United States Department of Agriculture

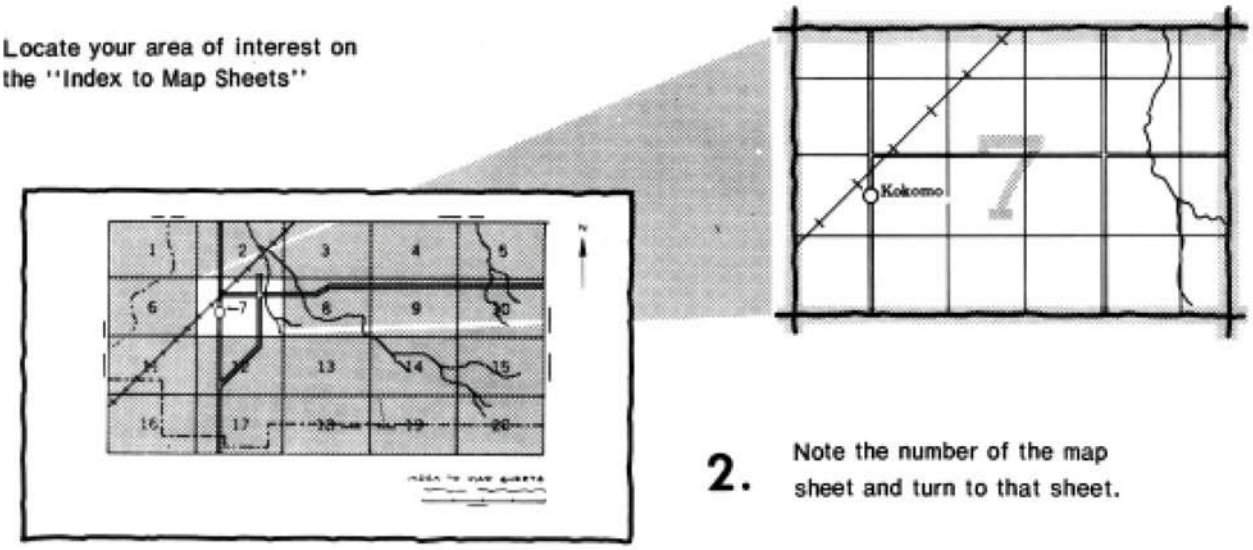
Soil Conservation Service

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

Soil Survey of Craven County, North Carolina

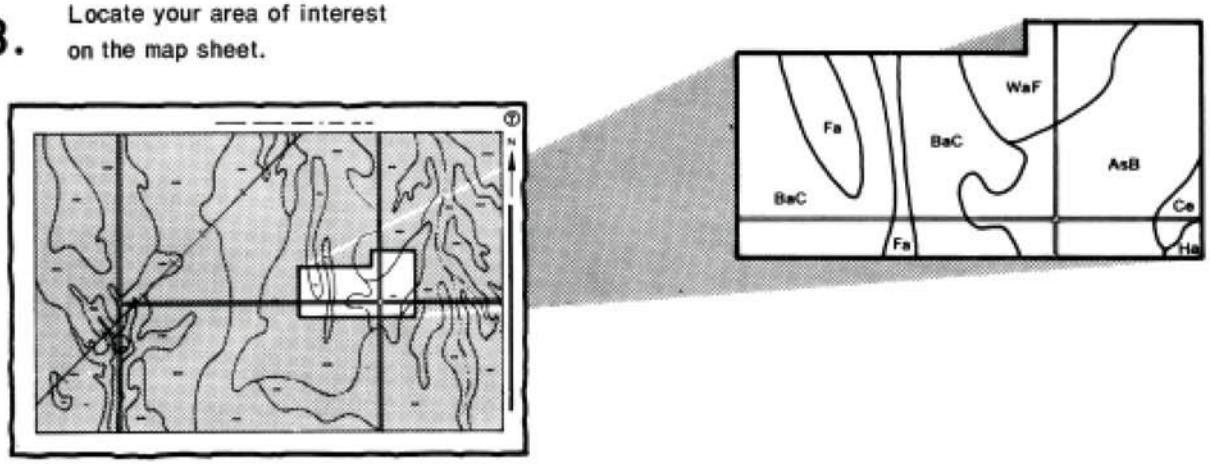
HOW TO USE

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

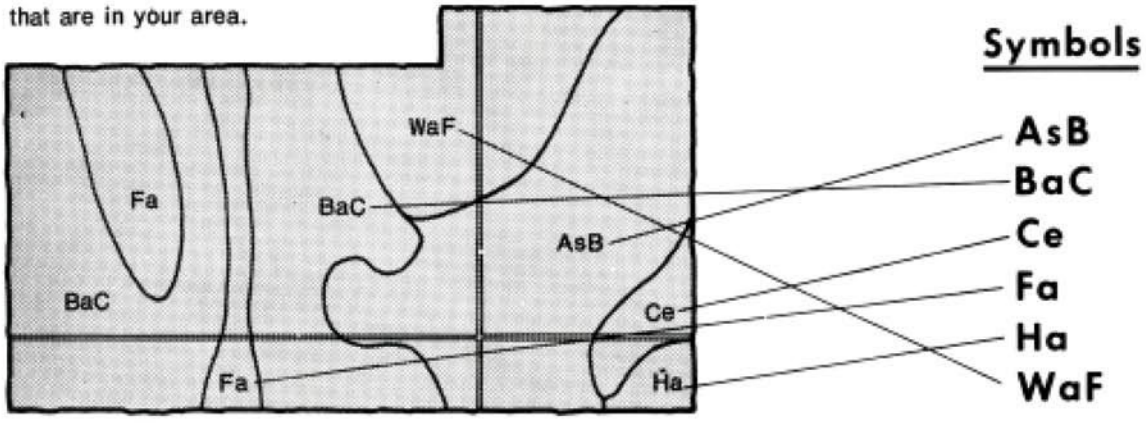


2. Note the number of the map sheet and turn to that sheet.

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

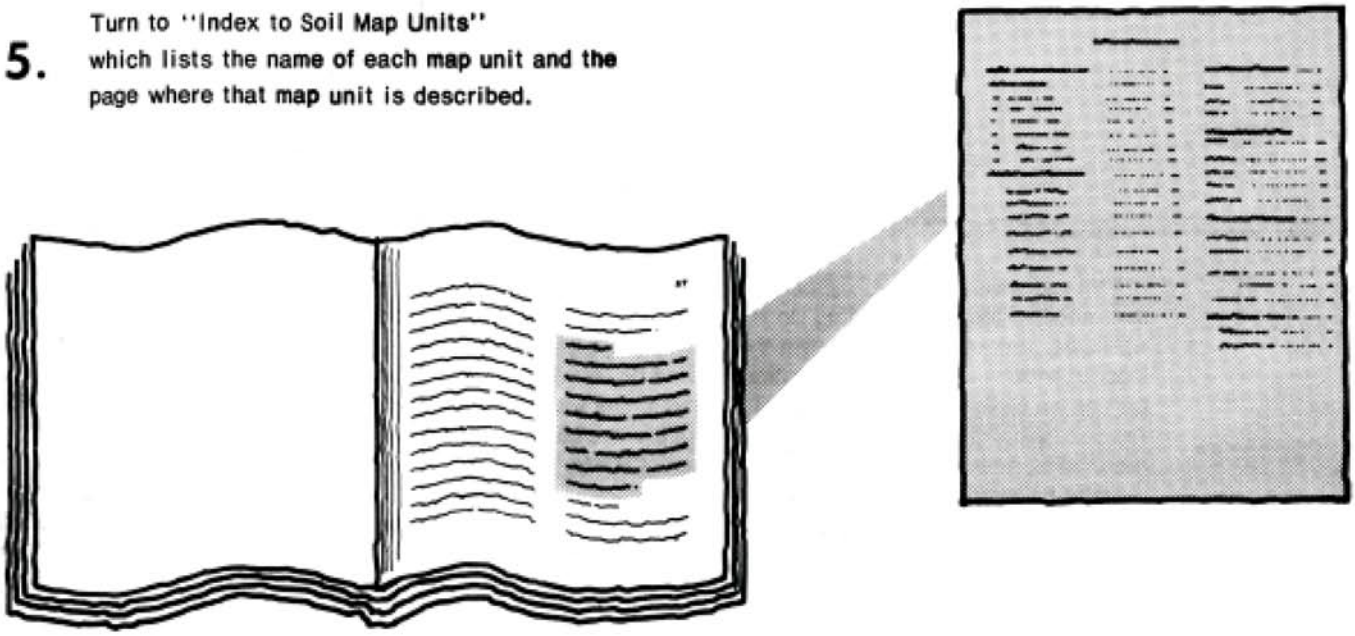


4. List the map unit symbols that are in your area.

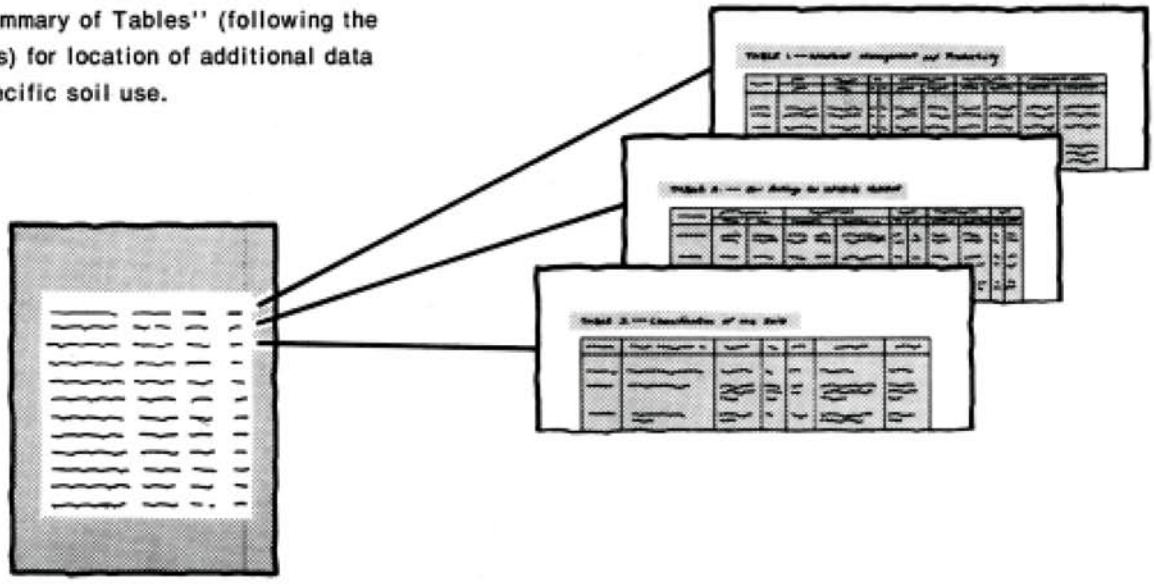


THIS SOIL SURVEY

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



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



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

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

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

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

This survey updates a soil survey of Craven County published in 1929 and provides additional information.

Cover: Tryon Palace, completed in 1770, was the residence of the colonial governor of North Carolina and meeting place of the colonial assembly. It later served as the first state capitol of North Carolina. The soil is Tarboro-Urban land complex, 0 to 6 percent slopes. (Photo courtesy of North Carolina Department of Commerce, Travel and Tourism Division.)

Contents

Soil Series

Issued March 1989

Index to map units

Summary of Tables

Foreword

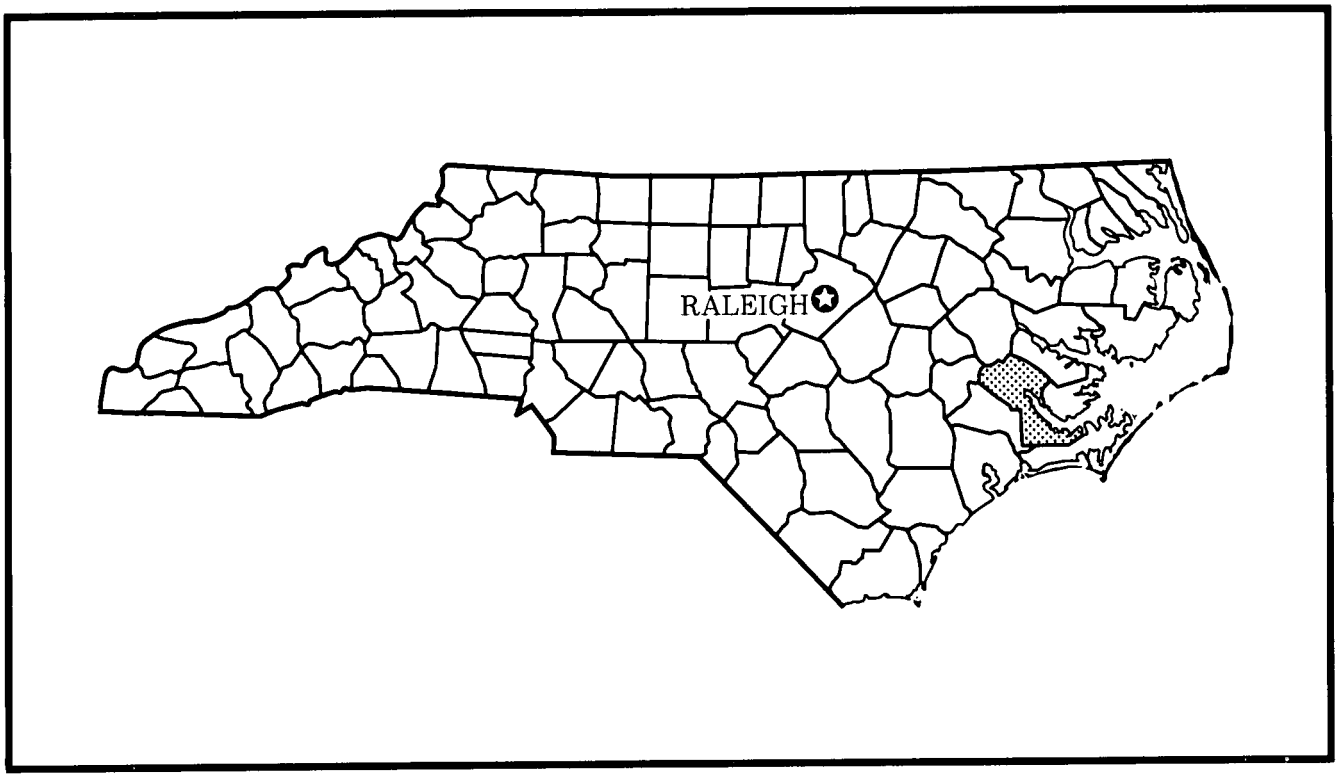
This soil survey contains information that can be used in land-planning programs in Craven County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

Bobbye Jack Jones
State Conservationist
Soil Conservation Service



Location of Craven County in North Carolina.

Soil Survey of Craven County, North Carolina

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

Soils surveyed by Roy A. Goodwin, Jr., J. Michael Ortosky, Jr., John A. Gagnon, Jr., Peter T. Kleto, Van S. Jenkins, L.L. Mallard, and J.A. Meadows, Soil Conservation Service; and Gina Boccetti, North Carolina Department of Natural Resources and Community Development

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

CRAVEN COUNTY is in the Lower Coastal Plain of eastern North Carolina. In 1980, the U.S. Census reported a county population of 71,043. About two-thirds of the population live in and around New Bern, the county seat, and Havelock, which includes the Cherry Point U.S. Marine Corps Air Station. In 1980, the population in Township 8, the New Bern area, was 24,645; in Township 6, the Havelock-Cherry Point area, it was 21,963.

