2	4	3	1
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	2	2	2	2	2	2	2	2	2	2	4	4	2	2	1	2	4	4	2
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	2	2	2	2	2	2	2	2	2	2	4	4	2	2	1	2	4	4	2
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	3	3	3	3	3	3	3	3	2	2	4	4	3	3	1	3	4	4	2
Plummer loamy sand	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4
Portsmouth and Okenee loams	2	4	2	4	4	4	2	4	2	3	2	3	2	2	4	4	2	2	4
Rains sandy loam	3	4	3	4	4	4	3	4	3	3	3	4	3	3	4	4	3	3	4
Ruston loamy sand, 0 to 2 percent slopes	1	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	4	3	1
Ruston loamy sand, 2 to 6 percent slopes	1	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	4	3	1
Ruston loamy sand, 2 to 6 percent slopes, eroded	2	2	2	2	2	2	2	2	1	1	3	4	1	1	1	1	4	3	1
Ruston loamy sand, 6 to 10 percent slopes, eroded	3	3	3	3	3	3	3	3	2	2	4	4	3	3	2	3	4	4	2
Ruston loamy sand, thick surface, 0 to 2 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	4	4	1
Ruston loamy sand, thick surface, 2 to 6 percent slopes	2	2	2	2	2	2	2	2	1	1	4	4	2	2	1	2	4	4	1

TABLE 2.—*Relative suitability of the soils for specified crops*—Continued

Soil	Corn	Cotton	Soybeans	Tobacco	Tomatoes	Barley	Oats	Wheat	Bahiagrass	Coastal bermudagrass	Dallisgrass	Tall fescue	Millet	Ryegrass	Bicolor lespedeza	Crimson clover	White clover	Annual lespedeza	Sericea lespedeza
Ruston loamy sand, thick surface, 6 to 10 percent slopes	3	3	3	3	3	3	3	3	2	2	4	4	3	3	1	3	4	4	2
Rutlege loam	3	4	3	4	4	4	3	4	2	2	1	3	2	2	4	3	2	2	4
Rutlege loamy sand	3	4	3	4	4	4	3	4	3	3	2	3	4	4	4	4	3	2	4
Swamp	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vaucluse sand, 2 to 6 percent slopes	3	3	3	3	3	3	3	3	2	2	4	4	3	2	2	3	4	4	2
Vaucluse sand, 6 to 10 percent slopes	3	3	3	3	3	3	3	3	2	2	4	4	3	2	2	3	4	4	2
Vaucluse sand, 6 to 10 percent slopes, eroded	4	4	4	4	4	4	4	4	3	3	4	4	4	4	3	4	4	4	3
Vaucluse sand, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vaucluse sand, 10 to 15 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vaucluse sand, 15 to 25 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vaucluse sand, thick surface, 2 to 6 percent slopes	3	3	3	3	3	4	3	4	2	2	4	4	3	3	2	4	4	4	2
Vaucluse sand, thick surface, 6 to 10 percent slopes	3	3	3	3	3	4	3	4	2	2	4	4	3	3	2	4	4	4	2
Vaucluse sand, thick surface, 10 to 15 percent slopes	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wahee very fine sandy loam	2	3	2	3	3	3	2	3	2	2	2	3	2	2	3	3	2	2	3
Wehadkee silt loam	4	4	4	4	4	4	4	4	3	4	4	3	4	4	4	4	3	3	4
Wickham sandy loam, 2 to 6 percent slopes	2	1	1	2	2	1	1	1	1	1	3	3	2	2	1	2	3	3	2
Wickham sandy loam, 2 to 6 percent slopes, eroded	3	2	2	3	3	2	2	2	2	2	4	4	3	3	2	3	4	4	3

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*

[Yields in columns A are those to be expected under management common in the county; those in columns B, under improved management. Absence of figure indicates crop is not suited to the soil specified or is not commonly grown on it]

Soil	Cotton		Corn		Oats		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Bayboro loam			30	60	30	60	15	30			180	300
Cahaba fine sandy loam, 0 to 2 percent slopes	500	800	40	75	45	80	20	40	1,300	2,000	180	325
Cahaba fine sandy loam, 2 to 6 percent slopes	400	750	35	65	35	65	15	30	1,000	1,500	180	325
Caroline fine sandy loam, 0 to 2 percent slopes	400	650	35	65	35	65	15	35	1,000	1,500	100	180
Caroline fine sandy loam, 2 to 6 percent slopes	350	600	30	60	30	60	15	30			100	180
Caroline fine sandy loam, 2 to 6 percent slopes, eroded			20	40	20	40	10	20			90	120
Chewacla silt loam			45	85	45	85	20	40			280	350
Congaree fine sandy loam	400	600	50	100	50	90	25	45			280	350
Coxville sandy loam	300	550	30	60	30	75	15	30			200	350
Coxville fine sandy loam	300	550	30	60	30	75	15	30			200	350
Coxville fine sandy loam, thin surface											100	150
Craven fine sandy loam, 0 to 2 percent slopes	475	800	30	60	30	60	15	30	1,000	1,500	180	300
Dunbar fine sandy loam	500	750	45	90	45	90	20	40	1,500	2,500	220	350
Dunbar sandy loam	500	750	45	90	45	90	20	40	1,500	2,500	220	350

See footnote at end of table.

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Cotton		Corn		Oats		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Eustis loamy sand, terrace, 0 to 6 percent slopes	300	500	20	45	30	55	10	15	800	1, 300	90	180
Eustis sand, 0 to 6 percent slopes	300	500	20	45	30	55	10	15	800	1, 300	90	180
Eustis sand, moderately shallow, 0 to 2 percent slopes	350	550	30	45	35	65	10	25	1, 000	1, 500	100	200
Eustis sand, moderately shallow, 2 to 6 percent slopes	300	500	20	45	30	55	10	15	800	1, 300	90	180
Eustis sand, moderately shallow, 6 to 10 percent slopes			20	35							90	180
Faceville loamy sand, 0 to 2 percent slopes	450	900	35	75	35	75	20	40	1, 550	1, 950	210	350
Faceville loamy sand, 2 to 6 percent slopes	450	900	35	75	35	75	20	40	1, 550	1, 950	210	350
Faceville loamy sand, 2 to 6 percent slopes, eroded	400	800	30	60	30	60	15	30	1, 500	1, 900	180	300
Flint fine sandy loam, 0 to 2 percent slopes	350	600	35	65	35	65	15	30			180	350
Flint fine sandy loam, 2 to 6 percent slopes	300	600	30	60	30	60	15	30			180	300
Flint fine sandy loam, 2 to 6 percent slopes, eroded	250	500	20	40	20	40	10	20			150	250
Flint fine sandy loam, 6 to 12 percent slopes	300	550	25	50	25	50	15	25			120	220
Gilead sand, 0 to 2 percent slopes	350	600	30	60	40	65	15	30	1, 000	1, 600	150	240
Gilead sand, 2 to 6 percent slopes	350	600	30	60	40	65	15	30	1, 000	1, 600	150	240
Gilead sand, 6 to 10 percent slopes	250	400	20	35	30	45	10	25	800	1, 400	120	200
Gilead sand, thick surface, 0 to 2 percent slopes	200	400	25	50	35	60	15	30			140	350
Gilead sand, thick surface, 2 to 6 percent slopes	200	400	25	50	35	60	15	30			140	350
Gilead sand, thick surface, 6 to 10 percent slopes	200	375	20	40	25	50					135	300
Goldsboro loamy sand, 0 to 2 percent slopes	500	850	40	80	40	85	20	35	1, 700	2, 500	220	350
Grady loam	300	500	25	60	30	75	15	30			200	300
Izagora fine sandy loam	400	650	35	65	35	65	15	30	1, 100	1, 700	180	300
Kalmia loamy fine sand, 0 to 2 percent slopes	450	800	40	75	45	80	20	40	1, 300	2, 000	180	325
Kalmia loamy fine sand, 2 to 6 percent slopes	400	750	35	65	35	65	15	30	1, 000	1, 500	180	300
Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes	400	750	35	65	35	65	15	30	1, 100	1, 700	180	300
Klej loamy sand	350	600	30	60	30	60	15	30	900	1, 500	160	260
Lakeland sand, 0 to 6 percent slopes	225	425	20	40	25	50	10	20	800	1, 300	90	180
Lakeland sand, 6 to 10 percent slopes	150	400	15	35	25	40	10	15	600	1, 000	90	180
Lakeland sand, 10 to 15 percent slopes												
Lakeland sand, gravelly variant, 0 to 10 percent slopes												
Lakeland sand, gravelly variant, 10 to 15 percent slopes												
Lakeland sand, moderately shallow, 0 to 2 percent slopes	350	550	30	50	35	65	15	30	1, 000	1, 500	100	200
Lakeland sand, moderately shallow, 2 to 6 percent slopes	250	450	20	45	30	55	15	25	800	1, 300	90	180
Lakeland sand, moderately shallow, 6 to 10 percent slopes	150	400	20	35	20	45	10	15	625	1, 200	90	180
Lakeland sand, terrace, 0 to 6 percent slopes	300	500	20	45	30	55	15	20	800	1, 300	90	180
Lakewood sand												
Leaf fine sandy loam			30	50	25	45	10	20			140	300
Lenoir loam	300	550	25	55	25	55	15	30	1, 200	1, 800	180	300
Local alluvial land	400	800	40	70	45	80	20	40	1, 300	2, 000	180	250
Lynchburg loamy sand	500	750	40	85	50	80	20	40	1, 500	2, 500	220	350
Magnolia loamy sand, 0 to 2 percent slopes	450	900	35	75	35	75	20	40	1, 550	1, 950	210	350
Magnolia loamy sand, 2 to 6 percent slopes, eroded	400	800	30	60	30	60	15	30	1, 500	1, 900	180	300
Marlboro loamy sand, 0 to 2 percent slopes	450	900	35	75	35	75	20	40	1, 600	2, 000	210	350
Marlboro loamy sand, 2 to 6 percent slopes	450	900	35	75	35	75	20	40	1, 600	2, 000	210	350
Marlboro loamy sand, 2 to 6 percent slopes, eroded	400	800	30	60	30	60	15	30	1, 500	1, 900	180	300
Marlboro loamy sand, 6 to 12 percent slopes, eroded	275	475	25	45	25	45	10	20			155	225
McColl loam	300	500	25	60	30	75	15	30			200	300
Mine pits and dumps												
Mixed alluvial land												

See footnote at end of table.

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Cotton		Corn		Oats		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Molena loamy sand, 0 to 10 percent slopes	300	500	30	50	30	50	15	25	1, 000	1, 500	180	300
Myatt sandy loam											150	200
Norfolk loamy sand, 0 to 2 percent slopes	500	800	35	75	35	75	25	45	1, 600	2, 500	210	350
Norfolk loamy sand, 2 to 6 percent slopes	500	800	35	75	35	75	25	45	1, 600	2, 500	210	350
Norfolk loamy sand, 2 to 6 percent slopes, eroded	450	700	30	65	30	65	20	35	1, 400	2, 000	180	300
Norfolk loamy sand, 6 to 10 percent slopes	300	500	25	45	25	45	15	25			100	180
Norfolk loamy sand, thick surface, 0 to 2 percent slopes	400	750	30	60	35	70	15	30	1, 400	1, 750	150	300
Norfolk loamy sand, thick surface, 2 to 6 percent slopes	400	700	30	60	35	70	10	25	1, 350	1, 700	150	300
Norfolk loamy sand, thick surface, 6 to 10 percent slopes	275	450	20	40	20	40	10	20			120	250
Plummer loamy sand											90	180
Portsmouth and Okenee loams			30	60	30	60	15	30			180	300
Rains sandy loam											100	180
Ruston loamy sand, 0 to 2 percent slopes	500	800	35	75	35	75	25	45	1, 600	2, 500	210	350
Ruston loamy sand, 2 to 6 percent slopes	500	800	35	75	35	75	25	45	1, 600	2, 500	210	350
Ruston loamy sand, 2 to 6 percent slopes, eroded	450	700	300	65	30	65	20	35	1, 400	2, 000	180	300
Ruston loamy sand, 6 to 10 percent slopes, eroded	300	500	25	45	25	45	15	25			100	180
Ruston loamy sand, thick surface, 0 to 2 percent slopes	400	750	30	60	35	70	15	30	1, 400	1, 750	150	300
Ruston loamy sand, thick surface, 2 to 6 percent slopes	400	700	30	60	35	70	10	25	1, 350	1, 700	150	300
Ruston loamy sand, thick surface, 6 to 10 percent slopes	275	450	20	40	20	40	10	20			120	250
Rutlege loam			30	55	35	50	15	30			100	180
Rutlege loamy sand			30	55	35	50	15	30			100	180
Swamp												
Vaucluse sand, 2 to 6 percent slopes	200	375	20	45	30	55	10	20	700	1, 400	120	200
Vaucluse sand, 6 to 10 percent slopes	150	300	20	45	20	45	10	20	600	1, 200	100	200
Vaucluse sand, 6 to 10 percent slopes, eroded												
Vaucluse sand, 10 to 15 percent slopes												
Vaucluse sand, 10 to 15 percent slopes, eroded												
Vaucluse sand, 15 to 25 percent slopes, eroded												
Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded												
Vaucluse sand, thick surface, 2 to 6 percent slopes	150	350	15	45	25	50	10	20	600	1, 200	100	180
Vaucluse sand, thick surface, 6 to 10 percent slopes	150	300	15	40	25	45	10	20			100	180
Vaucluse sand, thick surface, 10 to 15 percent slopes												
Wahee very fine sandy loam			30	60	30	60	15	25			180	350
Wehadkee silt loam											280	350
Wickham sandy loam, 2 to 6 percent slopes	450	700	40	70	40	70	20	40	1, 300	2, 000	150	250
Wickham sandy loam, 2 to 6 percent slopes, eroded	400	600	35	65	35	65	15	30	800	1, 500	150	250

[1] The number of days a year 1 acre will graze 1 animal unit (1 cow, 1 steer, or 1 horse; 5 hogs; or 7 sheep or goats) without injury to the pasture.

2. Make preliminary estimates of the soil properties that are important in designing drainage and irrigation structures and in planning dams and other structures for water and soil conservation.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting highway, pipeline, and airport locations and in planning detailed investigations at the selected locations.
4. Locate probable sources of sand and gravel and other construction material.
5. Correlate performance of engineering structures with soil mapping units to develop information that will be useful in designing and maintaining engineering structures.
6. Determine the suitability of soil mapping units for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps and reports and aerial photographs to make maps and reports that can be used readily by engineers.

8. Develop other preliminary estimates for construction purposes pertinent to the particular areas.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may not be familiar to engineers, and some words—for example, *soil*, *clay*, *silt*, *sand*, *parent material*, and *structure*—have special meanings in soil science. These terms and other special terms used in this report are defined in the Glossary at the back of this report. Other parts of this report also may be useful to engineers, particularly the section "Descriptions of the Soils."

Engineering classification systems

Two systems of classifying soils are in general use among engineers. Both are used in this report.

Most highway engineers classify soil materials in accordance with the system approved by the American Association of State Highway Officials (AASSHO) (*1*).[3] In this system, soil materials are classified in seven principal groups. The groups range from A–1 (gravelly soils of high bearing capacity) to A–7 (clay soils having low strength when wet). Within each group, the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best materials to 20 for the poorest. The group index number is shown in parentheses, following the soil subgroup symbol; for example, A–2–4(0).

Some engineers prefer to use the Unified soil classification system established by the Waterways Experiment Station, Corps of Engineers (*17*). This system is based on performance as engineering construction material. Soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic.

The classifications of the major horizons of the soils in Marlboro County, under both systems, are given in table 5. The classifications of soils selected for laboratory testing are given in table 4.

Soil properties and engineering interpretations

The information and interpretations of most significance to engineers are presented in tables 4, 5, and 6. Additional information can be found in the sections "Descriptions of the Soils" and "General Soil Map." Brief explanations of how the information in the tables was obtained and explanations of the significance of some of the items follow.

Engineering Test Data.—To help evaluate the soils for engineering purposes, soil samples from six soil profiles were tested according to standard procedures. The tests were performed by the U.S. Department of Commerce, Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (*1*). The test data are given in table 4. Grain-size distribution, liquid limit, and plasticity index were determined. The soils were subsequently classified according to the Unified classification system and the AASHO system.

Each soil profile was sampled to a depth of about 4 feet. The test data show some variations in the characteristics of the soils but probably do not show the entire range of variations in the lower horizons. The data, therefore, are not adequate for estimating the characteristics of soil material in deep cuts on rolling topography.

Mechanical analysis to determine the relative proportion of particles of different sizes was made by a combination of the sieve and hydrometer methods. The percentage of clay was obtained by the hydrometer method and should not be used as a basis for naming soil textural classes.

Liquid limit and plastic limit tests measure the effect of moisture on the consistence of soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil is in a plastic condition.

Estimated Properties of Soils.—Brief descriptions of most of the soils in Marlboro County and estimates of some of the properties that affect engineering work are given in table 5. Data are not given for Local alluvial land, Mine pits and dumps, Mixed alluvial land, or Swamp.

Because samples from only six soil profiles were tested, it was necessary to estimate the AASHO and Unified engineering classifications and the significant physical properties of the rest of the soils. The permeability, available moisture capacity, and shrink-well potential were estimated.

Permeability, expressed in inches of water transmitted per hour, is based on the movement of water through the undisturbed soil material. The rate depends largely on the texture and structure of the soil.

Available moisture capacity, measured in inches per inch of soil depth, is the approximate amount of capillary water in a soil that is wet to field capacity. When the soil is air dry, this amount of water will wet the soil material to a depth of 1 inch without deeper percolation.

The shrink-swell potential is an indication of the volume change to be expected with a change in moisture content. It is estimated primarily on the basis of the amount and type of clay present. In general, soils classified as CH and A–7 have a high shrink-swell potential. Clean sands and gravels (single-grain structure) and those having small amounts of nonplastic to slightly plastic fines, as well as most other nonplastic to slightly plastic soil material, have a low shrink-swell potential.

Interpretations of Engineering Properties.—Table 6 gives the soil characteristics most likely to affect engineering practices. These characteristics are evaluated on the basis of estimates given in table 5, on test data shown in table 4, or on actual field experience and performance. The soils are rated as to their suitability for winter grading, and as material for road subgrade and road fill. The

[3] Italic numbers in parentheses refer to "Literature Cited," p. 106.

TABLE 4.—*Engineering test data for*

[Tests performed by Bureau of Public Roads (BPR) in accordance with standard

Soil and location	Parent material	Bureau of Public Roads report number	Depth	Horizon
			Inches	
Craven fine sandy loam: 2.5 miles N. and 0.5 mile W. of Blenheim (modal profile).	Unconsolidated sands and clays.	S-40549	2 to 8	A2
		S-40550	20 to 29	B22
		S-40551	29 to 40+	C
Gilead sand: 0.25 mile NE. of junction of county roads 165 and 203 (modal profile).	Unconsolidated sands and clays.	S-40552	0 to 8	Ap
		S-40553	20 to 28	B2
		S-40554	28 to 36+	C
Klej loamy sand: 0.5 mile E. of Brownsville, along S.C. Highway 34 (modal profile).	Unconsolidated sands and clays.	S-40555	0 to 8	Ap
		S-40556	21 to 34	B2
		S-40557	34 to 42+	C
Lenoir loam: 2 miles N. and 1 mile W. of Blenheim (red mottles).	Unconsolidated sands and clays.	S-40558	0 to 6	Ap
		S-40559	11 to 22	B22
		S-40560	32 to 41+	C
Marlboro loamy sand: 3 miles E. of Breedens; 200 yards SE. of county road 17 along county road 275 (modal profile).	Unconsolidated sands and clays.	S-40561	0 to 9	Ap
		S-40562	18 to 27	B22
		S-40563	31 to 38+	C
Wahee very fine sandy loam: 2 miles S. of Drake and 0.5 mile S. of Genoa (modal profile).	Alluvium.	S-40564	0 to 3	A1
		S-40565	19 to 27	B22
		S-40566	27 to 41+	C

[1] Mechanical analysis according to AASHO Designation: T 88-57 (*2*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). 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 the 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 analysis data used in this table are not suitable for naming textural classes for soils.

TABLE 5.—*Brief description of soils and their*

Map symbol	Soil	Brief description of soil	Depth to seasonally high water table	Depth from surface
			Feet	*Inches*
Ba	Bayboro loam.	1 to 1½ feet of friable black loam, high in organic-matter content, over 1 to 2 feet of firm clay; slow permeability.	0	0 to 12
				12 to 36
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes.	1 to 1½ feet of well-drained sandy loam over 1 to 2 feet of fine sandy clay loam; developed in beds of unconsolidated clays and sandy clays.	3+	0 to 18
CaB	Cahaba fine sandy loam, 2 to 6 percent slopes.			18 to 32
CfA	Caroline fine sandy loam, 0 to 2 percent slopes.	½ foot of well-drained fine sandy loam over 3 feet of sandy clay; developed in beds of unconsolidated sandy clays.	5+	0 to 6
CfB	Caroline fine sandy loam, 2 to 6 percent slopes.			6 to 38
CfB2	Caroline fine sandy loam, 2 to 6 percent slopes, eroded.			
Ch	Chewacla silt loam.	1 foot of silt loam underlain by 1½ feet of silty clay; formed in alluvium derived from granite, Carolina slate, and Coastal Plain material.	0	0 to 8
				8 to 24

soil samples taken from six soil profiles

procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis [1]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than—						AASHO	Unified [2]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
98	97	95	70	64	44	20	12	18	3	A–4(7)	ML.
98	97	96	82	78	70	56	50	65	35	A–7–5(20)	MH–CH.
100	97	95	80	76	63	51	46	61	29	A–7–5(20)	MH–CH.
100	66	45	14	10	6	3	2	(3)	(3)	A–2–4(0)	SM.
100	74	60	40	38	36	33	31	44	22	A–7–6(4)	SC.
100	72	56	38	37	36	35	33	40	18	A–6(2)	SC.
100	65	32	16	15	13	10	6	(3)	(3)	A–2–4(0)	SM.
100	67	35	21	20	16	13	11	(3)	(3)	A–2–4(0)	SM.
100	64	30	12	11	10	7	6	(3)	(3)	A–2–4(0)	SP–SM.
100	95	90	78	74	55	27	14	25	6	A–4(8)	ML–CL.
100	97	94	87	84	69	54	45	58	31	A–7–6(20)	CH.
100	97	94	87	84	69	54	46	61	33	A–7–6(20)	CH.
100	82	66	26	21	11	5	4	(3)	(3)	A–2–4(0)	SM.
100	88	78	60	58	56	54	52	55	31	A–7–6(15)	CH.
100	88	78	62	60	56	49	47	59	31	A–7–6(16)	CH.
100	96	91	73	66	42	18	8	29	5	A–4(8)	ML–CL.
100	98	96	84	79	63	47	40	55	29	A–7–6(19)	CH.
100	98	95	82	78	69	53	46	56	30	A–7–6(19)	CH.

[2] SCS and BPR have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification.

[3] Nonplastic.

estimated properties significant to engineering

Classification			Grain sizes		Permeability	Available moisture capacity	Reaction	Shrink-swell potential
USDA texture	Unified	AASHO	Passing No. 10 sieve (2.0 mm.)	Passing No. 200 sieve (0.074 mm.)				
			Percent	*Percent*	*Inches per hour*	*Inches per inch*	*pH*	
Loam	SM, ML, or OL.	A–4	100	35 to 75	0.80 to 2.50	0.11	5.1 to 5.5	Moderate.
Clay	CH	A–7	100	90 to 100	0.05 to 0.20	.13	5.1 to 5.5	High.
Fine sandy loam	SM	A–4	100	35 to 45	0.80 to 2.50	.09	5.6 to 6.0	Low.
Fine sandy clay loam	CL	A–6 or A–7	100	55 to 70	0.05 to 0.20	.12	5.1 to 5.5	Moderate.
Fine sandy loam	SM	A–4	100	35 to 45	0.05 to 0.20	.08	5.6 to 6.0	Low.
Sandy clay to clay	SC or CL	A–6 or A–7	100	45 to 65	0.05 to 0.20	.08	5.6 to 6.0	Moderate.
Silt loam	ML	A–4	100	90 to 100	0.80 to 2.50	.13	5.6 to 6.0	Moderate.
Silty clay	CH	A–7 or A–6	100	95 to 100	0.80 to 2.50	.13	5.6 to 6.0	High.

TABLE 5.—*Brief description of soils and their estimated*

Map symbol	Soil	Brief description of soil	Depth to seasonally high water table	Depth from surface
			Feet	*Inches*
Co	Congaree fine sandy loam.	1 foot of silt loam or fine sandy loam over 1½ feet of silty clay; developed in silty and clayey alluvium; contains flakes of mica.	0	0 to 8 8 to 27
Cs Ct Cu	Coxville fine sandy loam. Coxville fine sandy loam, thin surface. Coxville sandy loam.	½ to 1 foot of poorly drained sandy loam over 2 feet of sandy clay; derived from beds of unconsolidated sandy clays and clays.	0	0 to 12 12 to 36
CvA	Craven fine sandy loam, 0 to 2 percent slopes.	½ to 1 foot of fine sandy loam over 2 feet of firm sandy clay to clay; derived from beds of unconsolidated sandy clays and clays.	2	0 to 10 10 to 30
Db Dd	Dunbar fine sandy loam. Dunbar sandy loam.	1 foot of somewhat poorly drained sandy loam over 2 feet of sandy clay loam or sandy clay; derived from beds of unconsolidated sandy clay loams, sandy clays, and clays.	1	0 to 12 12 to 36
EbB EdB EmA EmB EmC	Eustis loamy sand, terrace, 0 to 6 percent slopes. Eustis sand, 0 to 6 percent slopes. Eustis sand, moderately shallow, 0 to 2 percent slopes. Eustis sand, moderately shallow, 2 to 6 percent slopes. Eustis sand, moderately shallow, 6 to 10 percent slopes.	2½ to 10 feet of excessively drained sand or loamy sand; derived from beds of unconsolidated sands.	5+	0 to 12 12 to 46
FaA FaB FaB2	Faceville loamy sand, 0 to 2 percent slopes. Faceville loamy sand, 2 to 6 percent slopes. Faceville loamy sand, 2 to 6 percent slopes, eroded.	1 foot of well-drained loamy sand over 2 feet of sandy clay; developed from beds of unconsolidated sandy clays.	3	0 to 12 12 to 36
FfA FfB FfB2 FfC	Flint fine sandy loam, 0 to 2 percent slopes. Flint fine sandy loam, 2 to 6 percent slopes. Flint fine sandy loam, 2 to 6 percent slopes, eroded. Flint fine sandy loam, 6 to 12 percent slopes.	½ foot of moderately well drained sandy loam over 2 to 3 feet of clay; derived from beds of unconsolidated sandy clays and silts, deposited by streams; flakes of mica in places.	1	0 to 6 6 to 42
GaA GaB GaC GbA GbB GbC	Gilead sand, 0 to 2 percent slopes. Gilead sand, 2 to 6 percent slopes. Gilead sand, 6 to 10 percent slopes. Gilead sand, thick surface, 0 to 2 percent slopes. Gilead sand, thick surface, 2 to 6 percent slopes. Gilead sand, thick surface, 6 to 10 percent slopes.	1 to 2½ feet of well-drained sand underlain by ½ to 1½ feet of compact to slightly cemented sandy clay loam; derived from beds of unconsolidated sandy clays.	3	0 to 18 18 to 27 0 to 30 30 to 38
GoA	Goldsboro loamy sand, 0 to 2 percent slopes.	1 to 1½ feet of moderately well drained loamy sand over 2 to 3 feet of sandy clay loam; derived from beds of unconsolidated sandy clays.	1	0 to 10 10 to 36
Gr	Grady loam.	½ to 1 foot of poorly drained loam or sandy loam over 1½ to 2 feet of sandy clay loam to sandy clay; derived from beds of unconsolidated sands and clays.	0	0 to 12 12 to 36
Iz	Izagora fine sandy loam.	1 to 1½ feet of moderately well drained to somewhat poorly drained sandy loam over 1 to 2 feet of sandy clay loam; derived from beds of unconsolidated sands and clays deposited by streams.	1	0 to 12 12 to 36
KaA KaB	Kalmia loamy fine sand, 0 to 2 percent slopes. Kalmia loamy fine sand, 2 to 6 percent slopes.	1 to 1½ feet of well-drained loamy fine sand over 1 to 3 feet of sandy clay loam; derived from beds of unconsolidated sands and clays deposited by streams.	3+	0 to 12 12 to 36

properties significant to engineering—Continued

Classification			Grain sizes		Permeability	Available moisture capacity	Reaction	Shrink-swell potential
USDA texture	Unified	AASHO	Passing No. 10 sieve (2.0 mm.)	Passing No. 200 sieve (0.074 mm.)				
			Percent	*Percent*	*Inches per hour*	*Inches per inch*	*pH*	
Fine sandy loam and silt loam.	ML	A-4	100	90 to 100	2.50 to 5.00	0.13	6.1 to 6.5	Low.
Silty clay	CL	A-7 or A-6	100	95 to 100	2.50 to 5.00	.13	5.6 to 6.0	High.
Fine sandy loam or sandy loam.	SM or ML	A-4	100	45 to 55	0.05 to 0.20	.13	5.1 to 5.5	Low.
Sandy clay loam to sandy clay.	CL	A-6	100	55 to 65	0.05 to 0.20	.12	5.1 to 5.5	Low to moderate.
Fine sandy loam	ML	A-4	100	55 to 70	0.20 to 0.80	.09	5.1 to 5.5	Low.
Sandy clay to clay	MH-CH	A-7	100	80 to 100	0.05 to 0.20	.10	5.1 to 5.5	Moderate to high.
Sandy loam	SM	A-4	100	35 to 45	0.20 to 0.80	.10	5.6 to 6.1	Low.
Sandy clay loam to sandy clay.	CL	A-4 or A-6	100	55 to 65	0.05 to 0.20	.10	5.1 to 5.5	Low to moderate.
Sand or loamy sand	SP	A-3	100	5 to 10	>10.0	.06	5.1 to 5.5	Low.
Sand to loamy sand	SP	A-3	100	5 to 10	>10.0	.06	5.6 to 6.0	Low.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	6.1 to 6.5	Low.
Sandy clay	CL	A-6	100	55 to 65	0.05 to 0.20	.10	5.6 to 6.0	Moderate.
Fine sandy loam	ML	A-4	100	55 to 65	0.05 to 0.20	.09	6.1 to 6.5	Low.
Clay	MH	A-7	100	80 to 90	0.05 to 0.20	.10	5.1 to 5.5	High.
Sand	SM	A-2	100	10 to 30	>10.0	.06	5.6 to 6.0	Low.
Sandy clay or sandy clay loam.	CL	A-6 or A-7	100	55 to 65	0.05 to 0.20	.10	5.6 to 6.0	Moderate.
Sand	SM	A-2	100	10 to 30	>10.0	.06	5.6 to 6.0	Low.
Sandy loam	SM	A-4	100	35 to 45	0.05 to 0.20	.07	5.6 to 6.0	Low.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	5.6 to 6.0	Low.
Sandy clay loam	CL	A-4 or A-6	100	55 to 65	0.05 to 0.20	.10	5.1 to 5.5	Low to moderate.
Sandy loam or loam	SM	A-4	100	35 to 45	0.80 to 2.50	.17	5.1 to 5.5	Low.
Sandy clay or sandy clay loam.	CL	A-6 or A-7	100	55 to 65	0.05 to 0.20	.12	5.6 to 6.0	Moderate.
Fine sandy loam	SM	A-4	100	35 to 45	0.20 to 0.80	.07	5.6 to 6.0	Low.
Sandy clay loam	CL	A-4 or A-6	100	55 to 65	0.05 to 0.20	.12	5.1 to 5.5	Low to moderate.
Loamy fine sand	SM	A-2	100	10 to 30	>10.0	.06	6.1 to 6.5	Low.
Sandy clay loam	CL	A-4 or A-6	100	55 to 65	0.05 to 0.20	.10	5.6 to 6.0	Low to moderate.