The county has a land area of 464,000 acres, or 725 square miles. According to data collected by the North Carolina Agricultural Extension Service in 1981, more than 72,000 acres was used as cropland. Most of the remaining acreage was in woodland. There is 60,933 acres of the Croatan National Forest in Craven County. The Cherry Point U.S. Marine Corps Air Station covers an 18 square mile area in the southern part of the county.

General Nature of the Survey Area

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

Physiography and Drainage

Craven County is drained by the Neuse and Trent Rivers. The flow is sluggish in the rivers and their tributaries. The general slope of the county is to the southeast. According to the U.S. Geologic Survey topographic maps, elevation ranges from 63 feet above sea level at Dover to less than 5 feet in marshes and flood plains in the central and southeastern parts of the county. About 88 percent of the land is nearly level, 11 percent is gently sloping, and less than 1 percent is sloping to moderately steep.

The major physiographic areas in Craven County are the uplands of the Wicomico surface, the uplands of the Talbot surface, the flood plains along streams, and the stream terraces.

On the uplands of the Talbot and Wicomico surfaces, large areas of poorly drained and very poorly drained soils are on broad, nearly level interstream divides. Near the streams, nearly level and somewhat poorly drained soils grade into gently sloping, moderately well drained and well drained soils. Short, moderately steep side slopes are beside some larger drainageways (fig. 1).

Organic soils are in large pocosins in the southern part of the county and in other scattered areas. The surface appears flat, but an imperceptible slope extends from the

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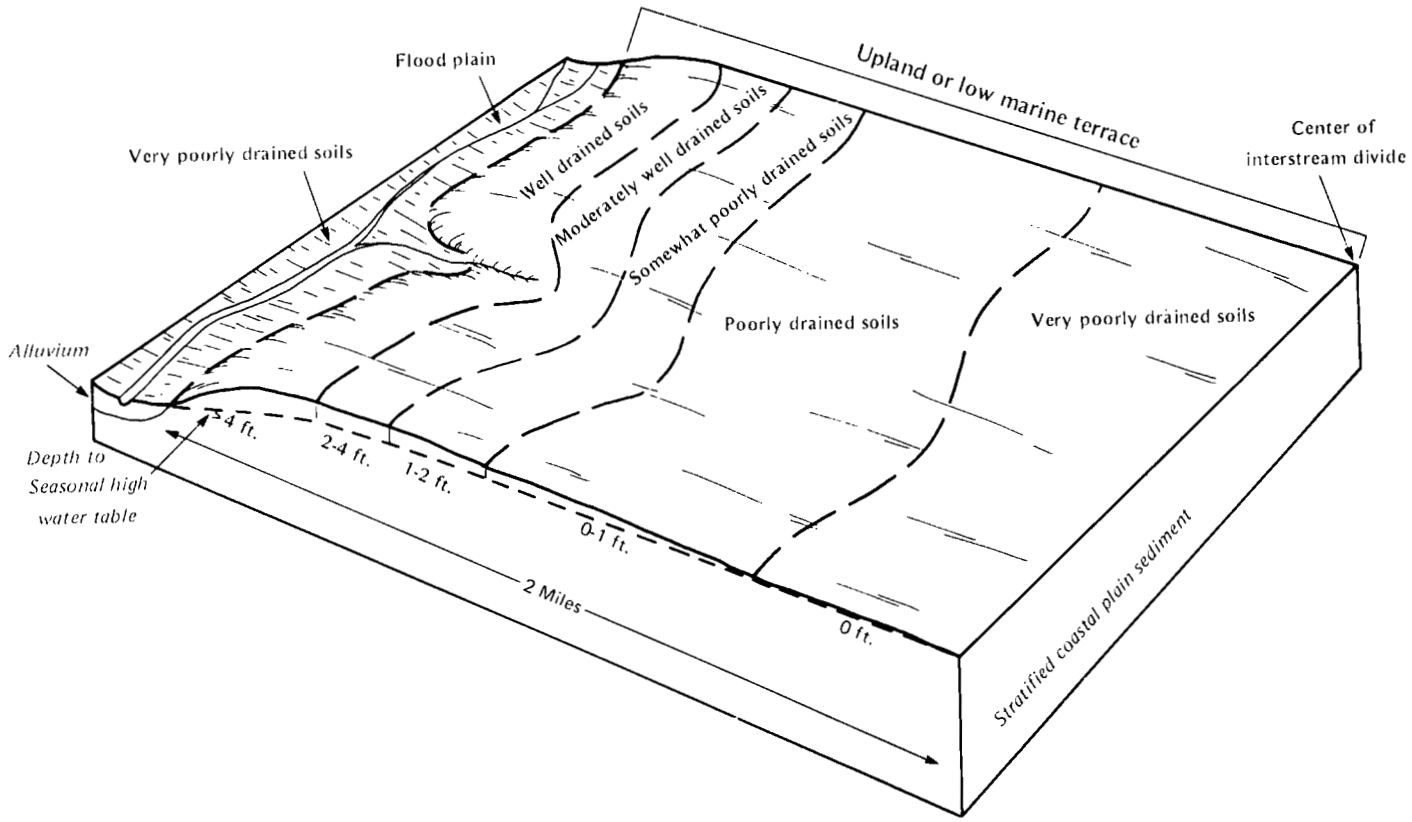

Figure 1.—Typical landscape position and drainage class relationships of soils from a drainageway to the center of a broad interstream divide. The seasonal high water table approaches the surface as distance from the drainageway increases.

center outward. In these places, surface runoff is very slow, the underlying material is slowly permeable, and rainfall exceeds evapotranspiration by about 19 inches a year *(7)*. These factors favor the accumulation of layers of organic material.

Nearly level, poorly drained and very poorly drained soils are on flood plains along the streams. Broad stream terraces are along the rivers and the larger creeks in the southeastern, central, and west-central parts of the county. On these terraces, excessively drained to very poorly drained soils are on nearly level to gently sloping ridges and nearly level flats and in depressions.

About 38 percent of the soils in Craven County is very poorly drained, 26 percent is poorly drained, 10 percent is somewhat poorly drained, 16 percent is moderately well drained, 7 percent is well drained, and 3 percent is excessively drained or somewhat excessively drained. The remaining 1 percent is urban land, pits, or small areas of water.

History and Development

Craven County was inhabited by the Tuscarora Indians when the first European settlers arrived in 1707. The first permanent settlements were made in 1710 by Germans and Swiss at New Bern and by Welsh Quakers near Hancock and Clubfoot Creeks *(14)*. After the Tuscarora War of 1711, Scotch and English settlers came from Virginia and other parts of North Carolina.

In 1712, Craven Precinct was established and named in honor of Lord William Craven, an English nobleman. The precinct became Craven County in 1722. New Bern, the county seat, was incorporated in 1723 and is the second oldest city in North Carolina. From 1737 to 1792, the city served as the colonial capital of North Carolina. Tryon Palace, completed in 1770, was used as the governor's residence and state house *(8)*. It has been restored and is a major tourist attraction.

Early agriculture in the county consisted of the production of corn, peas, wheat, oats, rice, and potatoes, and the raising of cattle, hogs, and sheep. By 1880, the leading crops were corn, cotton, sweet potatoes, rice,

oats, and wheat. In the early 1900's, the cotton acreage decreased because of the boll weevil, and tobacco and corn were the main crops. The soybean acreage also began to increase during this period.

Forest products have been a major part of the county's economy since the colonial period. Tar, pitch, and turpentine were produced in great quantity until about 1900, when most of the longleaf pine had been harvested. In 1979, the North Carolina Forest Service reported that 65 million board feet of logs for lumber, plywood, and veneer were harvested. Pulpwood production was 204,000 cords.

Early in the history of Craven County, New Bern was a thriving port and one of the largest towns in North Carolina. Large amounts of locally grown crops, naval stores, lumber, beef, pork, hides, furs, and other goods were exported. After the Civil War, New Bern became less important as a port. Other parts of the county became more populated as better roads and railroads replaced water as the principal means of transporting goods. As methods of farming and forestry became more efficient, many people moved away from the farms, and the county became more industrialized. The development of the Cherry Point U.S. Marine Corps Air Station made Havelock the fastest growing city in the state in the 1940's. National defense continues to be a major factor in the local economy *(14)*.

Water Supply

Ground water is plentiful throughout the survey area. It is near the surface in most places, particularly in winter and early in spring. On many farms, excavated ponds supply water for irrigation, livestock, and recreation. Most of the inactive borrow pits contain water, and several large lakes are in the southern part of the county.

Thousands of feet of sedimentary deposits underlie the soils of the survey area. The upper part of these deposits contains aquifers that supply the county's well water. The surficial aquifer ranges from the water table down to a maximum of about 60 feet. It is thicker in the southern part of the county. Earlier in the development of Craven County, this aquifer was the main source of small domestic water supplies. The use of shallow wells has decreased considerably because of small yield, frequent high content of dissolved iron, and the risk of contamination. The Castle Hayne Formation supplies most wells across the county. This aquifer is thin near the Lenoir and Pitt County lines but ranges up to 700 feet thick along the Carteret County line. In the upper part of this aquifer, the water is generally hard and often high in dissolved iron. In the lower part, the water is low in iron but is salty in some places, particularly in the southern part of the county. Because of the salty water in this aquifer, New Bern installed deep wells near Cove City. These wells draw large quantities of water with excellent chemical quality from the Black Creek Formation and the upper part of the Tuscaloosa Formation. However, this aquifer is not used east of Cove City because of its depth and probable content of salty water *(9)*.

Climate

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

Craven County is hot and humid in summer, but the coast is frequently cooled by sea breezes. Winter is cool and has occasional, brief cold spells. Rainfall occurs throughout the year and is fairly heavy at times. Annual precipitation is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at New Bern in the period 1951 to 1977. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 46 degrees F, and the average daily minimum temperature is 35 degrees. The lowest temperature on record, which occurred at New Bern on February 13, 1973, is 7 degrees. In summer the average temperature is 78 degrees, and the average daily maximum temperature is 89 degrees. The highest recorded temperature, which occurred at New Bern on June 27, 1954, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 54.5 inches. Of this, 33 inches, or 60 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 28 inches. The heaviest 1-day rainfall during the period of record was 12.23 inches at New Bern on September 19, 1955. Thunderstorms occur on about 50 days each year, and most occur in summer.

The average seasonal snowfall is 2 inches. The greatest snow depth at any one time during the period of record was 10 inches. Days with at least 1 inch of snow is on the ground are rare.

The average relative humidity in midafternoon is about 65 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in spring.

Hurricanes occasionally cross the area. Records show that 12 have caused severe flooding and extensive damage in New Bern since 1902. In 5 of these, the flood

waters exceeded 7 feet above mean sea level. The highest was 10.6 feet during Hurricane Ione in September 1955 *(18)*. During these storms, flooding occurs in low-lying areas along the Neuse River and its tributaries, including parts of New Bern and Bridgeton.

How This Survey Was Made

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

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

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

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

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

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

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

Map Unit Composition

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

is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

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

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

General Soil Map Units

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

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

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

Very Poorly Drained and Poorly Drained, Mineral Soils; on Broad Interstream Flats and in Depressions

The two map units in this group make up about 22 percent of the county. They consist of seasonally wet soils on uplands and stream terraces. The soils are used mainly as woodland and cropland. A seasonal high water table and rare flooding in low areas limit the use of these soils.

1. Rains-Pantego-Torhunta

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

The soils of this map unit are on interstream flats and in depressions of the Talbot and Wicomico surfaces (fig. 2). Large areas of this map unit are in the vicinity of Cove City and Dover and in the Croatan National Forest. Other areas are scattered across the county. The areas are broad and irregular in shape.

This map unit makes up 17 percent of the county. About 43 percent is Rains soils, 30 percent is Pantego soils, 12 percent is Torhunta soils, and 15 percent is soils of minor extent.

The Rains soils are poorly drained and are slightly higher on the landscape or closer to drainageways than the other major soils. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

The Pantego soils are very poorly drained and are in the middle of broad interstream areas and depressions. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

The Torhunta soils are very poorly drained and are also in the middle of broad interstream areas and depressions. The surface layer is fine sandy loam, and the subsoil is sandy loam.

Of minor extent in this map unit are the Lynchburg, Bayboro, Croatan, Grantham, Leaf, and Meggett soils. The Lynchburg soils are near shallow drainageways. The Bayboro, Croatan, Grantham, Leaf, and Meggett soils are on flats and in depressions.

The soils of this map unit are used mainly as woodland, pasture, and for row crops. A seasonal high water table is the main limitation.

2. Deloss-Tomotley

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

The soils of this map unit are on interstream flats and in depressions (fig. 3). They are in several broad, irregularly shaped areas north of Bridgeton, northwest of Vanceboro, and in the southeastern corner of the county.

This map unit makes up about 5 percent of the county. About 46 percent is Deloss soils, 28 percent is Tomotley soils, and 26 percent is soils of minor extent.

The Deloss soils are very poorly drained and are in the middle of the interstream flats and depressions. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

The Tomotley soils are poorly drained and are in areas slightly higher or closer to drainageways than the Deloss soils. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

Of minor extent are the Augusta, Arapahoe, Murville, and Roanoke soils. The Augusta soils are near shallow drainageways. The Arapahoe, Murville, and Roanoke soils are on flats and in depressions.

About three-fourths of the acreage of this map unit is woodland. The rest is in row crops or pasture. A seasonal high water table and rare flooding limit the use of these soils.

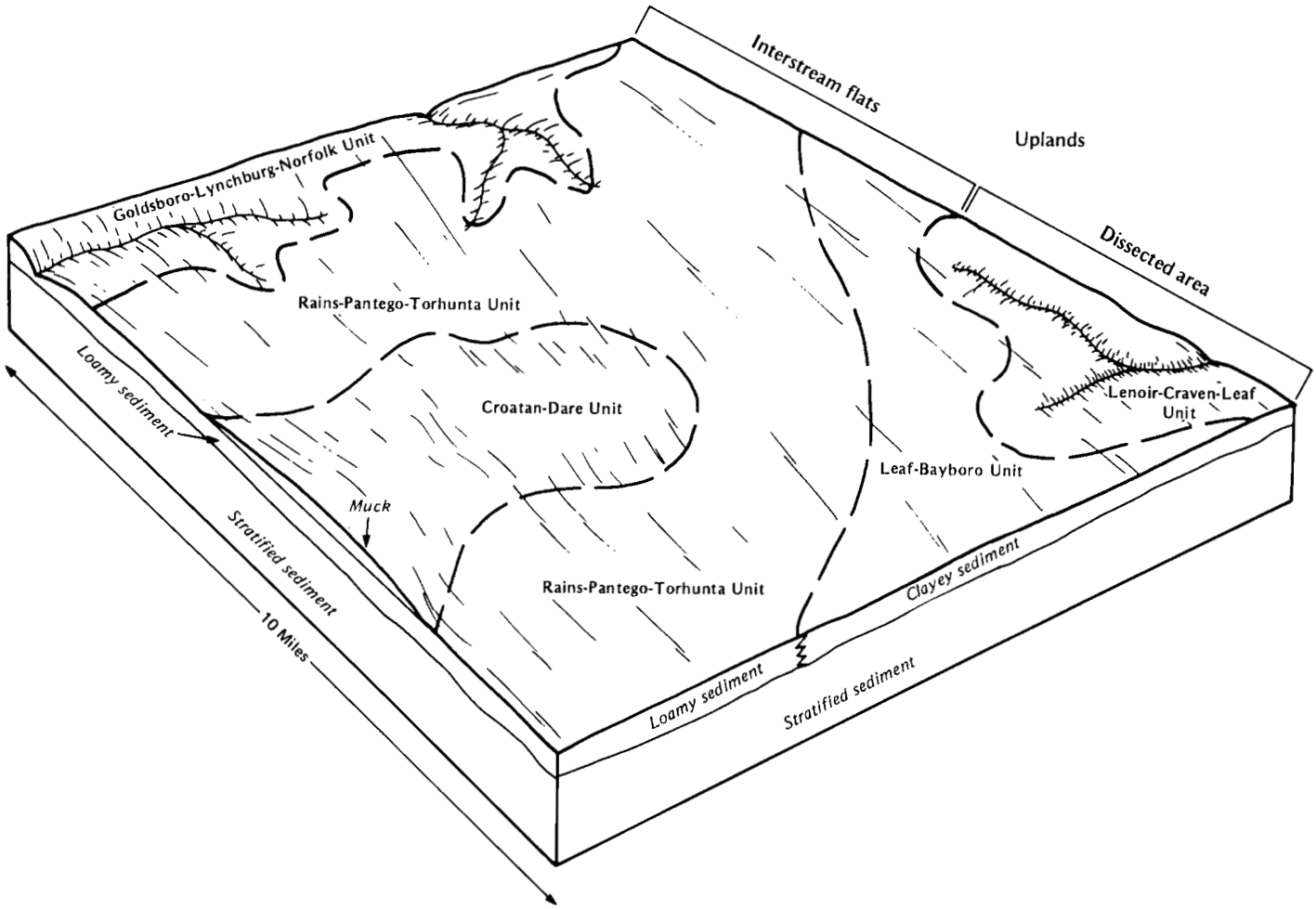

Figure 2.—On uplands of the Talbot and Wicomico surfaces, soil texture is influenced by the sediment in which the soils formed. Natural drainage and organic matter content are related to position on the landscape.

Well Drained to Poorly Drained, Mineral Soils; Near Drainageways

The two map units in this group make up about 23 percent of the county. The soils of these map units are on uplands and stream terraces. They are used mainly as woodland or cropland. A seasonal high water table is the main limitation to uses other than woodland.

3. Goldsboro-Lynchburg-Norfolk

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

These soils are on the Talbot and Wicomico surfaces near drainageways throughout the county (fig. 2). The areas parallel the drainageways and are long and variable in width.

The map unit makes up about 17 percent of the county. About 30 percent is Goldsboro soils, 22 percent is Lynchburg soils, 12 percent is Norfolk soils, and 36 percent is soils of minor extent.

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

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

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

Of minor extent are the Suffolk, Autryville, Craven, Exum, Onslow, Lenoir, Rains, Masontown, and Muckalee soils. The Suffolk soils are on side slopes adjacent to drainageways; the Autryville and Craven soils are near drainageways; and the Exum, Onslow, and Lenoir soils are in smooth areas. The Rains soils are in depressions, and the Masontown and Muckalee soils are in drainageways.

Most of the acreage of this map unit is woodland, and the rest is in row crops. A seasonal high water table is the main limitation to uses other than woodland in areas of Goldsboro and Lynchburg soils. The Norfolk soils have no major limitations for most uses.

4. Altavista-Augusta-Tomotley

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

The soils of this map unit are near major drainageways in the southeastern, central, and northwestern parts of the county (fig. 3). The areas parallel the drainageways and are long and variable in width.

This map unit makes up about 6 percent of the county. About 30 percent is Altavista soils, 18 percent is Augusta soils, 15 percent is Tomotley soils, and 37 percent is soils of minor extent.

The Altavista soils are moderately well drained and are nearer to the drainageways than the Augusta and Tomotley soils. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

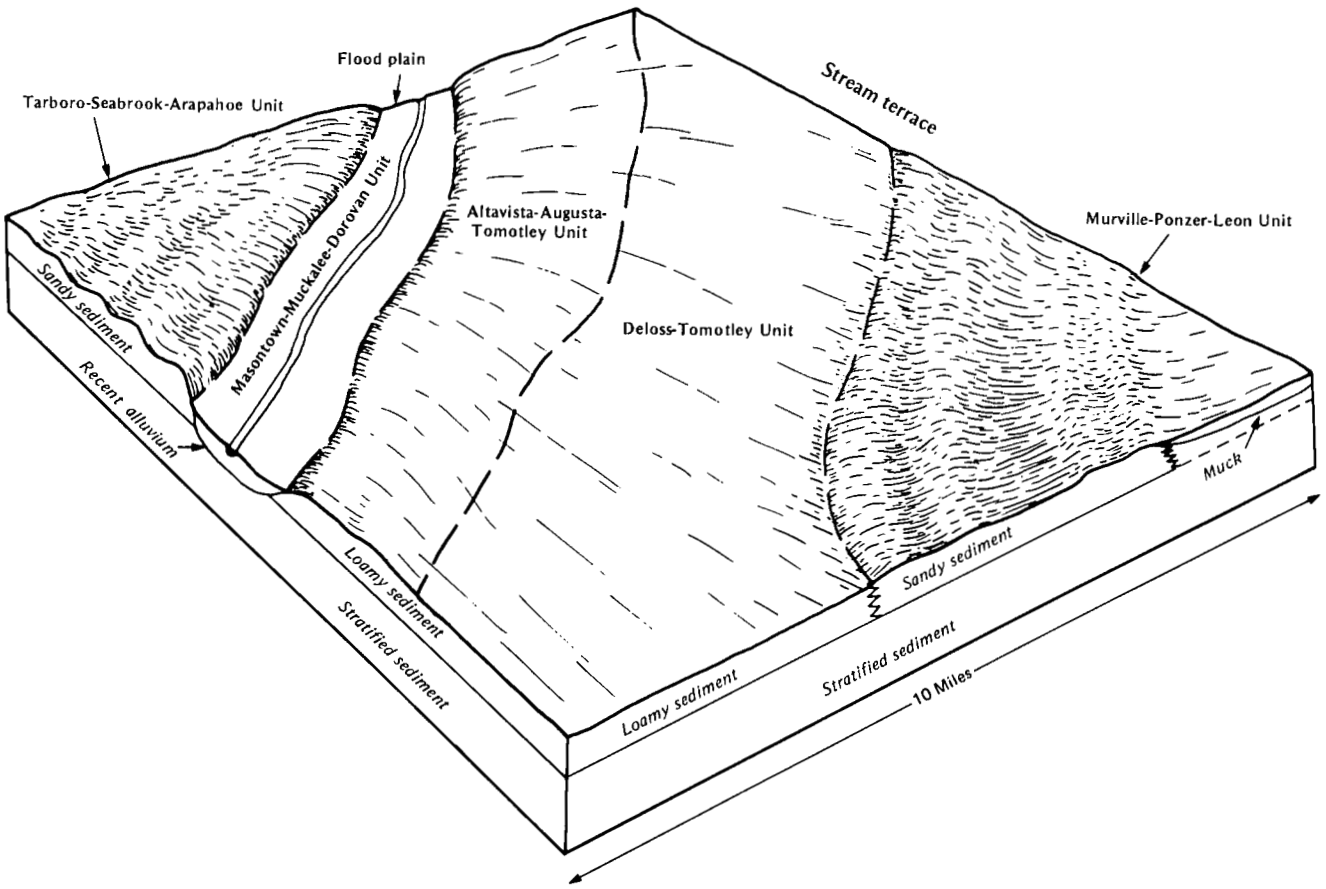

Figure 3.—The soils on stream terraces and flood plains formed in sandy and loamy sediment and in organic material. Natural drainage is related to landscape position.

The Augusta soils are somewhat poorly drained and commonly are between the Altavista and Tomotley soils. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

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

Of minor extent are the Arapahoe, Conetoe, Deloss, Lafitte, Masontown, Muckalee, Roanoke, Seabrook, State, and Tarboro soils. The Conetoe, Seabrook, State, and Tarboro soils are on low ridges. The Arapahoe, Deloss and Roanoke soils are in depressions. The Masontown and Muckalee soils are in drainageways, and the Lafitte soils are in marshes.

About two-thirds of the acreage of this map unit is woodland. The rest is mainly in row crops. A seasonal high water table is a limitation for uses other than woodland. Soils in low-lying areas are subject to rare flooding.

Moderately Well Drained to Very Poorly Drained, Mineral Soils; on Interstream Flats and in Depressions

The two map units in this group make up about 27 percent of the county. The soils of these map units are mainly used as woodland and cropland. Seasonal wetness, ponding, slow or very slow permeability, moderate to high shrink-swell potential, and low strength are the major limitations.

5. Lenoir-Craven-Leaf

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

These soils are on the Talbot surface in a landscape of interstream flats, depressions, and gentle slopes near drainageways (fig. 2). Some of the largest areas are in the vicinity of Vanceboro in the northern part of the county, south of New Bern between James City and Riverdale, west of New Bern to Tuscarora, and north of Dover. The areas are broad and irregular in shape.

This map unit makes up about 15 percent of the county. About 27 percent is Lenoir soils, 24 percent is Craven soils, 22 percent is Leaf soils, and 27 percent is soils of minor extent.

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

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

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

Of minor extent in this map unit are the Suffolk, Goldsboro, Lynchburg, Onslow, Meggett, Rains, Dorovan, Masontown, and Muckalee soils. The Suffolk soils are on side slopes beside drainageways. The Goldsboro, Lynchburg, and Onslow soils are in smooth areas. The Meggett and Rains soils are in depressions, and the Dorovan, Masontown, and Muckalee soils are in drainageways.

About three-fourths of the acreage of the major soils is woodland. The rest is mainly in row crops. A seasonal high water table, slow or very slow permeability, moderate to high shrink-swell potential, and low strength are the major limitations.

6. Leaf-Bayboro

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

These soils are on interstream flats and in depressions on the Talbot surface (fig. 2). The largest areas are in Big Pocosin in the northern part of the county and in the Croatan National Forest. Smaller areas are northwest of New Bern. The areas are broad and irregular in shape.

This map unit makes up about 12 percent of the county. About 63 percent is Leaf soils, 24 percent is Bayboro soils, and 13 percent is soils of minor extent.

The Leaf soils are poorly drained and are on flats and in small depressions. The surface layer is silt loam, and the subsoil is silty clay and silty clay loam.

The Bayboro soils are very poorly drained and are mainly in large depressions. The surface layer is mucky loam, and the subsoil is clay loam and clay.

Of minor extent are the Lenoir, Rains, Croatan, and Pantego soils. The Lenoir soils are near shallow drainageways; the Rains soils are on flats and in small depressions; and the Croatan and Pantego soils are in the larger depressions.

Most of the acreage of this map unit is woodland. The rest is cropland or pasture. A seasonal high water table, ponding of water in depressions, slow or very slow permeability, moderate to high shrink-swell potential, and low strength are the major limitations.

Very Poorly Drained, Organic Soils; on Intersteam Flats

The map unit in this group makes up about 10 percent of the county. The soils in this map unit are used mainly as habitat for wildlife. The main limitations are a high water table, ponding, low strength, and the danger of fire in the organic matter during dry periods.

7. Croatan-Dare

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

These soils are on the Talbot and Wicomico surfaces on large interstream flats (fig. 2) in the Croatan Pocosin in the Croatan National Forest, in Big Pocosin west of Vanceboro, and in the vicinity of Cove City and Dover. The areas are broad and irregular in shape.

This map unit makes up about 10 percent of the county. About 52 percent is Croatan soils, 37 percent is Dare soils, and 11 percent is soils of minor extent.

The Croatan soils are near the edge of the mapped areas. Typically, the soils are well decomposed organic matter 28 inches deep. The organic matter is underlain by mucky sandy loam, sandy loam, and sandy clay loam.

The Dare soils are mainly in the center of the interstream flats. Typically, the soils are well decomposed organic matter 60 inches deep. The organic matter is underlain by mucky loamy sand and sand.

Of minor extent are the mineral Bayboro, Murville, Pantego, and Torhunta soils near the edge of the mapped areas.

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

Very Poorly Drained, Organic Soils and Very Poorly Drained to Somewhat Excessively Drained, Mineral Soils; on Stream Terraces

The two map units in this group make up about 12 percent of the county. The soils of these map units are used as woodland, although a small acreage is cropland. The major limitations vary widely among the soils but include wetness, ponding, droughtiness, leaching of plant nutrients, low strength, and the danger of fire in the organic soils during dry periods. The soils in low areas are subject to flooding.

8. Murville-Ponzer-Leon

Nearly level and gently sloping, very poorly drained and poorly drained, sandy soils and nearly level, very poorly drained, organic soils; on stream terraces

These soils are on flats and in depressions and are on low ridges (fig. 3) around Bridgeton, northwest of Vanceboro, and in the southeastern corner of the county.

This map unit makes up about 4 percent of the county. About 28 percent is Murville soils, 28 percent is Ponzer soils, 25 percent is Leon soils, and 18 percent is soils of minor extent.

The Murville soils are very poorly drained and are on flats and in depressions. The surface layer is mucky loamy sand, and the subsoil is weakly cemented sand.

The Ponzer soils are very poorly drained and are in the middle of broad flats and depressions. Typically, the soils are well decomposed organic matter 40 inches deep. The organic matter is underlain by mucky fine sandy loam, sandy loam, and loamy sand.

The Leon soils are poorly drained and are on low ridges, flats, and in depressions. The surface layer is sand, and the subsoil is weakly cemented sand.

Of minor extent are the Conetoe, Seabrook, Tarboro, Arapahoe, Dare, Deloss, and Tomotley soils. The Conetoe, Seabrook, and Tarboro soils are on ridges, and the Arapahoe, Dare, Deloss, and Tomotley soils are on flats and in depressions.

Nearly all of the acreage of this map unit is woodland. The main limitations to the use of Murville soils are a high water table, frequent ponding, and the weakly cemented subsoil. The Ponzer soils are limited by a high water table, frequent ponding, low strength, and the danger of fire in the organic matter after drainage. A seasonal high water table, rare flooding of low-lying areas, leaching of plant nutrients, and the weakly cemented subsoil limit the use of Leon soils.

9. Tarboro-Seabrook-Arapahoe

Nearly level and gently sloping, somewhat excessively drained and moderately well drained, sandy soils and nearly level, very poorly drained, loamy soils; on stream terraces

These soils are on ridges and in depressions in the central and northwestern parts of the county (fig. 3). The areas are along the Neuse and Trent Rivers and other major streams. They are long and broad.

This map unit makes up about 8 percent of the county. About 24 percent is Tarboro soils, 23 percent is Seabrook soils, 21 percent is Arapahoe soils, and 32 percent is soils of minor extent.

The Tarboro soils are gently sloping and somewhat excessively drained. They are on ridges. The surface layer and underlying material are sand.

The Seabrook soils are nearly level and moderately well drained. They are in slightly rounded areas. The surface layer is loamy sand, and the underlying material is loamy sand and sand.

The Arapahoe soils are nearly level and very poorly drained. They are in depressions. The surface layer and subsoil are fine sandy loam.

Of minor extent are the Conetoe, Kureb, Altavista, State, Augusta, Deloss, Murville, Tomotley, Dorovan, Masontown, and Muckalee soils. The Conetoe and Kureb soils are on ridges; the Altavista and State soils are in slightly convex areas; and the Augusta, Deloss, Murville, and Tomotley soils are on flats and in depressions. The Dorovan, Masontown, and Muckalee soils are in drainageways.

About two-thirds of the acreage of this map unit is woodland. The rest is in row crops or pasture.

Droughtiness, leaching of plant nutrients, and wind erosion are the main limitations of Tarboro and Seabrook soils. A seasonal high water table is also a limitation of the Seabrook soils. Low-lying areas of Tarboro and Seabrook soils are subject to rare flooding. The major limitations to use of Arapahoe soils are a seasonal high water table and frequent ponding in depressions.

Very Poorly Drained and Poorly Drained, Mineral and Organic Soils; on Flood Plains

The map unit in this group makes up about 6 percent of the county. The soils of this map unit are used only as woodland and wildlife habitat. Frequent flooding is a hazard, and a continuous high water table is the main limitation.