TABLE 5.—*Brief description of soils and their estimated*

Map symbol	Soil	Brief description of soil	Depth to seasonally high water table	Depth from surface
			Feet	*Inches*
KbA	Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes.	1½ to 2½ feet of well-drained loamy fine sand over sandy clay loam; derived from beds of unconsolidated sands and clays deposited by streams.	3+	0 to 30 30 to 38
Kd	Klej loamy sand.	3 feet of moderately well drained to somewhat poorly drained loamy sand; formed from beds of unconsolidated sand.	1	0 to 26 26 to 38
LaB LaC LaD LgC LgD LkA LkB LkC LnB	Lakeland sand, 0 to 6 percent slopes. Lakeland sand, 6 to 10 percent slopes. Lakeland sand, 10 to 15 percent slopes. Lakeland sand, gravelly variant, 0 to 10 percent slopes. Lakeland sand, gravelly variant, 10 to 15 percent slopes. Lakeland sand, moderately shallow, 0 to 2 percent slopes. Lakeland sand, moderately shallow, 2 to 6 percent slopes. Lakeland sand, moderately shallow, 6 to 10 percent slopes. Lakeland sand, terrace, 0 to 6 percent slopes.	3 to 15 feet of excessively drained sand; developed from beds of unconsolidated sands.	5+	0 to 8 8 to 54
Lo	Lakewood sand.	3 to 8 feet of excessively drained white sand; derived from unconsolidated sands.	5+	0 to 16 16 to 36
Lp	Leaf fine sandy loam.	½ to 1 foot of poorly drained fine sandy loam over 2 to 2½ feet of sandy clay; derived from unconsolidated sandy clays and clays deposited by streams.	0	0 to 6 6 to 30
Lr	Lenoir loam.	½ to 1 foot of somewhat poorly drained loam over 1 to 2 feet of firm, slowly permeable clay; derived from beds of unconsolidated sandy clays and clays.	0	0 to 12 12 to 36
Ly	Lynchburg loamy sand.	1 to 1½ feet of somewhat poorly drained loamy sand over 2 to 2½ feet of sandy clay loam; derived from beds of unconsolidated sands and clays.	1	0 to 12 12 to 34
MaA MaB2	Magnolia loamy sand, 0 to 2 percent slopes. Magnolia loamy sand, 2 to 6 percent slopes, eroded.	½ to 1 foot of well-drained loamy sand over 2 to 3 feet of sandy clay; derived from beds of unconsolidated sandy clays and clays.	3	0 to 12 12 to 36
MbA MbB MbB2 MbC2	Marlboro loamy sand, 0 to 2 percent slopes. Marlboro loamy sand, 2 to 6 percent slopes. Marlboro loamy sand, 2 to 6 percent slopes, eroded. Marlboro loamy sand, 6 to 12 percent slopes, eroded.	½ to 1 foot of well-drained loamy sand over 2 to 3 feet of sandy clay; derived from beds of unconsolidated sandy clays and clays.	3	0 to 12 12 to 36
Mc	McColl loam.	½ to 1 foot of poorly drained loam or sandy loam over 1½ to 2 feet of sandy clay loam to sandy clay; derived from beds of unconsolidated sands and clays.	0	0 to 12 12 to 36
Mob	Molena loamy sand, 0 to 10 percent slopes.	3 to 15 feet of well-drained to excessively drained loamy sand; developed from beds of unconsolidated sandy alluvium.	5+	0 to 8 8 to 54
Mt	Myatt sandy loam.	1 to 1½ feet of poorly drained sandy loam over 2 feet of sandy clay loam or clay loam; derived from unconsolidated sands and clays deposited by streams.	0	0 to 8 8 to 32

properties significant to engineering—Continued

Classification			Grain sizes		Permeability	Available moisture capacity	Reaction	Shrink-swell potential
USDA texture	Unified	AASHO	Passing No. 10 sieve (2.0 mm.)	Passing No. 200 sieve (0.074 mm.)				
			Percent	*Percent*	*Inches per hour*	*Inches per inch*	*pH*	
Loamy fine sand	SM	A-2	100	10 to 30	>10.0	0 06	6.1 to 6.5	Low.
Sandy clay loam	SM	A-4	100	35 to 45	2.50 to 5.00	. 07	5.6 to 6.0	Low.
Loamy sand	SM	A-2	100	10 to 30	0.80 to 2.50	. 08	5.6 to 6.0	Low.
Loamy sand to sandy loam.	SM	A-2 to A-4	100	10 to 45	0.80 to 2.50	. 08	5.1 to 5.5	Low.
Sand	SP-SM	A-3	100	5 to 10	>10.0	. 06	5.1 to 5.5	Low.
Sand or loamy sand	SP-SM or SM.	A-2 or A-3	100	5 to 30	>10.0	. 06	5.6 to 6.0	Low.
Sand	SP-SM	A-3	100	5 to 10	>10.0	. 05	5.5 to 6.0	Low.
Sand	SP-SM	A-3	100	5 to 10	>10.0	. 05	5.0 to 5.5	Low.
Fine sandy loam	SM	A-4	100	35 to 45	0.05 to 0.20	. 13	5.6 to 6.0	Low.
Sandy clay	CL	A-6 or A-7	100	55 to 65	>0.05	. 12	5.1 to 5.5	Moderate.
Loam	SM or ML	A-4	100	35 to 75	0. 80 to 2. 50	. 11	5. 1 to 5. 5	Low to moderate.
Clay	CH	A-7	100	90 to 100	0. 05 to 0. 20	. 11	5. 1 to 5. 5	High.
Loamy sand	SM	A-4	100	35 to 45	0. 80 to 2. 50	. 10	5. 6 to 6. 0	Low.
Sandy clay loam	CL	A-4 or A-6	100	55 to 65	0. 20 to 0. 80	. 10	5. 1 to 5. 5	Low to moderate.
Loamy sand	SM	A-2	100	10 to 30	0. 80 to 2. 50	. 07	6. 1 to 6. 5	Low.
Sandy clay	CL or CH	A-6 or A-7	100	55 to 65	0. 05 to 0. 20	. 10	5. 6 to 6. 0	Moderate to high.
Loamy sand	SM	A-2	100	10 to 30	0. 20 to 0. 80	. 07	6. 1 to 6. 5	Low.
Sandy clay	CL or CH	A-6 or A-7	100	55 to 65	0. 05 to 0. 20	. 10	5. 6 to 6. 0	Moderate to high.
Sandy loam or loam	SM	A-4	100	35 to 45	0. 80 to 2. 50	. 17	5. 1 to 5. 5	Low.
Sandy clay or sandy clay loam.	CL	A-6	100	55 to 65	0. 05 to 0. 20	. 12	5. 6 to 6. 0	Moderate.
Loamy sand	SP-SM	A-3	100	5 to 10	Over 10. 0	. 06	5. 1 to 5. 5	Low.
Sand or loamy sand	SP to SM	A-2 or A-3	100	5 to 30	Over 10. 0	. 06	5. 6 to 6. 0	Low.
Sandy loam	SM	A-4	100	35 to 45	0. 80 to 2. 50	. 08	5. 1 to 5. 5	Low.
Sandy clay loam to clay loam.	SC or CL	A-4 or A-6	100	35 to 65	0. 05 to 0. 80	. 11	5. 1 to 5. 5	Low to moderate.

TABLE 5.—*Brief description of soils and their estimated*

Map symbol	Soil	Brief description of soil	Depth to seasonally high water table	Depth from surface
			Feet	*Inches*
NoA	Norfolk loamy sand, 0 to 2 percent slopes.	1 to 2½ feet of well-drained loamy sand over 1 to 3 feet of sandy clay loam; derived from beds of unconsolidated sands and clays.	3	0 to 18
NoB	Norfolk loamy sand, 2 to 6 percent slopes.			18 to 44
NoB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded.			
NoC	Norfolk loamy sand, 6 to 10 percent slopes.			
NtA	Norfolk loamy sand, thick surface, 0 to 2 percent slopes.	1 to 2 feet of well-drained loamy sand over 1 to 3 feet of sandy clay loam; derived from beds of unconsolidated sands and clays.	3	0 to 30
NtB	Norfolk loamy sand, thick surface, 2 to 6 percent slopes.			30 to 44
NtC	Norfolk loamy sand, thick surface, 6 to 10 percent slopes.			
Po	Okenee loam (in Portsmouth and Okenee loams).	1 to 1½ feet of very poorly drained organic loam over 1 to 2 feet of sandy loam or clay loam; developed from beds of unconsolidated sands and clays deposited by streams.	0	0 to 19
				19 to 36
Pm	Plummer loamy sand.	1 foot of very poorly drained loamy sand underlain by sand or loamy sand.	0	0 to 12
				12 to 42
Po	Portsmouth loam (in Portsmouth and Okenee loams).	1 to 1½ feet of very poorly drained organic loam over 1 to 2 feet of sandy clay.	0	0 to 9
				9 to 48
				48+
Ra	Rains sandy loam.	1 foot of poorly drained sandy loam over 2 to 2½ feet of sandy clay loam; derived from beds of unconsolidated sands and clays.	0	0 to 9
				9 to 27
RsA	Ruston loamy sand, 0 to 2 percent slopes.	10 inches to 1 foot of well-drained loamy sand over 2 to 2½ feet of sandy loam to sandy clay loam; derived from beds of unconsolidated sands and clays.		0 to 12
RsB	Ruston loamy sand, 2 to 6 percent slopes.			12 to 36
RsB2	Ruston loamy sand, 2 to 6 percent slopes, eroded.			
RsC2	Ruston loamy sand, 6 to 10 percent slopes, eroded.			
RtA	Ruston loamy sand, thick surface, 0 to 2 percent slopes.	1 to 2½ feet of well-drained loamy sand over 2 to 2½ feet of sandy loam to sandy clay loam; derived from beds of unconsolidated sands and clays.	3	0 to 30
RtB	Ruston loamy sand, thick surface, 2 to 6 percent slopes.			30 to 38
RtC	Ruston loamy sand, thick surface, 6 to 10 percent slopes.			
Ru	Rutlege loam.	1 to 1½ feet of very poorly drained loam or loamy sand, high in organic-matter content, over 1 to 2 feet of sand or loamy sand; derived from beds of sands.	0	0 to 12
Rv	Rutlege loamy sand.			12 to 26
VaB	Vaucluse sand, 2 to 6 percent slopes.	½ to 2½ feet of well-drained sand underlain by ½ to 1½ feet of compact to slightly cemented sandy clay loam to sandy clay; derived from beds of unconsolidated sands and clays.	5+	0 to 12
VaC	Vaucluse sand, 6 to 10 percent slopes.			12 to 25
VaC2	Vaucluse sand, 6 to 10 percent slopes, eroded.			
VaD	Vaucluse sand, 10 to 15 percent slopes.			
VaD2	Vaucluse sand, 10 to 15 percent slopes, eroded.			
VaE2	Vaucluse sand, 15 to 25 percent slopes, eroded.			
VgD2	Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded.			
VkB	Vaucluse sand, thick surface, 2 to 6 percent slopes.			0 to 30
				30 to 36
VkC	Vaucluse sand, thick surface, 6 to 10 percent slopes.			
VkD	Vaucluse sand, thick surface, 10 to 15 percent slopes.			

properties significant to engineering—Continued

Classification			Grain sizes		Permeability	Available moisture capacity	Reaction	Shrink-swell potential
USDA texture	Unified	AASHO	Passing No. 10 sieve (2.0 mm.)	Passing No. 200 sieve (0.074 mm.)				
			Percent	*Percent*	*Inches per hour*	*Inches per inch*	*pH*	
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	5.6 to 6.0	Low.
Sandy clay loam	CL	A-6	100	55 to 65	0.05 to 0.20	.11	5.6 to 6.0	Moderate.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	5.6 to 6.0	Low.
Sandy loam to sandy clay loam.	SM or CL	A-4 or A-6	100	35 to 65	0.05 to 0.80	.11	5.6 to 6.0	Low to moderate.
Loam	SM, ML, or OL.	A-4	100	35 to 75	0.80 to 2.50	.13	5.1 to 5.5	Moderate.
Sandy loam to sandy clay loam.	CL	A-6	100	55 to 65	0.05 to 0.20	.14	5.1 to 5.5	Moderate.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.06	5.1 to 5.5	Low.
Loamy sand or sand	SP to SM	A-2 or A-3	100	5 to 30	>10.0	.05	5.1 to 5.5	Low.
Loam	OL	A-3	100	35 to 75	0.80 to 2.50	.13	5.1 to 5.5	Moderate.
Sandy loam or sandy clay loam.	CL	A-4	100	55 to 65	0.80 to 2.50	.14	5.1 to 5.5	Low.
Sand	SP	A-3	100	5 to 30	>10.0	.10	5.1 to 5.5	Low.
Sandy loam	SM	A-4	100	35 to 45	0.80 to 2.50	.07	5.6 to 6.0	Low.
Sandy loam to sandy clay loam.	SM or CL	A-4 or A-6	100	35 to 65	0.20 to 0.80	.06	5.1 to 5.5	Low to moderate.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	5.6 to 6.0	Low.
Sandy clay loam	CL	A-4 or A-6	100	55 to 65	0.05 to 0.20	.11	5.6 to 6.0	Low to moderate.
Loamy sand	SM	A-2	100	10 to 30	>10.0	.07	5.6 to 6.0	Low.
Sandy loam	SM	A-4	100	35 to 45	0.80 to 2.50	.10	5.6 to 6.0	Low.
Loam or loamy sand	SM	A-2	100	10 to 30	>10.0	.11	5.1 to 5.5	Low.
Sand or loamy sand	SM	A-2	100	10 to 30	>10.0	.10	5.1 to 5.5	Low.
Sand	SM	A-2	100	10 to 30	>10.0	.06	5.6 to 6.0	Low.
Sandy clay loam	CL	A-6	100	55 to 65	0.05 to 0 20	.09	5.1 to 5.5	Moderate.
Sand	SM	A-2	100	10 to 30	>10.0	.06	5.6 to 6.0	Low.
Sandy loam to sandy clay loam.	SM to CL	A-4 or A-6	100	35 to 65	0.05 to 0.20	.09	5.1 to 5.5	Low to moderate.

TABLE 5.—*Brief description of soils and their estimated*

Map symbol	Soil	Brief description of soil	Depth to seasonally high water table	Depth from surface
Wa	Wahee very fine sandy loam.	½ to 1 foot of moderately well drained very fine sandy loam over 2 feet of sandy clay; deposited by streams.	1	0 to 8 8 to 28
Wd	Wehadkee silt loam.	½ foot of very poorly drained silt loam over ½ to 1½ feet of silty clay; derived from beds of silty clay deposited by streams.	0	0 to 5 5 to 15
WkB	Wickham sandy loam, 2 to 6 percent slopes.	1 to 1½ feet of well-drained sandy loam over 2 to 3 feet of sandy clay; derived from alluvium washed from soils of the Piedmont Plateau.	3	0 to 12
WkB2	Wickham sandy loam, 2 to 6 percent slopes, eroded.			12 to 36

TABLE 6.—*Interpretations of*

[Dashes indicate information not

Soil series and map symbol	Adaptability for winter grading	Suitability for—		Suitability as source of—		Degree of limitation for use as sewage disposal field	Soil features affecting—	
		Road subgrade	Road fill	Topsoil	Sand		Farm ponds	Seepage in reservoir area
Bayboro (Ba)	Poor	Unsuitable; organic material.	Unsuitable; organic material.	Poor	Unsuitable	Severe	Slow	
Cahaba (CaA, CaB)	Fair	Fair	Fair	Fair in surface layer.	Unsuitable	Moderate	Slow	
Caroline (CfA, CfB, CfB2)	Poor	Fair	Fair	Fair in surface layer.	Unsuitable	Severe	Slow	
Chewacla (Ch)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Moderate	
Congaree (Co)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Rapid	
Coxville (Cs, Ct, Cu)	Poor	Poor	Fair	Poor	Unsuitable	Severe	Slow	
Craven (CvA)	Poor	Fair to a depth of 1 foot; poor below 1 foot.	Fair	Poor	Unsuitable	Severe	Slow	
Dunbar (Db, Dd)	Fair	Fair	Fair	Fair	Unsuitable	Severe	Slow	
Eustis (EbB, EdB, EmA, EmB, EmC)	Good	Poor; good if confined.	Fair on gentle slopes.	Unsuitable	Good	Slight	Excessive	

See footnote at end of table.

properties significant to engineering—Continued

Classification			Grain sizes					
USDA texture	Unified	AASHO	Passing No. 10 sieve (2.0 mm.)	Passing No. 200 sieve (0.074 mm.)	Permeability	Available moisture capacity	Reaction	Shrink-swell potential
Very fine sandy loam	SM	A-4	100	35 to 45	0.20 to 0.80	0.15	4.5 to 5.0	Low.
Sandy clay	CL or CH	A-6 or A-7	100	55 to 65	0.05 to 0.20	.14	5.1 to 5.5	Moderate to high.
Silt loam	ML	A-4	100	90 to 100	0.20 to 0.80	.13	5.1 to 5.5	Low.
Silty clay	CL or CH	A-7 or A-6	100	90 to 100	0.05 to 0.20	.13	5.1 to 5.5	Moderate to high.
Sandy loam	SM	A-2	100	10 to 30	0.80 to 2.50	.07	6.1 to 6.5	Low.
Sandy clay	CL	A-6	100	55 to 65	0.05 to 0.20	.10	5.6 to 6.0	Moderate.

engineering properties of the soils

available or not applicable]

Soil features affecting—Continued								Remarks
Farm ponds—Continued		Agricultural drainage		Irrigation		Terraces and diversions	Waterways	
Embankment								
Strength and stability	Permeability	Water table	Permeability	Infiltration	Water-holding capacity			
Moderate	Slow	Seasonally high.	Slow	Slow to moderate.	Moderate			
Moderate	Moderate	Low	Moderate; slow in few spots.	Moderate	Moderate	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	A few areas have slopes of 2 percent or more.
Low	Slow	Low	Slow	Slow	Moderate	High erodibility.	High erodibility.	
Low	Moderate	Seasonally high much of the time.	Moderate	Slow	High	Not needed	No adverse features.	Subject to overflow.
Low	Moderately rapid.	Moderately low.	Moderately rapid.	Slow to moderate.	Moderate	Not needed	No adverse features.	Subject to overflow.
Moderate	Slow	Seasonally high.	Slow	Slow	Moderate			
Low	Slow	Moderately low.	Slow	Slow to moderate.	Moderate	High erodibility.	High erodibility.	
Moderate	Slow to moderate.	Seasonally high.	Slow to moderate.	Moderate	Moderate			
Low	Rapid	Low	Rapid	Rapid	Low			

TABLE 6.—*Interpretations of engineering*

[Dashes indicate information not

Soil series and map symbol	Adaptability for winter grading	Suitability for—		Suitability as source of—		Degree of limitation for use as sewage disposal field	Soil features affecting—
		Road subgrade	Road fill	Topsoil	Sand		Farm ponds: Seepage in reservoir area
Faceville (FaA, FaB, FaB2)	Good	Fair to good.	Fair to good.	Good	Unsuitable	Moderate	Slow in subsoil.
Flint (FfA, FfB, FfB2, FfC)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Slow
Gilead (GaA, GaB, GaC, GbA, GbB, GbC).	Good	Fair to good.	Fair to good on gentle slopes.	Fair	Poor for sand.	Moderate to severe.	Slow in subsoil.
Goldsboro (GoA)	Poor	Fair to good.	Fair to good.	Fair	Unsuitable	Moderate	Slow
Grady (Gr)	Poor	Poor	Poor	Fair to poor.	Unsuitable	Severe	Slow
Izagora (Iz)	Fair	Fair	Fair	Poor	Unsuitable	Severe	Slow
Kalmia (KaA, KaB, KbA)	Good	Fair to good.	Fair to good.	Good	Poor	Moderate	Moderate to slow.
Klej (Kd)	Good	Good	Good	Poor	Good	Slight	Excessive
Lakeland (LaB, LaC, LaD, LgC, LgD, LkA, LkB, LkC, LnB).	Good	Poor; good if confined.	Fair on gentle slopes.	Poor	Good	Slight	Excessive
Lakewood (Lo)	Good	Poor; good if confined.	Fair; erodible.	Poor	Good	Slight	Excessive
Leaf (Lp)	Poor	Poor	Fair	Poor	Unsuitable	Severe	Slow
Lenoir (Lr)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Slow
Lynchburg (Ly)	Poor	Fair	Fair	Fair	Unsuitable	Severe [1]	Slow to moderate.
Magnolia (MaA, MaB2)	Good	Fair	Fair	Fair to good.	Unsuitable	Moderate	Slow in subsoil.
Marlboro (MbA, MbB, MbB2, MbC2).	Good	Fair	Fair	Good	Unsuitable	Moderate	Slow
McColl (Mc)	Poor	Poor	Poor	Fair to poor.	Unsuitable	Severe	Slow
Molena (MoB)	Good	Fair to good.	Fair on gentle slopes.	Poor	Good	Slight	Excessive
Myatt (Mt)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Slow to moderate.
Norfolk (NoA, NoB, NoB2, NoC, NtA, NtB, NtC).	Good	Fair to good.	Fair to good.	Good	Poor	Moderate	Slow to moderate.

See footnote at end of table.

properties of the soils—Continued

available or not applicable]

Soil features affecting—Continued								Remarks
Farm ponds—Continued		Agricultural drainage		Irrigation		Terraces and diversions	Waterways	
Embankment								
Strength and stability	Permeability	Water table	Permeability	Infiltration	Water-holding capacity			
Moderate to high.	Slow	Low	Slow	Moderate	High	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	
Moderate	Slow	Moderately low.	Slow	Slow	Moderate	High erodibility.	High erodibility.	
Moderate to high.	Slow	Seasonally high along natural drains; hillside seepage.	Slow	Moderate	Low	High erodibility.	High erodibility.	
Moderate to high.	Slow in subsoil.	Moderately low.	Moderate	Moderate to high.	Moderate	----------	----------	
Moderate	Slow	Seasonally high.	Slow	Slow	Moderate	----------	----------	
Moderate	Moderate to slow.	Moderately low.	Moderate to slow.	Slow to moderate.	Moderate	----------	----------	
Moderate to high.	Moderate	Low	Moderate	Moderate	Moderate	----------	----------	
Low to moderate.	Rapid	Moderate	Rapid	Rapid	Low	Not needed	----------	
Low to moderate.	Rapid	Moderate	Rapid	Rapid	Low	----------	----------	Subject to wind erosion.
Low	Rapid	Low; poor agricultural soil.	Rapid	Rapid; poor agricultural soil.	Low	----------	----------	
Moderate	Slow	Seasonally high.	Slow	Slow	Moderate	----------	----------	
Low	Slow	Moderate	Slow	Slow	Moderate	----------	----------	
Moderate	Moderate	Seasonally high.	Moderate	Moderate	Moderate	----------	----------	
Moderate to high.	Slow	Low	Slow	Moderate	Moderate	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	
Moderate to high.	Slow	Low	Slow	Moderate	Moderate	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	
Moderate	Slow	Seasonally high.	Slow	Slow	Moderate	----------	----------	
Low to moderate.	Rapid	Moderate	Rapid	Rapid	Low	----------	----------	Subject to wind erosion.
Low to moderate.	Moderate in subsoil.	High	Moderate	Moderate	Low	----------	----------	
Moderate to high.	Slow to moderate.	Low	Slow to moderate.	Moderate	Moderate	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	Thick surface; subject to wind erosion.

TABLE 6.—*Interpretations of engineering*

[Dashes indicate information not

Soil series and map symbol	Adaptability for winter grading	Suitability for—		Suitability as source of—		Degree of limitation for use as sewage disposal field	Soil features affecting—
		Road subgrade	Road fill	Topsoil	Sand		Farm ponds: Seepage in reservoir area
Okenee (Po)	Poor	Unsuitable; organic matter.	Unsuitable to a depth of 1½ feet; poor below 1½ feet.	Fair	Unsuitable	Severe [1]	Slow in subsoil.
Plummer (Pm)	Poor	Fair	Good	Poor	Good	Severe [1]	Moderate
Portsmouth (Po)	Poor	Unsuitable; organic material.	Poor	Fair	Unsuitable	Severe [1]	Slow in subsoil.
Rains (Ra)	Poor	Fair	Fair	Fair	Unsuitable	Severe [1]	Slow to moderate.
Ruston (RsA, RsB, RsB2, RsC2, RtA, RtB, RtC).	Good	Fair to good.	Fair to good.	Fair to good.	Poor	Slight	Slow to moderate.
Rutlege (Ru, Rv)	Poor	Unsuitable; organic material.	Unsuitable to a depth of 1 foot; fair below 1 foot.	Poor	Fair	Severe [1]	High in subsoil.
Vaucluse (VaB, VaC, VaC2, VaD VaD2, VaE2, VgD2, VkB, VkC VkD).	Good	Fair to good.	Fair to good.	Fair	Poor	Moderate	Slow to high.
Wahee (Wa)	Poor	Poor	Poor	Poor	Unsuitable	Severe	Slow
Wehadkee (Wd)	Poor	Poor	Poor	Fair	Unsuitable	Severe	Slow
Wickham (WkB, WkB2)	Fair	Fair to good.	Fair to good.	Good	Unsuitable	Slight	Slow in subsoil.

[1] If these soils are adequately drained (so that water table is permanently below 4 feet) the degree of limitation may be only slight to moderate.

suitability of soil material for road subgrade and road fill depends largely on the texture and the natural water content. Highly plastic soil material is rated poor for road subgrade and poor or fair for road fill. These ratings depend on the natural water content and the difficulty of handling, drying, and compacting the soil material. The erodibility of the soils and the effect of erodibility on cuts and fills are also indicated. Each soil is rated as a source of topsoil and sand. The limitations of the soils for use as sewage-disposal fields are rated. The features affecting suitability for farm ponds, agricultural drainage, irrigation, terraces and diversions, and waterways are also listed in table 6. The land types—Local alluvial land, Mixed alluvial land, Mine pits and dumps, and Swamp—are omitted from table 6.

Conservation engineering

This subsection discusses some of the practices required to meet the problems encountered in installing drainage and irrigation systems and constructing highways in Marlboro County.

Tables 4 and 5 give descriptions of the physical properties of the soils that affect engineering work. The information shown in these tables can be useful to farmers who are considering conservation structures or drainage systems, as well as to engineers who are concerned with construction of highways.

DRAINAGE.—A good drainage system is essential for the effective use of some of the farmland on the Coastal Plain in Marlboro County. Both open drainage ditches and tile underdrains are used.

properties of the soils—Continued

available or not applicable]

Soil features affecting—Continued								Remarks
Farm ponds—Continued		Agricultural drainage		Irrigation		Terraces and diversions	Waterways	
Embankment								
Strength and stability	Permeability	Water table	Permeability	Infiltration	Water-holding capacity			
Unsuitable; organic material.	Slow [1]	High	Slow to moderate.	Moderate	Moderate to high.			
Low	Moderate	High; poor agricultural soil.	Moderate	Moderate; poor agricultural soil.	Moderate to high.			
Unsuitable; organic material.	Slow [1]	High	Slow to moderate.	Moderate	Moderate		Not needed.	
Moderate	Moderate	Seasonally high.	Moderate	Moderate	Low			
Moderate to high.	Moderate	Low	Slow to moderate.	Moderate	Moderate	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	
Low	Rapid	High	Rapid; sand below 12 inches.	Moderate	Moderate			
Moderate to high.	Slow to rapid.	Low	Rapid	Moderate	Low	High erodibility.	High erodibility.	
Low	Slow	Moderate	Slow	Slow	Moderate			
Low	Slow	Seasonally high.	Slow	Slow	High			Subject to overflow.
Moderate to high.	Slow	Low	Slow	Moderate	High	Erodibility on slopes of 2 percent or more.	Erodibility on slopes of 2 percent or more.	

Most of the open drainage ditches are at least 4 feet deep and have side slopes of ½ to 1 or 1 to 1. Generally such ditches are excavated by means of draglines or bucket-shaped backhoes and are trapezoidal in shape (fig. 18).

Tile drains eliminate the need for open ditches and the maintenance that ditches require. They make it easier to lay out fields so as to allow efficient use of mechanical equipment. Most soils that have a permeability rate of at least 0.05 inch of water per hour can be drained with tile.

V-type and W-type ditches can be used to improve surface drainage of some of the nearly level soils, such as the Congaree soils. They can also be used to supplement trapezoidal ditches and tile drains on nearly level soils that have a slow infiltration rate. Such ditches collect water from crop rows, row ditches, or smooth surfaces. Generally they are shallow and have nearly flat side slopes. They are easy to maintain and can be crossed with farm machinery.

A ditch of the V-shape should have side slopes of 4 to 1 or less. The spoil should be leveled or spread, or else there should be openings through the spoil bank to let surface water into the ditch.

A W-type ditch consists of two parallel channels, each having a V-shaped cross section. The excavated material is placed between the ditches. Water drains into both channels, and the raised center can be cultivated or used as a road or a turnrow.

A half-W ditch is a modified W type ditch. It has a V-shaped channel, but the soil is all placed on one side

Figure 18.—A backhoe drainage ditch that has side slopes of ½ to 1.

to allow surface drainage from the other side. A ditch of this type can be used on the side of a field, along a road, or on the border of a wooded area.