10. Masontown-Muckalee-Dorovan

Nearly level, very poorly drained and poorly drained, loamy soils and nearly level, very poorly drained, organic soils that are flooded frequently; on flood plains

The soils of this map unit are along major streams (fig. 3). The areas are long, narrow to broad, and are at the lowest elevation in the county.

This map unit makes up about 6 percent of the county. About 56 percent is Masontown and Muckalee soils, 24 percent is Dorovan soils, and 20 percent is soils of minor extent.

The Masontown soils are very poorly drained and generally are on flats and in depressions away from the stream channels. The surface layer is mucky fine sandy loam, and the underlying material is sand.

The Muckalee soils are poorly drained and commonly are beside stream channels. The surface layer is sandy loam, and the underlying material is sandy loam and loamy sand.

The Dorovan soils are very poorly drained and are on the broadest flood plains, mainly at the head of the Neuse Estuary. The soils are very dark brown and black muck to a depth of 80 inches.

Of minor extent are the Altavista, Augusta, Arapahoe, Conetoe, Deloss, Roanoke, Tarboro, and Tomotley on stream terraces and the Lafitte soil in marshes.

The acreage of this map unit is in hardwood forests. The main limitation is a continuous high water table, and frequent flooding is a hazard. Low strength is also a major limitation to the use of Dorovan soils.

Detailed Soil Map Units

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

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

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

Important or commonly occurring plants are listed by their recognized common plant names *(10, 13)* in each map unit. Local plant names are given in parentheses following the common names if they differ. An alphabetical list of these plants and their scientific names is given in table 4.

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Norfolk loamy fine sand, 2 to 6 percent slopes, is one phase in the Norfolk series.

Some map units are made up of two or more major soils or of a soil and a miscellaneous land area. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more soils or of a soil and a miscellaneous land area in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Seabrook-Urban land complex is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps. These include wet spots, borrow pits, sandy spots, marshes, and short steep slopes.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps.

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

AaA—Altavista fine sandy loam, 0 to 2 percent slopes. This soil is moderately well drained. It is in slightly convex areas on stream terraces along the Neuse River and the larger creeks in the southeastern, central, and northwestern parts of the county. The areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 7 inches thick. The subsurface layer is pale brown fine sandy loam to a depth of 10 inches. The subsoil extends to a depth of 46 inches. It is light yellowish brown fine sandy loam and brownish yellow sandy clay loam in the upper part. The middle part is strong brown sandy clay loam that has light brownish gray mottles, and the lower part is gray sandy clay loam and sandy loam. The substratum to a depth of 80 inches is brownish yellow stratified loamy sand and sandy loam

in the upper part and light gray coarse sand in the lower part.

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

Included with this soil in mapping are small areas of Augusta, State, and Seabrook soils. The Augusta soils are somewhat poorly drained and are in depressions. The State and Seabrook soils are well drained and are in slightly higher areas than the Altavista soil. Also included at random within the map unit are a few areas of a soil that is similar to Altavista soil except that it has a clayey subsoil. Some areas of wet soils in depressions and sandy soils in higher areas of less than 4 acres are shown on the map with a special symbol. The included soils make up about 10 to 15 percent of this map unit.

This Altavista soil is used mainly as cropland. Small acreages are used as pasture or woodland.

The main cultivated crops are corn (fig. 4), tobacco, soybeans, and wheat. Because of wetness, a drainage system that includes tile and open ditches may be needed, especially in areas where tobacco is grown. Pasture forages include tall fescue, ladino clover, and coastal bermudagrass.

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

Seasonal wetness and rare flooding of low-lying areas limit the use of this soil as sites for buildings, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and by the use of tile and open ditches. The hazard of flooding should be determined before planning the use and management of specific sites.

This Altavista soil is in capability subclass IIw. The woodland ordination symbol is 9W.

AcA—Altavista-Urban land complex, 0 to 2 percent slopes. This complex consists of Altavista soil and Urban land. A typical mapped area contains about 50 percent Altavista soil and 30 to 40 percent Urban land. The Altavista soil is moderately well drained and is in slightly convex areas on stream terraces of the Neuse and Trent Rivers. The Urban land is in the city of New Bern. The areas are irregular in shape and range from 10 to 200 acres.

Typically, Altavista soil has a dark grayish brown fine sandy loam surface layer 7 inches thick. The subsurface layer is pale brown fine sandy loam to a depth of 10 inches. The subsoil extends to a depth of 46 inches. It is light yellowish brown fine sandy loam and brownish yellow sandy clay loam in the upper part. The middle part is strong brown sandy clay loam that has light brownish gray mottles, and the lower part is gray sandy clay loam and sandy loam. The substratum to a depth of 80 inches is brownish yellow stratified loamy sand and sandy loam in the upper part and light gray coarse sand in the lower part.

Permeability of the subsoil is moderate, and the available water capacity is high. The soil ranges from very strongly acid to medium acid except where lime has been added. The seasonal high water table is 1.5 to 2.5 feet below the surface except in areas that have been drained. Low-lying areas of this soil are subject to rare flooding. Surface runoff from rooftops and paved areas increases the hazard of flooding in low-lying areas.

Urban land consists of areas covered with buildings, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Augusta, State, and Seabrook soils. The Augusta soils are somewhat poorly drained and are in depressions. The State and Seabrook soils are in slightly higher areas than the Altavista soil and are well drained. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Drainage systems were installed in most areas of this complex as urban development progressed. Unless the soil is artificially drained, the seasonal high water table is a limitation for building site development, sanitary facilities, and recreation. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Ag—Augusta fine sandy loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on stream terraces along the Neuse River and the larger creeks in the northwestern, central, and southeastern parts of the county. The areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of 13 inches. The subsoil extends to a depth of 45 inches. The upper part is yellowish brown fine sandy loam that has light brownish gray mottles. The middle part is light brownish gray and light gray sandy clay loam, and the lower part is light gray fine sandy loam. The substratum to a depth of 80 inches is light gray loamy sand.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil ranges from very strongly acid to medium acid except where

Figure 4.—Corn is one of the major crops on Altavista fine sandy loam, 0 to 2 percent slopes.

lime has been added. The seasonal high water table is I foot to 2 feet below the surface. Low-lying areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Altavista, Seabrook, and Tomotley soils. The Altavista and Seabrook soils are moderately well drained and are in slightly higher areas than the Augusta soil. The Tomotley soils are poorly drained and are in depressions. Also included at random within the mapped areas are a few areas of soils similar to Augusta soil except that they have sandy layers 30 to 40 inches below the surface or they have a clayey subsoil. The included soils make up about 10 to 15 percent of this map unit.

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

Corn, soybeans, tobacco, and wheat are the major cultivated crops on this soil. Because of wetness, a drainage system that includes tile and open ditches may be needed. Pasture forages include tall fescue and ladino clover.

Loblolly pine, longleaf pine, southern red oak, water oak, yellow-poplar, sweetgum, red maple, white oak, and blackgum are the dominant trees on this soil. The understory plants include redbay, sweetleaf, sweet

pepperbush, waxmyrtle, American holly, Virginia creeper, honeysuckle, sweetbay, bitter gallberry, blueberry, greenbrier, switchcane, poison-ivy, and Carolina jessamine. There are no major limitations for woodland use and management.

Seasonal wetness and rare flooding of low-lying areas limit the use of this soil as sites for buildings, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and by the use of tile and open ditches. The hazard of flooding should be determined before planning the use and management of specific sites.

This Augusta soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

Ap—Arapahoe fine sandy loam. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on stream terraces along the Neuse River, Trent River, and the larger creeks in the southeastern, central, and northwestern parts of the county. The areas are irregular in shape and range from 5 to 500 acres.

Typically, the surface layer is black fine sandy loam 16 inches thick. The subsoil is dark grayish brown and grayish brown fine sandy loam to a depth of 41 inches. The substratum to a depth of 80 inches is gray fine sandy loam and loamy sand.

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

Included with this soil in mapping are small areas of the Deloss, Murville, Ponzer, Tomotley, and Leon soils. The Deloss and Murville soils are very poorly drained and occur at random within the map unit. The Ponzer soils are very poorly drained and are in depressions. The Tomotley and Leon soils are poorly drained and are in slightly higher areas than the Arapahoe soil. The included soils make up about 10 to 20 percent of this map unit.

Most of the acreage of this Arapahoe soil is native woodland. Small acreages are used as cropland.

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

This soil has been intensively drained in cultivated areas and is used for corn, soybeans, and wheat. Drainage systems include open ditches and tile. The sandy substratum causes ditchbank caving and makes ditch maintenance difficult. Suitable outlets are not available for drainage of some low-lying areas. Land grading improves surface drainage by eliminating depressions in which water ponds.

This soil generally is not used as sites for buildings, sanitary facilities, or recreation because of wetness, ponding, and rare flooding.

This Arapahoe soil is in capability subclass VIw (undrained) and IIIw (drained). The woodland ordination symbol is 10W.

AuB—Autryville loamy sand, 0 to 6 percent slopes. This soil is well drained. It is on gently undulating ridges on uplands near large drainageways mainly along the Trent and Neuse Rivers. The areas are irregular in shape and range from 5 to 500 acres.

Typically, the surface layer is grayish brown loamy sand 5 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 29 inches. The subsoil to a depth of 37 inches is yellowish brown sandy loam. The next layer is very pale brown sand. Below that, the subsoil is brownish yellow sandy loam and loamy sand to a depth of 69 inches. The substratum to a depth of 80 inches is yellow sand and brownish yellow loamy sand.

Permeability of the subsoil is moderately rapid, and the available water capacity is low. The soil is very strongly acid or strongly acid except where lime has been added. It does not have a water table within a depth of 5 feet. Wind erosion is a hazard in areas not protected by plant cover.

Included with this soil in mapping are small areas of Norfolk and Goldsboro soils. The Norfolk soils are well drained and occur at random within the map unit. The Goldsboro soils are moderately well drained and are in slightly lower areas than the Autryville soil. Some areas of wet soils are in depressions. These areas are smaller than 4 acres and are shown on the map with a special symbol. The included soils make up about 10 to 15 percent of this map unit.

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

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

The main crops on this soil are corn, tobacco, soybeans, and wheat. Leaching of plant nutrients and droughtiness are the main limitations, and wind erosion is a hazard. Blowing sand can damage young plants. Conservation practices are needed to help conserve soil and water. Coastal bermudagrass is the common pasture forage.

This soil has no major limitations for building site development. Seepage is the main limitation for sanitary facilities, and the sandy surface layer is a limitation for recreation uses.

This Autryville soil is in capability subclass IIs. The woodland ordination symbol is 7S.

Ba—Bayboro mucky loam. This soil is nearly level and very poorly drained. It is in depressions on uplands. The largest areas are in the Big Pocosin east of Vanceboro and in areas south of Clarks and Riverdale. The areas are irregular in shape and range from 5 to 1,000 acres.

Typically, the surface layer is black mucky loam 13 inches thick. The subsurface layer is grayish brown loam to a depth of 17 inches. The subsoil extends to a depth of 62 inches. It is grayish brown clay loam in the upper part and gray clay in the middle and lower parts. The substratum to a depth of 72 inches is gray clay loam.

Permeability of the subsoil is slow, and the shrink-swell potential is moderate. The surface and subsurface layers range from extremely acid to strongly acid except where lime has been added. The subsoil and underlying material are very strongly acid or strongly acid. The seasonal high water table is at or near the surface. Water ponds on the surface for long periods (fig. 5) except in areas that have been drained.

Included with this soil in mapping are small areas of Leaf, Rains, and Pantego soils. The Leaf and Rains soils

Figure 5.—Water ponds for long periods in undrained, depressional areas of Bayboro mucky loam.

are poorly drained and are in slightly higher areas than the Bayboro soil. The Pantego soils are very poorly drained and occur at random within the map unit. Also included are some areas of soils similar to Bayboro soil except that they are nonacid, have an organic surface layer, or have loamy or sandy layers 40 to 60 inches below the surface. The included soils make up about 15 to 25 percent of this map unit.

Most of the acreage of this Bayboro soil is native woodland. A few areas are cropland or pasture.

The dominant trees on this soil are sweetgum, blackgum, red maple, baldcypress, yellow-poplar, water oak, willow oak, and swamp chestnut oak. The understory plants include redbay, loblolly bay, titi, sweet pepperbush, fetterbush, huckleberry, waxmyrtle, American holly, switchcane, blueberry, poison-ivy, Virginia creeper, sweetbay, Virginia chainfern, sweetleaf, cinnamon fern, bitter gallberry, large gallberry, honeysuckle, and greenbrier. Some areas of this soil have been ditched, bedded, fertilized, and planted in loblolly pine. Wetness is the main limitation to commercial woodland use and management. Logging when this soil is wet causes deep ruts, compaction, poor drainage, and lower productivity.

This soil has been intensively drained in cultivated areas and is used for corn, soybeans, and wheat. The drainage systems include open ditches and land grading for surface drainage. Tile is not used because of slow internal drainage. Pasture forages include tall fescue and ladino clover.

This soil is not used as sites for buildings, sanitary facilities, or recreation because of wetness and slow permeability. Moderate shrink-swell potential and the clayey subsoil are also limitations for urban and recreational areas.

This Bayboro soil is in capability subclass VIw (undrained) and IIIw (drained). The woodland ordination symbol is 8W.

BrB—Bragg soils, 0 to 8 percent slopes. These soils are well drained and are on uplands where construction methods have caused extensive alteration of the original soils. The soils consist of material that has been cut, filled, and graded. The areas of these soils have been built up to provide drainage for buildings, roads, and military facilities, or they formed from dredging during construction and maintenance of the Intracoastal Waterway. The largest areas are at Cherry Point Marine Corps Air Station adjacent to the runways and along the Intracoastal Waterway. The areas are long, variable in width, and range from 5 to 75 acres.

Typically, the surface layer is dark grayish brown, light gray, and yellow sandy loam 8 inches thick. The underlying material to a depth of 66 inches is very dark gray, strong brown, light brownish gray, and light gray sandy clay loam and sandy loam in the upper part. It is dark gray fine sandy loam and sandy clay loam in the middle part, and the lower part is light gray, yellow, and very dark grayish brown fine sandy loam.

Permeability of the underlying material is moderately slow, and the available water capacity is moderate. Typically, the soils range from extremely acid to strongly acid; however, if they contain limed material or marl, the soils range from extremely acid to neutral. Bragg soils do not have a water table within a depth of 6 feet, but water is between layers of filled soil for short periods after heavy rainfall.

Included with these soils in mapping are small areas where the depth of fill is less than 20 inches, and areas of soils along the Intracoastal Waterway that are sandy. The included soils make up about 15 to 25 percent of this map unit.

The Bragg soils are mostly openland vegetated with grasses, but in some areas along the Intracoastal Waterway, they are used as woodland.

Loblolly pine, longleaf pine, red maple, blackgum, sweetgum, and yellow-poplar are dominant on these soils. Waxmyrtle, bitter gallberry, sourwood, sassafras, winged sumac, honeysuckle, blueberry, persimmon, and greenbrier are common in the understory. Soil compaction is the main limitation for woodland use and management.

Moderately slow permeability is the only major limitation to the use of these soils as sites for buildings, sanitary facilities, and recreation.

The Bragg soils are in capability subclass IIIe. There is no woodland ordination symbol because of insufficient site index data.

CnB—Conetoe loamy sand, 0 to 5 percent slopes. This soil is well drained and is on low ridges on stream terraces along the Neuse River, Trent River, and the larger creeks in the central and northwestern parts of the county. The areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is brown loamy sand 7 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 24 inches. The subsoil extends to a depth of 40 inches. It is yellowish brown sandy loam in the upper part and brownish yellow loamy sand in the lower part. The substratum to a depth of 80 inches is pale yellow loamy sand and very pale brown sand.

Permeability of the subsoil is moderately rapid, and the available water capacity is low. The soil ranges from very strongly acid to medium acid except where lime has been added. It does not have a water table within a depth of 6 feet. Low-lying areas of this soil are subject to rare flooding. Wind erosion is a hazard in areas not protected by plant cover.

Included with this soil in mapping are small areas of Tarboro, Seabrook, and State soils. The Tarboro soils are somewhat excessively drained and are in slightly higher areas than the Conetoe soil. The Seabrook and

State soils are in slightly lower areas. The Seabrook soils are moderately well drained, and the State soils are well drained. Some areas of wet soils are in depressions. These areas are smaller than 4 acres and are shown on the map with a special symbol. The included soils make up about 10 to 15 percent of this map unit.

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

Corn, tobacco, soybeans, and wheat are the major crops on this soil. Limitations are leaching of plant nutrients and droughtiness. Wind erosion is a hazard, and blowing sand can damage young plants (fig. 6). Conservation practices are needed to help conserve soil and water. Coastal bermudagrass is the common pasture forage.

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

This soil generally does not have major limitations for building site development; however, low-lying areas are

Figure 6.—Blowing sand damages corn seedlings on Conetoe loamy sand, 0 to 5 percent slopes.

subject to rare flooding. The hazard of flooding should be determined before planning use and management of specific sites. Seepage is the main limitation for sanitary facilities, and the sandy surface layer is a limitation for recreation uses.

This Conetoe soil is in capability subclass IIs. The woodland ordination symbol is 8S.

CrB—Craven silt loam, 1 to 4 percent slopes. This soil is moderately well drained and is on low ridges and side slopes on uplands near drainageways. Some of the larger areas of this soil are along North Carolina Highway 55 west of New Bern and along North Carolina Highway 43 north of Vanceboro. The areas are irregular in shape and range from 5 to 500 acres.

Typically, the surface layer is grayish brown silt loam 7 inches thick. The subsurface layer is light yellowish brown silt loam to a depth of 9 inches. The subsoil extends to a depth of 54 inches. It is brownish yellow silty clay loam and silty clay in the upper part. The middle part is light yellowish brown clay that has gray mottles, and the lower part is gray clay. The substratum to a depth of 80 inches is brownish yellow fine sandy loam and loamy sand.

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

Included with this soil in mapping are small areas of Lenoir, Onslow, and Goldsboro soils. The Lenoir soils are somewhat poorly drained and are in depressions. The Goldsboro and Onslow soils are moderately well drained and occur at random within the map unit. Also included are small areas of Craven soil that are eroded. Areas of wet soils in depressions smaller than 4 acres and short steep slopes are shown on the map with special symbols. The included soils make up about 10 to 20 percent of this map unit.

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

The main crops on this soil are corn, soybeans, tobacco (fig. 7), and wheat. Erosion is a hazard, and eroded spots are in the more sloping parts of many areas. The surface layer is easily eroded unless the soil is protected by plant cover. Conservation practices that reduce erosion and add organic matter are needed. Tillage should be avoided if the soil is wet because large clods form, resulting in a poor seedbed, runoff, and erosion. Pasture forages include tall fescue and ladino clover.

Loblolly pine, red maple, water oak, sweetgum, yellow-poplar, blackgum, southern red oak, white oak, and post oak are dominant on this soil. The understory plants include bitter gallberry, sourwood, flowering dogwood, American holly, waxmyrtle, Virginia creeper, redbay, sweetbay, blueberry, honeysuckle, sweet pepperbush, Carolina jessamine, and poison-ivy. Logging when the soil is wet causes compaction, deep ruts, poor surface drainage, and lower productivity.

Slow permeability, seasonal wetness, moderate shrink-swell potential, and the clayey subsoil are the main limitations to use of this soil as sites for buildings, sanitary facilities, and recreation. Foundations need to be designed to resist cracking caused by the shrinking and swelling of the subsoil as a result of changes in moisture. Erosion is a severe hazard on construction sites where the plant cover has been removed, and erosion control practices need to be used. Seasonal wetness can be reduced by the use of open ditches or grassed waterways. Tile is not used because of slow internal drainage.

This Craven soil is in capability subclass IIIe. The woodland ordination symbol is 8W.

CT—Croatan muck. This soil is nearly level and very poorly drained. It is on broad flats and in depressions, or pocosins, on uplands. The largest acreage is in the Croatan National Forest in the southern part of the county. The areas are irregular in shape and range from 25 to more than 10,000 acres. They are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected uses.

Typically, the soil is organic matter 28 inches thick. It is granular black muck to a depth of 13 inches and has a dense root mat. Below that, the organic matter is massive black muck. The underlying mineral soil to a depth of 80 inches is very dark gray mucky sandy loam and dark gray or gray sandy loam and sandy clay loam.

Permeability ranges from slow to moderately rapid in the organic material and from moderately slow to moderately rapid in the mineral material. The organic material is extremely acid except where lime has been added. The underlying mineral soil ranges from extremely acid to slightly acid. The high water table is at or near the surface most the time, and water frequently ponds for long periods except where drainage is installed. Subsidence is a problem if this soil is drained. This soil is subject to rare flooding.

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

Most of the acreage of this Croatan soil is native woodland. The two types of vegetation are "short pocosin" and "tall pocosin." The pattern of pocosin vegetation is determined by such factors as fire, depth of organic matter, length of periods of saturation, and

Figure 7.—Tobacco is one of the main crops on Craven silt loam, 1 to 4 percent slopes.

nutrient availability. The short pocosin type consists of a dense shrub thicket, 3 to 6 feet tall, that has very scattered, stunted pond pines (fig. 8). This type of vegetation is typically in the center of the pocosin on the deepest and most waterlogged accumulations of organic matter. Common plants are titi, loblolly bay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, sundew, pitcherplant, bayberry, and sedges. The areas of tall pocosin vegetation are mostly along the pocosin margin where organic deposits are thinner. Nutrient availability is better because of greater circulation of ground water *(16)*, and plant growth is more vigorous than in the center of the pocosin. The shrub layer reaches 10 to 12 feet, and pond pines, 25 to 55 feet tall, form a canopy of up to 75 percent. Loblolly bay, red maple, sweetbay, redbay, blackgum, sweetgum, and baldcypress are also common. These wetland areas are important escape and cover habitat for a variety of wildlife *(11)*. Extreme wetness, low fertility, and possible ground fires after drainage are major limitations to the use of this soil as commercial woodland.

Small acreages of this soil have been intensively drained and are in corn, soybeans, and wheat. The drainage systems include open ditches and grading or "crowning" fields for surface drainage. Tile is not used because of moderately slow internal drainage. Subsidence and possible ground fires after drainage are also problems. Subsidence exposes buried logs and

Figure 8.—Native short pocosin vegetation on Croatan muck is a dense shrub thicket that has a few stunted pond pines.

wood and requires root raking every few years to permit the use of equipment. The organic material is highly reactive with many pesticides, making them ineffective or effective only at high rates of application.

This soil is not used as sites for buildings, sanitary facilities, or recreation because of extreme wetness and low strength of the organic material.

This Croatan soil is in capability subclass VIIw (undrained) and IVw (drained). The woodland ordination symbol is 2W.

DA—Dare muck. This soil is nearly level and very poorly drained. It is on broad flats and in depressions, locally known as pocosins. The largest areas are in the Croatan National Forest and south of Bridgeton. The areas are irregular in shape and range from 25 to more than 5,000 acres. They are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected uses.

Typically, the soil is organic matter 60 inches thick. It is granular black muck to a depth of 8 inches and has a dense root mat. Below that, it is massive black and dark reddish brown muck. Buried stumps, logs, and wood fragments are common. The underlying mineral soil to a depth of 80 inches is black loamy sand and very dark gray sand.

Permeability is slow. The organic soil material is extremely acid throughout, and the underlying mineral material ranges from extremely acid to slightly acid. The high water table is at or near the surface continuously, and the soil is subject to frequent ponding for long

periods. Subsidence is a problem if this soil is drained. This soil is subject to rare flooding.

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

The acreage of this Dare soil is in native vegetation of plants adapted to extreme wetness. The "short pocosin" type vegetation consists of a dense shrub thicket 3 to 6 feet tall and very scattered, stunted pond pines. Larger trees do not grow in areas of this soil because of very low availability of plant nutrients in the waterlogged soil *(16)*. Common plants in the shrub thicket are titi, loblolly bay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, bayberry, sundew, pitcherplant, and sedges (fig. 9). These wetland areas are important escape and cover habitat for a variety of wildlife *(11)*.

This soil is not used as cropland or as sites for buildings, sanitary facilities, or recreation because of extreme wetness and low strength of the organic soil. If this soil is used as cropland, an intensive drainage system, including open ditches and "crowning" of fields for surface drainage, is needed. Management problems include subsidence and possible ground fires after drainage. Subsidence exposes buried logs and wood, and root raking is needed every few years to permit the use of equipment.

Figure 9.—Pitcherplants grow on waterlogged soils, such as Dare muck.

This Dare soil is in capability subclass VIIw. There is no woodland ordination symbol because of insufficient site index data.

De—Deloss fine sandy loam. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on stream terraces along the Neuse River and the larger creeks in the southeastern, central, and northwestern parts of the county. The areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is very dark gray and black fine sandy loam 19 inches thick. The subsoil extends to a depth of 58 inches. It is light brownish gray sandy clay loam in the upper part and light brownish gray fine sandy loam in the lower part. The substratum to a depth of 80 inches is light gray loamy sand.

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

Included with this soil in mapping are small areas of Arapahoe, Murville, and Tomotley soils. The Arapahoe and Murville soils are very poorly drained. Occurring at random within the map unit are these soils and small areas of a soil that is similar to Deloss soil except that it has a clayey subsoil. The Tomotley soils are poorly drained and are in slightly higher areas than Deloss soil. The included soils make up about 10 to 20 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, pond pine, water oak, willow oak, swamp chestnut oak, red maple, blackgum, yellow-poplar, and sweetgum. Hardwoods are dominant in depressions that are ponded for long periods. The understory plants include redbay, sweet pepperbush, loblolly bay, American holly, sweetbay, bitter gallberry, large gallberry, fetterbush, switchcane, huckleberry, waxmyrtle, blueberry, Virginia chainfern, cinnamon fern, poison-ivy, sweetleaf, Virginia creeper, honeysuckle, titi, and greenbrier. Trees grow well on this soil; however, wetness increases seedling mortality and restricts harvest operations. Areas managed for loblolly pine are commonly ditched and bedded. Fertilizer is also used in many plantations.

The principal crops on this soil are corn, soybeans, and wheat. Small acreages are in cabbage or potatoes. Wetness is the main limitation, and a drainage system that includes tile, open ditches, and land grading for surface drainage may be needed. Crops in low-lying areas can be damaged by rare flooding. Pasture forages include tall fescue and ladino clover.

Seasonal wetness, ponding in depressions, rare flooding, and seepage are major limitations to use of the Deloss soil as sites for buildings and sanitary facilities. This soil generally is not used for recreation because of wetness. Wetness can be reduced somewhat by an intensive artificial drainage system that includes land grading for surface drainage and by the use of open ditches and tile. However, drained areas are subject to rare flooding.

This Deloss soil is in capability subclass VIw (undrained) and IIIw (drained). The woodland ordination symbol is 10W.

DO—Dorovan muck, frequently flooded. This soil is nearly level and very poorly drained. It is on broad flood plains along the Neuse River, Swift Creek, and a few smaller creeks. The areas are long and variable in width. The largest delineation, about 4,000 acres, is northwest of New Bern. Areas of this soil are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected uses.

Typically, the soil is organic matter 80 inches thick. It is very dark brown muck to a depth of 15 inches and has a dense root mat. Below that, it is black muck.

Permeability is moderate. The soil ranges from extremely acid to strongly acid. The high water table is at or near the surface continuously. Flooding occurs frequently for long periods. Subsidence is a problem if this soil is drained.

Included with this soil in mapping are small areas of the Lafitte and Masontown soils, which are very poorly drained. The Lafitte soils are in marshes, and the Masontown soils occur at random within the map unit. Also included at random within this map unit are some areas of a soil that is similar to the Dorovan soil except that it has organic material less than 51 inches thick. The included soils make up about 10 to 20 percent of this map unit.

The acreage of this Dorovan soil is native woodland (fig. 10). The dominant trees are blackgum, baldcypress, American elm, sweetgum, green ash, red maple, and swamp tupelo. Common understory plants include Virginia willow, redbay, poison-ivy, greenbrier, grape, Virginia creeper, Virginia chainfern, river birch, lizardstail, netted chainfern, Pennsylvania smartweed, arrowhead, cattail, American hornbeam, sedges, climbing hydrangea, Alabama supplejack, royal fern, and cinnamon fern. Wetness and flooding are the major concerns for commercial woodland use and management. These wetland areas produce a large amount of food for wildlife and support a wide variety of animal species *(11)*.

This soil is not used as cropland or as sites for buildings, sanitary facilities, or recreation because of extreme wetness, flooding, subsidence, and low strength of the organic material. If this soil is used as cropland,

Figure 10.—Native vegetation on Dorovan muck, frequently flooded, includes water-tolerant hardwoods.

an intensive drainage system, including open ditches and "crowning" of fields for surface drainage, is needed. Management problems include subsidence and possible ground fires after drainage. Subsidence exposes buried logs and wood, and root raking is needed every few years to permit the use of equipment.

This Dorovan soil is in capability subclass VIIw. The woodland ordination symbol is 7W.

ExA—Exum silt loam, 0 to 2 percent slopes. This soil is moderately well drained. It is in slightly convex areas on uplands near drainageways mainly between U.S. Highway 70 and State Road 1111 several miles south of New Bern. The areas are irregular in shape and range from 15 to 100 acres.

Typically, the surface layer is grayish brown silt loam 6 inches thick. The subsurface layer is pale brown silt loam to a depth of 11 inches. The subsoil extends to a depth of at least 80 inches. It is brown silt loam in the upper part. The middle part is yellowish brown silt loam that has light gray mottles, and the lower part is light gray silty clay loam and silty clay.

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

Included with this soil in mapping are small areas of Craven and Goldsboro soils. These soils are moderately well drained, and they occur at random within the map unit. Also included are some areas of soils that are somewhat poorly drained and silty and some areas of wet soils in depressions. The wet areas are smaller than 4 acres and are shown on the map with a special

symbol. The included soils make up about 10 to 20 percent of this map unit.

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

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

The major crops on this soil are corn, soybeans, tobacco, and wheat. Wetness is the main limitation, and a drainage system that includes tile and open ditches may be needed, especially in areas where tobacco is grown. Erosion is a hazard near drainageways. Pasture forages include tall fescue and ladino clover.

Seasonal wetness is the main limitation to use of this soil as sites for buildings and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and by the use of tile and open ditches. Conservation practices need to be used to control erosion near drainageways at construction sites.

This Exum soil is in capability subclass IIw. The woodland ordination symbol is 9W.

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

Typically, the surface layer is grayish brown loamy fine sand 10 inches thick. The subsoil extends to a depth of 72 inches. It is brownish yellow fine sandy loam and sandy clay loam in the upper part. The middle part is brownish yellow and light yellowish brown sandy clay loam that has light brownish gray mottles, and the lower part is light brownish gray sandy clay loam. The substratum to a depth of 80 inches is light brownish gray clay loam.

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

Included with this soil in mapping are small areas of Norfolk, Craven, Exum, Onslow, and Lynchburg soils. The Norfolk soils are well drained and are in slightly higher areas or closer to drainageways than the Goldsboro soil. The Lynchburg soils are somewhat poorly drained and are in depressions. The Craven, Onslow, and Exum soils are moderately well drained. Occurring at random within the map unit are these soils and some areas of a soil similar to Goldsboro soil except that it has sandy layers 40 to 60 inches below the surface. Some areas of wet soils are in depressions. These areas are smaller than 4 acres and are shown on the map with a special symbol. The included soils make up about 15 to 25 percent of this map unit.