Adequate outlets are essential for the effective operation of any drainage system. Rivers and the many small streams and draws in the county are natural outlets, but many of the small bays, or depressions, that are scattered throughout most of the county have no natural outlets. In these areas, draglines or backhoe ditches can be excavated to provide outlets for open ditches or tile drains.

Water Disposal.—If cultivated, most of the soils in soil associations 4 and 9 (see General Soil Map) need a complete water-disposal system, including terraces and waterways and appropriate agronomic practices. Channel-type gradient terraces, which consist of a channel and a ridge built across the slope, are best suited to conditions in this county. Natural depressions can serve as vegetated outlets, and terraces should be constructed so that water will drain from the ridges to the depressions. Grading or smoothing where the soil is deep enough improves terrace alinement and facilitates row drainage. Terraces that are parallel or as nearly parallel as possible are suitable for the type of farming practiced in this county. The use of four-row farm machinery is increasing. This kind of machinery can be used only if the terraces have good alinement, flat curves, a broad base, and flat slopes. It may be necessary to construct trapezoidal waterways with flat side slopes in small depressions that can be crossed with farm machinery. These waterways should be kept in vegetation and will need some maintenance until vegetation is established.

Farm Ponds.—Some soils in soil associations 4 and 9 are suitable sites for dams to impound water to be used for livestock, for irrigation, and for fishing and other recreational activities. In the other soil associations, dug wells or pits provide a limited amount of water for irrigation and for livestock. Assistance in selecting the type of pond and the best site can be obtained from the local representative of the Soil Conservation Service.

Irrigation.—Conservation irrigation is the application of irrigation water in the amounts needed to maintain crop yields at a high level without waste of water and without damage to the soil. The average annual rainfall in Marlboro County is about 46 inches. Rainfall is fairly well distributed through the year, but dry periods of 4 to 6 weeks are not unusual, so supplemental irrigation is likely to be needed during the growing season. Tobacco, corn, and cotton are the crops most commonly irrigated.

Many of the soils in this county are suited to sprinkler irrigation. This method consists of spraying water into the air, so as to simulate natural rainfall, in a uniform pattern and at such a rate that the water is absorbed by the soil and very little or none runs off. The amount of water applied depends on the water-holding capacity of the soil and the needs of the crop.

Highway Construction.—The data in table 5 can be used to determine the suitability of the soils of Marlboro County for highway construction. Bedrock is at a great depth; it presents no problem in road building, and it cannot be used as a footing for highway foundations.

Table 5 shows the suitability of the soils as a source of topping material. Sandy loam and loamy sand are the best topping material to use for road shoulders. They will support a limited amount of traffic.

Many of the soils either have a high water table or have ponded water on the surface for long periods. On such soils roads should be built on fill sections and should have adequate surface drains and underdrains. In areas that are flooded, roads should be constructed on a continuous embankment that is several feet above the flood level. Because of poor drainage, swampy soils provide poor foundations for roads, and swampy soil material should be removed and replaced with more stable material. Medium-textured soils provide stable foundations for farm roads. Good surface drainage is needed for roadbeds and road shoulders. Highway shoulders should be protected by vegetation to help control erosion and washouts, to prevent ditches from filling, and to keep maintenance costs down.

Woodland [4]

Cypress, blackgum, and tupelo-gum were abundant in the very poorly drained swampland of Marlboro County when the area was first settled. Sweetgum, white oak, water oak, ash, yellow-poplar, and some loblolly pine grew on the better drained alluvial bottom lands and in the poorly drained flatwoods on the Coastal Plain. Longleaf pine

[4] George E. Smith, Jr., woodland conservationist, Soil Conservation Service, assisted in the preparation of this subsection.

was the most common species on the dry ridges, especially in the Sand Hills.

The virgin forests of longleaf pine in the Coastal Plain areas and in the Sand Hills provided material for the naval stores industry and later for logging and sawmilling operations. By the late 1800's most of the original timber had been cut. Much of the acreage reseeded naturally to loblolly pine. In the last few years, the forests have been protected from fire and the pine has been heavily cut from the mixed pine-hardwood stands. Many of these areas are now reseeding naturally to hardwoods.

At present 150,600 acres—approximately 49 percent of the total land area of the county—is in woodland. The major types of forest cover are longleaf pine, loblolly pine, shortleaf pine, hardwood-pine, oak-hickory, and swamp-bottom land hardwoods. Detailed descriptions of the forest cover types are given in "Forest Cover Types of the Eastern United States" (*9*).

Woodland suitability groups

Management of woodland can be planned more effectively if soils are grouped according to those characteristics that affect the growth of trees and management of the stands. For this reason, the soils and land types of Marlboro County have been placed in 18 woodland groups. Each group consists of soils that have about the same suitability for wood crops, require about the same management, and have about the same potential productivity.

Important among the factors to be considered in planning woodland management are site index, plant competition, seedling mortality, equipment limitation, windthrow hazard, and erosion hazard. Table 7 gives the site index for loblolly pine, longleaf pine, shortleaf pine, slash pine, and pond pine for the soils of each suitability group. It shows the relative severity of the hazards and limitations that affect the management of the soils in each group. More specific and detailed information than can be shown in the table is given in the descriptions of the individual groups of soils.

Site Index.—Site index is a means of measuring the potential productivity of a site. It is expressed as the height, in feet, that trees of a specified kind, growing on that soil, will attain in 50 years. It depends mainly on the capacity of the soil to supply moisture and to provide growing space for tree roots.

Plant Competition.—Plant competition refers to the rate of invasion by unwanted trees, shrubs, and vines when openings are made in the canopy. Competition from the invading vegetation hinders the establishment and growth of desirable trees.

A rating of slight indicates that competition by other plants will only slightly impede the natural regeneration of the designated species; a rating of moderate, that competition may delay but will not prevent regeneration; and a rating of severe, that natural regeneration cannot be relied upon to restock the site and that seedlings must be planted and measures taken to remove competing plants.

Seedling Mortality.—Even when healthy seedlings of suitable species are correctly planted and the environment is normal, some seedlings fail to survive because of unfavorable characteristics of the soil in which they are planted.

A rating of slight indicates that generally no more than 25 percent of either planted or naturally occurring seedlings will die, and that one planting will produce a satisfactory stand; a rating of moderate, that losses will be between 25 and 50 percent; and a rating of severe, that more than half the seedlings will die and that replanting, special site preparation, and superior planting techniques are necessary for adequate restocking.

Equipment Limitation.—Some soil characteristics and topographic features restrict or prohibit the use of conventional equipment for planting and harvesting wood crops, for constructing roads, and for controlling unwanted vegetation and fires.

An equipment rating of slight indicates that there is no restriction on the use of equipment at any time of the year; a rating of moderate, that most types of equipment can be used and that there are periods of no more than 3 months when the use of equipment is restricted; and a rating of severe, that the type of equipment that can be used is limited and that, for periods of 3 months or more, the use of equipment may cause serious damage to the structure and stability of the soils.

Windthrow Hazard.—Soil characteristics affect the development of tree roots, and this in turn determines the resistance of a tree to the force of the wind. It is important to know the degree of this hazard when choosing tree species for planting or when planning release cuttings or harvest cuttings.

A rating of slight indicates that individual trees will withstand normal winds, even when released on all sides; a rating of moderate, that trees will remain standing unless the wind is of high velocity or the soil is excessively wet; and a rating of severe, that the soil does not allow adequate rooting for stability.

Erosion Hazard.—The erosion hazard is rated according to increasing risk of erosion. It refers to the potential erosion hazard when woodland is managed according to current acceptable standards.

Species Suitability.—This indicates which species of trees ought to be favored in the management of existing stands and which are suitable for planting.

WOODLAND GROUP 1

This group consists of deep, excessively drained, very friable, sandy soils on uplands and stream terraces. The rate of infiltration is rapid, permeability is rapid, and the available moisture capacity is very low. Natural fertility is low, and the organic-matter content is low. The soils are—

EbB	Eustis loamy sand, terrace, 0 to 6 percent slopes.
EdB	Eustis sand, 0 to 6 percent slopes.
LaB	Lakeland sand, 0 to 6 percent slopes.
LaC	Lakeland sand, 6 to 10 percent slopes.
LaD	Lakeland sand, 10 to 15 percent slopes.
LgC	Lakeland sand, gravelly variant, 0 to 10 percent slopes.
LgD	Lakeland sand, gravelly variant, 10 to 15 percent slopes.
LnB	Lakeland sand, terrace, 0 to 6 percent slopes.
Lo	Lakewood sand.
MoB	Molena loamy sand, 0 to 10 percent slopes.

Longleaf pine, slash pine, and loblolly pine are the preferred species, and shortleaf pine is suitable also. The important commercial hardwoods are not suitable.

These soils are suited to both sawtimber and pulpwood rotations and to the production of short and medium-length poles and pilings. Shortleaf pine is suitable mainly in pulpwood rotations. Arizona cypress and redcedar can be grown for Christmas trees and as the understory in windbreaks. Cherry laurel is suitable for either

757-198—65——6

TABLE 7.—*Woodland suitability groups and ratings*

[Dashes indicate that data are not available for estimating site

Woodland group	Site index [1]				
	Loblolly pine	Longleaf pine	Shortleaf pine	Slash pine	Pond pine
Group 1: Deep, excessively drained, very friable, sandy soils on uplands and stream terraces (EbB, EdB, LaB, LaC, LaD, LgC, LgD, LnB, Lo, MoB).	78±7	67±5	53±7	[2] 78	
Group 2: Moderately shallow, excessively drained, very friable soils that have a subsoil of sandy loam or sandy clay loam (EmA, EmB, EmC, LkA, LkB, LkC).	80±5	70±6	68±7	[2] 80	
Group 3: Deep, dominantly well-drained, nearly level to strongly sloping soils that have a subsoil of sandy loam to sandy clay loam (CaA, CaB, CfA, CfB, CfB2, FaA, FaB, FaB2, GoA, KaA, KaB, MaA, MaB2, MbA, MbB, MbB2, MbC2, NoA, NoB, NoB2, NoC, RsA, RsB, RsB2, RsC2).	85±5	71±7	69±9	[2] 84	
Group 4: Deep, well-drained, friable soils that have a subsoil of sandy loam to sandy clay loam (KbA, NtA, NtB, NtC, RtA, RtB, RtC).	81±8	66±3	57	[2] 81	
Group 5: Deep, somewhat poorly drained to well-drained, nearly level, alluvial soils that have a subsoil of loamy sand to silty clay loam (Co, Lv).	99±2	72	67	[2] 99	
Group 6: Moderately deep, somewhat poorly drained or moderately well drained soils that have a subsoil of silty clay to clay; water moves through these soils slowly (FfA, FfB, FfB2, FfC, Wa).	80±7	62±3	73	[2] 80	
Group 7: Somewhat poorly drained or moderately well drained, nearly level soils: the subsoil is dominantly sandy loam to clay, but in some places it is loamy sand (CvA, Db, Dd, Iz, Kd, Ly).	80±3	71±4	70	86	66
Group 8: Deep, somewhat poorly drained or moderately well drained, nearly level soil on the alluvial flood plains (Ch).	101±10	73		[2] 101	
Group 9: Poorly drained, level or nearly level soil on stream terraces; subsoil of silty clay or clay; frequently flooded (Lp).	94±6	67		[2] 94	
Group 10: Poorly drained, nearly level soils that have a subsoil of sandy clay loam to clay (Cs, Ct, Cu, Gr, Lr, Mc, Ra).	89±7	69±6	67	87	70
Group 11: Very poorly drained, alluvial soil that has a subsoil of silty clay; frequently flooded (Wd).	101±9				
Group 12: Very poorly drained, nearly level soils that have a subsoil of sandy loam to sandy clay loam (Po).	98±7	68±4		[2] 98	71±8
Group 13: Very poorly drained or poorly drained soils; the subsoil is dominantly loamy sand to sand, but in some places it is sandy clay loam or clay loam (Mt, Pm, Ru, Rv).	85±3	72±5		[2] 85	76
Group 14: Well-drained soils that have a subsoil of sandy clay or sandy clay loam (GaA, GaB, GaC, GbA, GbB, GbC).	83±8	64±5	69±0	[2] 83	72
Group 15: Well-drained soils that have a thin, compact, discontinuous subsoil (VaB, VaC, VaC2, VaD, VaD2, VaE2, VgD2, VkB, VkC, VkD).	63±7	55±8	51±14	[2] 63	
Group 16: Very poorly drained, nearly level soil that has a subsoil of sandy clay to clay (Ba).	103±7			106	
Group 17: Deep, well-drained, gently sloping soils that have a subsoil of friable sandy clay loam (WkB, WkB2).	77±7		65±7	[2] 77	
Group 18: Miscellaneous land types (Md, Mn, Sw).	Varied	Varied	Varied	Varied	Varied

[1] Average height of trees at 50 years of age. These values are based on field studies made by the Soil Conservation Service and the South Carolina State Commission of Forestry (*3*).

for major limitations and hazards affecting management

index, or that the specified species is not commonly grown]

Plant competition	Seedling mortality	Equipment limitation	Windthrow hazard	Erosion hazard	Suitable species
Severe	Slight to severe	Slight to moderate	Slight	Slight to moderate	Pine.
Severe	Slight to moderate	Slight to moderate	Slight	Slight to moderate	Pine.
Severe	Slight	Slight to moderate	Slight	Slight to moderate	Pine.
Severe	Slight to moderate	Slight	Slight	Slight	Pine.
Slight or severe [3]	Slight to severe	Slight to moderate	Slight	Slight	Lowland hardwoods and pine.
Slight or severe [3]	Slight to moderate	Slight to moderate	Slight to moderate	Slight to severe	Lowland hardwoods and pine.
Severe	Slight to moderate	Slight to moderate	Slight	Slight	Pine.
Slight or severe [3]	Moderate to severe	Moderate to severe	Slight	Slight	Lowland hardwoods and pine.
Slight or severe [3]	Slight to severe	Slight to moderate	Slight	Slight	Lowland hardwoods and pine.
Moderate to severe	Slight to severe	Moderate to severe	Slight	Slight	Pine, cypress, and blackgum.
Slight or severe [3]	Slight to severe	Severe	Slight	Slight	Lowland hardwoods and pine.
Slight or severe [3]	Moderate to severe	Severe	Slight	Slight	Lowland hardwoods and pine.
Slight or severe [3]	Severe	Severe	Slight	Slight	Pond hardwoods and pine.
Severe	Slight	Moderate	Slight	Slight to moderate	Pine.
Slight to severe	Slight to severe	Slight to severe	Moderate to severe	Moderate to severe	Pine.
Slight to severe [3]	Moderate to severe	Severe	Slight	Slight	Pine and lowland hardwoods.
Severe	Slight	Slight to moderate	Slight	Slight	Pine and lowland hardwoods.
Varied	Varied	Varied	Varied	Varied	Varied.

[2] Site index is estimated. It is based on experience and judgment of local soil scientists, woodland conservationists, foresters, and landowners and on measurements in other locations.

[3] Severe for preferred species; slight if there are no preferred species.

the understory or the overstory in windbreaks. Persimmon, hickory, gum, and oak are important sources of food for wildlife. Acorn yields are limited because of the limited supply of moisture.

The average site index for loblolly pine is 78±7; for longleaf pine it is 67+5; and for slash pine it is 78 (estimated). The site index in the Sand Hills is 10 points or more below these averages. Where the slope is more than 6 percent, the site index is as much as 10 points higher than the average given if the moisture supply is favorable and 10 points less than average if the soil is dry.

The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 400 board feet (Scribner) for loblolly pine, 190 for longleaf pine, 120 for shortleaf pine, and 385 for slash pine (*3*).

Plant competition is severe. Blackjack oak, turkey oak, bluejack oak, post oak, water oak, live oak, red oak, hickory, sassafras, persimmon, sweetgum, blackgum, wiregrass, and other vegetation compete severely with the preferred species. Intensive treatment is needed to eliminate or control competing vegetation and to prepare sites for regeneration with desirable species. Such treatment may include furrowing, disking, clearing, cutting brush, undercutting root systems, prescribed burning, and applying herbicides.

Seedling mortality is slight to severe. High surface temperatures and a limited supply of moisture contribute to seedling mortality where the surface is not adequately covered (fig. 19). Where the slope is no more than 6 percent, the loss of seedlings is from 25 to 50 percent of the planted stock. Light preparation of the seedbed is needed to obtain adequate restocking through natural regeneration. Where the slope is more than 6 percent, seedling mortality ranges from slight to severe, depending on the moisture supply. In the rolling and hummocky areas, where the ridges and slopes are usually dry, and also on dry, smooth slopes, seedling losses generally are more than 50 percent of the planted stock and natural regeneration cannot be relied on to maintain well-stocked stands. Superior planting techniques, high-quality seedlings, and replanting generally are necessary. Because moisture conditions are favorable, seedling mortality is slight at intermediate elevations on soils that have slopes of more than 6 percent. The production potential of these soils is higher than that of soils that have a limited supply of moisture.

The limitation on the use of equipment is slight to moderate. It is moderate on the gravelly variants of Lakeland sand and on the other soils that have slopes of more than 10 percent. The loose sandy surface is abrasive, and it provides poor traction for light rubber-tired vehicles. Heavy equipment requires extra power, and it is not well supported by the loose sand.

Windthrow is no problem. The erosion hazard is slight to moderate. On the steeper slopes, furrowing or other soil-disturbing operations should be on the contour. In spring, open fields are likely to be eroded by the wind, and windstrips may be needed to control soil blowing.

The Nantucket pine-tip moth (*Rhyacionia frustrana*) causes severe damage to loblolly pine on these soils. A root-rot fungus (*fomes annosus*) severely damages several of the conifers if their roots are injured by equipment, livestock, or fire. Nematodes severely damage seedlings of susceptible species in areas once used as cropland.

***Figure 19.*—An area of Lakewood sand of woodland group 1. A very low production potential and severe seedling mortality restrict the production of wood crops on this soil.**

WOODLAND GROUP 2

This group consists of moderately shallow, excessively drained, very friable soils. The soil material at a depth of 30 to 42 inches is sandy loam or sandy clay loam. Infiltration and permeability are rapid. The available moisture capacity is low. Natural fertility is low, and the organic-matter content is low. The supply of moisture is generally more favorable on the stream terraces than on the upland areas. The soils are—

- EmA Eustis sand, moderately shallow, 0 to 2 percent slopes.
- EmB Eustis sand, moderately shallow, 2 to 6 percent slopes.
- EmC Eustis sand, moderately shallow, 6 to 10 percent slopes.
- LkA Lakeland sand,, moderately shallow, 0 to 2 percent slopes.
- LkB Lakeland sand, moderately shallow, 2 to 6 percent slopes.
- LkC Lakeland sand, moderately shallow, 6 to 10 percent slopes.

Slash pine, loblolly pine, and longleaf pine are the preferred species, and shortleaf pine is suitable also. Commercial hardwoods generally are not suitable.

These soils are suited to both pulpwood and sawtimber rotations and to the production of medium-length poles and pilings. Arizona cypress and redcedar can be grown for Christmas trees and are suitable for the understory in windbreaks. Cherry laurel is suitable for use in windbreaks. Dogwood, persimmon, gum, oak, and hickory are sources of food for wildlife.

The average site index for loblolly pine is 80±5; for longleaf pine it is 70±6; for shortleaf pine it is 68±7; and for slash pine it is 80 (estimated). These soils contain more fine material than the soils in woodland group 1 and have a more favorable moisture supply.

The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 425 board feet (Scribner) for loblolly pine, 230 for longleaf pine, 330 for shortleaf pine, and 410 for slash pine (*3*).

Plant competition is severe. Blackjack oak, post oak, water oak, willow oak, white oak, live oak, red oak, hickory, dogwood, sassafras, persimmon, blackgum, turkey oak, bluejack oak, sandhills post oak, and wiregrass compete severely with the preferred species. Intensive treatment is needed to eliminate or control competing vegetation or to prepare sites for regeneration with desirable species. Such treatment includes furrowing, disking, clearing, cutting brush, undercutting root systems, prescribed burning, and applying herbicides.

Seedling mortality is slight to moderate. It is slight on most of the soils in this group (fig. 20), but on the dry slopes it is moderate. Losses of seedlings are from 25 to 50 percent of the planted stock. Some replanting is needed to fill in openings.

The equipment limitation is slight to moderate. The sandy surface is abrasive, and it provides poor traction for light rubber tired vehicles. Heavy equipment requires extra power, and it is not well supported by the loose sand.

The windthrow hazard is slight. Individual trees can be expected to remain standing, even if released on all sides.

The erosion hazard is slight to moderate. In spring, soil blowing may be a serious problem in open areas, and windstrips may be needed to protect the seedlings.

The Nantucket pine-tip moth (*Rhyacionia frustrana*) causes severe damage to loblolly pine. A rot-root fungus (*fomes annosus*) severely damages conifers if their roots are injured by equipment, livestock, or fire. Nematodes occur in some sandy soils, especially those that have been used for crops. They can cause severe damage to trees of susceptible species.

***Figure 20.*—An area of Lakeland sand, moderately shallow, 0 to 2 percent slopes. Seedling mortality is slight on most of the soils in woodland group 2.**

WOODLAND GROUP 3

This group consists of nearly level to strongly sloping, deep, dominantly well-drained soils. The surface layer is sandy loam or loamy sand, and the subsoil is sandy loam to sandy clay loam. Infiltration is moderate to rapid, and permeability is moderate. The available moisture capacity is moderate to high. The organic-matter content and natural fertility are moderate. The soils are—

CaA	Cahaba fine sandy loam, 0 to 2 percent slopes.
CaB	Cahaba fine sandy loam, 2 to 6 percent slopes.
CfA	Caroline fine sandy loam, 0 to 2 percent slopes.
CfB	Caroline fine sandy loam, 2 to 6 percent slopes.
CfB2	Caroline fine sandy loam, 2 to 6 percent slopes, eroded.
FaA	Faceville loamy sand, 0 to 2 percent slopes.
FaB	Faceville loamy sand, 2 to 6 percent slopes.
FaB2	Faceville loamy sand, 2 to 6 percent slopes, eroded.
GoA	Goldsboro loamy sand, 0 to 2 percent slopes.
KaA	Kalmia loamy fine sand, 0 to 2 percent slopes.
KaB	Kalmia loamy fine sand, 2 to 6 percent slopes.
MaA	Magnolia loamy sand, 0 to 2 percent slopes.
MaB2	Magnolia loamy sand, 2 to 6 percent slopes, eroded.
MbA	Marlboro loamy sand, 0 to 2 percent slopes.
MbB	Marlboro loamy sand, 2 to 6 percent slopes.
MbB2	Marlboro loamy sand, 2 to 6 percent slopes, eroded.
MbC2	Marlboro loamy sand, 6 to 12 percent slopes, eroded.
NoA	Norfolk loamy sand, 0 to 2 percent slopes.
NoB	Norfolk loamy sand, 2 to 6 percent slopes.
NoB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded.
NoC	Norfolk loamy sand, 6 to 10 percent slopes.
RsA	Ruston loamy sand, 0 to 2 percent slopes.
RsB	Ruston loamy sand, 2 to 6 percent slopes.
RsB2	Ruston loamy sand, 2 to 6 percent slopes, eroded.
RsC2	Ruston loamy sand, 6 to 10 percent slopes, eroded.

The Goldsboro soil is moderately well drained.

Loblolly pine and slash pine are the preferred species. Longleaf pine and shortleaf pine are suitable also. Black walnut can be grown, though the site is not optimum.

These soils are suited to both sawtimber and pulpwood rotations and to the production of poles and pilings of medium length. Cherry laurel, redcedar, Arizona cypress, and ligustrum are suitable for the understory in windbreaks. Oak, hickory, black cherry, mulberry, and other species provide food for wildlife.

The average site index for loblolly pine is 84±5; for longleaf pine it is 71±7; for shortleaf pine it is 69±9; and for slash pine it is 84 (estimated). Where the slope is more than 6 percent and the moisture supply is favorable, the site index may be higher than these averages.

The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 475 board feet (Scribner) for loblolly pine, 240 for longleaf pine, 345 for shortleaf pine, and 455 for slash pine (*3*).

Plant competition is severe. Red oak, white oak, water oak, sassafras, dogwood, persimmon, sweetgum, hickory, and other vegetation compete severely with pine. Intensive practices, such as furrowing, clearing, disking, prescribed burning, brush cutting, undercutting root systems, and applying herbicides, are necessary to eliminate or control the competing vegetation or to prepare sites for natural regeneration.

Seedling mortality is slight. Satisfactory restocking is generally obtained from the first planting. If the sources of seed are adequate and the competing vegetation is controlled, a well-stocked stand is maintained through natural regeneration.

The equipment limitation is slight to moderate. It is moderate in the eroded areas and on the steep slopes. If equipment is used on eroded sites in wet weather, soil structure and tree roots may be damaged.

Windthrow is no special problem.

The erosion hazard is slight to moderate. Operations that disturb the protective ground cover should be avoided. If access roads and firebreaks are necessary, they should follow the contour as closely as possible. Soil blowing occurs in large open areas. A protective cover of a plant such as Abruzzi rye may be necessary to protect seedlings planted for windbreaks.

The Nantucket pine-tip moth (*Rhyacionia frustrana*) causes severe damage to loblolly pine, especially on the loamy sand soils. Nematodes may severely damage seedlings.

WOODLAND GROUP 4

This group consists of deep, well-drained, friable soils. The surface layer is thick loamy sand and loamy fine sand. The subsoil is sandy loam to sandy clay loam. Infiltration is rapid. Permeability and the available moisture capacity are moderate. The organic-matter content and natural fertility are moderate to low. The soils are—

KbA	Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes.
NtA	Norfolk loamy sand, thick surface, 0 to 2 percent slopes.
NtB	Norfolk loamy sand, thick surface, 2 to 6 percent slopes.
NtC	Norfolk loamy sand, thick surface, 6 to 10 percent slopes.
RtA	Ruston loamy sand, thick surface, 0 to 2 percent slopes.
RtB	Ruston loamy sand, thick surface, 2 to 6 percent slopes.
RtC	Ruston loamy sand, thick surface, 6 to 10 percent slopes.

Loblolly pine and slash pine are the preferred species. Longleaf pine and shortleaf pine are suitable also.

These soils are suited to both sawtimber and pulpwood rotations and to the production of medium-length poles and pilings. Cherry laurel, redcedar, Arizona cypress, and ligustrum are suitable for the understory in windbreaks. Persimmon, mulberry, dogwood, pecan, black cherry, oak, and hickory are important sources of food for wildlife.

The average site index for loblolly pine is 81±8; for longleaf pine it is 66±3; for shortleaf pine it is 57; and for slash pine it is 81 (estimated). The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 440 board feet (Scribner) for loblolly pine, 180 for longleaf pine, 170 for shortleaf pine, and 420 for slash pine (*3*).

Plant competition is severe. Upland oaks, hickory, dogwood, and other vegetation compete severely with pine. Clearing, disking, furrowing, undercutting root systems, prescribed burning, brush cutting, and applying herbicides are needed to eliminate or control competing vegetation and to prepare sites for the natural regeneration of seedlings.

Seedling mortality is slight to moderate. The loss of planted seedlings generally is less than 25 percent, but in some places it ranges from 25 to 50 percent. Some replanting may be necessary to fill in the large openings. Natural reseeding generally is adequate if the sites are prepared, competing vegetation is controlled, and the supply of seed is adequate.

The equipment limitation, the windthrow hazard, and the erosion hazard are all slight. Large open areas are likely to be eroded by the wind. They require a protective cover, such as Abruzzi rye, to control soil blowing before planting seedlings for windbreaks.

WOODLAND GROUP 5

This group consists of deep, somewhat poorly drained to well drained, nearly level alluvial soils on river fronts, at higher elevations on alluvial flood plains, and in depressions on the uplands. The surface layer is loam to loamy sand. The subsoil is loamy sand to silty clay loam. Infiltration is moderate to rapid. Permeability and the available moisture capacity are moderate. The moisture supply is favorable for trees. Natural fertility is medium, and the organic-matter content is moderate. These soils are subject to occasional overflow. They are—

Co Congaree fine sandy loam.
Lv Local alluvial land.

Sweetgum, yellow-poplar, blackgum, ash, sycamore, cottonwood, black walnut, red maple, cherrybark oak, Shumard oak, white oak, cow oak, loblolly pine, and slash pine are the preferred species. Also suitable are hackberry, beech, birch, American elm, winged elm, hickory, magnolia, post oak, water oak, willow oak, persimmon, mulberry, dogwood, redcedar, and honeylocust.

These soils are suited to both sawtimber and pulpwood rotations and to the production of long poles and pilings and high-quality veneer woods. Most of the suitable species are important sources of food for wildlife.

The average site index for loblolly pine is 99±2; for longleaf pine it is 72; for shortleaf pine it is 67; and for slash pine it is 99 (estimated). The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 685 board feet (Scribner) for loblolly pine, 250 for longleaf pine, 315 for shortleaf pine, and 610 for slash pine (*3*).

Plant competition is severe. Clearing, disking, furrowing, brush cutting, prescribed burning, or applying herbicides may be necessary to prepare sites for pines and selected hardwoods and to eliminate or control the less desirable hardwoods and the undergrowth of grasses, vines, and reeds. If no measures are taken to prepare sites or to control competing vegetation, the stands will consist mainly of the more tolerant species.

Seedling mortality is slight to severe. Regeneration of some species may be adversely affected by prolonged flooding and silting. Generally, satisfactory stocking is obtained if the seed sources are adequate, if competing vegetation is controlled, if seeds or seedlings are planted, and if proper techniques are used. Losses of planted seedlings are generally less than 25 percent.

The equipment limitation is slight to moderate. These fine-textured soils puddle and pack when wet, and the use of equipment during wet periods is likely to damage tree roots and break down soil structure. Generally, the period of restriction is less than 3 months during the year. Overflow occasionally restricts use of equipment.

Erosion and windthrow hazards are slight.

During prolonged droughts, sweetgum and some other species may be damaged by dieback.

Cattle should not be permitted to concentrate in these areas when the soils are wet, because trampling is likely to damage tree roots and impair soil structure.

WOODLAND GROUP 6

This group consists of moderately deep, somewhat poorly drained or moderately well drained soils on stream terraces. The surface layer is fine sandy loam or very fine sandy loam, and the subsoil is silty clay to clay. Water moves through these soils at a slow rate. Infiltration and permeability are slow. The available moisture capacity is high. The organic-matter content and natural fertility are moderate. These soils are subject to occasional overflow. They are—

FfA Flint fine sandy loam, 0 to 2 percent slopes.
FfB Flint fine sandy loam, 2 to 6 percent slopes.
FfB2 Flint fine sandy loam, 2 to 6 percent slopes, eroded.
FfC Flint fine sandy loam, 6 to 12 percent slopes.
Wa Wahee very fine sandy loam.

Loblolly pine, slash pine, sweetgum, blackgum, ash, white oak, cherrybark oak, cow oak, Shumard oak, red maple, and yellow-poplar are the preferred species. Some of these are important sources of food for wildlife.

These soils are suited to both sawtimber and pulpwood rotations and to the production of medium-length poles and pilings and of veneer.

The average site index for loblolly pine is 80±7; for longleaf pine it is 62±3; for shortleaf pine it is 73; and for slash pine it is 80 (estimated). The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 430 board feet (Scribner) for loblolly pine, 140 for longleaf pine, 400 for shortleaf pine, and 410 for slash pine (*3*).

Plant competition is severe. Clearing, disking, brush cutting, prescribed burning, and applying herbicides are necessary to eliminate or control competing vegetation or to prepare sites for seedlings. If there is no species preference, the hazard is slight and well-stocked mixed stands usually develop.

Seedling mortality generally is slight, but in severely eroded areas and in areas that are flooded for long periods during the growing season it is moderate. Losses of planted seedlings are between 25 and 50 percent. Some replanting is needed to fill in openings. Seedlings of some of the preferred species are damaged or destroyed by overflow or by excess water during the growing season.

The equipment limitation is slight to moderate. The soils puddle and pack easily when wet; consequently, the use of equipment in wet weather may damage tree roots and break down the soil structure. It is difficult to use certain types of equipment during periods of drought. Water management is needed to maintain roads and to facilitate operations. Floodwaters and debris may interfere with drainage ditches and water-control structures.

The windthrow hazard is slight to moderate. It is moderate in the severely eroded areas because the soils have a thin surface layer and root development is restricted by the compact subsoil.

The erosion hazard is severe in the areas already severely eroded and slight in other areas. Where possible, road construction and other operations that remove the natural ground cover should be avoided.

During droughts, hardwoods are susceptible to dieback.

Cattle should not be allowed to concentrate in these areas when the soils are wet, because trampling is likely to damage tree roots and impair soil structure.

WOODLAND GROUP 7

This group consists of somewhat poorly drained or moderately well drained, nearly level soils. The subsoil is dominantly sandy loam to clay. The Klej soil has a subsoil of loamy sand. Infiltration and permeability are mod-

erate to rapid. The available moisture capacity is moderate to low. The soils are—

CvA Craven fine sandy loam, 0 to 2 percent slopes.
Db Dunbar fine sandy loam.
Dd Dunbar sandy loam.
Iz Izagora fine sandy loam.
Kd Klej loamy sand.
Ly Lynchburg loamy sand.

Loblolly pine and slash pine are the preferred species, and shortleaf pine and longleaf pine are suitable also. Pond pine, a less desirable species, is common in poorly drained and burned-over areas.

These soils are suited to both sawtimber and pulpwood rotations and to the production of medium-length poles and pilings. Pond pine can be grown for pulpwood and small sawtimber. Oak, maple, and gum are important sources of food for wildlife.

The average site index for loblolly pine is 80±3; for longleaf pine it is 71±4; for shortleaf pine it is 70; for slash pine it is 86; and for pond pine it is 66. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 425 board feet (Scribner) for loblolly pine, 240 for longleaf pine, 360 for shortleaf pine, 475 for slash pine, and 100 for pond pine (*3*).

Plant competition is severe. Water oak, willow oak, sweetgum, maple, gallberry, myrtle, saw-palmetto, wiregrass, briers, and other vegetation compete with the preferred species. Intensive treatment is needed to eliminate or control competing vegetation and to prepare sites for seedlings. Such treatment may include clearing, disking, brush cutting, prescribed burning, and applying herbicides.

Seedling mortality is slight or moderate. In the poorly drained areas and in depressions, natural reproduction of the preferred species cannot always be relied on for restocking. Losses of between 25 and 50 percent of planted stock are to be expected, and some replanting may be necessary to fill in large openings. Site preparation and water management will reduce the loss of seedlings.

The limitation on the use of equipment is slight on the somewhat poorly drained soils and moderate on the poorly drained soils. The use of equipment in wet weather may damage tree roots and break down the soil structure. Water management reduces the risk of such damage, particularly in the larger areas of these soils.

The windthrow hazard is slight, and the erosion hazard is slight.

In wet periods livestock should be excluded from the poorly drained areas.

WOODLAND GROUP 8

The only soil in this group is Chewacla silt loam (Ch), a deep, somewhat poorly drained or moderately well drained, nearly level soil on the alluvial flood plains. It is frequently flooded. Infiltration and permeability are moderate. The available moisture capacity is moderate. Natural fertility and the organic-matter content are moderate.

Sweetgum, blackgum, cherrybark oak, cow oak, Shumard oak, white oak, ash, yellow-poplar, cottonwood, loblolly pine, cypress, and red maple are the preferred species. Willow oak, water oak, post oak, hackberry, American elm, winged elm, hickory, American beech, persimmon, and mulberry are suitable also. Weed species include boxelder, blue beech, hophornbeam, and hawthorn. Most of these species are sources of food for wildlife.

This soil is suited to both sawtimber and pulpwood rotations and to the production of high-quality veneer and long poles and pilings.

The average site index for loblolly pine is 101±10; for longleaf pine it is 73; and for slash pine it is 101 (estimated). Site indexes for other species have not been determined. Preliminary field studies indicate that the site index for sweetgum may be similar to that for loblolly pine. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is about 715 board feet (Scribner) for loblolly pine, 265 for longleaf pine, and 630 for slash pine (*3*).

Plant competition is slight or severe. The natural vegetation, composed primarily of hardwoods and ground cover, competes severely with pine and with preferred hardwoods, particularly if these are intolerant species. Intensive treatment is needed to control or eliminate competing vegetation and to prepare seedbeds. Such treatment may include prescribed burning, applying herbicides, clearing, and disking. If there is no species preference, the hazard of competition is slight and a well-stocked mixed stand can be expected to develop.

Seedling mortality is moderate to severe. It varies according to the species and the duration and season of overflow. Water that stands on the surface for long periods is detrimental to seed germination and to the development of seedlings. Water management, where feasible, improves site quality and reduces seedling mortality.

The equipment limitation is moderate to severe because of the overflow hazard and the poor natural drainage of this level, fine-textured soil. The use of equipment is likely to cause puddling and packing of the soil and damage to tree roots. Adequate drainage is necessary for the maintenance of roads, and water management is needed to permit access to sites and to facilitate operations, but floodwaters and debris interfere with drainage and water control.

Windthrow and erosion hazards are slight. During droughts, hardwoods are susceptible to dieback.

This soil is suited to many species of trees. Its potential is high but can be attained only if suitable species are selected and the site is improved by water management. Evaluation of the requirements of the selected species is necessary before suitable treatment can be planned. Putnam, Furnival, and McKnight (*8*) list approximately 70 important commercial species suited to the bottom lands of the Southern States and describe some of the characteristics and site requirements of each species.

Cattle should not be permitted to concentrate in these areas, because trampling is likely to pack the soil and damage tree roots.

WOODLAND GROUP 9

Leaf fine sandy loam (Lp) is the only soil in this group. It is a poorly drained, level or nearly level soil on stream terraces and is flooded frequently. The subsoil is silty clay or clay. Infiltration and permeability are slow. The available moisture capacity is high. Natural fertility is medium.

Loblolly pine and slash pine are the preferred conifers. Preferred hardwoods include yellow-poplar, sweetgum, cherrybark oak, white oak, cow oak, blackgum, ash, and red maple.

This soil is suited to both sawtimber and pulpwood rotations and to the production of long poles and pilings and

high-quality veneer. The hardwood species are excellent sources of food for wildlife.

The average site index for loblolly pine is 94±6; for longleaf pine it is 67; and for slash pine it is 94 (estimated). The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 610 board feet (Scribner) for loblolly pine, 190 for longleaf pine, and 560 for slash pine (*3*).

Plant competition is slight or severe. Undesirable species and ground vegetation compete severely with preferred species selected for management, particularly if these are intolerant species. Intensive treatment is needed to control or eradicate competing vegetation and to prepare sites for seedlings. Such treatment may include clearing, disking, furrowing, brush cutting, prescribed burning, and applying herbicides. If species preference is not important, competition is insignificant and a mixed stand generally will develop.

Seedling mortality is slight to severe. The loss of planted stock is generally less than 25 percent. Seedling mortality during floods may be severe; it varies according to the species and the duration and season of overflow. If water stands on the surface for long periods, seedling mortality may be more than 75 percent of the planted stock and replanting may be necessary. Superior planting techniques and water management help to reduce seedling mortality.

The equipment limitation is slight to moderate. Drainage is generally needed to permit access to sites and to maintain roads. The use of equipment in wet weather and after floods may result in damage to roots and to soil structure.

The windthrow hazard and the erosion hazard are slight.

Cattle should not be permitted to concentrate in these areas when the soil is wet, because trampling may seriously damage tree roots and affect the structure and stability of the soil.

WOODLAND GROUP 10

This group consists of poorly drained or somewhat poorly drained, nearly level soils that have a subsoil of sandy clay loam to clay. Natural fertility is medium, and the organic-matter content is moderate. Infiltration and permeability are slow, and the available moisture capacity is high. In slight depressions water stands on the surface for long periods. The soils are—

Cs	Coxville fine sandy loam.
Ct	Coxville fine sandy loam, thin surface.
Cu	Coxville sandy loam.
Gr	Grady loam.
Lr	Lenoir loam.
Mc	McColl loam.
Ra	Rains sandy loam.

For adequately drained areas, loblolly pine and slash pine are preferred. Longleaf pine, shortleaf pine, and pond pine are suitable also. For areas not well enough drained to be suited to pine, blackgum and cypress are the preferred species, and sweetgum and maple are suitable also.

These soils are suitable for both sawtimber and pulpwood rotations and for the production of medium-length and long poles and pilings. The timber is inferior in quality to timber of the same species grown on the flood plains.

The average site index for loblolly pine is 89±7; for longleaf pine it is 69±6; for shortleaf pine it is 67; for slash pine it is 87; and for pond pine it is 70. The site index for cypress and hardwoods has not been determined. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 545 board feet (Scribner) for loblolly pine, 215 for longleaf pine, 315 for shortleaf pine, 485 for slash pine, and 115 for pond pine (*3*).

Plant competition is moderate to severe. It is moderate in the poorly drained areas where cypress and hardwoods are preferred. Moderately intensive measures for preparation of seedbeds or control of undesirable vegetation may be beneficial in establishing these species. Sweetgum, maple, holly, ironwood, elm, gallberry, myrtle, briers, and sedges compete severely with pine. Intensive treatment is needed to eliminate or control the competing vegetation. Such treatment may include water management, prescribed burning, clearing, cutting brush, and applying herbicides.

Seedling mortality varies from slight on the higher sites to severe in the very poorly drained depressions. In the depressions, water stands on the surface for long periods. Some of the lower areas of these soils are almost treeless, partly because of seedling mortality and partly because of heavy cuttings and fires. Water management is necessary for the establishment of adequate stands of preferred species in some places.

The equipment limitation is moderate to severe. It is moderate on the higher sites. In low areas and in depressions, water management is required to permit access to sites and to maintain roads. The use of equipment in the low areas is likely to cause compaction of the soil and damage to tree roots.

Windthrow is no problem. The erosion hazard is slight.

Cattle should not be permitted to concentrate in the low areas, because trampling may result in compaction of the soil and injury to tree roots.

WOODLAND GROUP 11

This group consists of Wehadkee silt loam (Wd), a very poorly drained alluvial soil that is frequently flooded. The subsoil is silty clay. Infiltration and permeability are slow. The available moisture capacity is high. Natural fertility is moderate to high, and the organic-matter content is moderate.

Loblolly pine, sweetgum, ash, blackgum, tupelo, cypress, and red maple are the preferred species. Persimmon, hickory, willow oak, water oak, elm, and beech are suitable also.

This soil is suited to both sawtimber and pulpwood rotations and to the production of long poles and pilings and high-quality veneer. Many of the hardwood species are important sources of food for wildlife.

The average site index for loblolly pine is 101±9. The site index has not been determined for the hardwoods. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 710 board feet (Scribner) for loblolly pine (*3*).

Plant competition is slight or severe. The natural vegetation, composed of hardwoods and ground vegetation, competes severely with pine and with hardwoods selected for management, especially if these are intolerant species. Prescribed burning, applying herbicides, clearing, disking, or other intensive treatment is needed to control or eradicate competing vegetation and to prepare seedbeds.

If no particular species is preferred, the hazard of competition is slight and a well-stocked, mixed stand can be expected.

Seedling mortality is slight to severe, depending on the species. Poor drainage and flooding interfere with germination of seed and growth of seedlings. Prolonged flooding and silting during the growing season kill many new seedlings. Water management, where feasible, improves site quality and reduces seedling mortality.

The equipment limitation is severe because of poor drainage, a high water table, and overflow. The fine-textured surface layer is boggy and slippery when wet, and it puddles and packs easily. The use of equipment may cause severe damage to tree roots. Roads need to be drained, and in some places drainage is not feasible.

Windthrow and erosion are slight hazards.

This soil is suited to many species of trees. Its potential productivity is excellent and justifies intensive treatment, including selection of species and improvement of sites by drainage. To attain the potential production, it is necessary to recognize the requirements of each site and the treatment needed for each species. Putnam, Furnival, and McKnight (*8*) list about 70 important species suited to the bottom lands of the Southern States and describe some of their characteristics and site requirements.

Cattle should not be permitted to concentrate in these areas when the soil is wet, because trampling is likely to pack the soil and damage tree roots.

WOODLAND GROUP 12

This group consists of Portsmouth and Okenee loams (Po), an undifferentiated group of very poorly drained, nearly level soils. The surface layer is black loam high in organic-matter content. The subsoil is gray sandy loam to sandy clay loam. Permeability and the available moisture capacity are moderate. The organic-matter content is high, and natural fertility is moderate.

For adequately drained areas, loblolly pine and slash pine are the preferred species. Pond pine and longleaf pine are suitable also. For areas not well enough drained to be suited to pine, the preferred species are sweetgum, blackgum, tupelo, maple, and cypress.

If adequately drained, these soils are very productive. They are suited to both sawtimber and pulpwood rotations and to the production of long poles and pilings. The sawtimber is of high quality.

The average site index for loblolly pine is 98±5; for longleaf pine it is 68; for slash pine it is 98 (estimated); and for pond pine it is 71±8. The site index has not been determined for cypress and hardwoods. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 670 board feet (Scribner) for loblolly pine, 205 for longleaf pine, 600 for slash pine, and 120 for pond pine (*3*).

Plant competition is slight or severe. Water oak, willow oak, maple, sweetgum, blackgum, gallberry, myrtle, bay, briers, and other ground vegetation compete severely with the preferred species. Intensive treatment, which may include water management, prescribed burning, clearing, disking, cutting brush, and applying herbicides, is needed to control or to eradicate competing vegetation and to prepare the site for seedlings of preferred species. If species preference is not important, the hazard is slight.

Seedling mortality is moderate to severe. It is severe in ponded areas, and water management is frequently necessary for adequate restocking of desired species. In areas that are not ponded, seedling mortality is moderate. From 25 to 50 percent of the planted stock can be expected to die, and replanting may be necessary to fill in large openings. Unless sites are prepared, natural regeneration cannot be relied upon to establish stands of desired species.

Equipment limitations are severe because the surface soil is fine textured and drainage is poor. Water management is required to permit access to sites, management of the stands, and maintenance of roads. The use of equipment during wet periods is likely to cause puddling, compaction, and damage to soil structure and tree roots.

Windthrow and erosion are slight hazards.

Cattle should not be permitted to concentrate in these areas in wet weather, because trampling is likely to cause compaction of the soil and damage to tree roots.

WOODLAND GROUP 13

This group consists of very poorly drained or poorly drained soils. They are flooded frequently, and in some places water stands on the surface for long periods. The surface layer is dark-gray to black sandy loam, loamy sand, or loam, and the subsoil is generally loamy sand to sand. The Myatt soil has a subsoil of sandy clay loam or clay loam. Infiltration and permeability are rapid. The available moisture capacity is low. The soils are—

Mt Myatt sandy loam.
Pm Plummer loamy sand.
Ru Rutlege loam.
Rv Rutlege loamy sand.

For adequately drained areas loblolly pine and slash pine are the preferred species. Longleaf pine is also suitable. Pond pine, blackgum, juniper, sweetgum, ash, and red maple are preferred for sites that receive seepage from higher lying soils. For areas where water stands on the surface for long periods, cypress and tupelo are the preferred species.

These soils are suited to both sawtimber and pulpwood rotations and to the production of medium-length poles and pilings. Most of the hardwoods produce food for wildlife. Both the hardwoods and the conifers are of poorer quality than those grown on the alluvial flood plains.

The average site index for loblolly pine is 85±3; for longleaf pine it is 72±5; for slash pine it is 85 (estimated); and for pond pine it is 76. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 490 board feet (Scribner) for loblolly pine, 250 feet for longleaf pine, 465 for slash pine, and 145 for pond pine (*3*).

Plant competition is slight or severe. Hardwoods, switchcane, briers, vines, gallberry bushes, bay, and other vegetation compete severely with pine and with intolerant hardwoods selected for management. Intensive treatment is needed to control or eradicate competing vegetation. Such treatment may include water management, prescribed burning, clearing, disking, brush cutting, and applying herbicides. If species preference is not important, the hazard is slight.

Seedling mortality is severe. The loss in planted stands may exceed 50 percent. Natural regeneration of preferred species cannot be relied on to maintain adequate

stands. Water management, intensive site preparation, superior planting stock, and proper planting techniques are necessary to ensure well-stocked stands.

The equipment limitation is severe because of poor drainage, seepage, and overflow. The use of equipment when the soils are wet may damage tree roots seriously. Water management is necessary for maintenance of roads and to permit access to sites. It also makes the soil less susceptible to compaction. Some areas may be difficult to drain. Ditches are likely to cave in because of the coarse texture of the subsoil.

Erosion and windthrow are slight hazards.

Trampling by cattle is likely to cause serious damage to tree roots on this wet soil.

WOODLAND GROUP 14

This group consists of well-drained soils that have a subsoil of sandy clay or sandy clay loam. Infiltration is moderate to high, and permeability is moderate. The available moisture capacity is moderate. Natural fertility is low, and the organic-matter content is low. The soils are—

GaA Gilead sand, 0 to 2 percent slopes.
GaB Gilead sand, 2 to 6 percent slopes.
GaC Gilead sand, 6 to 10 percent slopes.
GbA Gilead sand, thick surface, 0 to 2 percent slopes.
GbB Gilead sand, thick surface, 2 to 6 percent slopes.
GbC Gilead sand, thick surface, 6 to 10 percent slopes.

Loblolly pine and slash pine are the preferred species. Longleaf pine, shortleaf pine, and pond pine are suitable also.

These soils are suitable for both sawtimber and pulpwood rotations and for the production of medium-length poles and pilings.

The average site index for loblolly pine is 83±8; for longleaf pine it is 64±5; for shortleaf pine it is 69±0; and for pond pine it is 72. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 465 board feet (Scribner) for loblolly pine, 160 for longleaf pine, 345 for shortleaf pine, and 115 for pond pine (*3*).

Plant competition is severe. Natural regeneration cannot be relied on. Intensive treatment, which may include prescribed burning, clearing, disking, furrowing, brush cutting, and applying herbicides, is needed to control or eradicate competing vegetation or to prepare sites for seedlings.

Seedling mortality is slight. If plant competition is controlled, adequate restocking by natural regeneration or by planting may be expected.

The equipment limitation is moderate. Frequent use of equipment in wet seasons may damage tree roots and cause deep ruts to form in logging roads.

The windthrow hazard is slight. The erosion hazard is slight to moderate. Erosion is a moderate hazard on slopes of more than 6 percent. Operations that destroy or disturb the ground cover should be kept to a minimum. Roads, firebreaks, and furrows should follow the contour wherever possible.

Cattle should not be permitted to concentrate in these areas when the soil is wet, because trampling may damage tree roots.

WOODLAND GROUP 15

In this group are well-drained soils that have a thin, compact, discontinuous subsoil. Infiltration is rapid, and permeability is moderate to slow. The available moisture capacity is moderate to low. Natural fertility is low, and the organic-matter content is low. The eroded phases have variable characteristics, and many galled spots and gullies have formed. The soils are—

VaB Vaucluse sand, 2 to 6 percent slopes.
VaC Vaucluse sand, 6 to 10 percent slopes.
VaC2 Vaucluse sand, 6 to 10 percent slopes, eroded.
VaD Vaucluse sand, 10 to 15 percent slopes.
VaD2 Vaucluse sand, 10 to 15 percent slopes, eroded.
VaE2 Vaucluse sand, 15 to 25 percent slopes, eroded.
VgD2 Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded.
VkB Vaucluse sand, thick surface, 2 to 6 percent slopes.
VkC Vaucluse sand, thick surface, 6 to 10 percent slopes.
VkD Vaucluse sand, thick surface, 10 to 15 percent slopes.

The uneroded soils are low in production potential. They are suited to the production of small sawlogs, pulpwood, and short pilings and poles. Slash pine, loblolly pine, shortleaf pine, longleaf pine, and Virginia pine are the preferred species. Sandhill oak is a source of food for wildlife, but acorn yields are low.

The eroded soils are not suited to the production of sawtimber or pulpwood, because of their shallow solum and restricted root zone. Control of erosion is the main objective of management. Loblolly pine, slash pine, and Virginia pine are the preferred species.

The average site index on the slightly eroded areas is 63±7 for loblolly pine, 55±8 for longleaf pine, 51±14 for shortleaf pine, and 63 for slash pine (estimated). The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 210 board feet (Scribner) for loblolly pine, 75 for longleaf pine, 100 for shortleaf pine, and 185 for slash pine (*3*).

Plant competition is slight to severe. It is slight in eroded areas because the eroded soils are too droughty for hardwoods. Turkey oak, sandhill post oak, bluejack oak, and wiregrass compete severely with the preferred species where the soils are uneroded. Intensive treatment is needed to control or eradicate competing vegetation and to prepare sites for seedlings. Such treatment may include brush cutting, furrowing, clearing, disking, and applying herbicides.

Seedling mortality is slight to severe. It is slight where the soils are gently sloping and not severely eroded. Where moisture conditions are favorable for natural regeneration, the seedling stands may be overstocked. Seedling mortality is severe in the eroded areas and in areas where the root zone is shallow because of unfavorable moisture supply and soil characteristics. Natural regeneration cannot be relied on for adequate restocking, and loss of more than 50 percent of planted stock can be expected. To establish adequate stands, it is necessary to plant high-quality seedlings and use superior planting techniques that include site preparation and mulching.

The equipment limitation is slight to severe. The use of equipment is severely limited on steep slopes, in severely eroded areas, and in areas that have a shallow rooting zone. The limitation is slight in other areas.

The erosion hazard is moderate to severe because the surface soil is loose and the subsoil is slowly permeable. The erosion hazard is moderate on slopes of less than 6 percent and in slightly eroded areas. It is severe on slopes of more than 6 percent and in severely eroded areas. Roads, fire-

Figure 21.—**An area of Mine pits and dumps before leveling. Investigation should be made at the site to determine the production potential and the conservation needs of the land types that make up woodland group 18.**

breaks, and furrows, which necessitate disturbance of the protective cover, should be carefully planned.

The windthrow hazard is moderate to severe. On the eroded soils and in areas that have a shallow root zone because of cementation or concretions, trees do not develop a stabilizing root system. In other places there is some hazard of windfall during high winds. If winds loosen or injure roots, a root-rot fungus (*fomes annosus*) or insects may damage trees to the extent that they have to be removed. Where the root zone is shallow, fire may damage roots severely.

WOODLAND GROUP 16

The only soil in this group is Bayboro loam (Ba), a very poorly drained soil that occupies nearly level areas and depressions. The surface layer is black loam, and the subsoil is sandy clay to clay. Infiltration and permeability are very slow. The available moisture capacity is high. Natural fertility is medium, and the organic-matter content is high.

Loblolly pine and slash pine are the preferred species. Water management may be necessary for maximum productivity. Sweetgum, blackgum, tupelo, cypress, red maple, and water-tolerant oaks are suitable also, and these species are important sources of food for wildlife.

This soil is suited to both sawtimber and pulpwood rotations and to the production of long poles and pilings.

The average site index for loblolly pine is 103±7, and for slash pine it is 106. The average annual growth per acre in well-stocked, unmanaged stands at 50 years is 740 board feet (Scribner) for loblolly pine and 680 for slash pine (*3*).

Plant competition is slight to severe. Sweetgum, oak, hickory, maple, and ground-cover vegetation compete severely with the pine and desirable hardwoods. Intensive treatment is needed to control or eliminate competing vegetation or to prepare sites for seedlings. If no particular species is preferred, the hazard of competition is unimportant.

Seedling mortality is moderate to severe because of slow surface runoff and ponding. Water management is necessary in many areas if seedlings are planted, or if good stands of preferred trees are to seed naturally. If adequate drainage outlets are not available, water-tolerant species should be selected for management.

The equipment limitation is severe because of the fine-textured surface layer, poor drainage, and ponding. The restriction may last for more than 3 months each year. Drainage and water management are needed for maintenance of roads and for full utilization of the sites. Operation of equipment during wet periods is likely to cause damage to the soil and to tree roots.

Windthrow and erosion are slight hazards.

Woodlands on this soil should not be grazed in wet weather.

WOODLAND GROUP 17

This group consists of deep, well-drained, gently sloping soils. The subsoil is friable sandy clay loam. Infiltration and permeability are moderately rapid or moderately slow. The available moisture capacity is high. Natural fertility is moderately high, and the organic-matter content is moderate. The soils are—

WkB Wickham sandy loam, 2 to 6 percent slopes.
WkB2 Wickham sandy loam, 2 to 6 percent slopes, eroded.

Loblolly pine is the preferred conifer. Shortleaf pine and Virginia pine are also suited. Longleaf pine and slash pine have been grown successfully. Yellow-poplar and black walnut are the preferred broadleaf species. Scarlet oak, northern red oak, black oak, white oak, and southern red oak are also suited. Oak, hickory, persimmon, and wild black cherry produce food for wildlife. Pine, redcedar, and ligustrums are suitable for windbreak plantings. Dogwood, redbud, holly, redcedar, sugar maple, basswood, oak, hickory, and pine are some of the native species suitable for urban use.

These soils are suited to both sawtimber and pulpwood rotations and to the production of poles and pilings of medium or short length.

The average site index for loblolly pine is 77±7; (on the moist sites it is 94±8); for shortleaf pine it is 65±7 (on the moist sites it is 79); and for Virginia pine it is 70±5 (*3*).

Plant competition is severe. In some places upland hardwoods compete severely with pine or with other hardwoods selected for management. It is necessary to prepare seedbeds and to control or eradicate competing vegetation by intensive practices that may include burning, clearing, disking, undercutting roots, cutting brush, and applying herbicides.

Seedling mortality is slight. Generally less than 25 percent of planted seedlings die. Natural reseeding is generally satisfactory if the supply of seed is adequate.

The equipment limitation is slight to moderate.

Windthrow and erosion are only slight hazards on these soils.

WOODLAND GROUP 18

This group consists of miscellaneous land types so varied that no detailed descriptions are given. They are—

Md Mine pits and dumps.
Mn Mixed alluvial land.
Sw Swamp.

These land types are unimportant for the commercial production of pine. Swamp, Mixed alluvial land, and leveled areas of Mine pits and dumps, if adequately drained and protected from floods, can be used for pine and, except for Mine pits and dumps, for selected hardwoods (figs. 21 and 22). Site indexes and hazards are not

Figure 22.—**An area of Mine pits and dumps after leveling. This is the same area shown in figure 21.**

listed in table 7. Investigation should be made at the site to determine the production potential and the conservation needs of these land types.

Woodland production and yields

Forest stands in Marlboro County have not been managed long enough to determine the total amount of wood that can be grown and harvested per acre in managed stands. If variation in soil quality is considered, it would seem that reasonably well-stocked stands, if carefully managed, should produce 400 to 500 board feet of sawtimber or 1 to 1½ cords of pulpwood an acre a year. Under favorable conditions this rate of growth often has been exceeded (*4*).

Table 8, based on published research (*12*), shows how site index ratings can be converted readily into cords or into board-foot measure. This table can be used as a guide until information on managed stands is available.

Management of the Soils for Wildlife and Fish [5]

The soils of Marlboro County have been placed in five groups on the basis of their capacity to provide food and

[5] W. W. NEELY, biologist, Soil Conservation Service, assisted in the preparation of this subsection.

TABLE 8.—*Stand and yield information for fully stocked, unmanaged*

[Statistics are compiled from United States Department of Agriculture Miscellaneous Publication No. 50.

Loblolly pine					Shortleaf pine				
Site index	Age	Total merchantable volume		Average diameter at breast height	Site index	Age	Total merchantable volume		Average diameter at breast height
	Years	*Cords*	*Board feet* (Scribner)	*Inches*		*Years*	*Cords*	*Board feet* (Scribner)	*Inches*
50	20				50	20			3. 2
	30					30	23	50	4. 8
	40					40	33	1, 450	6. 1
	50					50	43	4, 400	7. 3
	60					60	48	8, 150	8. 3
	70					70	51	11, 600	9. 1
	80					80	53	14, 400	9. 9
60	20	12		4. 6	60	20	12		3. 8
	30	25	1, 250	6. 6		30	32	750	5. 7
	40	35	4, 500	8. 1		40	46	4, 400	7. 3
	50	41	8, 550	9. 4		50	54	10, 600	8. 4
	60	46	12, 250	10. 4		60	60	15, 850	9. 7
	70	49	15, 250	11. 2		70	65	19, 700	10. 6
	80	51	17, 550	11. 9		80	68	22, 600	11. 4
70	20	17	100	5. 4	70	20	18		4. 5
	30	31	3, 500	7. 8		30	41	2, 400	6. 6
	40	42	9, 400	9. 6		40	56	9, 900	8. 4
	50	50	15, 200	10. 9		50	66	17, 850	9. 8
	60	55	19, 600	12. 1		60	73	23, 450	11. 0
	70	59	22, 550	13. 0		70	79	27, 550	12. 0
	80	62	24, 600	13. 8		80	83	30, 700	12. 8
80	20	22	700	6. 2	80	20	25	200	5. 2
	30	38	6, 500	8. 7		30	48	5, 200	7. 5
	40	51	14, 800	10. 7		40	65	16, 200	9. 5
	50	60	21, 700	12. 2		50	77	24, 900	11. 1
	60	66	26, 400	13. 6		60	85	30, 900	12. 3
	70	70	29, 500	14. 6		70	92	35, 200	13. 3
	80	73	31, 550	15. 5		80	97	38, 550	14. 2
90	20	27	1, 600	6. 9	90	20	30	1, 100	6. 1
	30	46	10, 700	9. 6		30	54	11, 200	8. 8
	40	61	20, 550	11. 7		40	73	23, 400	10. 9
	50	71	28, 250	13. 6		50	87	32, 400	12. 6
	60	78	33, 100	15. 0		60	98	38, 700	14. 0
	70	82	36, 600	16. 2		70	105	43, 000	15. 2
	80	85	39, 100	17. 2		80	112	46, 500	16. 2
100	20	32	2, 750	7. 4	100	20	33	3, 200	7. 3
	30	53	14, 800	10. 4		30	60	17, 700	10. 4
	40	71	26, 700	12. 8		40	82	30, 600	12. 8
	50	84	35, 050	14. 7		50	99	40, 000	14. 7
	60	92	41, 000	16. 2		60	111	46, 400	16. 2
	70	96	44, 750	17. 6		70	121	50, 900	17. 5
	80	100	47, 400	18. 6		80	128	54, 400	18. 6

cover for wildlife. (Mine pits and dumps are not included in any group.) Each group is made up of soils that support about the same kinds of wildlife in about the same numbers and that respond in about the same way to wildlife management practices.