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

The major crops on this soil are corn, tobacco, soybeans, and wheat. Because of wetness, a drainage system that includes tile and open ditches may be needed, especially in areas where tobacco is grown. Pasture forages include tall fescue, ladino clover, and coastal bermudagrass.

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

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

This Goldsboro soil is in capability subclass IIw. The woodland ordination symbol is 9W.

Gr—Grantham silt loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands mainly south of New Bern between State Road 1111 and U.S. Highway 70. The areas are irregular in shape and range from 5 to 600 acres.

Typically, the surface layer is black silt loam 5 inches thick. The subsurface layer is light brownish gray silt loam to a depth of 10 inches. The subsoil is gray silt loam and silty clay loam to a depth of 72 inches. The substratum to a depth of 80 inches is gray silty clay loam.

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

Included with this soil in mapping are small areas of Lynchburg, Pantego, Rains, and Leaf soils. The Lynchburg soils are somewhat poorly drained and are in slightly higher areas than the Grantham soil. The Pantego soils are very poorly drained and are in depressions. The Rains and Leaf soils are poorly drained and occur at random within the map unit. Also included are a few areas of soils that are somewhat poorly drained and silty. These soils are in slightly higher areas than the Grantham soil. The included soils make up about 10 to 15 percent of this map unit.

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

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

Corn, soybeans, and wheat are the major crops on this soil. Because of wetness, a drainage system that includes open ditches and land grading for surface drainage may be needed. Pasture forages include tall fescue and ladino clover.

Seasonal wetness is a major limitation to the use of this soil as sites for buildings, sanitary facilities, and recreation. Moderately slow permeability is also a limitation. Wetness can be reduced somewhat by an intensive drainage system that includes land grading for surface drainage and by open ditches.

This Grantham soil is in capability subclass Vlw (undrained) and IIIw (drained). The woodland ordination symbol is 9W.

GuA—Goldsboro-Urban land complex, 0 to 2 percent slopes. This complex consists of Goldsboro soil and Urban land. A typical mapped area contains about 50 percent Goldsboro soil and 30 to 40 percent Urban land. The Goldsboro soil is moderately well drained and is in slightly convex areas on uplands near drainageways. The Urban land is in the cities of New Bern and Havelock and at Cherry Point Marine Corps Air Station. The areas are irregular in shape and range from 10 to 200 acres.

Typically, Goldsboro soil has a grayish brown loamy sand surface layer 10 inches thick. The subsoil extends to a depth of 72 inches. It is brownish yellow fine sandy loam and sandy clay loam in the upper part. The middle part is brownish yellow and light yellowish brown sandy clay loam that has light brownish gray mottles, and the lower part is light brownish gray sandy clay loam. The substratum to a depth of 80 inches is light brownish gray clay loam.

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

Urban land consists of areas covered with buildings, runways, military facilities, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Norfolk, Onslow, Craven, and Lynchburg soils. The Norfolk soils are well drained and are in slightly higher areas or closer to drainageways than the Goldsboro soil. The Lynchburg soils are somewhat poorly drained and are in depressions. The Craven and Onslow soils are moderately well drained and occur at random within the map unit. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Drainage systems were installed in most areas of this complex as building site development progressed. In undrained areas, seasonal wetness is a limitation for building site development, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and by the use of tile and open ditches. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

KuB—Kureb sand, 0 to 6 percent slopes. This soil is excessively drained. It is on ridges on uplands and stream terraces mostly north of Bridgeton and Cove City. The areas are irregular in shape and range from 10 to 150 acres.

Typically, the surface layer is gray sand 5 inches thick. The subsurface layer is light gray uncoated sand to a depth of 18 inches. The subsoil, to a depth of 35 inches, is brownish yellow loose sand that has bands and nodules of dark brown and dark reddish brown, weakly cemented sand. The substratum to a depth of 80 inches is very pale brown and light gray sand.

Permeability is rapid, and the available water capacity is very low. The soil ranges from very strongly acid to neutral. It does not have a water table within a depth of 6 feet.

Included with this soil in mapping are small areas of Tarboro, Seabrook, and Leon soils. The Tarboro soils are somewhat excessively drained and occur at random within the map unit. The Seabrook soils are moderately well drained, and the Leon soils are poorly drained. These soils are in depressions or near the edge of delineations. The included soils make up about 10 to 15 percent of this map unit.

The acreage of this Kureb soil is in native plants adapted to extreme droughtiness and very low fertility. Longleaf pine is the dominant tree, but some scattered loblolly pine are also on this soil. The understory plants include turkey oak, bluejack oak, scrubby post oak, blackjack oak, and threeawn grass. Droughtiness and very low fertility are major limitations to the use of this soil for commercial woodland.

This soil is not used as cropland because of droughtiness and very low fertility.

The only major limitation to the use of this soil as sites for buildings is caving of cutbanks. Lawn grasses are difficult to establish because of severe droughtiness and leaching of plant nutrients. Seepage and poor filtering in the subsoil are limitations for sanitary facilities. Loose sand is the main limitation for recreational uses.

The Kureb soil is in capability subclass VIIs. The woodland ordination symbol is 3S.

La—Leaf silt loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands. The largest areas are in the Big Pocosin east of Vanceboro and in areas south of Clarks and Riverdale. The areas are irregular in shape and range from 5 to more than 10,000 acres.

Typically, the surface layer is dark gray silt loam 8 inches thick. The subsoil extends to a depth of 72 inches. It is gray silty clay in the upper part, light brownish gray silty clay in the middle part, and gray silty clay loam in the lower part. The substratum to a depth of 80 inches is light brownish gray fine sandy loam.

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

Included with this soil in mapping are small areas of Bayboro, Lenoir, Rains, Grantham, and Meggett soils. The Bayboro soils are very poorly drained, and the Meggett soils are poorly drained. These soils are in depressions. The Lenoir soils are somewhat poorly drained and are in slightly higher positions than the Leaf soil. The Rains and Grantham soils are poorly drained. Occurring at random within the map unit are these soils and some areas of a soil similar to the Leaf soil except that it has loamy or sandy layers 40 to 60 inches below the surface. The included soils make up about 15 to 25 percent of this map unit.

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

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

Corn, soybeans, and wheat are the main crops on this soil. Wetness is a major limitation. Because the very slowly permeable subsoil limits internal drainage, open ditches and land grading for surface drainage are used to reduce wetness. Tile is not effective. Tillage should be avoided if the soil is wet because soil structure is destroyed and large clods form, resulting in ponding and a poor seedbed. Pasture forages include tall fescue and ladino clover.

Seasonal wetness, ponding in depressions, very slow permeability, high shrink-swell potential, and the clayey subsoil are major limitations to the use of this soil as sites for buildings, sanitary facilities, and recreation. Wetness can be reduced somewhat with an intensive drainage system; however, inadequate results from artificial drainage have limited development for these uses. Foundations must be designed to resist cracking because the subsoil shrinks and swells as a result of changes in moisture.

This Leaf soil is in capability subclass VIw (undrained) and IVw (drained). The woodland ordination symbol is 9W.

Lc—Lynchburg-Urban land complex. This complex consists of Lynchburg soil and Urban land. A typical mapped area contains about 50 percent Lynchburg soil and 30 to 40 percent Urban land. The Lynchburg soil is nearly level and somewhat poorly drained. It is on flats and in depressions on uplands. The Urban land is in the cities of New Bern and Havelock and at Cherry Point Marine Corps Air Station. The areas are irregular in shape and range from 10 to 60 acres.

Typically, Lynchburg soil has a very dark grayish brown fine sandy loam surface layer 9 inches thick. The subsurface layer is pale brown fine sandy loam to a depth of 14 inches. The subsoil extends to a depth of 74 inches. In the upper part, it is pale brown sandy clay loam that has yellowish brown and light brownish gray mottles. The middle part is light brownish gray sandy clay loam, and the lower part is light brownish gray fine sandy loam. The substratum to a depth of 80 inches is light brownish gray loamy fine sand.

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

Urban land consists of areas covered with buildings, runways, military facilities, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Goldsboro, Onslow, Lenoir, and Rains soils. The Goldsboro and Onslow soils are moderately well drained and are in slightly higher positions than the Lynchburg soil. The Lenoir soils are somewhat poorly drained and occur at random within the mapped areas. The Rains

Figure 11.—When the drainage system is completed, this area of Leaf silt loam will be cleared and replanted to loblolly pine.

soils are poorly drained and are in depressions. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Drainage systems were installed in most areas of this complex as urban development progressed. In areas without artificial drainage, seasonal wetness is a limitation for building site development, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and by the use of tile and open ditches. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Le—Lenoir silt loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on uplands. Some of the larger areas of this soil are north of Vanceboro and south and west of New Bern for about 10 miles along U.S. Highway 70 and State Road 1005. The areas are irregular in shape and range from 5 to 1,000 acres.

Typically, the surface layer is very dark grayish brown silt loam 5 inches thick. The subsurface layer is light yellowish brown silt loam to a depth of 8 inches. The subsoil extends to a depth of 72 inches. It is brownish yellow silt loam in the upper part. The middle part is brownish yellow clay that has light gray mottles, and the lower part is gray clay. The substratum to a depth of 80 inches is light brownish gray fine sandy loam.

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

Included with this soil in mapping are small areas of Craven, Leaf, and Lynchburg soils. The Craven soils are moderately well drained and are in slightly higher positions than the Lenoir soil. The Leaf soils are poorly drained and are in depressions. The Lynchburg soils are somewhat poorly drained and occur at random within the mapped areas. Also included are some areas of a soil similar to Lenoir soil except that it has loamy and sandy layers 40 to 60 inches below the surface. The included soils make up about 15 to 25 percent of this map unit.

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

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

The major crops on this soil are corn, soybeans, tobacco, and wheat. Wetness is the main limitation. Because the slowly permeable subsoil limits internal drainage, open ditches and land grading for surface drainage are used to reduce wetness. Tile is generally not used. Tillage should be avoided if the soil is wet because soil structure is destroyed and large clods form, resulting in ponding and a poor seedbed. Pasture forages include tall fescue and ladino clover.

Seasonal wetness, slow permeability, moderate shrink-swell potential, and the clayey subsoil are the major limitations to the use of this soil as sites for buildings, sanitary facilities, and recreation. An intensive drainage system that includes land grading for surface drainage and open ditches can reduce wetness somewhat. Foundations need to be designed to resist cracking because the subsoil shrinks and swells as a result of changes in moisture.

This Lenoir soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

LF—Lafitte muck, frequently flooded. This soil is nearly level and very poorly drained. It is on marsh flats adjacent to the Neuse River, Trent River, and the larger creeks in the central and southeastern parts of the county. The areas are long, variable in width, and range from 5 to 200 acres. Elevation is less than 2 feet above sea level. Access is limited in many places because of water, so observations of this soil were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected uses.

Typically, the soil is organic matter 54 inches thick. It is black muck to a depth of 15 inches and has a dense root mat. Below that, it is black and very dark brown muck. The underlying mineral material is very dark grayish brown sandy loam to a depth of 72 inches.

Permeability is moderately rapid. The soil ranges from slightly acid to moderately alkaline. The high water table is at or near the surface continuously, and the soil is subject to frequent flooding for long periods. The salt concentration generally ranges from 5 to 10 parts per thousand. Subsidence is a problem if this soil is drained.

Included with this soil in mapping are some areas of a soil similar to Lafitte soil except that it has an organic layer that is less than 51 inches thick. Also included are some very poorly drained mineral soils adjacent to uplands and stream terraces and a few areas of a soil similar to Lafitte soil except that it is in marshes that have salt concentrations of less than 5 parts per thousand. The included soils make up about 20 to 30 percent of this map unit.

The acreage of this Lafitte soil is in native vegetation that is adapted to long periods of wetness, flooding, and exposure to salt. Common plants are big cordgrass, sawgrass, seashore mallow, saltgrass, rose mallow, black needlerush, and climbing hempweed. The marshland areas are an important part of the ecology of the Neuse Estuary. The marsh plants contribute nutrients to the estuary benefiting fish and shellfish and provide habitat for wetland wildlife.

This soil is not used as cropland, woodland, or sites for buildings, sanitary facilities, or recreation.

This Lafitte soil is in capability subclass VIIIw. There is no woodland ordination symbol for this soil.

Ln—Leon sand. This soil is nearly level to gently sloping and poorly drained. It is on low ridges and flats and in depressions on uplands and stream terraces. Some of the larger areas of this soil are in the vicinity of Bridgeton. The areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is black sand 7 inches thick. The subsurface layer is light brownish gray uncoated sand to a depth of 21 inches. The subsoil extends to a depth of 49 inches. It is black and very dark brown weakly cemented and brittle sand. The substratum to a depth of 72 inches is pale brown sand.

Permeability is rapid in the surface and subsurface layers and moderate to moderately rapid in the weakly cemented subsoil. The available water capacity is very low in the surface and subsurface layers and low in the subsoil. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is commonly within 1 foot of the surface from November to April. Low-lying areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Murville, Seabrook, and Kureb soils. The Murville soils are very poorly drained and are in depressions. The Kureb soils are excessively drained and are on ridges. The Seabrook soils are moderately well drained. Occurring at random within the mapped areas are these Seabrook soils and small areas of soils similar to the Leon soil except that they have a weakly cemented subsoil 30 to 50 inches below the surface or they have loamy material within a depth of 80 inches. The included soils make up 10 to 15 percent of this map unit.

This Leon soil is used mainly as woodland. The dominant trees are loblolly pine, longleaf pine, and pond pine. Scattered water oak, blackgum, and red maple are also on this soil. The understory plants include threeawn grass, blueberry, huckleberry, brackenfern, bitter gallberry, large gallberry, fetterbush, waxmyrtle, sassafras, turkey oak, redbay, and sweetbay. Wetness during the winter months limits woodland use and management, and the soil is droughty during the growing season. Rooting depth is restricted by the weakly cemented subsoil.

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

Seasonal wetness and rare flooding of low-lying areas limit the use of this soil as sites for buildings, sanitary facilities, and recreation. A drainage system reduces wetness, but the weakly cemented subsoil interferes with installation and performance of the system, and caving of ditchbanks is a maintenance problem. The hazard of flooding should be determined at specific sites before planning use and management. Droughtiness in the summer is a limitation in establishing and maintaining lawns and shrubs.

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

Ly—Lynchburg fine sandy loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on uplands throughout the county. The areas are irregular in shape and range from 5 to 150 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 9 inches thick. The subsurface layer is pale brown fine sandy loam to a depth of 14 inches. The subsoil extends to a depth of 74 inches. In the upper part, it is pale brown sandy clay loam that has light brownish gray mottles. The middle part is light brownish gray sandy clay loam, and the lower part is light brownish gray fine sandy loam. The substratum to a depth of 80 inches is light brownish gray loamy fine sand.

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

Included with this soil in mapping are small areas of Goldsboro, Onslow, Lenoir, and Rains soils. The Goldsboro and Onslow soils are moderately well drained and are in slightly higher positions than the Lynchburg soil. The Lenoir soils are somewhat poorly drained. Occurring at random within the mapped areas are these soils and some areas of a soil similar to Lynchburg soil except that it has sandy layers 4 to 5 feet below the surface. The Rains soils are poorly drained and are in depressions. The included soils make up 15 to 20 percent of this map unit.

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

The principal crops on this soil are corn, soybeans (fig. 12), tobacco, and wheat. Because of wetness, a drainage system that includes tile and open ditches is needed. Pasture forages include tall fescue and ladino clover.

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

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

This Lynchburg soil is in capability subclass IIw. The woodland ordination symbol is 9W.