There is a two-step relationship between wildlife species and groups of soils: birds and animals of given species prefer certain food plants, and each kind of plant grows best on soils that have particular characteristics.

The suitability of soils for wildlife management depends on (1) their productivity of native or planted food and cover; (2) their degree of wetness or droughtiness; (3) the hazard of overflow or severe erosion; (4) their suitability for necessary engineering practices.

Table 9 rates each group of soils according to suitability for the different kinds of wildlife in the county. The management of each group is discussed in the following pages.

Wildlife group A

The soils in this group support wildlife in greater numbers and wider variety than do any other soils in the

stands of loblolly pine, shortleaf pine, longleaf pine, and slash pine

Absence of figure indicates that timber of specified size is not generally used for the specific purpose]

Longleaf pine					Slash pine				
Site index	Age	Total merchantable volume		Average diameter at breast height	Site index	Age	Total merchantable volume		Average diameter at breast height
	Years	*Cords*	*Board feet* (Scribner)	*Inches*		*Years*	*Cords*	*Board feet* (Scribner)	*Inches*
50	20	4		2.8	50	20			
	30	11	200	4.1		30			
	40	17	900	5.1		40			
	50	21	2,100	5.9		50			
	60	25	3,700	6.6		60			
	70	28	5,400	7.2		70			
	80	31	7,250	7.8		80			
60	20	8	50	3.3	60	20	20		4.4
	30	19	900	4.9		30	32	1,050	6.1
	40	27	2,800	6.0		40	40	4,100	7.6
	50	34	5,900	7.0		50	45	7,500	8.6
	60	40	9,300	7.8		60	48	10,500	9.3
	70	45	12,350	8.5		70			
	80	49	15,000	9.1		80			
70	20	14	200	3.8	70	20	28		5.2
	30	28	2,000	5.5		30	40	3,500	7.3
	40	39	6,100	6.8		40	49	9,300	8.9
	50	48	11,400	7.9		50	55	14,250	10.0
	60	55	16,400	8.8		60	59	17,400	10.8
	70	62	20,400	9.6		70			
	80	67	23,700	10.3		80			
80	20	20	550	4.3	80	20	35	900	6.0
	30	36	3,800	6.1		30	48	7,300	8.3
	40	49	10,800	7.6		40	58	15,150	10.1
	50	61	17,600	8.8		50	65	20,350	11.4
	60	70	23,500	9.8		60	69	23,600	12.2
	70	78	28,300	10.6		70			
	80	85	32,100	11.5		80			
90	20	26	1,000	4.7	90	20	41	2,750	6.8
	30	43	6,500	6.7		30	54	12,300	9.4
	40	59	15,800	8.3		40	66	20,600	11.4
	50	72	24,100	9.6		50	73	25,900	12.9
	60	84	31,000	10.7		60	78	29,600	13.9
	70	94	36,200	11.6		70			
	80	103	40,600	12.5		80			
100	20	30	1,700	5.2	100	20	46	5,050	7.7
	30	49	10,150	7.4		30	59	16,850	10.5
	40	66	20,200	9.0		40	72	25,450	12.8
	50	82	29,550	10.5		50	81	31,250	14.5
	60	96	37,400	11.7		60	86	35,400	15.5
	70	108	43,000	12.7		70			
	80	118	48,100	13.7		80			

TABLE 9.—*Suitability of soils for wildlife*

[A rating of 1 means the soils of the specified group are well suited, 2 means suited but there are some limitations, 3 means marginal, and 4 means not suited]

Wildlife species	Wildlife suitability group				
	A	B	C	D	E
Quail	1	2	2	3	4
Deer	1	3	1	1	1
Doves	1	3	1	3	4
Ducks in fields	3	4	2	1	3
Ducks in woodland ponds	3	4	1	1	2
Fish in ponds	1	2	2	3	4
Foxes	1	1	1	4	4
Opossums	1	2	2	4	3
Rabbits	1	3	2	3	4
Raccoons	2	3	2	1	2
Squirrels	1	3	2	1	1
Snipe	4	4	3	1	4
Wild geese	3	4	1	2	4
Wild turkeys	1	3	2	1	1

county, and they are generally easier to manage successfully. The soils in this group are—

CaA Cahaba fine sandy loam, 0 to 2 percent slopes.
CaB Cahaba fine sandy loam, 2 to 6 percent slopes.
CfA Caroline fine sandy loam, 0 to 2 percent slopes.
CfB Caroline fine sandy loam, 2 to 6 percent slopes.
CfB2 Caroline fine sandy loam, 2 to 6 percent slopes, eroded.
Co Congaree fine sandy loam.
CvA Craven fine sandy loam, 0 to 2 percent slopes.
FaA Faceville loamy sand, 0 to 2 percent slopes.
FaB Faceville loamy sand, 2 to 6 percent slopes.
FaB2 Faceville loamy sand, 2 to 6 percent slopes, eroded.
FfA Flint fine sandy loam, 0 to 2 percent slopes.
FfB Flint fine sandy loam, 2 to 6 percent slopes.
FfB2 Flint fine sandy loam, 2 to 6 percent slopes, eroded.
FfC Flint fine sandy loam, 6 to 12 percent slopes.
GaA Gilead sand, 0 to 2 percent slopes.
GaB Gilead sand, 2 to 6 percent slopes.
GaC Gilead sand, 6 to 10 percent slopes.
GbA Gilead sand, thick surface, 0 to 2 percent slopes.
GbB Gilead sand, thick surface, 2 to 6 percent slopes.
GbC Gilead sand, thick surface, 6 to 10 percent slopes.
KaA Kalmia loamy fine sand, 0 to 2 percent slopes.
KaB Kalmia loamy fine sand, 2 to 6 percent slopes.
KbA Kalmia loamy fine sand, thick surface, 0 to 2 percent slopes.
MaA Magnolia loamy sand, 0 to 2 percent slopes.
MaB2 Magnolia loamy sand, 2 to 6 percent slopes, eroded.
MbA Marlboro loamy sand, 0 to 2 percent slopes.
MbB Marlboro loamy sand, 2 to 6 percent slopes.
MbB2 Marlboro loamy sand, 2 to 6 percent slopes, eroded.
MbC2 Marlboro loamy sand, 6 to 12 percent slopes, eroded.
NoA Norfolk loamy sand, 0 to 2 percent slopes.
NoB Norfolk loamy sand, 2 to 6 percent slopes.
NoB2 Norfolk loamy sand, 2 to 6 percent slopes, eroded.
NoC Norfolk loamy sand, 6 to 10 percent slopes.
NtA Norfolk loamy sand, thick surface, 0 to 2 percent slopes.
NtB Norfolk loamy sand, thick surface, 2 to 6 percent slopes.
NtC Norfolk loamy sand, thick surface, 6 to 10 percent slopes.
RsA Ruston loamy sand, 0 to 2 percent slopes.
RsB Ruston loamy sand, 2 to 6 percent slopes.
RsB2 Ruston loamy sand, 2 to 6 percent slopes, eroded.
RsC2 Ruston loamy sand, 6 to 10 percent slopes, eroded.
RtA Ruston loamy sand, thick surface, 0 to 2 percent slopes.
RtB Ruston loamy sand, thick surface, 2 to 6 percent slopes.
RtC Ruston loamy sand, thick surface, 6 to 10 percent slopes.
WkB Wickham sandy loam, 2 to 6 percent slopes.
WkB2 Wickham sandy loam, 2 to 6 percent slopes, eroded.

These soils are suited to many plants that provide food and cover for quail, deer, doves, ducks, rabbits, squirrels, and wild turkeys. Suitable sites for fishponds and game farms are available.

QUAIL.—Bicolor lespedeza is a dependable food that can be grown on these soils. It should be planted to strips along the edges of fields or in openings in the woods. These soils are also suited to tickclover and other perennials that provide food for quail, and to annuals, such as browntop millet and annual lespedeza.

The woodlands can be improved as quail habitats by a carefully planned program of controlled burning. Generally, this practice should be confined to the gently sloping soils because of the erosion hazard resulting from the temporary loss of ground cover. Burning removes the duff and, by controlling hardwood sprouts, helps to keep areas open for shooting.

DEER.—The soils in this group are well suited to grasses and legumes that provide food for deer. White clover, crimson clover, and rescuegrass are good winter food crops. Fields seeded to attract deer should be 1 to 5 acres in size. Proper use of lime and fertilizer makes the plants more palatable and attractive. Mixed stands of hardwoods provide good habitats and a variety of natural food. Some native trees and plants that furnish food for deer are water oak, blackgum, red maple, white bay, blackberry, grasses, herbs, greenbrier, and switchcane. After the trees are harvested, new browse will grow in the openings. Oak trees that bear acorns heavily should be left standing. Cutting the competing trees helps to increase the acorn crop. Cattle and hogs compete with deer for food.

DOVES.—Corn and soybeans are widely grown on the soils of this group. The waste left when these crops are hogged down or harvested mechanically furnishes good food for doves in fall and early in winter. Excellent dove fields can be established by planting browntop millet in rows. Applications of 500 to 600 pounds of fertilizer, such as 5–10–10, are necessary for good seed production.

DUCKS.—Because of their position and slope and the lack of suitable sources of water, the soils in this group are generally not suited to flooding for duck fields. A few level areas can be drained, diked, and planted to corn, which is the most suitable food that can be grown on these soils. Browntop millet is also a choice food that is highly productive. A well or some other source of water is necessary to flood the planted fields in fall and winter. In some places a reservoir can be constructed above a duck field to store water for flooding.

FISH.—Some of the best sites for impounded fishponds are in draws and valleys associated with this group of soils. These soils also provide good material for constructing dams to impound the water. The watersheds from which water drains into the ponds should be small.

RABBITS.—These are the best soils in the county for rabbits. A variety of natural food is generally available, and planting is unnecessary. Thorny vegetation is needed for protection against predators. Living fences of multiflora rose provide good protective cover.

SQUIRRELS.—Some of the woodlands on these soils are favorable for both gray squirrels and fox squirrels. The squirrel population depends on the number of hardwood trees. Squirrels seldom inhabit predominantly pine

forests. Trees that produce some choice natural food are beech, black cherry, dogwood, hickory, oak, pecan, and pine. Corn is the farm crop eaten most often by squirrels.

WILD TURKEYS.—The soils of this group are well suited to grasses and legumes that provide food for wild turkeys. The species of plants and size of plantings suitable for deer are also best for turkeys. The grazing fields should be no more than one-half mile from water. Bahiagrass that is planted in firebreaks or on the shoulders of access roads provides food in August and September.

The woodlands also provide choice natural foods. From October to March about 25 percent of the food is acorns, and from September to April about 1 to 15 percent is dogwood berries. Wild turkeys prefer beechnuts, but they are not abundant on these soils.

Wildlife group B

The soils in this group produce only a small amount of native food and cover for wildlife; consequently, the wildlife population is small. To attract wildlife, plants suitable for food should be planted and liberally fertilized. Perennials need to be fertilized every year. The soils in this group are—

EbB	Eustis loamy sand, terrace, 0 to 6 percent slopes.
EdB	Eustis sand, 0 to 6 percent slopes.
EmA	Eustis sand, moderately shallow, 0 to 2 percent slopes.
EmB	Eustis sand, moderately shallow, 2 to 6 percent slopes.
EmC	Eustis sand, moderately shallow, 6 to 10 percent slopes.
LaB	Lakeland sand, 0 to 6 percent slopes.
LaC	Lakeland sand, 6 to 10 percent slopes.
LaD	Lakeland sand, 10 to 15 percent slopes.
LgC	Lakeland sand, gravelly variant, 0 to 10 percent slopes.
LgD	Lakeland sand, gravelly variant, 10 to 15 percent slopes.
LkA	Lakeland sand, moderately shallow, 0 to 2 percent slopes.
LkB	Lakeland sand, moderately shallow, 2 to 6 percent slopes.
LkC	Lakeland sand, moderately shallow, 6 to 10 percent slopes.
LnB	Lakeland sand, terrace, 0 to 6 percent slopes.
Lo	Lakewood sand.
MoB	Molena loamy sand, 0 to 10 percent slopes.
VaB	Vaucluse sand, 2 to 6 percent slopes.
VaC	Vaucluse sand, 6 to 10 percent slopes.
VaC2	Vaucluse sand, 6 to 10 percent slopes, eroded.
VaD	Vaucluse sand, 10 to 15 percent slopes.
VaD2	Vaucluse sand, 10 to 15 percent slopes, eroded.
VaE2	Vaucluse sand, 15 to 25 percent slopes, eroded.
VgD2	Vaucluse sand, gravelly variant, 10 to 15 percent slopes, eroded.
VkB	Vaucluse sand, thick surface, 2 to 6 percent slopes.
VkC	Vaucluse sand, thick surface, 6 to 10 percent slopes.
VkD	Vaucluse sand, thick surface, 10 to 15 percent slopes.

Except for the steep and eroded Vaucluse soils, these soils are suited to perennial legumes and other plants that furnish food and cover for quail, deer, doves, ducks, rabbits, squirrels, and wild turkeys. Some sites are suitable for fishponds.

The soils of this group provide excellent locations for commercial shooting preserves managed for put-and-take shooting. The soils are permeable, so little hunting time is lost because of rain. Maintaining the open areas desirable for shooting is easy because the vegetation grows slowly. Native stands of wiregrass provide places from which to release birds. Establishing release cover plantings is difficult, but grain sorghum or sudangrass can be grown if very large amounts of a complete fertilizer are applied. Sites suitable for ponds from which to release mallards are available.

QUAIL.—These soils can produce food and cover for a large number of quail, but intensive management is needed. Because the soils are droughty, annuals are likely to fail 1 year out of 3, and perennials are a more dependable source of food. Bicolor lespedeza is a dependable perennial if fertilizer, such as 0–14–14, is applied every year. Because the soils are light textured, transplanting is more satisfactory than seeding.

DEER.—The soils in this group are the poorest in the county for deer fields, but in some parts of the county, none better suited as a source of deer food are available. Crimson clover and chufa can be grown on carefully selected sites.

DOVES.—These soils are not generally suited to plants grown specifically for dove food, but watermelons are grown on some of the soils, and doves will feed on the seeds of the waste melons left in the field when the crop is harvested. They also eat crabgrass seed.

DUCKS.—These soils are so porous that the shallow flooding required for duck fields is not practical, even where flat areas are available.

FISH.—Some good sites for fishponds occur in draws and valleys, and in many places there is a dependable flow of water that keeps the ponds filled. The greatest disadvantage is the lack of suitable material for building dams. Because water is likely to be either slightly acid or deficient in calcium, fish will grow slowly unless lime is added.

RABBITS.—Suitable protective cover for rabbits is generally lacking on these soils. Small plantings of thorny vegetation would provide some protection from predators.

SQUIRRELS.—Turkey oak, blackjack oak, and post oak grow on these soils, but they do not produce acorns regularly enough to make the areas suitable as permanent habitats for squirrels. The crop of pine mast is irregular, also. Fox squirrels are more common in these areas than gray squirrels.

WILD TURKEYS.—Chufa or crimson clover planted on some of the less droughty sites would furnish winter food for wild turkeys, but unless there are soils of group D or group E within half a mile, efforts to attract turkeys are not likely to succeed.

Wildlife group C

The soils in this group are nearly level and wet, but they are highly productive if drained. Wildlife food crops can be grown only in drained areas or in those that have the best natural drainage. The soils in this group are—

Db	Dunbar fine sandy loam.
Dd	Dunbar sandy loam.
GoA	Goldsboro loamy sand, 0 to 2 percent slopes.
Iz	Izagora fine sandy loam.
Lv	Local alluvial land.
Ly	Lynchburg loamy sand.

These soils are suited to plants that provide food and cover for quail, deer, doves, ducks, rabbits, squirrels, and wild turkeys. Some sites suitable for fishponds are available.

QUAIL.—In adequately drained areas of these soils, bicolor lespedeza can be grown as food for quail. It should be planted in strips along or near drainage ditches. For undrained areas the choice is limited, but a combination of browntop millet and sesbania in adjacent strips is

suitable. The millet furnishes food early in fall, and the sesbania later in winter. Quail are sometimes driven from their nests in undrained areas by heavy or prolonged rains.

Woodlands can be improved as quail habitats by a carefully planned program of controlled burning to remove the duff and to keep areas open for shooting.

DEER.—The soils in this group are well suited to grasses and legumes that provide food for deer. White clover, crimson clover, and rescuegrass are good winter food crops. Fields seeded to attract deer should be 1 to 5 acres in size. Liming and fertilizing make the plants more palatable and attractive.

Native stands of water oak, blackgum, red maple, white bay, blackberry, grasses, herbs, greenbrier, and switchcane furnish food and cover for deer. After the trees are harvested, new browse will grow in the openings. Oak trees that bear acorns heavily should be left standing. If competing plants are destroyed, the acorn yield will increase. Cattle and hogs compete with deer for food.

DOVES.—Excellent dove fields can be established on soils of this group by planting browntop millet in rows. Applications of 500 to 600 pounds of fertilizer, such as 5–10–10, are necesary for good seed production. In fall and winter, doves also feed on waste corn and soybeans in fields that have been hogged down or harvested mechanically.

DUCKS.—Some excellent sites for upland duck fields occur on the soils of this group. In constructing duck fields, drained areas are enclosed with low dikes, planted to suitable food crops, then flooded in fall and winter. Corn is the best food crop that can be grown on these soils. Browntop millet is also well suited. A source of water for flooding is required, and generally pumping is necessary. In some places reservoirs can be built at higher elevations to store water for flooding.

Some of the lower lying wooded areas are good sites for woodland duckponds. A suitable site is a flat, wooded draw, several acres in size, that can be flooded to a depth of 1 to 15 inches by building a dike and a water-control structure at its lower end. By leaving the control structure open in spring and summer, the pond can be drained. It is flooded only in winter. Year-round flooding kills the trees, but winter flooding encourages the growth of commercial hardwoods. Acorns and beechnuts are choice duck foods. Smartweed and panicum furnish additional food in areas where the tree canopy is open. Brushy areas can be cleared and planted to browntop millet or smartweed.

FISH.—There are suitable sites for fishponds on the soils of this group, but many sites are not suitable, because a pond would have too large an area of shallow water or too large a watershed.

RABBITS.—The rabbit population is low to medium. Cottontail rabbits do not seem to thrive on these wet soils, although food and cover are available.

SQUIRRELS.—These soils provide less variety of squirrel food than those in group A, but some woodland areas are favorable habitats for gray squirrels and fox squirrels. The squirrel population depends on the number of hardwood trees. Squirrels seldom inhabit predominantly pine forests. Trees that produce natural food for squirrels are beech, black cherry, dogwood, hickory, oak, pecan, and pine. Corn is the most suitable farm crop.

WILD TURKEYS.—The soils in this group are well suited to the grasses and legumes that provide food for wild turkeys. White clover, crimson clover, and rescuegrass are suitable winter food crops. The plantings should be from 1 to 5 acres in size and no more than one-half mile from water. Bahiagrass planted in firebreaks or on the shoulders of access roads provides food in August and September.

The woodlands also furnish choice natural food for turkeys. Acorns provide about 25 percent of the food between October and March, and dogwood berries furnish from 1 to 15 percent of the food between September and April. Wild turkeys prefer beechnuts, which are not abundant on these soils.

Wildlife group D

Most of the soils in this group are wet and difficult to drain and are poorly suited to crops and pasture. Much of the acreage is wooded. If properly managed, these areas are excellent habitats for deer, wild turkeys, and squirrels. Cleared areas provide good sites for waterfowl. The soils in this group are—

Ba	Bayboro loam.
Ch	Chewacla silt loam.
Cs	Coxville fine sandy loam.
Ct	Coxville fine sandy loam, thin surface.
Cu	Coxville sandy loam.
Gr	Grady loam.
Kd	Klej loamy sand.
Lp	Leaf fine sandy loam.
Lr	Lenoir loam.
Mc	McColl loam.
Wa	Wahee very fine sandy loam.

These soils are suited to plants that furnish food for deer, ducks, squirrels, wild geese, and wild turkeys. They are not suited to food plants for quail, doves, and rabbits. Generally, they are poor sites for fishponds, because impounding water deep enough for fish is difficult.

DEER.—Water oak, blackgum, red maple, blackberry, greenbrier, switchcane, white bay, herbs, and grasses are native trees and plants that furnish food for deer. After the trees are harvested, new browse grows in the sunlit openings. Oak trees that bear acorns heavily should be left standing. Cutting the competing trees helps to increase the acorn yield. Cattle and hogs compete with deer for food.

DUCKS.—The soils in this group provide some excellent sites for duck fields. Dikes and water-control structures are required to permit flooding in winter and draining in summer. The field should be dry enough in summer to support farm machinery. Browntop millet and Japanese millet are choice food plants that can be grown on these soils. Smartweed, another choice duck food, generally grows naturally in sites that are properly managed. Moderate grazing encourages the growth of smartweed, because cattle will not eat it but will eat competing plants. Regardless of the kind of plants grown, the field must be flooded to a depth of 8 to 12 inches in fall and winter.

The woodlands also provide good sites for duckponds. A flat wooded draw, several acres in size, can be diked and flooded to a depth of 1 to 15 inches or more in winter. A water-control structure at the lower end of the draw can be opened in spring and summer to drain the pond. The ponds should be flooded only in winter. Acorns and

beechnuts are choice foods. Smartweed and panicgrass furnish additional food in areas where the tree canopy is open. Brushy areas can be cleared and planted to browntop millet or smartweed.

SQUIRRELS.—The soils of this group furnish good habitats for gray squirrels but not for fox squirrels. Dens generally are available in the cavities of old trees. Squirrels eat the buds and bark of hardwoods early in spring and the seeds of maple trees in spring and summer. Blackgum, magnolia, and oak trees produce choice winter food.

WILD GEESE.—Geese feed in the duck fields. They are attracted by the native aquatic plants that volunteer in these fields.

WILD TURKEYS.—Turkeys roost in many of the small ponded areas in this group of soils. They generally nest at a slightly higher elevation, but within a few hundred feet of these wet areas. The same management that attracts deer will attract turkeys. Acorns are the choice winter food. Panicgrass and paspalum, which grow in the openings made by logging operations, are important foods. These grasses attract grasshoppers and crickets, which are another important food, particularly for the young turkeys.

Wildlife group E

The soils in this group are difficult to manage for wildlife. They are generally not suited to agricultural crops unless they are diked and drained. For all types of wildlife except ducks, management would consist of improving the native vegetation. The soils and land types in this group are—

Mn	Mixed alluvial land.
Mt	Myatt sandy loam.
Pm	Plummer loamy sand.
Po	Portsmouth and Okenee loams.
Ra	Rains sandy loam.
Ru	Rutlege loam.
Rv	Rutlege loamy sand.
Sw	Swamp.
Wd	Wehadkee silt loam.

These soils provide suitable habitats for deer, ducks, squirrels, and wild turkeys but not for quail, doves, and rabbits. There are few sites suitable for fishponds.

DEER.—Water oak, blackberry, blackgum, greenbrier, red maple, switchcane, white bay, grasses, and herbs are native trees and plants that furnish food for deer. After trees are harvested, new browse will grow in the sunlit openings. Oak trees that bear acorns heavily should be left standing. The acorn crop will increase if competing trees are cut. Cattle and hogs compete with deer for food.

DUCKS.—Because it is difficult to control water on soils of this group, only a limited number of sites are suitable for duck fields. Many areas do not have drainage outlets. Dikes and water-control structures can be built in areas that have drainage outlets that permit flooding in winter and draining in summer. The field should be dry enough in summer to support farm machinery. Browntop millet and Japanese millet are choice food plants that can be grown. Smartweed, another choice duck food, generally grows naturally if the sites are properly managed. Moderate grazing encourages the growth of smartweed because cattle will not eat it but will eat the competing plants. Regardless of the kinds of plants grown, the field must be flooded to a depth of 8 to 12 inches in fall and winter. Woodland areas that cannot be drained well enough for plantings provide good sites for duckponds.

FISH.—There are very few good sites for fishponds on the soils of this group. In most areas impounded ponds would have too much shallow water, and pondweeds would invade. Also, the watersheds would be too large for effective management. Ponds have been excavated in some areas and are used as a source of irrigation water, but overflow from the adjacent areas is likely to bring in wild fish and permit the stocked fish to escape.

SQUIRRELS.—The wooded areas of these soils are better suited to gray squirrels than to fox squirrels. Choice food for the winter months is produced by blackgum, magnolia, and oak trees. Early in spring squirrels eat the buds and bark of several species of hardwoods, and in spring and summer they eat maple seeds. Old trees with cavities, suitable for den trees, are common.

WILD TURKEYS.—Turkeys roost in many of the small ponded areas on the soils of this group. They generally nest at a slightly higher elevation, but within a few hundred feet of these wet areas. The same management that attracts deer will attract turkeys. Acorns are the choice winter food. Panicgrass and paspalum, which grow in the openings made by logging, are important foods. These grasses attract grasshoppers and crickets, which are another important food, particularly for the young turkeys.

Formation, Classification, and Morphology of the Soils

In this section, the factors that have affected the formation of the soils in Marlboro County are discussed, the system of soil classification used in the United States is briefly described, the soils of the county are classified, and the outstanding morphological characteristics of these soils are described.

Factors of Soil Formation

The factors that contribute to the differences among soils are parent material, climate, living organisms, relief, and time. All of these factors are important, but the relative importance of each differs from place to place.

The active forces that gradually form a soil from parent material are climate and plant and animal life. Relief, in most places, largely controls natural drainage. It, therefore, influences the effectiveness of the active soil-forming processes. If the parent material has not been in place long enough for climate and living organisms to produce a soil that is nearly in equilibrium with its environment, the soil is considered young. When a soil has developed certain definite characteristics and has a well-developed profile, it is said to be mature.

Generally, the soil-forming process is complex. Each force interacts with others, and slowly, but constantly, changes are brought about. The soil itself is a complex substance; it is constantly changing and never reaches a static condition. It passes slowly through stages that may be considered as youth, maturity, and even old age. Thus, the character and thickness of a soil depend upon the intensity of the soil-forming processes, the length of time

during which the processes have acted, and the resistance of the parent material to change.

At any stage of its history, a soil may be affected by mechanical processes. For example, the surface layer may be wholly or partly removed by erosion and the material beneath exposed. Then, the soil-forming processes begin working on the exposed material to form a new surface layer. Whether or not erosion is beneficial depends on the rate at which soil material is removed and on the supply of plant nutrients available in the new surface layer. Normal erosion may improve the soil. Accelerated erosion generally is caused by misuse of the land and is almost always detrimental.

Parent material

Marlboro County is in the middle and upper parts of the Atlantic Coastal Plain of northeastern South Carolina. It it is in the Red-Yellow Podzolic soil zone of the southeastern part of the United States (*7*). The soils have formed from materials that were transported by the waters of the Atlantic Ocean and coastal streams and deposited as beds of unconsolidated, acid sands and clays.

Geologically, Marlboro County consists of marine terraces that probably were under some fluvial influence in the Pleistocene epoch. There are four marine terraces in the county: the Brandywine, the Coharie, the Sunderland, and the Penholoway (*2*). The Sand Hills in the northern part of the county are a part of the Brandywine and Coharie terraces, but the material may have been reworked by wind or water after it was deposited. The elevations of the terraces are as follows: Brandywine, 215 to 270 feet; Coharie, 170 to 215 feet; Sunderland, 100 to 170 feet; and Penholoway, 70 to 100 feet. The Sand Hills are somewhat higher; the elevation in some places is 300 feet or more. The unconsolidated sediments deposited on these terraces by the ocean are sand, sandy clay loam, sandy clay, and clay.

Alluvial materials that consist of sand, gravel, silt, and clay have been deposited in the valleys of all the major streams and of some of their tributaries. These deposits are recent and show little evidence of soil development. Colluvial deposits, made up largely of sandy materials, occur along the upper drainageways of the uplands. Soils formed in the colluvial deposits generally are sandy and do not have well-developed profiles.

Climate

Marlboro County has a warm, humid, continental type of climate. The average annual temperature is about 62 degrees. Rainfall is abundant. It averages about 46 inches a year. The amount of rainfall is slightly greater in spring and summer than in fall and winter. The average temperatures and the distribution of rainfall by months are given in table 11, page 105.

Because the climate of this county is warm and the soils are moist much of the time, chemical reactions in the soils are rapid. The large amount of rainfall promotes the removal of soluble material by leaching and the downward movement of the less soluble, fine materials. Weathering is further hastened by the lack of prolonged periods during which the soil is frozen.

Some of the variations in plant and animal life are caused by the action of climatic forces on the soil material. To that extent, climate influences the changes in the soil that are brought about by differences in the plant and animal population.

Living Organisms

Plants, micro-organisms, earthworms, and other forms of life that live on and in the soil are active in the soil-forming processes. The changes they bring about depend mainly on the kind of life processes peculiar to each. The kinds of plants and animals are determined by the climate, parent material, relief, age of the soil, and by other organisms.

Generally, the kind of soil in an area varies according to the kind of vegetation. In Marlboro County the soils formed under three types of vegetation: (1) pine-hardwood forest; (2) cypress-swamp hardwood forest in which there was some pond pine; and (3) southern white-cedar-swamp hardwood forest in which there was some cypress and pond pine.

The soils that formed under a pine-hardwood forest are the most extensive in the county. They are poorly drained to well-drained mineral soils that have a light-colored surface layer in which the content of organic matter is about 1 to 3 percent.

Poorly drained mineral soils formed under a cypress-swamp hardwood forest in which there were some pond pines. These soils have a dark-gray or black surface layer. In forested areas the organic-matter content of the surface layer is 5 to 15 percent. The water table is at the surface part of the time, but for significant periods it is low enough to permit oxidation of the organic matter.