Me—Meggett sandy loam. This soil is nearly level and poorly drained. It is in depressions on uplands. The largest areas are in the vicinity of Dover. The areas are long, variable in widths, and range from 10 to 500 acres.

Typically, the surface layer is very dark brown sandy loam 8 inches thick. The subsurface layer is light brownish gray sandy loam to a depth of 14 inches. The subsoil extends to a depth of 48 inches. It is dark gray clay in the upper part and gray sandy clay in the lower

Figure 12.—Soybeans grow well on Lynchburg fine sandy loam.

part. The substratum to a depth of 80 inches is greenish gray sandy clay that has common shell fragments.

Permeability of the subsoil is slow, and shrink-swell potential is high. The surface and subsurface layers range from very strongly acid to slightly acid except where lime has been added. The subsoil ranges from slightly acid to moderately alkaline. The seasonal high water table is at or near the surface. Water ponds in depressions for brief to long periods except where a drainage system has been installed.

Included with this soil in mapping are small areas of Leaf, Bayboro, and Rains soils. The Bayboro soils are very poorly drained and are slightly lower on the landscape than the Meggett soil. The Leaf and Rains soils are poorly drained and occur at random within the mapped areas. The included soils make up about 10 to 20 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, pond pine, blackgum, yellow-poplar, water oak, sweetgum, swamp chestnut oak, red maple, willow oak, and baldcypress. Hardwoods are dominant in low areas for long periods. The common understory plants include bitter gallberry, large gallberry, blueberry, greenbrier, American holly, switchcane, sweet pepperbush, waxmyrtle, grape, fetterbush, honeysuckle, poison-ivy, Carolina jessamine, sweetleaf, sweetbay, Virginia

creeper, redbay, Virginia chainfern, and cinnamon fern. Wetness is the main limitation. Logging when the soil is wet causes deep ruts, compaction, poor surface drainage, and lower productivity. Areas managed for loblolly pine are ditched and bedded.

Corn, soybeans, and wheat are the main crops on this soil. Wetness is a major limitation. Because the slowly permeable subsoil limits internal drainage, open ditches and land grading for surface drainage are used to reduce wetness. Tile is generally not used. Tillage needs to be avoided if the soil is wet because soil structure is destroyed and large clods form, resulting in ponding and a poor seedbed. Pasture forages include tall fescue and ladino clover.

This soil is generally not used as sites for buildings, sanitary facilities, or recreation because of wetness, ponding in low areas, and slow permeability. Other limitations are shrink-swell potential and the clayey subsoil.

This Meggett soil is in capability subclass IVw. The woodland ordination sybmol is 11W.

MM—Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded. These soils are nearly level, very poorly drained and poorly drained. They are on flood plains throughout the county. The Masontown soil is very poorly drained and is mainly in depressions on the broad flood plains. The Muckalee soil is poorly drained. It is near stream channels on the broad flood plains and is dominant on the narrow flood plains. The areas are long, variable in width, and range from 10 to more than 2,000 acres. They contain either or both of these soils in variable proportions. The areas are difficult to traverse because of ponded water and dense vegetation, so observations of these soils were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected use.

The Masontown soil makes up about 40 percent of this map unit. Typically, the surface layer is black mucky fine sandy loam and fine sandy loam 60 inches thick. The underlying material to a depth of 80 inches is light brownish gray sand.

The Muckalee soil makes up about 30 percent of this map unit. Typically, the surface layer is very dark grayish brown sandy loam 5 inches thick. The underlying material to a depth of 80 inches is dark gray sandy loam and gray loamy sand.

Permeability is moderately rapid in Masontown soil and moderate in Muckalee soil. Masontown soil ranges from medium acid to mildly alkaline throughout. Muckalee soil ranges from strongly acid to slightly acid in the surface layer and from medium acid to neutral in the underlying material. The seasonal high water table is at or near the surface in Masontown soil and within 1.5 feet of the surface in Muckalee soil. These soils are frequently flooded for long periods.

Included with these soils in mapping are areas of Dorovan, Arapahoe, Deloss, Roanoke, and Tomotley soils, which are very poorly drained. The Dorovan soils are in lower areas than Masontown and Muckalee soils. The Arapahoe, Deloss, Roanoke, and Tomotley soils are on slightly higher stream terraces. The included soils make up about 30 percent of this map unit.

Nearly all of the acreage of the Masontown and Muckalee soils is native woodland (fig. 13). The dominant trees are sweetgum, baldcypress, blackgum, green ash, swamp tupelo, red maple, willow oak, water oak, American elm, and swamp chestnut oak. The common understory plants include Virginia willow, redbay, poison-ivy, greenbrier, lizardstail, black willow, arrowhead, American hornbeam, American holly, sedges, climbing hydrangea, Alabama supplejack, netted chainfern, Pennsylvania smartweed, cattail, royal fern, and cinnamon fern. These wetland areas produce large amounts of food for wildlife and support a wide variety of animals *(11)*. Tree growth is excellent; however, because of wetness and flooding, managing this soil for timber production is difficult.

These soils are not generally used as cropland or as sites for buildings, sanitary facilities, or recreation because of wetness and flooding.

Masontown soil is in capability subclass VIIw. Muckalee soil is in capability subclass Vw. The woodland ordination symbol for Masontown soil is 12W. It is 7W for Muckalee soil.

Mu—Murville mucky loamy sand. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on stream terraces and uplands. Some of the larger areas of this soil are in the vicinity of Bridgeton. The areas are irregular in shape and range from 10 to more than 3,000 acres.

Typically, the surface layer is black mucky loamy sand 10 inches thick. The subsoil is dark reddish brown weakly cemented sand to a depth of 36 inches. The underlying material to a depth of 80 inches is dark brown sand.

Permeability of the subsoil is moderately rapid. The soil ranges from extremely acid to strongly acid. The high water table is at or near the surface most of the time, and water ponds frequently for brief to long periods. This soil is also subject to rare flooding.

Included with this soil in mapping are small areas of Torhunta, Arapahoe, Leon, Croatan, and Ponzer soils. The Torhunta and Arapahoe soils are very poorly drained and occur at random in the mapped areas. The Leon soils are poorly drained and are slightly higher on the landscape than the Murville soil. The Croatan and Ponzer soils are very poorly drained and are in the center of the mapped areas. The included soils make up about 15 to 20 percent of this map unit.

The acreage of this Murville soil is in native vegetation. The two types of vegetation are "short pocosin" and

Figure 13.—Most areas of Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded, are native woodland.

"tall pocosin." The pattern of pocosin vegetation is determined by such factors as fire, depth of organic matter, length of periods of saturation, and nutrient availability. The "short pocosin" type consists of a dense shrub thicket, 3 to 6 feet tall, with very scattered, stunted pond pines. The short pocosin vegetation is typically in the center of the pocosin over the deepest and most waterlogged accumulations of organic matter. Common plants are titi, loblolly bay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, sundew, pitcherplant, bayberry, and sedges. The areas of tall pocosin vegetation are mostly along the pocosin margin where organic deposits are thinner. Nutrient availability is better because of greater circulation of ground water *(16)*, and plant growth is more vigorous than in the center of the pocosin. The shrub layer reaches 10 to 12 feet, and pond pines, 25 to 55 feet tall, form a canopy of up to 75 percent. Loblolly bay, red maple, sweetbay, redbay, and blackgum are also common trees. These wetland areas are important escape and cover habitat for a variety of wildlife *(11)*. Extreme wetness, low fertility, and possible ground fires after artificial drainage are major limitations to the use of this soil as commercial woodland.

This soil generally is not used as cropland because of extreme wetness and the weakly cemented subsoil. However, several large blueberry farms are at Bridgeton (fig. 14).

Murville soil is generally not used as sites for buildings, sanitary facilities, or recreation because of extreme wetness and the weakly cemented subsoil.

This Murville soil is in capability subclass Vw. The woodland ordination symbol is 2W.

NoA—Norfolk loamy fine sand, 0 to 2 percent slopes. This soil is well drained. It is in slightly convex areas near drainageways on uplands throughout the county. The areas are irregular in shape and range from 5 to 150 acres.

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

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

Included with this soil in mapping are small areas of Autryville and Goldsboro soils. The Autryville soils are well drained and are slightly higher on the landscape than the Norfolk soil, or they are near drainageways. The Goldsboro soils are moderately well drained and are slightly lower on the landscape. Also included are a few areas of a soil similar to Norfolk soil except that it has sandy layers 4 to 5 feet below the surface. Some areas of wet soils in depressions smaller than 4 acres and short steep slopes near drainageways are shown on the map with special symbols. The included soils make up about 10 to 20 percent of this map unit.

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

The main crops on this soil are tobacco (fig. 15), corn, soybeans, and wheat. There are no major limitations to the use of this soil as cropland. Pasture forages include tall fescue, ladino clover, and coastal bermudagrass.

Figure 14.—Murville mucky loamy sand is generally not used for crops; however, blueberries are grown in areas that have been drained.

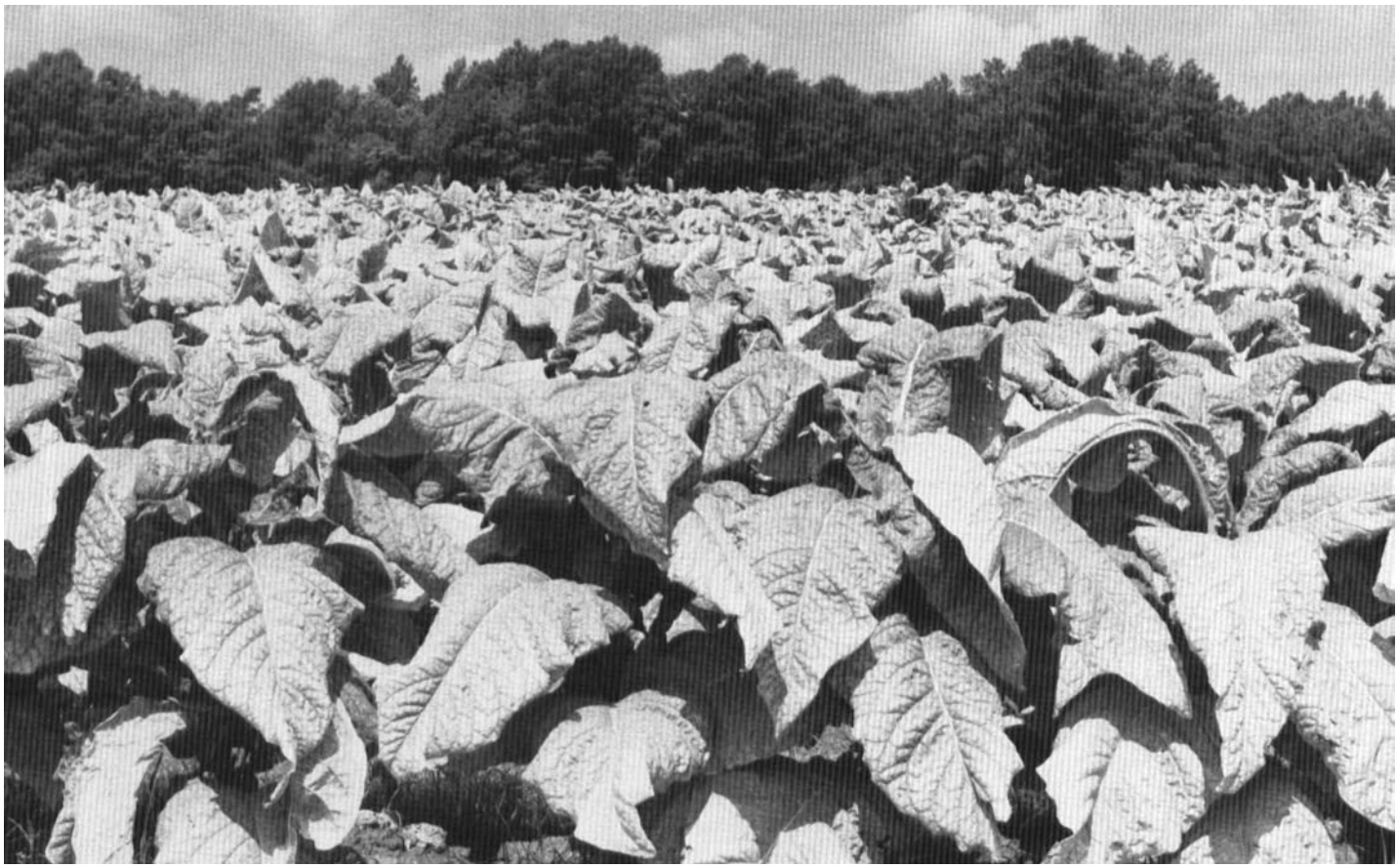

Figure 15.—Tobacco is an important crop on Norfolk loamy fine sand, 0 to 2 percent slopes.

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

This soil has no major limitations for building site development or recreation; however, wetness and seepage are limitations for sanitary facilities.

This Norfolk soil is in capability class I. The woodland ordination symbol is 9A.

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

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

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

Included with this soil in mapping are small areas of Autryville, Suffolk, and Craven soils. The Autryville and Suffolk soils are well drained. The Autryville soils are slightly higher on the landscape than the Norfolk soil, or they are near drainageways. The Suffolk soils are on sloping to steep side slopes. The Craven soils are moderately well drained. Occurring at random within the mapped areas are these soils and some areas of a soil similar to Norfolk soil except that it has sandy layers 40 to 60 inches below the surface. Some small areas of

Norfolk soil that are moderately eroded are in the more sloping areas of this map unit. Areas of wet soils in depressions smaller than 4 acres and short steep slopes beside drainageways are shown on the map with special symbols. The included soils make up about 15 to 30 percent of this map unit.

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

Tobacco, corn, soybeans, and wheat are the major crops on this soil. Slope, surface runoff, and susceptibility to erosion are the main limitations. Conservation practices that reduce erosion are needed. Pasture forages include tall fescue, ladino clover, and coastal bermudagrass.

Loblolly pine, longleaf pine, southern red oak, Shumard oak, hickory, American beech, yellow-poplar, white oak, post oak, and water oak are dominant on this soil. The common understory plants include flowering dogwood, sourwood, sweetbay, Carolina jessamine, waxmyrtle, redbay, poison-ivy, blueberry, grape, partridgeberry, American holly, Virginia creeper, and bitter gallberry. There are no major limitations for woodland use and management.

This soil has no major limitations for building site development or recreation; however, wetness and seepage are limitations for sanitary facilities.

This Norfolk soil is in capability subclass IIe. The woodland ordination symbol is 9A.

NuB—Norfolk-Urban land complex, 0 to 6 percent slopes. This complex consists of Norfolk soil and Urban land. A typical mapped area contains about 50 percent Norfolk soil and 30 to 40 percent Urban land. The Norfolk soil is well drained and is on low ridges and side slopes near drainageways on uplands. The Urban land is in the cities of New Bern and Havelock and at Cherry Point Marine Corps Air Station. The areas are irregular in shape and range from 10 to 300 acres.

Typically, Norfolk soil has a brown loamy fine sand surface layer 7 inches thick. The subsurface layer is very pale brown loamy fine sand to a depth of 14 inches. The subsoil to a depth of 80 inches is sandy clay loam. It is yellowish brown in the upper part, brownish yellow in the middle part, and brown with light gray and strong brown mottles in the lower part.

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

Urban land consists of areas covered with buildings, runways, military facilities, streets, driveways, and parking lots.