In a few small swampy areas are soils that have a surface layer that is 5 to 20 percent organic matter. These soils formed under a southern whitecedar and swamp hardwood forest that included a little pond pine and some cypress. Water stood at or near the surface most of the time.

Relief

Relief strongly influences drainage, aeration, runoff, erosion, and exposure to sun and wind. By its effect on natural drainage, it modifies the effects of the other factors of soil formation. Several different soils may form in similar parent material because of differences in drainage. Most of Marlboro County is a nearly level to gently sloping plain. There are, however, four general landscapes that affect the formation of the soils. These landscapes are—

1. The Sand Hills. This area is rolling and is deeply dissected by streams. The soils on the ridges are deep and sandy, but those on side slopes adjacent to the streams have a shallow to moderately thick solum.
2. Gently sloping to sloping, moderately dissected areas below the Sand Hills. The soils are mostly well drained and have a thick solum.
3. Broad, slightly dissected, nearly level areas between streams. Most of the soils in these areas are yellow to gray, and many are distinctly mottled. They are poorly drained to moderately well drained and have a thick solum.
4. Valley floors, stream bottoms, and low terraces. The soils in these areas are young, are predominantly gray (gleyed), and have poorly defined genetic layers.

Time

The degree of horizonation in the soil profile is the chief measure of the effect of time in the formation of soils. Parent material and slope, however, affect the length of time required for a soil to form. Because Marlboro County is warm and humid, less time is required for a soil to form a distinct profile than is required in dry or cold regions. Also, less time is required for the formation of a distinct profile in moderately fine textured Coastal Plain deposits than in coarse-textured deposits. The soils of Marlboro County range from young and only slightly developed to mature and well developed, although soil maturity is not so striking as in some older landscapes.

Morphology and Classification

One of the main objectives of a soil survey is to describe and identify the soils and determine their relationship to agriculture. A second objective is to group the soils according to characteristics. Such a grouping shows the relationship of the soils to one another and to soils of other areas. This grouping is necessary because there are so many different kinds of soils that it would be difficult to remember the characteristics of all of them. If the soils that share a number of characteristics are classified by groups, the nature of those soils is more easily remembered.

The comprehensive system of soil classification used in the United States consists of six categories (*10*). Beginning with the most inclusive, these categories are the order, the suborder, the great soil group, the family, the series, and the type. There are three orders and thousands of types. The suborder and family categories have never been fully developed and consequently have been little used.

The lower categories of classification—the soil series and soil types—are defined in the section "How Soils Are Named, Mapped, and Classified." The soil phase, a subdivision of the soil series, is also defined in that section.

All three soil orders—the zonal, intrazonal, and azonal—are represented in Marlboro County. The great soil groups recognized in the county are Red-Yellow Podzolic soils, Low-Humic Gley soils, Humic Gley soils, Planosols, Regosols, and Alluvial soils. Some of the soils are not representative of the central concept of any one great soil group but are intergrades between one group and another. The classification of the soils in this county is based largely on characteristics observed in the field. It may be revised as knowledge of the soils increases.

The soil series of Marlboro County are listed by orders and great soil groups in table 10. This table also gives some of the distinguishing characteristics of each series. The soil order and the great soil group are described briefly in the subsequent paragraphs. The soil series are also classified into great soil groups, and a typical profile of each series is described. (The miscellaneous land types—Local alluvial land, Mine pits and dumps, Mixed alluvial land, and Swamp—are not classified.)

The *zonal order* consists of soils that have well-developed characteristics that reflect the predominant influence of climate and living organisms in their formation. Zonal soils are considered normal because their profiles are essentially in equilibrium with the climate as well as with the other soil-forming factors. All of the zonal soils in Marlboro County are in the Red-Yellow Podzolic great soil group.

The *intrazonal order* consists of soils that have more or less well-developed characteristics that reflect the dominating influence of some local factor, such as relief or parent material, over the normal influence of climate and living organisms. In places intrazonal soils occur in association with zonal soils. The intrazonal soils in this county are in the Low-Humic Gley, Humic Gley, and Planosol great soil groups.

The *azonal order* consists of soils that lack well-developed profile characteristics, either because of their youth or because the nature of their parent material or their relief prevents normal development of such characteristics. The azonal soils in this county belong to the Regosol and Alluvial great soil groups.

Red-Yellow Podzolic group

The Red-Yellow Podzolic great soil group is made up of well-drained, acid soils that have well-developed profiles. These soils have a thin organic A0 horizon and an organic-mineral A1 horizon over a light-colored, bleached A2 horizon. The A2 horizon rests on a red, yellowish-red, or yellow, more clayey B horizon. The parent material is more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic of the deep horizons of certain of the Red-Yellow Podzolic soils that are underlain by a thick layer of parent material.

Red-Yellow Podzolic soils form under deciduous, coniferous, or mixed forests in a humid, warm-temperate climate. Under such conditions the decomposition of organic matter and the leaching of plant nutrients are rapid. Consequently, the soils are acid to very strongly acid and are low in calcium, magnesium, and other bases. The clay fraction is commonly dominated by kaolinite. It generally contains moderate to large amounts of free iron oxides or hydroxides, or it may contain small amounts of aluminum. Hydrous mica, montmorillonite, or both, may form part of the clay fraction in some of the soils. The Red-Yellow Podzolic soils in Marlboro County have a base-exchange capacity ranging from 8 to 20 milliequivalents per 100 grams of soil. The base saturation is less than 35 percent and generally about 15 percent.

The differences in morphology among the Red-Yellow Podzolic soils in this county are largely, but not entirely, associated with the nature of the parent material, especially with its texture. In cultivated areas the soil materials in the A0 and A1 horizons have been so mixed that the two horizons are no longer distinguishable. Where accelerated erosion has occurred, much or all of the A horizon has been removed. A few soils of this group, especially the more sandy soils, lack the horizon that has reticulate streaks or mottles.

The soils in Marlboro County that most nearly fit the central concept of Red-Yellow Podzolic soils are those of the Cahaba, Caroline, Craven, Faceville, Flint, Gilead, Goldsboro, Kalmia, Magnolia, Marlboro, Norfolk, Ruston, Vaucluse, and Wickham series. The Dunbar, Izagora, Lenoir, Lynchburg, and Wahee soils are also classified as Red-Yellow Podzolic soils but they have some characteristics of Low-Humic Gley soils and are considered intergrades toward that great soil group. All of the soils grading toward Low-Humic Gley have characteristics as-

TABLE 10.—*Classification of soils by order, great soil group, and series, and some distinguishing characteristics*

Order, group, and series	Slope range	Brief profile description [1]	Natural drainage class	Parent material
Zonal order:				
Red-Yellow Podzolic group:				
Central concept:	*Percent*			
Cahaba series	0 to 6	Dark-brown to yellowish-brown fine sandy loam over yellowish-red sandy clay loam.	Well drained	Unconsolidated sand and clay.
Caroline series	0 to 6	Pale-brown fine sandy loam over strong-brown fine sandy clay mottled with brownish yellow.	Well drained	Unconsolidated sand and clay.
Craven series	0 to 2	Very dark gray fine sandy loam over yellowish-brown clay mottled with grayish brown.	Moderately well drained.	Unconsolidated sandy clay and clay.
Faceville series	0 to 6	Grayish-brown loamy sand over yellowish-red sandy clay.	Well drained	Unconsolidated sand and clay.
Flint series	0 to 12	Grayish-brown sandy loam over reddish-yellow, firm, sticky clay.	Moderately well drained.	Unconsolidated sand and clay.
Gilead series	0 to 10	Grayish-brown sand over yellowish-brown and strong-brown, compact sandy clay.	Well drained	Unconsolidated sand and clay.
Goldsboro series	0 to 2	Dark grayish-brown loamy sand over light olive-brown sandy clay loam mottled with light gray.	Moderately well drained.	Unconsolidated sand and clay.
Kalmia series	0 to 6	Grayish-brown loamy fine sand over yellowish-brown sandy clay loam.	Moderately well drained.	Unconsolidated sand and clay.
Magnolia series	0 to 6	Dark-brown loamy sand over red, friable, sticky sandy clay.	Well drained	Unconsolidated sand and clay.
Marlboro series	0 to 12	Dark grayish-brown loamy sand over yellowish-brown, friable, sticky sandy clay.	Well drained	Unconsolidated sand and clay.
Norfolk series	0 to 10	Grayish-brown loamy sand over yellowish-brown, friable sandy clay loam.	Well drained	Unconsolidated sand and clay.
Ruston series	0 to 10	Dark-brown loamy sand over yellowish-red, friable sandy clay loam.	Well drained	Unconsolidated sand and clay.
Vaucluse series	2 to 25	Dark grayish-brown sand over yellowish-red, firm to cemented sandy clay loam.	Well drained	Unconsolidated sand and clay.
Wickham series	2 to 6	Reddish-brown sandy clay over red sandy clay loam.	Well drained	Unconsolidated sand and clay.
Grading toward Low-Humic Gley group:				
Dunbar series	0 to 2	Dark-gray sandy loam over light olive-brown sandy clay mottled with strong brown and brownish yellow.	Somewhat poorly drained.	Unconsolidated sand and clay.
Izagora series	0 to 2	Dark-gray fine sandy loam over light olive-brown sandy clay loam mottled with light brownish gray.	Somewhat poorly drained or moderately well drained.	Unconsolidated sand and clay.
Lenoir series	0 to 2	Dark-gray loam over grayish-brown, firm clay mottled with yellowish brown and red.	Somewhat poorly drained.	Unconsolidated sandy clay and clay.
Lynchburg series	0 to 2	Dark-gray sandy loam over light brownish-gray sandy clay loam mottled with gray and brown.	Somewhat poorly drained.	Unconsolidated sand and clay.
Wahee series	0 to 2	Very dark gray very fine sandy loam over light yellowish-brown, red, and gray clay.	Somewhat poorly drained or moderately well drained.	Unconsolidated sandy clay and clay.
Intrazonal order:				
Low-Humic Gley group:				
Coxville series	0 to 2	Very dark gray fine sandy loam over gray, red, strong-brown, and brownish-yellow silty clay.	Poorly drained	Unconsolidated sand and clay.
Grady series	0 to 2	Very dark gray loam over gray clay mottled with brownish yellow. The color and texture are variable.	Very poorly drained or poorly drained.	Unconsolidated sand and clay.
McColl series	0 to 2	Black loam over gray sandy clay over yellowish-brown clay loam.	Poorly drained or somewhat poorly drained.	Unconsolidated sand and clay.
Myatt series	0 to 2	Very dark grayish-brown sandy loam over gray, yellow, and brown sandy clay loam.	Poorly drained	Unconsolidated sand and clay.
Plummer series	0 to 2	Very dark grayish-brown loamy sand over gray sand.	Poorly drained	Unconsolidated sand.
Rains series	0 to 2	Very dark gray sandy loam over gray sandy clay loam.	Very poorly drained or poorly drained.	Unconsolidated sand and clay.
Wehadkee series	0 to 2	Brown silt loam over gray, brown, and yellow silty clay.	Very poorly drained.	Alluvial silty clay and clay.

See footnote at end of table.

TABLE 10.—*Classification of soils by order, great soil group, and series, and some distinguishing characteristics*—Con.

Order, group, and series	Slope range	Brief profile description [1]	Natural drainage class	Parent material
Intrazonal order—Continued				
Humic Gley group:	*Percent*			
Bayboro series	0 to 2	Black loam over very dark gray, firm, sticky, and plastic clay.	Very poorly drained.	Unconsolidated sandy clay and clay.
Okenee series	0 to 2	Black loam over gray and brownish-yellow sandy clay loam.	Very poorly drained.	Unconsolidated sand and clay.
Portsmouth series	0 to 2	Black loam over gray and brownish-yellow sandy clay loam.	Very poorly drained.	Unconsolidated sand and clay.
Rutlege series	0 to 2	Black loam over light-gray loamy sand	Very poorly drained.	Unconsolidated sand.
Planosol group (with claypan):				
Leaf series	0 to 2	Very dark gray fine sandy loam over dense, firm, gray clay.	Poorly drained	Unconsolidated clay.
Azonal order:				
Regosol group:				
Central concept:				
Eustis series	0 to 10	Dark-brown sand over yellowish-red sand or loamy sand.	Excessively drained.	Unconsolidated sand.
Lakeland series	0 to 15	Grayish-brown sand over yellowish-brown sand or loamy sand.	Excessively drained.	Unconsolidated sand.
Molena series	0 to 10	Dark-red loamy sand over dark reddish-brown loamy sand.	Excessively drained.	Unconsolidated sand.
Grading toward Low-Humic Gley group:				
Klej series	0 to 2	Very dark grayish-brown loamy sand over yellowish-brown and gray loamy sand.	Moderately well drained.	Unconsolidated sand and loamy sand.
Grading toward Podzol group:				
Lakewood series	0 to 2	Gray sand over white sand over strong-brown or reddish-brown sand.	Excessively drained.	Unconsolidated sand.
Alluvial group:				
Central concept:				
Congaree series	0 to 2	Dark grayish-brown fine sandy loam over dark yellowish-brown silty clay loam.	Well drained	Stream alluvium.
Grading toward Low-Humic Gley group:				
Chewacla series	0 to 2	Dark-brown silt loam over grayish-brown and yellowish-brown silty clay loam.	Somewhat poorly drained or moderately well drained.	Stream alluvium.

[1] The first color and texture named are those of the A1 or Ap horizon, and the second are those of the B2 or the next major horizon.

sociated with wetness. These characteristics are more strongly expressed in the poorly drained Dunbar, Lenoir, and Lynchburg soils, especially in the upper part of the B horizon. The soils that most nearly fit the central concept of Red-Yellow Podzolic soils are well drained, except for the Goldsboro soils, which are only moderately well drained. Except for poorer drainage, Dunbar soils are similar to Marlboro soils and Lynchburg soils are similar to Norfolk soils. Izagora and Wahee soils are similar to Kalmia soils, but they are somewhat poorly drained to moderately well drained. Wahee soils formed in finer textured sediments than Kalmia soils.

Descriptions of profiles representative of the Red-Yellow Podzolic soils in Marlboro County follow.

CAHABA SERIES

The following profile of Cahaba fine sandy loam is located in a cultivated field along S.C. Highway No. 209, 3 miles northwest of Sawmill Baptist Church.

Ap—0 to 8 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; many small roots; many small pores; slightly acid; clear, smooth boundary; layer is 6 to 9 inches thick.

B21t—8 to 15 inches, yellowish-red (5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; few small roots; few small pores; narrow streaks of organic stain; medium acid; clear, wavy boundary; layer is 6 to 8 inches thick.

B22t—15 to 35 inches, yellowish-red (5YR 4/8) to red (2.5YR 4/8), heavy sandy clay loam; moderate, medium, subangular blocky structure; firm to friable; few small roots; few small pores; few patchy clay films; narrow streaks of organic stain; strongly acid; gradual, wavy boundary; layer is 18 to 22 inches thick.

B3—35 to 46 inches, yellowish-red (5YR 4/8), heavy sandy loam; few, fine, distinct, strong-brown (7.5YR 5/8) and red (2.5YR 4/8) mottles; weak to moderate, medium, subangular blocky structure; friable; strongly acid; gradual, wavy boundary; layer is 6 to 15 inches thick.

C—46 to 55 inches +, yellowish-red (5YR 5/8) sandy loam; few, medium, distinct, strong-brown (7.5YR 5/8) and brownish-yellow (10YR 6/6) mottles; weak, fine, granular structure; very friable; very strongly acid.

The color of the A horizon ranges from dark brown to yellowish brown. The texture of the A horizon is mostly fine sandy loam, but in a few areas it is loamy fine sand. The texture of the B horizon ranges from sandy loam to sandy clay loam. The color of the B horizon is yellowish red or red. In some places faint to distinct mottles occur in the lower part of this horizon.

Caroline Series

The following profile of Caroline fine sandy loam is located 2 miles northeast of Monroe, along S.C. Highway No. 29.

Ap—0 to 7 inches, pale-brown (10YR 6/3) fine sandy loam; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; slightly acid; abrupt, smooth boundary; layer is 5 to 8 inches thick.

A2—7 to 9 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, fine, granular structure; very friable; many medium roots; many medium pores; slightly acid; clear, smooth boundary; layer is 2 to 4 inches thick.

B21t—9 to 19 inches, strong-brown (7.5YR 5/8), heavy fine sandy clay loam; few, fine, faint, yellowish-red (5YR 5/6) mottles; moderate, medium, subangular blocky structure; friable to firm when moist, slightly plastic and sticky when wet; thin, continuous clay films; few medium roots; few medium pores; few fine mica flakes; strongly acid; gradual, wavy boundary; layer is 8 to 10 inches thick.

B22t—19 to 32 inches, strong-brown (7.5YR 5/8) fine sandy clay; common, medium, distinct, red (2.5YR 5/8) mottles, and few, medium, faint, brownish-yellow (10YR 6/6) mottles; moderate, medium, subangular blocky structure; firm when moist, plastic and sticky when wet; continuous clay films; few medium roots; few medium pores; few fine mica flakes; strongly acid; gradual, wavy boundary; layer is 12 to 15 inches thick.

C—32 to 40 inches +, brownish-yellow (10YR 6/6) sandy clay; many, medium, prominent, strong-brown (7.5YR 5/8), red (2.5YR 4/8), and gray (10YR 6/1) mottles; massive; firm when moist, slightly sticky when wet; few fine mica flakes; very strongly acid.

The color of the A horizon ranges from pale brown to grayish brown, and fine sandy loam is the principal texture of this horizon.

The thickness of the B horizon ranges from 22 to 45 inches. The color of the B horizon is strong brown to yellowish red. The principal texture of the B horizon is sandy clay, but it is sandy clay loam or clay in a few places. The lower part of the B horizon contains some distinct or prominent red and gray mottles.

Craven Series

The following profile of Craven fine sandy loam is located in a wooded area, along S.C. Highway No. 29, one-half mile west of the intersection of S.C. Highways No. 38 and No. 39.

A1—0 to 2 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; friable; maney small roots; few small pores; few, fine and medium, hard concretions; medium acid; clear, smooth boundary; layer is 2 to 3 inches thick.

A2—2 to 8 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; friable; few, fine and medium, hard concretions; medium acid; clear, wavy boundary; layer is 5 to 7 inches thick.

B1—8 to 14 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; abundant small roots; abundant small pores; few, fine and medium, hard concretions; extremely acid; clear, wavy boundary; layer is 4 to 8 inches thick.

B21t—14 to 20 inches, yellowish-brown (10YR 5/4) clay loam; few, fine, distinct, yellowish-red (5YR 4/8) mottles; moderate, medium, subangular blocky structure; firm when moist, slightly plastic and sticky when wet; few patchy clay films; few fine, hard concretions; few small roots; very strongly acid; clear, smooth boundary; layer is 4 to 8 inches thick.

B22t—20 to 29 inches, yellowish-brown (10YR 5/4) clay; common, medium, distinct, yellowish-red (5YR 4/8) mottles that increase in number with depth; few, medium, distinct, grayish-brown (2.5Y 5/2) mottles in lower part of horizon; moderate, fine, subangular blocky structure; firm when moist, sticky and plastic when wet; continuous clay films; few small roots and pores; common, medium, hard concretions; very strongly acid; gradual, wavy boundary; layer is 6 to 12 inches thick.

C—29 to 42 inches +, mottled light olive-brown (2.5YR 5/4), red (2.5YR 4/8), and yellowish-brown (10YR 5/4) clay; coarse, platy structure; firm to very firm when moist, sticky when wet; few, medium, hard concretions; very strongly acid.

The texture of the surface layer is chiefly fine sandy loam, but in a few places it is sandy loam. The color of the surface layer ranges from very dark gray to light brownish gray. The color of the subsoil ranges from yellowish brown to light olive brown and, in some places, reddish yellow. The texture of the subsoil is heavy sandy clay loam, silty clay, or clay. The thickness of the solum ranges from 24 to 42 inches.

Faceville Series

The following profile of Faceville loamy sand is located 1 mile northeast of the junction of U.S. Highway No. 15 and S.C. Highway No. 9.

Ap—0 to 6 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; friable; few small roots; few small pores; slightly acid; abrupt, smooth boundary; layer is 6 to 12 inches thick.

B21t—6 to 9 inches, strong-brown (7.5YR 5/6) sandy clay; weak, medium, subangular blocky structure; friable when moist, slightly sticky when wet; few small roots; few small pores; medium acid or slightly acid; clear, smooth boundary; layer is 3 to 10 inches thick.

B22t—9 to 21 inches, yellowish-red (5YR 5/8) sandy clay; moderate, medium, subangular blocky structure; friable when moist, sticky when wet; few small roots; few small pores; few, small, dark-brown, hard concretions; medium acid; gradual, wavy boundary; layer is 10 to 12 inches thick.

B23t—21 to 27 inches, yellowish-red (5YR 5/8) sandy clay; common, medium, distinct, red (2.5YR 4/8) mottles, and few, fine, distinct, brownish-yellow (10YR 6/6) mottles; moderate, medium, subangular blocky structure; friable to firm; few small roots; few small pores; few, small, dark-brown, hard concretions; strongly acid; gradual, smooth boundary; layer is 6 to 10 inches thick.

B3—27 to 42 inches +, yellowish-red (5YR 5/8) sandy clay; many, coarse, prominent, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; friable when moist, sticky when wet; few small roots; few small pores; few, small, dark-brown, hard concretions; very strongly acid.

The surface layer is loamy sand or loamy fine sand and is 6 to 12 inches thick. The color ranges from dark gray to grayish brown. The subsoil ranges from strong brown to yellowish red in color and from sandy clay loam to sandy clay in texture.

Flint Series

The following profile of Flint fine sandy loam is located in a pasture along S.C. Highway No. 209, 1.5 miles northwest of the intersection of S.C. Highways No. 209 and No. 912.

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) fine sandy loam; weak, fine, granular structure; very friable; few small roots; few small pores; strongly acid; clear, smooth boundary; layer is 6 to 8 inches thick.

B1—6 to 12 inches, reddish-yellow (7.5YR 6/8) clay loam; weak to moderate, medium, subangular blocky structure; friable to firm when moist, sticky and slightly plastic when wet; strongly acid; gradual, smooth boundary; layer is 5 to 7 inches thick.

B21t—12 to 20 inches, reddish-yellow (7.5YR 6/8) clay; few, faint, reddish-yellow (5YR 6/8) mottles in lower part; moderate, medium, angular blocky structure; firm when moist, sticky and slightly plastic when wet; few, small, dark-brown, hard concretions; few medium roots; few medium pores; strongly acid; gradual, wavy boundary; layer is 6 to 10 inches thick.

B22t—20 to 28 inches, reddish-yellow (7.5YR 6/8) clay; common, medium, distinct, red (2.5YR 5/8), brownish-yellow (10YR 6/6), and light-gray (2.5Y 7/2) mottles; moderate, medium, angular blocky structure; firm when moist, sticky and slightly plastic when wet; few, small, dark-brown, hard concretions; few medium roots; few medium pores; very strongly acid; gradual, wavy boundary; layer is 6 to 10 inches thick.

C—28 to 50 inches +, mottled strong-brown (7.5YR 5/8), yellowish-brown (10YR 5/8), light-gray (2.5Y 7/2), and yellowish-red (5YR 4/6) clay; massive; very firm when moist, sticky and plastic when wet; few, small, dark-brown, hard concretions; very strongly acid.

The texture of the surface layer is fine sandy loam, sandy loam, and silt loam. The color generally is grayish brown to dark brown, but in some places it is light olive brown. The subsoil ranges from light yellowish brown to reddish yellow. The depth to the mottled material ranges from 14 to 24 inches.

Gilead Series

The following profile of Gilead sand is located one-fourth of a mile northeast of the junction of County Roads No. 165 and No. 203.

Ap—0 to 8 inches, grayish-brown (10YR 5/2) sand; weak, fine, granular structure; very friable; many small roots; strongly acid; clear, smooth boundary; layer is 6 to 8 inches thick.

A2—8 to 15 inches, light yellowish-brown (10YR 6/4) loamy sand; weak, fine, granular structure; very friable; few pockets of darker material from layer above in old root channels; many small roots; many small pores and a few coarse pores; a little fine quartz gravel less than 5 millimeters in size; strongly acid; clear, smooth boundary; layer is 6 to 15 inches thick.

B1—15 to 20 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable; thin, patchy clay films; few small roots; a little fine and medium quartz gravel; very strongly acid; gradual, wavy boundary; layer is 4 to 8 inches thick.

B2t—20 to 28 inches, yellowish-brown (10YR 5/6) sandy clay; common, medium, distinct, strong-brown (7.5YR 5/8) mottles, and few, fine, distinct, yellowish-red (5YR 5/8) mottles; moderate, medium, subangular blocky structure; firm and somewhat compact; a little fine quartz gravel; extremely acid; gradual, wavy boundary; layer is 7 to 12 inches thick.

C—28 to 36 inches +, mottled, pale-brown (10YR 6/3), yellowish-brown (10YR 5/8), light-gray (10YR 7/2), and red (10R 5/6) sandy clay; massive; firm; few fine mica flakes; few small roots; few small pores; a little fine and medium quartz gravel; red and gray colors are more dominant at a depth of more than 36 inches; extremely acid.

The surface layer is 8 to 30 inches thick. Its color ranges from dark grayish brown to grayish brown. Quartz gravel and fragments of ferruginous sandstone are scattered over the surface in some areas. The depth to the firm, compact layer ranges from 14 to 24 inches. The color of the subsoil ranges from yellowish brown to reddish yellow.

Goldsboro Series

The following profile of Goldsboro loamy sand is located one-fourth of a mile northeast of S.C. Highway No. 40, 2 miles north of the intersection of S.C. Highways No. 40 and No. 19.

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 6 to 10 inches thick.

A2—8 to 12 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 3 to 6 inches thick.

B1—12 to 16 inches, light yellowish-brown (2.5Y 6/4) heavy sandy loam; weak, medium, subangular blocky structure; friable; few small roots; few small pores; strongly acid; clear, smooth boundary; layer is 4 to 6 inches thick.

B2t—16 to 34 inches, yellowish-brown (10YR 5/4) sandy clay loam; common, medium, distinct, strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; friable; few small and medium roots; few small and medium pores; strongly acid; clear, wavy boundary; layer is 18 to 20 inches thick.

B3—34 to 42 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, medium, distinct yellowish-brown (10YR 5/8) and light-gray (10YR 7/2) mottles, and few, medium, distinct, red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; friable; few medium roots; few medium pores; strongly acid; gradual, wavy boundary; layer is 6 to 9 inches thick.

C—42 to 54 inches +, pale-brown (10YR 6/3) sandy clay loam; many, medium or coarse, prominent, light-gray (N 7/0), brownish-yellow (10YR 6/6), reddish-brown (5YR 5/4), and red (2.5YR 4/8) mottles; massive; friable to firm when moist, slightly sticky when wet; ground water at a depth of 50 inches; very strongly acid.

The surface layer ranges from 6 to 18 inches in thickness and from dark grayish brown to grayish brown in color. The depth to mottling ranges from 24 to 30 inches.

Kalmia Series

The following profile of Kalmia loamy fine sand is located along a farm road, three-fourths of a mile southwest of the intersection of S.C. Highways No. 43 and No. 912.

Ap—0 to 8 inches, grayish-brown (2.5Y 5/2) loamy fine sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; slightly acid; clear, smooth boundary; layer is 7 to 10 inches thick.

A2—8 to 14 inches, pale-yellow (2.5Y 7/4) fine sandy loam; weak, fine, granular structure; very friable; few small roots; few small pores; medium acid; clear, smooth boundary; layer is 5 to 8 inches thick.

B21t—14 to 26 inches, yellowish-brown (10YR 5/4) sandy clay loam; weak to moderate, medium, subangular blocky structure; friable; few small roots; few small pores; strongly acid; clear, wavy boundary; layer is 10 to 15 inches thick.

B22t—26 to 32 inches, light yellowish-brown (10YR 6/4) sandy clay loam; few, medium, faint mottles of brownish

yellow (10YR 6/8), and common, medium, distinct mottles of strong brown (7.5YR 5/6); moderate, medium, subangular blocky structure; friable; few medium roots; few small pores; strongly acid; gradual, wavy boundary; layer is 6 to 12 inches thick.

C—32 to 42 inches +, light yellowish-brown (10YR 6/4) sandy clay and sandy clay loam; many, medium, prominent mottles of yellowish brown (10YR 5/8), yellowish red (5YR 4/8), and gray (N 6/0); friable to firm; very strongly acid.

The surface layer is 8 to 30 inches thick. It ranges in color from dark gray to grayish brown, depending on the organic-matter content. The texture of the surface layer is mostly loamy fine sand, but it is loamy sand in a few places. The texture of the subsoil grades from sandy clay loam or fine sandy clay loam in the upper part to sandy clay or fine sandy clay in the lower part.

Magnolia Series

The following profile of Magnolia loamy sand is located along S.C. Highway No. 48, 350 yards east of the Marlboro Manufacturing Company and 250 yards south of the Atlantic Coast Line Railroad crossing.

Ap—0 to 7 inches, dark-brown (7.5YR 4/4) loamy sand; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary; layer is 6 to 12 inches thick.

B1—7 to 12 inches, red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky when wet: abundant small pores; strongly acid; clear, smooth boundary; layer is 4 to 7 inches thick.

B21t—12 to 22 inches, red (2.5YR 4/6) sandy clay; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; many small pores; few, medium, dark-brown, hard concretions; strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

B22t—22 to 63 inches +, red (10R 4/6) sandy clay; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; many small pores; few, medium, dark-brown, hard concretions; strongly acid.

The surface layer is 7 to 12 inches thick and is grayish brown to dark brown. The texture of the subsoil is heavy sandy clay loam or sandy clay. The thickness of the solum ranges from 36 inches to several feet. The central color of the subsoil is red.

Marlboro Series

The following profile of Marlboro loamy sand is located 200 yards southeast of the junction of County Highways No. 17 and No. 275.

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; friable; abundant small roots; slightly acid; clear, smooth boundary; layer is 8 to 12 inches thick.

B11—9 to 18 inches, yellowish-brown (10YR 5/6) sandy clay; weak, medium, subangular blocky structure; friable when moist; sticky and slightly plastic when wet; abundant small roots; abundant small pores; medium acid; gradual, smooth boundary; layer is 7 to 12 inches thick.

B12—18 to 27 inches, yellowish-brown (10YR 5/8) sandy clay; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; abundant small roots; abundant small pores; a little fine, angular quartz gravel; few, fine, soft, brown concretions; strongly acid; gradual, wavy boundary; layer is 9 to 20 inches thick.

B2t—27 to 31 inches, yellowish-brown (10YR 5/8) clay; common, fine, prominent, red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; friable when moist, plastic and slightly sticky when wet; few small roots; few small pores; few coarse quartz grains; very strongly acid; gradual, wavy boundary; layer is 3 to 8 inches thick.

B3—31 to 38 inches +, yellowish-brown (10YR 5/8) clay; many, medium, prominent, red (2.5YR 4/8) mottles, and few, fine, distinct, light yellowish-brown (2.5Y 6/4) mottles; weak to moderate, medium, subangular blocky structure; friable; very strongly acid.

The surface layer is dark gray to light brownish gray and is 8 to 12 inches thick. The subsoil is sticky sandy clay. Its central color is yellowish brown, and there is little variation. In some places concretions are common on the surface and throughout the profile.

Norfolk Series

The following profile of Norfolk loamy sand is located 1 mile southwest of Clio, along S.C. Highway No. 381.

Ap—0 to 8 inches, grayish-brown (2.5Y 5/2) loamy sand; weak, fine, granular structure; very friable; few small roots; few small pores; slightly acid; clear, smooth boundary; layer is 6 to 8 inches thick.

A2—8 to 14 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; few, small, round, hard, dark-brown concretions; slightly acid; clear, wavy boundary; layer is 6 to 9 inches thick.

B21t—14 to 36 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; few, small, round, hard, dark-brown concretions; strongly acid; gradual, wavy boundary; layer is 20 to 22 inches thick.

B22t—36 to 60 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, medium, distinct mottles of yellowish red (5YR 4/8); moderate, medium, subangular blocky structure; friable; few, small, round, hard, dark-brown concretions; thin, discontinuous clay films; strongly acid; gradual, wavy boundary; layer is 22 to 26 inches thick.

B3—60 to 72 inches +, brownish-yellow (10YR 6/8), heavy sandy loam; common, medium, faint mottles of brownish yellow (10YR 6/6), and common, medium, distinct mottles of strong brown (7.5YR 5/8) and yellowish red (5YR 4/8); moderate, medium, subangular blocky structure; few, small, round, hard, dark-brown concretions; very strongly acid.

The color of the surface layer is dark gray to light grayish brown. Thick-surface phases are recognized where the surface layer is 18 to 30 inches thick. The texture of the subsoil ranges from sandy loam to sandy clay loam. Ordinarily, the color of the subsoil is yellowish brown, but in a few places it is yellow. The dark-brown concretions and quartz pebbles on the surface and throughout the profile vary in number.

Ruston Series

The following profile of Ruston loamy sand is located in a cultivated field along U.S. Highway No. 15, four-tenths of a mile northeast of the junction of U.S. Highway No. 15 and County Highway No. 43.

Ap—0 to 8 inches, dark-brown (10YR 4/3) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; slightly acid; clear, smooth boundary; layer is 7 to 9 inches thick.

A2—8 to 10 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, granular structure; very friable; few small roots; few small pores; medium acid; clear, wavy boundary; layer is 2 to 3 inches thick.

B1—10 to 15 inches, strong-brown (7.5YR 5/6) sandy loam; weak, medium, subangular blocky structure; friable; few small roots; few small pores; medium acid; gradual, wavy boundary; layer is 4 to 6 inches thick.

B2t—15 to 51 inches, yellowish-red (5YR 4/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; few medium roots; few medium pores; few, small, dark-brown, hard concretions; strongly acid; gradual, wavy boundary; layer is 33 to 38 inches thick.

B3—51 to 62 inches +, yellowish-red (5YR 5/8) sandy clay loam; common, medium, faint mottles of yellowish red (5YR 4/8), and common, medium, distinct mottles of red (2.5YR 4/8) and strong brown (7.5YR 5/6) in the lower part; moderate, medium, subangular blocky structure; friable; few, small, round, dark-brown, hard concretions; numerous large quartz grains; very strongly acid.

The color of the surface layer ranges from grayish brown to dark brown. In a few places the texture is loamy fine sand. The subsoil is yellowish red to red in color and is sandy loam to sandy clay loam in texture. The depth to the underlying material is 30 to 60 inches or more. Thick-surface phases are recognized where the surface layer is 18 to 30 inches thick.

Vaucluse Series

The following profile of Vaucluse sand is located 1 mile east of the junction of County Roads No. 30 and No. 165.

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) sand; very friable; weak, fine, granular structure; abundant small roots; few fine quartz grains and a little fine quartz gravel; strongly acid; clear, smooth boundary; layer is 2 to 4 inches thick.

A2—2 to 12 inches, yellowish-brown (10YR 5/6) loamy sand; very friable; weak, fine, granular structure; discontinuous, thin layer of ferruginous sandstone in contact area between A2 and B2 horizons; many coarse quartz grains and much gravel; few small and medium roots; strongly acid; clear, smooth boundary; layer is 8 to 12 inches thick.

B2t—12 to 20 inches, yellowish-red (5YR 5/6) sandy clay loam; firm; moderate, medium, subangular blocky structure; compact and brittle; discontinuous, thin, patchy clay films on peds; few small roots; few coarse quartz grains and a little gravel; very strongly acid; gradual, wavy boundary; layer is 6 to 10 inches thick.

C—20 to 36 inches, yellowish-brown (10 YR 5/6), yellowish-red (5YR 5/6), reddish-yellow (7.5YR 7/6), and weak-red (10R 5/4), unconsolidated sand and clay; very compact and very brittle; very strongly acid.

The surface layer is 4 to 30 inches thick in the normal soil and 18 to 30 inches thick in the thick-surface phases. It is dark grayish brown to light gray in color. Its texture generally is sand or loamy sand, but in a few places it is sandy loam. The subsoil is 8 to 20 inches thick and is yellowish red to reddish brown. Quartz gravel and ferruginous sandstone fragments on the surface and throughout the profile range from none to common.

Wickham Series

The following profile of Wickham sandy loam is located seven-tenths of a mile southwest of U.S. Highway No. 1, half a mile north of the intersection of U.S. Highway No. 1 and S.C. Highway No. 9.

Ap—0 to 7 inches, reddish-brown (5YR 4/4) sandy loam; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; medium acid; clear, smooth boundary; layer is 6 to 8 inches thick.

B2t—7 to 26 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; few small roots; few small pores, strongly acid; clear, wavy boundary; layer is 18 to 20 inches thick.

B3—26 to 38 inches, yellowish-red (5YR 4/8) sandy clay loam; friable; weak, medium, subangular blocky structure; numerous fine mica flakes; few, small, hard, dark-red concretions; strongly acid; gradual, wavy boundary; layer is 10 to 14 inches thick.

C—38 to 78 inches +, red (2.5YR 4/6) clay loam; common, medium, distinct mottles of brownish yellow (10YR 6/8), and common, medium, faint mottles of dark red (10R 3/6); massive; friable; numerous fine mica flakes; very strongly acid.

The surface layer is reddish brown to dark reddish brown and is 8 to 14 inches thick. The subsoil is yellowish red to red.

Dunbar Series

The following profile of Dunbar sandy loam is located in a cultivated field along S.C. Highway No. 9, one-half mile southeast of intersection of S.C. Highways No. 9 and No. 59.

Ap—0 to 7 inches, dark-gray (10YR 4/1) sandy loam; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 7 to 12 inches thick.

A2—7 to 11 inches, grayish-brown (2.5Y 5/2) sandy loam; weak, fine, granular structure; very friable; few fine roots; few fine pores; very strongly acid; clear, smooth boundary; layer is 3 to 4 inches thick.

B1—11 to 14 inches, light yellowish-brown (10YR 6/4) sandy clay loam; weak, medium, subangular blocky structure; friable to firm; few medium roots; few medium pores; strongly acid; gradual, wavy boundary; layer is 3 to 4 inches thick.

B21t—14 to 28 inches, light olive-brown (2.5Y 5/4) fine sandy clay; common, medium, distinct mottles of strong brown (7.5YR 5/6), light yellowish brown (2.5Y 6/4), and brownish yellow (10YR 6/6); moderate, medium, subangular blocky structure; firm when moist, sticky when wet; very strongly acid; gradual, wavy boundary; layer is 12 to 15 inches thick.

B22t—28 to 36 inches, light olive-brown (2.5Y 5/4) sandy clay; common, medium, distinct mottles of red (10R 4/6), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; firm when moist, slightly sticky when wet; very strongly acid; gradual, wavy boundary; layer is 6 to 10 inches thick.

Cg—36 to 46 inches +, gray (N 5/0) sandy clay; many, coarse, prominent mottles of red (10R 4/6), strong brown (7.5YR 5/6), and brownish yellow (10YR 6/6); massive; firm when moist, sticky when wet; very strongly acid.

The surface layer is 7 to 12 inches thick. The color ranges from dark gray to grayish brown, and the texture is sandy loam or fine sandy loam. The texture of the subsoil generally is sandy clay, but in a few places it is heavy sandy clay loam. In some places the upper part of the subsoil is free of mottles, but in many places the lower part is mottled with gray. The mottles increase in number and size with depth.

Izagora Series

The following profile of Izagora fine sandy loam is located in a wooded area 2½ miles southeast of Drake along a county road, three-fourths of a mile west of Rogers Creek.

A1—0 to 8 inches, dark-gray (10YR 4/1) fine sandy loam; weak, medium, granular structure; very friable; abundant small roots and few medium roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 8 to 15 inches thick.

A2—8 to 17 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, coarse, granular structure; friable; abundant small and medium roots; abundant small and medium pores; strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

B2t—17 to 32 inches, yellowish-brown (10YR 5/4) sandy clay loam; common, medium, distinct mottles of yellowish red (5YR 5/8), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2); weak, medium, subangular blocky structure; friable; few small roots; few small pores; very strongly acid; gradual, wavy boundary; layer is 12 to 18 inches thick.

Cg—32 to 42 inches +, light-gray (N 7/0) sandy clay; common, medium, prominent mottles of red (2.5YR 4/8) and brownish yellow (10YR 6/8); massive; firm; few small to medium roots; extremely acid.

The thickness of the surface layer ranges from 8 to 15 inches. The color of this layer ranges from dark gray to grayish brown. Ordinarily, the texture of the surface layer is fine sandy loam, but in a few places it is sandy loam. The subsoil is yellowish brown to light olive brown mottled with gray, yellowish red, brown, and red. The intensity of mottling varies. In some places the upper part of the subsoil is free of mottles.

Lenoir Series

The following profile of Lenoir loam is located along a farm road 2 miles north of Blenheim, 1 mile west of S.C. Highway No. 38.

Ap—0 to 6 inches, dark-gray (10YR 4/1) loam; weak, fine, granular structure; friable; strongly acid; abrupt, smooth boundary; layer is 4 to 6 inches thick.

B1—6 to 11 inches, light olive-brown (2.5Y 5/4) clay loam; a few vertical streaks of surface material in old root channels; few, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, medium, subangular blocky structure; firm; few small roots; few small pores; very strongly acid; clear, wavy boundary; layer is 4 to 7 inches thick.

B21tg—11 to 22 inches, grayish-brown (2.5Y 5/2) clay; yellowish-brown (10YR 5/6) and red (2.5YR 4/8) mottles; fine, medium, subangular blocky structure; firm or very firm; very strongly acid; clear, wavy boundary; layer is 10 to 12 inches thick.

B22tg—22 to 32 inches, light brownish-gray (2.5Y 6/2) clay; strong-brown (7.5YR 5/6) and red (2.5YR 4/6) mottles; fine, medium, subangular blocky structure with tendency toward platiness; firm when moist, sticky and plastic when wet; very patchy clay films; strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

Cg—32 to 41 inches +, coarsely mottled gray, strong-brown, and red clay; massive; red mottles are firm to very firm, other mottles are plastic and sticky; very strongly acid.

The surface layer is dark-gray to yellowish-brown or olive-brown loam and is 4 to 6 inches thick. The texture of the subsoil is silty clay or clay, and its color ranges from pale yellow or grayish brown to gray. The intensity of mottling varies. In some places the red mottles are more intense than in other areas.

Lynchburg Series

The following profile of Lynchburg loamy sand is located along S.C. Highway No. 56, 1¼ miles southeast of the intersection of U.S. Highway No. 15 and S.C. Highway No. 56.

Ap—0 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 6 to 10 inches thick.

A2—8 to 14 inches, light brownish-gray (2.5Y 6/2) loamy sand; few, fine, faint mottles of light yellowish brown (2.5Y 6/4); weak, fine, granular structure; very friable; few small roots; few small pores; strongly acid; clear, wavy boundary; layer is 5 to 8 inches thick.

B1—14 to 20 inches, light yellowish-brown (2.5Y 6/4) sandy loam; common, medium, distinct mottles of yellow (10YR 7/8), and few, fine, distinct mottles of yellowish brown (10YR 5/8); weak, medium, subangular blocky structure; friable; few small roots; few small pores; very strongly acid; gradual, wavy boundary; layer is 5 to 10 inches thick.

B2tg—20 to 31 inches, light brownish-gray (2.5Y 6/2) light sandy clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/8) and gray (10YR 6/1); weak to moderate, medium, subangular blocky structure; friable; few medium and small roots; few medium pores; few coarse quartz grains; very strongly acid; gradual, wavy boundary; layer is 10 to 14 inches thick.

B3g—31 to 42 inches +, gray (10YR 6/1) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6) and brownish yellow (10YR 6/8), and many, coarse, prominent mottles of red (2.5YR 4/8); moderate, medium, subangular blocky structure; friable; few, small, hard, red (10R 4/6) concretions; very strongly acid.

The surface layer ranges from 6 to 18 inches in thickness and from black to light brownish gray in color. The subsoil is sandy loam to sandy clay loam. The mottles in the subsoil vary in amount and color. The base colors are light yellowish brown and light brownish gray.

Wahee Series

The following profile of Wahee very fine sandy loam is located 2 miles south of Drake.

A1—0 to 3 inches, very dark gray (10YR 3/1) very fine sandy loam; weak, fine, granular structure; friable; abundant small roots; very strongly acid; clear, smooth boundary; layer is 3 to 5 inches thick.

A2—3 to 6 inches, grayish-brown (2.5Y 5/2) fine sandy loam; many, fine, faint, dark-gray (2.5Y 4/0) mottles, and many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, granular structure; friable; abundant small and medium roots; strongly acid; clear, smooth boundary; layer is 3 to 6 inches thick.

B1—6 to 10 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; abundant small roots; abundant small pores; very strongly acid; clear, wavy boundary; layer is 4 to 6 inches thick.

B21t—10 to 19 inches, light yellowish-brown (2.5Y 6/4) sandy clay; common, medium, distinct, yellowish-brown (10YR 5/6) mottles, and few, fine, prominent, red (2.5YR 4/8) mottles; weak, medium, subangular blocky structure; friable to firm; patchy clay films; few small and medium roots; few small and medium pores; very strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

B22t—19 to 27 inches, light yellowish-brown (2.5Y 6/4) clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; few, medium, distinct, gray (10YR 6/1) mottles, and few, fine, prominent, red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; friable to firm; continuous clay films; few small roots; few small pores; very strongly acid; clear, smooth boundary; layer is 6 to 10 inches thick.

C—27 to 41 inches+, mottled yellowish-brown, red, and gray clay; massive; red mottles are firm, gray and yellowish-brown mottles are plastic and sticky; strongly acid.

The surface layer is 6 to 12 inches of very fine sandy loam or fine sandy loam. Its color is very dark gray to gray. The upper part of the subsoil is sandy clay loam or clay loam, and the lower part is sandy clay or clay.

Low-Humic Gley group

The Low-Humic Gley great soil group is made up of very poorly drained or poorly drained soils that have a thin surface horizon, moderately high in organic-matter content, over a mottled gray and brown, gleylike mineral horizon that is little different from the surface horizon in texture. The soil-development process is gleization.

The soils of this group form in acid marine sediments or stream alluvium under a forest cover of loblolly pine, pond pine, and such hardwoods as sweetgum, blackgum, maple, beech, and various kinds of oak. These soils have characteristics that reflect more strongly the influence of nearly level relief, a high water table, and impeded drainage than the effects of climate and vegetation.

The color of the surface layer ranges from mottled gray, brown, and yellow to dominantly gray, and the texture from loamy sand to sandy clay or clay.

The Coxville, Grady, McColl, Myatt, Plummer, Rains, and Wehadkee soils are in the Low-Humic Gley great soil group. Descriptions of representative profiles of these soils follow.

Coxville Series

The following profile of Coxville fine sandy loam is located 1½ miles south of the Blenheim fire tower.

A1—0 to 8 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; many small and medium roots; very strongly acid; clear, wavy boundary; layer is 6 to 10 inches thick.

B21tg—8 to 13 inches, gray (N 5/0) fine sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; firm when moist, plastic and sticky when wet; many small and medium roots; few small pores; very strongly acid; gradual, wavy boundary; layer is 5 to 10 inches thick.

B22tg—13 to 36 inches, gray (N 6/0) silty clay; common, medium, prominent, red (2.5YR 4/8), strong-brown (7.5YR 5/6), and brownish-yellow (10YR 6/8) mottles; firm when moist, plastic and sticky when wet; few medium roots; extremely acid; gradual, wavy boundary; layer is 20 to 25 inches thick.

Cg—36 to 42 inches, gray (N 5/0) fine sandy clay; many, medium, prominent, brownish-yellow (10YR 6/6), strong-brown (7.5YR 5/8), and red (2.5YR 4/8) mottles; massive; firm when moist, plastic and sticky when wet; extremely acid.

The A horizon is very dark gray to black loam or fine sandy loam. The red mottles in the subsoil vary in size and number. The subsoil is gray to grayish-brown fine sandy clay loam to silty clay. In the thin-surface phase, the surface layer is 1 to 5 inches thick.

Grady Series

The following profile of Grady loam is located in a cultivated field along S.C. Highway No. 97, 1 mile east of its intersection with U.S. Highway No. 1.

Ap—0 to 8 inches, very dark gray (10YR 3/1) loam; weak, medium, subangular blocky structure; friable; a little fine quartz gravel; medium acid; clear, smooth boundary; layer is 6 to 8 inches thick.

B21tg—8 to 21 inches, gray (N 6/0) clay; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few small roots; few small pores; very strongly acid; gradual, wavy boundary; layer is 10 to 12 inches thick.

B22tg—21 to 28 inches, gray (10YR 6/1) clay; few, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure with a tendency toward platiness; firm when moist, sticky and plastic when wet; few small pores; strongly acid; clear, wavy boundary; layer is 6 to 14 inches thick.

Cg—28 to 35 inches +, gray (10YR 6/1) sandy clay; brownish-yellow and yellowish-brown mottles; massive; firm; a little fine quartz gravel; lenses of sand and pockets of clay suggest stratification; very strongly acid; water table at a depth of 35 inches.

The surface layer ranges from 5 to 12 inches in thickness and from sandy loam to loam in texture. The subsoil ranges from sandy clay loam to clay in texture. In some areas lenses of sandier material occur throughout the subsoil. The matrix color of the subsoil is gray. In places there are bright-colored mottles.

McColl Series

The following is a profile of McColl loam.

O2—1 inch to 0, dark reddish-brown and some black decomposed organic material.

A1—0 to 5 inches, black (10YR 2/1) loam; weak, fine and medium, granular structure; very friable; clear, wavy boundary; layer is 4 to 8 inches thick.

B2tg—5 to 9 inches, gray (10YR 5/1) heavy clay loam to sandy clay; weak, medium, subangular blocky structure; friable to slightly firm; common, thin, discontinuous clay films; few fine pores; black loam from A1 horizon in a few root channels; clear, wavy boundary; pockets and streaks extending into lower horizons; layer is 4 to 12 inches thick.

B31—9 to 14 inches, yellowish-brown (10YR 5/6) clay loam; common, fine, strong-brown (7.5YR 5/8) mottles; weak, fine and medium, subangular blocky sructure; friable; few, thin, discontinuous clay films; few fine and medium mica flakes; clear, wavy boundary; layer is 4 to 8 inches thick.

B32—14 to 23 inches, reddish-yellow (7.5YR 6/8) and strong-brown (7.5YR 5/6), firm or very firm, brittle fine sandy clay loam with common vertical streaks of light-gray (10YR 7/1) and dark-gray (10YR 4/1), slightly firm and sticky, heavy clay loam in channels and pores; brownish material contains common indurated iron nodules with red (2.5YR 4/8) interiors and a few with dark-red (10R 3/6) interiors; horizon difficult to spade, exhibiting plinthite-like characteristics; fragmental, with tendency toward weak, platy structure in lower part; common clay films as gray coatings on horizontal fractures; few fine mica flakes; gradual, irregular boundary; layer is 8 to 24 inches thick.

B33—23 to 36 inches, strong-brown (7.5YR 5/8) and reddish-yellow (7.5YR 6/8) sandy clay loam; common, vertical streaks of light gray (10YR 7/1); grayish material finer textured than brownish and yellowish material; slightly indurated iron nodules common in brown material; nodules have yellowish-red to dark-red interiors and become fewer and softer with depth; friable but contains common fragments that are very firm, very hard, and brittle; few grayish clay coatings on horizontal fracture planes; few fine mica flakes and local areas in which fine mica is common; fragmental, with some weak, medium, platy structure in brittle parts; gradual, irregular boundary; layer is 10 to 20 inches thick.

C—36 to 50 inches, yellow (10YR 7/8) and red (2.5YR 4/6) sandy loam; few, medium mottles of light gray (10YR 7/1); fragmental; very friable; common, fine, mica flakes.

The principal types are loam and fine sandy loam. The color of the A1 horizon ranges from black (N 2/0) to very dark gray (10YR 3/1). In cultivated areas, the color of the Ap is very dark gray (10YR 3/1), dark gray (10YR 4/1), or dark grayish brown (10YR 4/2). The B2tg horizon generally is gray (10YR 5/1 or 6/1), but in some places it is dark gray (10YR 4/1) or light brownish gray (10YR 6/2). In some places the B2tg horizon contains a few yel-

lowish-brown mottles. The texture is heavy clay loam to fine sandy clay loam. The B31 horizon is highly mottled in places, and the content of soft and hard iron nodules ranges from none to common. In places the B32 horizon has a matrix color of gray and many vertical streaks of strong brown. The number of nodules or aggregates of iron ranges from few to common. The B32 horizon ranges from a very brittle, fragipan-like layer to a hardened, plinthite-like formation. The substrata range from reddish, yellowish, and grayish sandy loam and sand to varicolored clay.

Myatt Series

The following profile of Myatt sandy loam is located 1 mile southwest of the junction of S.C. Highways No. 31 and No. 38 at Bristow.

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, fine, granular structure; very friable; abundant small and medium roots; abundant small pores; very strongly acid; clear, smooth boundary; layer is 3 to 9 inches thick.

A2—3 to 10 inches, gray (10YR 6/1) and light-gray (10YR 7/1) sandy loam; weak, fine, granular structure; very friable; abundant small and medium roots; abundant small pores; strongly acid; clear, wavy boundary; layer is 6 to 10 inches thick.

B21tg—10 to 26 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8); weak, medium, subangular blocky structure; firm when moist, sticky when wet; few medium pores; very strongly acid; gradual, wavy boundary; layer is 14 to 18 inches thick.

B22tg—26 to 42 inches, gray (N 6/1) heavy sandy clay loam to clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6); dark-brown (7.5YR 4/4) stains along root channels; moderate, medium, subangular blocky structure; firm when moist, sticky when wet; few small and medium pores; ground water at depth of 42 inches; very strongly acid; gradual, wavy boundary; layer is 14 to 18 inches thick.

C—42 to 60 inches +, mottled gray (N 6/0) and brownish-yellow (10YR 6/8) sand; structureless; loose; many coarse sand grains; a little small waterworn quartz gravel; few decomposed feldspar crystals; few fine mica flakes; very strongly acid.

The surface layer ranges from 3 to 10 inches in thickness and from very dark grayish brown to grayish brown in color. The subsoil ranges from sandy clay loam to clay loam in texture. The subsoil color is gray mottled with various shades of yellow and brown. Mottles range in number from few to common, and in a few places there are none.

Plummer Series

The following profile of Plummer loamy sand is located 2 miles north of the intersection of County Roads No. 257 and No. 165.

A1—0 to 7 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; very strongly acid; clear, smooth boundary; layer is 5 to 8 inches thick.

A2—7 to 12 inches, grayish-brown (2.5Y 5/2) loamy sand with darker streaks from A1 horizon; strong-brown (7.5YR 5/6) stains along root channels; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly acid; gradual, smooth boundary; layer is 4 to 6 inches thick.

C1g—12 to 34 inches, gray (N 5/0) sand; massive; loose; few coarse sand grains; water table at a depth of 34 inches; very strongly acid; gradual, smooth boundary; layer is 20 to 26 inches thick.

C2g—34 to 42 inches +, grayish-brown (10YR 5/2) sand; massive; loose; few coarse sand grains; very strongly acid.

The surface layer is black to light gray. The texture of the entire profile generally is loamy sand or sand, but in places a finer textured material occurs at a depth of 3 or 4 feet. The subsoil is gray, and in some places it is mottled with yellow and brown.

Rains Series

The following profile of Rains sandy loam is located 1¾ miles southeast of Clio, along S.C. Highway No. 9.

Ap—0 to 8 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; friable; abundant small roots; strongly acid; clear, smooth boundary; layer is 7 to 10 inches thick.

A2—8 to 12 inches, gray (10YR 5/1) sandy loam; few, fine, faint, yellowish-brown (10YR 5/6) mottles; streaks of very dark gray (10YR 3/1) in root holes and wormholes; weak, fine, granular structure; friable; abundant small roots; abundant small pores; very strongly acid; clear, wavy boundary; layer is 3 to 6 inches thick.

B21tg—12 to 21 inches, gray (10YR 5/1) sandy clay loam; common, medium, faint, yellowish-brown (10YR 5/6) mottles, and few, fine, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; few small roots; few small pores; few streaks of material from Ap horizon extending downward in root channels; very strongly acid; gradual, wavy boundary; layer is 7 to 12 inches thick.

B22tg—21 to 34 inches, gray (10YR 5/1) sandy clay loam; common, medium, faint, yellowish-brown (10YR 5/6 and 10YR 5/9) mottles, and few fine, prominent, yellowish-red (5YR 4/8) mottles; weak, coarse, subangular blocky structure; friable; few patchy clay films; few small pores; very strongly acid; gradual, wavy boundary; layer is 12 to 20 inches thick.

Cg—34 to 47 inches +, gray (10YR 5/1) sandy clay loam; common, medium, distinct, strong-brown (10YR 5/8) mottles, and few, fine, prominent, yellowish-red (5YR 4/6) mottles; massive; friable; contains lenses and pockets of sand; very strongly acid.

The surface layer is 8 to 18 inches thick and is very dark gray to light gray. The texture of the subsoil is sandy loam or sandy clay loam.

Wehadkee Series

Thee following profile of Wehadkee silt loam is 3 miles northeast of the Darlington County line, along U.S. Highway No. 15.

A1—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; abundant small and medium roots; abundant small and medium pores; strongly acid; clear, smooth boundary; layer is 6 to 10 inches thick.

C1g—8 to 17 inches, dark-gray (N 4/0) silty clay; few, fine, distinct mottles of yellowish brown (10YR 5/6); massive; firm or very firm when moist, plastic and sticky when wet; many small and medium roots; few small pores; few fine mica flakes; ground water at a depth of 12 inches; very strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

C2g—17 to 42 inches +, gray (N 5/0) silty clay; common, medium, distinct mottles of strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8); massive; very firm when moist, plastic and sticky when wet; few small roots; few small pores; few fine mica flakes; very strongly acid.

The surface layer ranges from 5 to 10 inches in thickness. In places thin layers of fresh alluvium have been

recently deposited on the surface, and in other places some of the surface layer has been removed by floodwaters. The amount and prominence of mottling in the subsoil vary from place to place.

Humic Gley group

The Humic Gley great soil group consists of very poorly drained or poorly drained hydromorphic soils. These soils have a moderately thick, dark-colored, organic-mineral horizon underlain by mineral gley horizons. The soil development process has been gleization.

The Humic Gley soils in this county formed in acid sediments in areas where the ground-water level fluctuated but was relatively high and runoff was very slow. The forest cover was chiefly loblolly pine, pond pine, water-tolerant oak, sweetgum, blackgum, red maple, and yellow-poplar.

The color of the surface layer is dark gray, very dark gray, or black. The subsoil is gray loamy sand to clay. In forested areas, the content of organic matter is 5 to 20 percent.

The Bayboro, Okenee, Portsmouth, and Rutlege soils are in the Humic Gley great soil group. Descriptions of representative profiles of these soils follow.

Bayboro Series

The following profile of Bayboro loam is located in a wooded area 1½ miles east of Monroe, three-fourths of a mile northeast of S.C. Highway No. 29.

A11—0 to 5 inches, black (N 2/0) loam; weak, fine, granular structure; friable, abundant small pores; abundant small and medium roots; very strongly acid; clear, smooth boundary; layer is 5 to 8 inches thick.

A12—5 to 11 inches, black (10YR 2/1) loam; weak, fine, granular structure; friable; slightly sticky and plastic; abundant small pores; abundant small and medium roots; very strongly acid; clear, smooth boundary; layer is 5 to 8 inches thick.

B21tg—11 to 19 inches, very dark gray (10YR 3/1) clay; fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; firm when moist, sticky and plastic when wet; many small and medium roots; many small pores; very strongly acid; gradual, smooth boundary; layer is 6 to 10 inches thick.

B22tg—19 to 30 inches, very dark gray (10YR 3/1) clay; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; very firm when moist, plastic and very sticky when wet; few medium roots; very strongly acid; clear, smooth boundary; layer is 10 to 12 inches thick.

Cg—30 to 42 inches +, very dark gray (10YR 3/1), heavy clay; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; and few, fine, distinct, strong-brown (7.5YR 5/6) mottles; massive; extremely firm when moist, sticky when wet; very strongly acid.

The surface layer ordinarily is loam, but in a few places it is fine sandy loam. The A horizon ranges from 8 to 18 inches in thickness. It is black or very dark gray in color. The subsoil is clay or silty clay and is predominantly very dark gray in color but ranges to gray. The degree of mottling and the organic-matter content vary.

Okenee Series

The following profile of Okenee loam is located on the terrace of the Great Pee Dee River on the south side of a paved road, three-tenths of a mile southwest of the Argyle crossroads.

A1—0 to 19 inches, black (10YR 2/1) loam; weak, fine, granular structure; very friable; many small and medium roots; abundant small and medium pores; very strongly acid; clear, smooth boundary; layer is 18 to 22 inches thick.

B21tg—19 to 32 inches, very dark gray (10YR 3/1) sandy clay loam; weak, medium, subangular blocky structure; friable to firm; few small roots; few small pores; strongly acid; gradual, wavy boundary; layer is 12 to 15 inches thick.

B22tg—32 to 42 inches, dark-gray (10YR 4/1) heavy sandy clay loam; weak, medium, subangular blocky structure; firm; strongly acid; gradual, wavy boundary; layer is 10 to 15 inches thick.

Cg—42 to 60 inches +, dark-gray (10YR 4/1) and gray (10YR 5/1) sandy clay to clay; few, fine, distinct, brownish-yellow (10YR 6/6) mottles; massive; very firm; very strongly acid.

The surface layer is 18 to 22 inches thick and is very dark gray or black. The subsoil is 15 to 34 inches thick. It consists of gray to very dark gray sandy loam or sandy clay loam mottled to varying degrees with yellow and brown. In many areas, a sandy substratum occurs at a depth of 3 or 4 feet.

Portsmouth Series

The following profile of Portsmouth loam is located 1¼ miles north of the intersection of S.C. Highway No. 165 and a county road, 1 mile west of the South Carolina-North Carolina line.

A11—0 to 9 inches, black (N 2/0) loam; weak, fine, granular structure; very friable; abundant small and medium roots; abundant small and medium pores; very strongly acid; clear, smooth boundary; layer is 7 to 10 inches thick.

A12—9 to 15 inches, very dark gray (10YR 3/1) sandy loam; weak, fine, granular structure; very friable; abundant small and medium roots; abundant small and medium pores; very strongly acid; clear, wavy boundary; layer is 5 to 7 inches thick.

B1g—15 to 33 inches, gray (N 5/0) sandy loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles in lower part; weak, medium, subangular blocky structure; friable; few small roots; few small pores; strongly acid; clear, wavy boundary; layer is 16 to 20 inches thick.

B2tg—33 to 48 inches, gray (N 6/0) sandy clay loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles; weak to moderate, medium, subangular blocky structure; friable to firm; few small roots; few small pores; strongly acid; gradual, wavy boundary; layer is 13 to 17 inches thick.

C—48 to 62 inches +, mottled white (10YR 8/2) and light-gray (10YR 7/2) sand; structureless; loose; extremely acid.

The surface layer is 8 to 18 inches thick and is very dark gray to black. The subsoil is 15 to 36 inches thick. It is gray sandy loam or sandy clay loam mottled with yellow and brown. The amount of mottling varies.

Rutlege Series

The following profile of Rutlege loamy sand is located two-tenths of a mile northwest of the junction of S.C. Highways No. 190 and No. 189.

A11—0 to 11 inches, black (10YR 2/1) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; very strongly acid; clear, smooth boundary; layer is 9 to 20 inches thick.

A12—11 to 15 inches, very dark gray (10YR 3/1) loamy sand; weak, fine, granular structure; very friable; abundant small roots; abundant small pores; strongly

acid; gradual, smooth boundary; layer is 4 to 8 inches thick.

C1g—15 to 19 inches, gray (10YR 6/1) loamy sand; weak, fine, granular structure; very friable; few small roots; few small pores; strongly acid; gradual, smooth boundary; layer is 4 to 10 inches thick.

C2g—19 to 28 inches, gray (10YR 6/1) to light-gray (10YR 7/1) loamy sand; weak, fine, granular structure; very friable; few dark stains along root channels; very strongly acid; gradual, smooth boundary; layer is 8 to 10 inches thick.

C3g—28 to 42 inches +, gray (10YR 6/1) to light-gray (10YR 7/1) sand; common, medium, distinct, grayish-brown (10YR 5/2) stains; massive; very friable to loose; very strongly acid.

The surface layer is 9 to 20 inches thick and is loamy sand or loam in texture. The subsoil color is dominantly gray, but yellowish-brown and strong-brown mottles occur in places.

Planosol group (with claypan)

Planosols have an eluviated surface horizon underlain by a B horizon that is more strongly illuviated, cemented, or compacted than that of the associated normal soils. This group is represented in Marlboro County by the Leaf series. Leaf soils have a surface layer of dark-colored fine sandy loam, more or less abruptly underlain by a slowly permeable claypan that restricts the movement of water and air. These soils are in nearly level or slightly depressed areas on the terrace of the Great Pee Dee River. Runoff is very slow, and a perched or fluctuating water table is near the surface part of the time.

Leaf Series

The following profile of Leaf fine sandy loam is located in a wooded area, 1¾ miles southwest of Bristow along S.C. Highway No. 31.

A1—0 to 5 inches, very dark gray (N 3/0) fine sandy loam; weak, fine, granular structure; very friable; abundant small and medium roots; abundant small pores; strongly acid; clear, smooth boundary; layer is 4 to 6 inches thick.

B21tg—5 to 12 inches, light brownish-gray (10YR 6/2) sandy clay; common, medium, distinct mottles of yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8); moderate, medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; few medium roots; few medium pores; strongly acid; gradual, wavy boundary; layer is 6 to 8 inches thick.

B22tg—12 to 22 inches, gray (N 6/0) clay; common, medium, distinct, mottles of yellowish brown (10YR 5/6); massive; very firm when moist, sticky and plastic when wet; few medium roots; very strongly acid; gradual, wavy boundary; layer is 8 to 12 inches thick.

B3g—22 to 36 inches +, gray (5YR 6/1) clay; many, medium, distinct mottles of yellowish brown (10YR 5/6); massive; very firm when moist, sticky and plastic when wet; very strongly acid.

The surface layer is 5 to 10 inches thick. It ranges from very dark gray to light gray in color. The texture is fine sandy loam or sandy loam. The subsoil is sandy clay or clay in texture. It is light brownish gray to gray and is distinctly mottled with strong brown and yellowish brown.

Regosol group

Regosols are soils in which few or no clearly expressed soil characteristics have developed. They form in deep, unconsolidated, nearly loose mineral deposits, chiefly sand.

The soils in Marlboro County that most nearly fit the central concept of Regosols are those of the Eustis, Lakeland, and Molena series. Klej and Lakewood soils are also classified as Regosols, but Lakewood soils have some characteristics of Podzols and are considered intergrades toward that great soil group, and Klej soils have some characteristics of Low-Humic Gley soils.

Klej soils developed from deep, unconsolidated parent material. Because of their topographic position, they are gleyed in the lower layers, but very few other soil characteristics are clearly expressed.

Descriptions of profiles representative of the Regosol soils in Marlboro County follow.

Eustis Series

The following profile of Eustis sand is located three-fourths of a mile west of the Junction of U.S. Highway No. 1 and S.C. Highway No. 267.

Ap—0 to 8 inches, dark-brown (10YR 4/3) sand; weak, fine, granular structure; very friable; abundant small roots; medium acid; clear, smooth boundary; layer is 7 to 9 inches thick.

A2—8 to 12 inches, yellowish-red (5YR 5/8) sand; weak, fine, granular structure; very friable; abundant small roots; strongly acid; gradual, smooth boundary; layer is 3 to 7 inches thick.

C1—12 to 24 inches, yellowish-red (5YR 4/6) sand; structureless; very friable to loose; few small roots; strongly acid; gradual, wavy boundary; layer is 10 to 14 inches thick.

C2—24 to 42 inches +, red (2.5YR 4/6) sand; structureless; loose; strongly acid; several feet thick.

The texture of the surface layer is sand or loamy sand. The color ranges from dark brown to grayish brown. The color of the underlying layers ranges from strong brown to red. In some places the texture of the underlying layers is sand or loamy sand. In the moderately shallow phase a sandy loam or sandy clay loam layer occurs at a depth of 30 to 42 inches.

Lakeland Series

The following profile of Lakeland sand is located one-fourth of a mile northwest of Brownsville along a county road connecting S.C. Highways No. 34 and No. 38.

Ap—0 to 7 inches, grayish-brown (2.5Y 5/2) sand; weak fine, granular structure; very friable; abundant fine roots; abundant fine pores; medium acid; clear, smooth boundary; layer is 6 to 9 inches thick.

C1—7 to 20 inches, yellowish-brown (10YR 5/6) sand; structureless; loose; abundant small roots and root hairs; medium to strongly acid; gradual, wavy boundary; layer is 12 to 40 inches thick.

C2—20 to 42 inches +, brownish-yellow (10YR 6/8) sand; structureless; loose; few small roots and root hairs; strongly acid; several feet thick.

The texture generally is sand, but in a few places it is loamy sand. In the moderately shallow phase, a finer textured layer occurs at a depth of 30 to 42 inches. In places the sand is 30 feet or more thick. In the gravelly phase, small rounded quartz gravel is abundant on the surface and throughout the profile.

Molena Series

The following profile of Molena loamy sand is located along a field road, 300 yards west of U.S. Highway No. 1 and 3 miles north of the intersection of U.S. Highway No. 1 and S.C. Highway No. 97.

Ap—0 to 10 inches, dark-brown (7.5YR 3/2) loamy sand; weak, medium, granular structure; very friable; few small roots; few small pores; medium acid; clear, smooth boundary; layer is 8 to 12 inches thick.
C1—10 to 40 inches, dark reddish-brown (5YR 3/4) loamy sand; structureless; nearly loose; strongly acid; clear, wavy boundary; layer is 28 to 34 inches thick.
C2—40 to 44 inches +, yellowish-red (5YR 4/8) loamy sand; structureless; nearly loose; strongly acid.

The surface layer is 8 to 12 inches thick and is dark brown to light brown in color. The underlying layers are reddish brown to yellowish red. The texture generally is loamy sand, but in some places finer textured material occurs at a depth of 3 to 6 feet. On the surface are few to many rounded quartz cobblestones, 1 inch to several inches in diameter.

Klej Series

The following profile of Klej loamy sand is located in a cultivated field along S.C. Highway No. 34, one-half mile east of Brownsville and one-fourth mile northwest of the Dillon County line.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, granular structure; very friable; abundant small roots; medium acid; clear, smooth boundary; layer is 6 to 8 inches thick.
A2—8 to 21 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; few small roots; few small pores; very strongly acid; gradual, wavy boundary; layer is 12 to 14 inches thick.
C1—21 to 34 inches, yellowish-brown (10YR 5/4) loamy sand; common, medium, distinct, yellowish-red (5YR 4/8) mottles, and few, fine, distinct, light brownish-gray (2.5Y 6/2) mottles; weak, fine, granular structure; friable; layer is 13 to 15 inches thick.
C2—34 to 42 inches +, grayish-brown (10YR 5/2) loamy sand; few, medium, faint, yellow (10YR 7/8) mottles; structureless; nearly loose; few small roots; extremely acid.

The color of the surface layer, depending on the organic-matter content, varies between black and grayish-brown. The entire profile generally is loamy sand, but in a few places it is sand. In the lower layers the color is mostly brown mottled with gray and yellow.

Lakewood Series

The following profile of Lakewood sand is located 1 mile northwest of S.C. Highway No. 189 and three-fourths of a mile south of S.C. Highway No. 27.

A1—0 to 8 inches, gray (N 5/0) sand; weak, fine, granular structure; very friable to loose; abundant small roots; abundant small pores; extremely acid; abrupt, smooth boundary; layer is 5 to 8 inches thick.
C1—8 to 30 inches, white (10YR 8/1) sand; weak, fine, granular structure or structureless; loose; few medium roots; very strongly acid; clear, smooth boundary; layer is 8 to 20 inches thick.
Bh—30 to 42 inches +, strong-brown (7.5YR 5/8) sand; irregular pockets of dark reddish-brown (5YR 3/2) sand; structureless; loose; moderate organic-matter content; strongly acid to extremely acid; several feet thick.

The layer stained by organic matter is at a depth of 20 inches to more than 30 inches. In some areas there are two or more stained layers with a pale leached layer between them.

Alluvial group

Alluvial soils are young soils on the flood plains of streams and in shallow depressions of the uplands. These soils are continually receiving additional deposits of soil material or are having their surface layer removed during floods.

The soil material has been modified very little or not at all by the soil-forming processes; consequently, texture and drainage determine the differences among the soils.

Although these soils show little horizonation, they are mottled in many places, and gleization may have progressed, especially in the lower layers.

The soils in Marlboro County that most nearly fit the central concept of Alluvial soils are those of the Congaree series.

Chewacla soils are classified as Alluvial soils, but they have some characteristics of Low-Humic Gley soils and are considered intergrades toward that great soil group.

Following are descriptions of representative profiles of the Alluvial soils in Marlboro County.

Chewacla Series

The following profile of Chewacla silt loam is located in a wooded area, 6 miles west of Brownsville along Highway No. 34.

A11—0 to 3 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; abundant small roots; many fine mica flakes; slightly acid; abrupt, smooth boundary; layer is 3 to 6 inches thick.
A12—3 to 12 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, fine and medium, subangular blocky structure; friable; many small roots; few fine mica flakes; strongly acid; clear, smooth boundary; layer is 8 to 12 inches thick.
C1—12 to 23 inches, grayish-brown (10YR 5/2) silty clay loam; common, fine, faint, yellowish-brown (10YR 5/4) mottles; weak, medium, subangular, blocky structure; friable to firm; few fine and medium roots; few fine mica flakes; strongly acid; gradual, wavy boundary; layer is 9 to 12 inches thick.
C2—23 to 42 inches +, light yellowish-brown (10YR 6/4) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) and pale-brown (10YR 6/3) mottles; massive; friable to firm; few fine mica flakes; extremely acid.

The surface layer is silty clay loam in some areas. Its color ranges from pale brown to dark brown or reddish brown. The color of the subsoil ranges from light yellowish brown to dark brown. The depth to mottling ranges from 12 to 26 inches. Mica flakes on the surface and throughout the profile range from few to many.

Congaree Series

The following profile of Congaree fine sandy loam is located on the flood plain of the Great Pee Dee River half a mile southeast of U.S. Highway No. 15.

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; many small roots; abundant small pores; many fine mica flakes; slightly acid; clear, smooth boundary; layer is 2 to 12 inches thick.
C1—9 to 20 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, medium, subangular blocky structure; friable; many small roots; many small pores; many fine mica flakes; medium acid; clear, smooth boundary; layer is 10 to 12 inches thick.
C2—20 to 42 inches +, yellowish-brown (10YR 5/4) silt loam; common, medium, faint, dark-brown (10YR 4/3) mottles; weak, medium, granular structure; friable; many fine mica flakes; strongly acid.

The texture of the surface layer generally is fine sandy loam, but in a few places it is silt loam. The color ranges from dark grayish brown to dark brown. The depth to mottling ranges from 18 to 30 inches. The number of mica flakes varies from place to place.

General Nature of the County

Marlboro County was established in 1785. The earliest recorded settlement in the county dates from 1736. The first settlements centered around the Great Pee Dee River, which was the only means of transportation.

Forests originally covered the area. The bottom lands in the vicinity of Welsh Neck were the first areas to be cultivated. Small clearings were first seeded to wheat and corn. Pasturage was plentiful, and livestock raising gained some importance early in the history of the county. As the production of and the demand for cotton increased, other crops and livestock declined in importance.

In 1960 the population of the county was 28,529, and that of Bennettsville, the county seat, was 6,963.

There are 10 high schools and 12 elementary schools scattered throughout the county. Two high schools and three elementary schools are in Bennettsville. Schoolbuses transport the children to and from school. A public library and about 90 churches of various denominations serve the county. A modern hospital is located in Bennettsville.

Recreational facilities, such as ball parks, golf courses, swimming pools, and tennis courts are available. A 500-acre lake near Bennettsville provides fishing, boating, swimming, and water skiing and is a refuge for waterfowl.

In 1963, there were 36 industries in the county, employing more than 3,000 people and producing, among other things, dog food, mixed feeds, mattresses, veneer products, kitchen cabinets, tire cord, asbestos yarn, fiberglass tape, carpet yarn, synthetic fibers, concrete masonry units, and brick. There were also meat and vegetable processing plants, printing and publishing companies, and sand-and-gravel mining companies.

Relief and Drainage

Marlboro County is in the upper and middle parts of the Atlantic Coastal Plain and extends across four marine terraces. The elevation of these terraces ranges from 70 to more than 300 feet.

The topography of the county is level or nearly level to moderately steep. The Sand Hills, including Pegues Plateau, are the highest part of the county. The topography is nearly level to moderately steep. The streams generally have steeper gradients and deeper and wider valleys than those in other areas of the county. Below the Sand Hills are the nearly level to sloping uplands. These areas are dissected by several sluggish, meandering streams. The narrow streambeds are 10 to 50 feet below the surrounding areas. The nearly level to level flood plains and stream terraces along the Great Pee Dee River are almost continuous along the western boundary of the county. They are less than a mile to several miles wide. The only streams crossing the terraces originate in the uplands. On the flood plains, drainage is mainly by intermittent, sluggish sloughs. The area near Dunbar is level or nearly level and is at a lower elevation than areas to the north and east. It is known as the flatwoods. The few streams in this area originate in the higher parts of the county. In all parts of the county except the Sand Hills are many scattered, small to moderately large depressions, commonly known as Carolina bays. These depressions lack natural surface outlets. Many are bounded on the south and east sides by a narrow sand ridge.

Water Supply

Marlboro County is well supplied with streams, ponds, and lakes. The Great Pee Dee River forms the western boundary of the county. It has a free flow of five billion seven hundred and forty million gallons of water daily; its minimum regulated flow is four hundred and fifty-two million gallons daily. Other principal streams are the Little Pee Dee River, Naked Creek, Whites Creek, Crooked Creek, Wolf Creek, Beaverdam Creek, Cottingham Creek, Three Creeks, and Gum Swamp Creek. Most of the 300 ponds and lakes are stocked with fish.

The Coastal Plain deposits around Bennettsville and McColl are about 475 feet thick. In these areas, bored wells supply water for domestic use and livestock. Streams or dug ponds are the main sources of water used for sprinkler irrigation. There are about 12 artesian wells in the southern part of the county. They produce a fairly constant flow and supply water for livestock and industries.

Climate [6]

The climate of Marlboro County is mild and temperate. Rainfall is well distributed throughout the year. Table 11 shows, by months, the average daily maximum temperature, the average minimum temperature, and the average precipitation.

The day-to-day weather is controlled mostly by the movement of pressure systems across the county, but there are relatively few complete exchanges of air masses in summer, since tropical maritime air masses persist for extended periods. Warm weather generally lasts from some time in May into September, and there are few breaks in the heat in midsummer. In a typical summer, temperatures of 100° F. or higher are recorded on about 6 days—2 in June, 3 in July, and 1 in August. Occasionally, temperatures of 100° F. or higher are recorded in spring and in fall. Temperatures of 90° or higher are recorded on an average of 78 days. Winters are mild and relatively short. On about half the days of winter, freezing temperatures are recorded. In a typical winter, temperatures of 20° F. or lower are recorded on about 7 days, 15° F. or lower on 3 days, and 10° F. or lower on 2 days. In winter a little snow may fall, but it soon melts. The ground is frozen only a few days at a time. Spring is the most changeable season. The weather is frequently cold and windy in March, but it is generally warm and pleasant in May. Fall is the most pleasant season, especially the period from late in September to early in November. During this period, rainfall is light, the percentage of sunshine is high, and the temperatures are generally mild.

[6] Prepared by NATHAN KRONBERG, State climatologist, U.S. Weather Bureau, Columbia, S.C.

TABLE 11.—*Temperature and precipitation data*

[All data from Cheraw, Chesterfield County, S.C. (*13*)]

Month	Temperature				Precipitation			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Inches
January	57	32	76	18	3.4	1.7	5.5	0.7
February	59	33	74	21	3.5	1.0	5.8	.3
March	66	38	79	24	4.1	2.1	6.4	.4
April	75	48	88	36	3.8	1.7	6.5	----------
May	84	57	93	45	3.4	1.3	5.2	----------
June	91	66	100	56	4.1	1.8	6.4	----------
July	92	69	100	62	5.6	2.5	8.3	----------
August	91	68	98	60	5.3	2.4	8.5	----------
September	86	62	96	50	4.3	1.6	7.6	----------
October	78	50	88	35	2.7	.4	5.9	----------
November	67	38	80	21	2.8	.7	5.2	[1]
December	57	32	74	18	3.3	1.3	5.8	7
Year	75	49	[2] 103	[3] 13	46.3	36.0	56.3	2.1

[1] Trace. [2] Average annual highest temperature. [3] Average annual lowest temperature.

In a typical year, about 77 days have one-tenth of an inch or more of rain, about 35 days have one-half inch or more, and 15 days have 1 inch or more. About 32 percent of the annual rainfall occurs in summer, chiefly in the form of thundershowers; about 21 percent occurs in fall, about 24 percent in winter, and about 24 percent in spring (*5*, *13*, *14*). The highest annual rainfall recorded at Cheraw, Chesterfield County, in the last 35 years was 67.93 inches in 1929, and the lowest was 32.59 inches in 1954. The maximum intensity of rainfall recorded in the 8-year period 1943–50, at Marion, Marion County, was 2.25 inches in 1 hour; 3.40 inches in 2 hours; 3.56 inches in 3 hours; 3.65 inches in 6 hours; 3.71 inches in 12 hours; and 8.50 inches in 24 hours (*15*).

No records of wind, humidity, or sunshine have been kept in Marlboro County but records at Columbia, Richland County, S.C., and at Charlotte, Mecklenburg County, N.C., show that the prevailing winds are from the northeast late in summer and early in fall and from the southwest the rest of the year. The average wind velocity is about 8 miles an hour. The highest wind velocity that has been recorded for a 1-minute period at the Columbia station is 60 miles an hour. The average relative humidity at 1 p.m. ranges from a maximum of 58 percent in winter to a minimum of 47 percent in April and May. The average relative humidity for a year, based on four daily readings taken at 1 a.m., 7 a.m., 1 p.m., and 7 p.m., is about 70 percent. In a year, the sun is visible 65 percent of the daylight hours. The range in percentage is from the high fifties in winter to the low seventies in summer. Skies are cloudy and overcast about 35 percent of the time. The clouds are below 500 feet about 2 percent of the time and below 1,000 feet about 6 percent of the time.

Heavy rains and gale-force winds resulting from nearby tropical storms occur occasionally from midsummer through late fall, but they are more likely to occur in September. They have occurred only about five times in the last 30 years. Damage from these storms generally has been minor in this county. Tornadoes and local thunderstorms are more likely to occur in spring. About four tornadoes have occurred in the county in the last 40 years.

The moist, mild climate of the county is favorable for many crops. The principal crops are cotton, tobacco, pasture and hay plants, soybeans, and trees. Moisture is stored in the soils in winter and spring so that generally the moisture content of the soils is at capacity at the time of planting. There are also enough dry periods to permit tillage. The length of the growing season is about 216 days, which is long enough for crops to mature even if the crops are planted over a period of weeks or months. The average date of the last freeze in spring is April 1, and that of the first freeze in fall is November 3. Probabilities of freezing temperatures on or after given dates in spring and on or before given dates in fall are given in table 12.

The amount of rainfall in the growing season is generally enough for crops, but in some years it is either inadequate or excessive. Table 11 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 5.6 inches, but in 1 year in 10, it may be less than 2.5 inches, and in another July in the same 10-year period, it may be more than 8.3 inches (*5*, *13*, *14*).

Disastrous droughts occurred in Marlboro County in 1925 and 1954 (*13*). Partial droughts occur about once or twice every 10 years. By definition, a drought is a period when there is no water available to plants in the root zone. Calculation of drought days is based on the capacity of the soil to hold available moisture, on the amount of precipitation, and on the amount of water used or transpired by plants. Even in a normal year there are periods

when rainfall does not supply the water needed for most crops. If maximum crop yields are to be obtained, supplementary irrigation is needed for most crops each year. During a severe drought, however, there is no water available for irrigation.

TABLE 12.—*Probabilities of last freezing temperatures in spring and first in fall*

[All data from Cheraw, Chesterfield County, S.C. (*6, 14*)]

Probability	Dates for given probability at temperature levels shown		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than.	March 25	April 5	April 22.
2 years in 10 later than.	March 17	March 29	April 15.
5 years in 10 later than.	March 4	March 15	April 1.
Fall:			
1 year in 10 earlier than.	November 12	November 1	October 19.
2 years in 10 earlier than.	November 18	November 6	October 24.
5 years in 10 earlier than.	November 28	November 16	November 3.

Table 13 gives estimates of the chances of drought days, by months, for soils of 1-inch, 2-inch, 3-inch, 4-inch, and 5-inch moisture-storage capacities. These estimates were obtained by using the Penman method to compute evapotranspiration and by defining a drought day as a day during which no water is available to plants. The total possible amount of stored moisture available to plants varies, depending on the soil and the rooting depth of the crop. For example, for a soil that has a 2-inch storage capacity, the chances are 5 in 10 that in July there will be at least 8 drought days (*16*).

Agriculture

Agriculture has always been important to the economy of Marlboro County. Wheat and corn were the main crops grown until about 1800, when the cultivation of cotton was started in the county. As cotton growing increased in importance, lumbering and turpentining declined. In 1909, cotton was grown on 67 percent of the acreage in cultivation. In the last few years, farming has become more diversified. Corn, grain, tobacco, and soybeans are now grown. In 1963, the area allotted to cotton was 38,844 acres, or 32 percent of the cultivated land. Livestock and dairy products are increasing in importance (*11*).

In 1959, about 174,814 acres, or 56.7 percent of the total land area of the county, was in cultivation. There were 1,246 farms in the county. The average size was 140.3 acres. In 1910, 69 percent of the acreage of the county was in farms, and the average size of farms was 62 acres.

Much of the acreage of the county is well suited to the use of heavy farm machinery. Many large farms are highly mechanized.

TABLE 13.—*Probabilities of drought days on soils of different moisture-storage capacities* (*5*)

Month [1]	Probability	Minimum drought days if soil has a moisture-storage capacity of [2]—				
		1 inch	2 inches	3 inches	4 inches	5 inches
April	1 in 10	15	0	0	0	0
	2 in 10	13	0	0	0	0
	3 in 10	11	0	0	0	0
	5 in 10	9	0	0	0	0
May	1 in 10	25	25	21	14	8
	2 in 10	23	21	17	9	0
	3 in 10	21	18	13	6	0
	5 in 10	17	14	8	0	0
June	1 in 10	24	24	23	20	18
	2 in 10	22	20	19	16	13
	3 in 10	20	17	16	13	9
	5 in 10	17	13	10	8	0
July	1 in 10	22	21	20	20	18
	2 in 10	19	17	16	15	13
	3 in 10	16	14	13	12	10
	5 in 10	12	8	7	6	0
August	1 in 10	20	17	15	14	14
	2 in 10	17	13	10	10	9
	3 in 10	15	10	7	6	5
	5 in 10	11	5	0	0	0
September	1 in 10	22	19	17	15	14
	2 in 10	19	15	12	9	8
	3 in 10	17	12	9	5	0
	5 in 10	14	8	0	0	0
October	1 in 10	28	27	24	23	22
	2 in 10	24	22	17	15	12
	3 in 10	21	17	12	8	6
	5 in 10	15	10	0	0	0

[1] January, February, March, November, and December are not shown, because crops are rarely damaged by drought in these months.

[2] Moisture-storage capacity of soil is expressed as the inches of rainfall or irrigation water that a soil can hold and make available to plants.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity. The capacity of a soil to hold water in a form available to plants. It is approximately the amount of moisture held at tensions of between one-third atmosphere and 15 atmospheres.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Colluvium. Soil material and rock fragments moved by soil creep, by slides, or by local wash and deposited at the base of steep slopes.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, easily crushed under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist can be crushed 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 presure.

Cemented.—Hard and brittle; little affected by moistening.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Erosion. The wearing away of the land surface by wind, running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in 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.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Genesis, soil. The manner in which the soil originated, with special reference to the processes responsible for the development of the solum, or true soil, from the unconsolidated parent material.

Gleization. The reduction, translocation, and segregation of soil compounds, notably of iron, usually in the subsoil or substratum, as a result of poor aeration and drainage; expressed in the soil by mottled colors dominated by gray. The soil-forming processes leading to the development of a gley soil.

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 soil horizons:

A horizon. The mineral horizon at the surface. It has an accumulation of organic matter, has been leached of soluble minerals and clay, or shows the effects of both.

B horizon. A horizon in which clay minerals or other material has accumulated, that has developed a characteristic blocky or prismatic structure, or that shows the effects of both processes.

C horizon. The unconsolidated material immediately under the true soil.

D horizon. Any layer, or stratum, underlying the C horizon, or the B horizon if no C horizon is present.

Infiltration. The downward entry of water into the immediate surface soil or other material, as contrasted with percolation which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, generally expressed in inches per hour. It may be limited either by the infiltration capacity of the soil or by the rate at which water is applied to the surface soil.

Intermittent stream. A stream or part of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is affected by the texture of the surface layer and subsoil and by the height of the ground water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Intolerance. The inability of a woody plant to grow well in a particular environment; commonly used to denote trees that cannot endure heavy shade.

Leached layer. A layer from which the soluble materials have been dissolved and washed away by percolating water.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Morphology, soil. The makeup of the soil, including the texture, structure, consistence, color, and other physical, mineralogical, and biological properties of the various horizons of the soil profile.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: For abundance—*few, common,* and *many;* for size—*fine* (less than 5 millimeters, about 0.2 inch, in diameter along the greatest dimension); *medium* (from 5 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); for contrast—*faint, distinct,* and *prominent.*

Natural drainage. Refers to the conditions that existed during the development of 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 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.

Imperfectly or 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.

Normal soil. A soil having a profile in equilibrium with its environment; developed under good but not excessive drainage from parent material of mixed mineral, physical, and chemical composition. Its characteristics show the full effects of the forces of climate and living matter.

Nutrients, plant. The elements taken in by plants that are essential to their growth and are used by them in 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.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Parent material (soil). The weathered rock or partly weathered soil material from which a soil has formed; the C horizon.

Percolation. The downward movement of water through the soil.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating relatively weak acidity and alkalinity, as in soils and other biological systems. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. See also Horizon, soil.

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. The degrees of acidity or alkalinity are expressed in words as follows:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6–7.3
Very strongly acid	4.5–5.0	Mildly alkaline	7.4–7.8
Strongly acid	5.1–5.5	Moderately alkaline	7.9–8.4
Medium acid	5.6–6.0	Strongly alkaline	8.5–9.0
Slightly acid	6.1–6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of the land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Runoff (hydraulics). The part of the precipitation on a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Second bottom. The first terrace above the normal flood plain of a stream.

Sand. As a soil separate, individual rock or mineral fragments 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz, but they may be of any mineral composition. As a soil textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 to 1.0 millimeters); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 millimeters to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in a mature soil includes the A and B horizons. Generally the characteristics of the material in these horizons are unlike those of the underlying parent material. Living roots and other plant and animal life are largely confined to the solum.

Stratified. Composed of, or arranged in, strata, or layers, such as stratified alluvium. The term is confined to geological material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

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 without any regular cleavage, as in many claypans and hardpans).

Substratum. Any layer lying beneath the solum, or true soil; the C or D horizon.

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. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that the water soaks into the soil or flows slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

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.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and ordinarily at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

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.

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