Included with this soil in mapping are small areas of Autryville, Goldsboro, and Craven soils. The Autryville soils are well drained and are slightly higher on the landscape than the Norfolk soil. The Goldsboro and Craven soils are moderately well drained. Goldsboro soils are slightly lower on the landscape, and Craven soils occur at random within the mapped areas. The Suffolk soils are well drained and are on strongly sloping to steep side slopes. Also included are small cut and fill areas where the natural soil has been altered or covered and the slope modified. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

As development has progressed, seasonal wetness has been reduced as necessary by artificial drainage. The Norfolk soil has no other limitations for building site development or recreation; however, wetness and seepage are limitations for sanitary facilities.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

On—Onslow loamy sand. This soil is nearly level and moderately well drained. It is in slightly convex areas on uplands near drainageways mainly in the vicinity of Havelock. The areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is dark grayish brown loamy sand 8 inches thick. The subsurface layer is brownish yellow loamy sand to a depth of 13 inches. It contains very dark grayish brown nodules that are weakly cemented and brittle. The subsoil extends to a depth of 65 inches. It is light yellowish brown sandy clay loam in the upper part. The middle part is pale brown sandy clay loam that has light brownish gray mottles, and the lower part is mottled light yellowish brown, light gray, and yellowish brown sandy loam. The substratum to a depth of 80 inches is light brownish gray sand.

Permeability of the subsoil and the available water capacity are moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 1.5 to 3 feet below the surface.

Included with this soil in mapping are small areas of Goldsboro, Lynchburg, Norfolk, and Craven soils. The Norfolk soils are well drained and are slightly higher on the landscape than Onslow soil. The Goldsboro and Craven soils are moderately well drained, and the Lynchburg soils are somewhat poorly drained. Occurring at random within the mapped areas are these soils and some areas of a soil similar to Onslow soil except that it has sandy layers 3 to 5 feet below the surface. Some areas of wet soils in depressions smaller than 4 acres are shown on the map with a special symbol. The included soils make up about 15 to 25 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, longleaf pine, southern red oak, water oak, sweetgum, red maple, post oak, white oak, yellow-poplar, and

blackgum. The important understory plants include flowering dogwood, redbay, blueberry, bitter gallberry, sourwood, waxmyrtle, American holly, sweetbay, sweetleaf, sweet pepperbush, Virginia creeper, grape, and Carolina jessamine. There are no major limitations for woodland use and management.

The main crops on this soil are corn, soybeans, tobacco, and wheat. Because of wetness, a drainage system that includes tile and open ditches may be needed, especially where tobacco is grown. Pasture forages include tall fescue, ladino clover, and coastal bermudagrass.

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

This Onslow soil is in capability subclass IIw. The woodland ordination symbol is 7A.

Pa—Pantego fine sandy loam. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on uplands throughout the county. The areas are irregular in shape and range from 5 to more than 2,000 acres.

Typically, the surface layer is black fine sandy loam 15 inches thick. The subsoil extends to a depth of 62 inches. It is dark gray sandy clay loam in the upper and middle parts and gray sandy clay in the lower part. The substratum to a depth of 80 inches is gray sandy clay.

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

Included with this soil in mapping are small areas of the Rains, Bayboro, and Torhunta soils. The Rains soils are poorly drained and are slightly higher on the landscape than the Pantego soil. The Bayboro and Torhunta soils are very poorly drained. Occurring at random within the mapped areas are these soils and some areas of a soil similar to Pantego soil except that it has an organic surface layer or has sandy layers 4 or 5 feet below the surface. The included soils make up about 15 to 25 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, pond pine (fig. 16), water oak, willow oak, swamp chestnut oak, red maple, blackgum, yellow-poplar, and sweetgum. Hardwoods are dominant in depressions that are ponded for long periods. The understory plants include redbay, loblolly bay, fetterbush, titi, huckleberry, blueberry, sweet pepperbush, Virginia creeper, grape, switchcane, waxmyrtle, bitter gallberry, large gallberry, sweetleaf, sweetbay, bayberry, greenbrier, honeysuckle, poison-ivy, American holly, Virginia chainfern, and cinnamon fern. Trees grow well on this soil; however, wetness causes seedling mortality and interferes with harvest operations. Areas managed for loblolly pine are generally ditched and bedded. Fertilizer is used in many plantations.

The main crops on this soil are corn, soybeans, and wheat. Because of wetness, a drainage system that includes land grading for surface drainage and the use of tile and open ditches is needed. Suitable drainage outlets can be difficult to develop in depressions. Pasture forages include tall fescue and ladino clover.

Seasonal wetness and ponding in depressions are major limitations to the use of this soil as sites for buildings, sanitary facilities, or recreation. A few areas have been developed using intensive drainage systems that include land grading for surface drainage, open ditches, and tile. Some wetness may remain, however, where these systems are not adequate.

This Pantego soil in capability subclass VIw (undrained) and IIIw (drained). The woodland ordination symbol is 10W.

PO—Ponzer muck. This soil is nearly level and very poorly drained. It is in depressions and on broad flats, locally known as pocosins, on stream terraces in the northwestern, central, and southeastern parts of the county. The areas are irregular in shape and range from 50 to 800 acres. Areas of this soil are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. The mapping, however, was controlled well enough to make interpretations for the expected uses.

Typically, the soil is organic matter 40 inches thick. It is granular, very dark brown muck to a depth of 5 inches and has a dense root mat. To a depth of 30 inches, it is granular black muck, and below that, it is massive black muck. The underlying mineral soil to a depth of 80 inches is black mucky fine sandy loam, very dark grayish brown sandy loam, and brown loamy sand.

Permeability ranges from slow to moderately rapid in the organic material and from moderately slow to moderately rapid in the mineral layers. The organic soil material is extremely acid. The underlying mineral soil ranges from extremely acid to mildly alkaline. The high water table is at or near the surface most of the time. The soil is subject to frequent ponding for very long periods except in drained areas. It is also subject to rare flooding. Subsidence is a problem in drained areas.

Included with this soil in mapping are small areas of Dare, Deloss, Arapahoe, and Murville soils. The Dare soils are very poorly drained and are in the center of the mapped areas. The Deloss, Arapahoe, and Murville soils are very poorly drained and are near the edge. Also occuring at random within the mapped areas are a few areas of a soil similar to Ponzer soil except that it has an organic surface layer 8 to 16 inches thick. The included soils make up about 15 to 20 percent of this map unit.

Figure 16.—Pond pines are a native tree in this area of Pantego fine sandy loam. Large areas of this soil are being drained, bedded, and planted with loblolly pine.

The acreage of this Donzer soil is in native vegetation. The two types of vegetation are "short pocosin" and "tall pocosin." The pattern of pocosin vegetation is determined by such factors as fire, depth of organic matter, length of periods of saturation, and nutrient availability. The short pocosin vegetation is a dense shrub thicket, 3 to 6 feet tall, and very scattered, stunted pond pines. This vegetation is typically in the center of the pocosin over the deepest and most waterlogged accumulations or organic matter. Common plants are titi, loblolly bay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, sundew, pitcherplant, bayberry, and sedges. The tall pocosin vegetation is mostly along the pocosin margin where organic deposits are thinner. Nutrient availability is better because of greater circulation of ground water *(16)*, and plant growth is more vigorous than in the center of the pocosin. The shrub layer reaches 10 to 12 feet, and pond pines, 25 to 55 feet tall, form a canopy of up to 75 percent. Loblolly bay, red maple, sweetbay, redbay, blackgum, sweetgum, and baldcypress are also common trees. These wetland areas are important escape and cover habitat for a variety of wildlife *(11)*. Extreme wetness, low fertility, and possible ground fires after artificial drainage are major limitations to the use of this soil as commercial woodland.

Small acreages of this soil have been intensively drained and are in corn, soybeans, and wheat. The drainage systems include open ditches and grading or "crowning" fields for surface drainage. Other problems

are subsidence and possible ground fires after drainage. Subsidence exposes buried logs and wood and requires root raking every few years to permit the use of equipment. The organic material is highly reactive with many pesticides, making them ineffective or effective only at high rates of application.

This soil is not used as sites for buildings, sanitary facilities, or recreation because of extreme wetness and the low strength of the organic material.

This Ponzer soil is in capability subclass VIIw (undrained) and IVw (drained). The woodland ordination symbol is 3W.

Pt—Pits. This map unit consists of a large pit on the west side of New Bern where marl is mined. The original soil has been excavated. The underlying marl rock is crushed, and as aggregate, it has many local uses. Part of the pit contains water at times. Vegetation is sparse.

This map unit has not been assigned to a capability subclass. There is no woodland ordination symbol for this map unit.

Ra—Rains fine sandy loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands throughout the county. The areas are irregular in shape and range from 5 to more than 2,000 acres.

Typically, the surface layer is black fine sandy loam 7 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 12 inches. The subsoil extends to a depth of 66 inches. It is gray fine sandy loam in the upper part and gray sandy clay loam in the middle and lower parts. The substratum to a depth of 80 inches is gray sandy clay loam.

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

Included with this soil in mapping are small areas of Lynchburg, Pantego, Grantham, and Leaf soils. The Lynchburg soils are somewhat poorly drained and are slightly higher on the landscape than Rains soil. The Pantego soils are very poorly drained and are in depressions. The Grantham and Leaf soils are poorly drained. Occurring at random within the mapped areas are these soils and some areas of a soil similar to Rains soil except that it has sandy layers 4 or 5 feet below the surface. The included soils make up about 10 to 15 percent of this map unit.

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

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

The principal crops on this soil are corn, soybeans, and wheat (fig. 17). Wetness is the main limitation, and a drainage system that includes open ditches, tile, and land grading for surface drainage is needed. Pasture forages include tall fescue and ladino clover.

Seasonal wetness is a major limitation to the use of this soil as sites for buildings, sanitary facilities, or recreation. However, some areas have been developed by using intensive drainage systems that include open ditches, tile, and land grading for surface drainage.

This Rains soil is in capability subclass IVw (undrained) and IIIw (drained). The woodland ordination symbol is 10W.

Rc—Rains-Urban land complex. This compex consists of Rains soil and Urban land. A typical area consists of about 50 percent Rains soil and 30 to 40 percent Urban land. The Rains soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands. The Urban land is in the cities of New Bern and Havelock and at Cherry Point Marine Corps Air Station. The areas are irregular in shape and range from 10 to 300 acres.

Typically, Rains soil has a black fine sandy loam surface layer 7 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 12 inches. The subsoil extends to a depth of 66 inches. It is gray fine sandy loam in the upper part and gray sandy clay loam in the middle and lower parts. The substratum to a depth of 80 inches is gray sandy clay loam.

Permeability in the subsoil is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is at or near the surface except in areas that have intensive drainage systems.

Urban land consists of areas covered with buildings, runways, military facilities, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Lynchburg, Pantego, and Leaf soils. The Lynchburg soils are somewhat poorly drained and are slightly higher on the landscape than the Rains soil. The Pantego soils are very poorly drained and are in depressions. The Leaf soils are poorly drained and occur at random within the mapped areas. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Figure 17.—Wheat grows in drained areas of Rains fine sandy loam.

Artificial drainage systems were installed in most areas of this Rains soil as urban development progressed. The systems include open ditches, tile, and land grading for surface drainage. Wetness is a major limitation for building site development, sanitary facilities, and recreation. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Ro—Roanoke fine sandy loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on stream terraces along the Neuse River mainly in the northwestern part of the county. The areas are irregular in shape and range from 10 to 500 acres.

Typically, the surface layer is very dark gray fine sandy loam 8 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 11 inches. The subsoil extends to a depth of 41 inches. It is light brownish gray clay loam in the upper part and gray clay in the middle and lower parts. The substratum to a depth of 80 inches is light brownish gray fine sandy loam and loamy sand.

Permeability of the subsoil is slow, and shrink-swell potential is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is at or near the surface, and this soil is subject to occasional ponding in depressions for brief periods.

Included with this soil in mapping are small areas of the Tomotley soils. These soils are poorly drained, and they occur at random within the mapped areas. Also included are a few areas of soils that are somewhat poorly drained and clayey. These soils are slightly higher on the landscape than the Roanoke soil. Soils that are very poorly drained and clayey are in depressions. The included soils make up about 10 to 15 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, pond pine, blackgum, sweetgum, water oak, swamp chestnut oak, red maple, yellow-poplar, and willow oak. The common understory plants include redbay, sweetbay, American holly, switchcane, sweet pepperbush, greenbrier, waxmyrtle, bitter gallberry, large gallberry, fetterbush, honeysuckle, blueberry, huckleberry, poison-ivy, sweetleaf, grape, Virginia chainfern, cinnamon fern, Virginia creeper, and Carolina jessamine. Wetness is the main limitation for woodland use. Logging when this soil is wet causes deep ruts, compaction, poor surface drainage, and lower productivity. Areas managed for loblolly pine are generally ditched and bedded. Fertilizer is also used in many plantations.

Corn, soybeans, and wheat are the main crops on this soil. Wetness is a major limitation. Because the slowly permeable subsoil limits internal drainage, open ditches and land grading for surface drainage are used to reduce wetness. Tile is generally not used. Tillage needs to be avoided if the soil is wet because soil structure is destroyed and large clods form, resulting in ponding and a poor seedbed. Pasture forages include tall fescue and ladino clover.

This soil is generally not used as sites for buildings, sanitary facilities, or recreation because of seasonal wetness, slow permeability, moderate shrink-swell potential, and the clayey subsoil.

This Roanoke soil is in capability subclass IVw (undrained) and IIIw (drained). The woodland ordination symbol is 9W.

Sc—Seabrook-Urban land complex. This complex consists of Seabrook soil and Urban land. A typical mapped area is about 50 percent Seabrook soil and 30 to 40 percent Urban land. The Seabrook soil is nearly level and moderately well drained. It is in slightly convex areas on stream terraces of the Neuse and Trent Rivers. The Urban land is in the city of New Born. The areas are irregular in shape and range from 10 to 250 acres.

Typically, Seabrook soil has a dark brown loamy sand surface layer 6 inches thick. The underlying material to a depth of 80 inches is light yellowish brown loamy sand in the upper part. The middle part is very pale brown sand that has light gray mottles, and the lower part is light gray sand.

Permeability is rapid, and the available water capacity is low. The soil ranges from very strongly acid to slightly acid except where lime has been added. The seasonal high water table is 2 to 4 feet below the surface except in drained areas. Low-lying areas of this soil are subject to rare flooding. Surface runoff from rooftops and paved areas increases the hazard of flooding in low-lying areas.

Urban land consists of areas covered with buildings, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Tarboro, Altavista, and Augusta soils. The Tarboro soils are somewhat excessively drained and are slightly higher on the landscape than Seabrook soil. The Altavista soils are moderately well drained, and the Augusta soils are somewhat poorly drained. These soils occur at random within the mapped areas. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Seasonal wetness, seepage, and the hazard of rare flooding in low-lying areas are major limitations to the use of the Seabrook soil for building site development and sanitary facilities. Drainage systems have generally been installed where needed but low-lying areas can flood during severe storms. Summer droughtiness is a limitation in establishing and maintaining lawns and shrubs. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination for the soil in this map unit.

Se—Seabrook loamy sand. This soil is nearly level and moderately well drained. It is in slightly convex areas on stream terraces mainly in the central and northwestern parts of the county along the Neuse River, Trent River, and the larger creeks. The areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is dark brown loamy sand 6 inches thick. The underlying material to a depth of 80 inches is light yellowish brown loamy sand in the upper part. The middle part is very pale brown sand that has light gray mottles, and the lower part is light gray sand.

Permeability is rapid, and the available water capacity is low. The soil ranges from very strongly acid to slightly acid except where lime has been added. The seasonal high water table is 2 to 4 feet below the surface. Low-lying areas of this soil are subject to rare flooding. Wind erosion is a hazard in areas that are not protected by plant cover.

Included with this soil in mapping are small areas of Altavista, Augusta, Conetoe, Leon, and Tarboro soils. The Altavista soils are moderately well drained, the Augusta soils are somewhat poorly drained, and the Leon soils are poorly drained. These soils occur at random within the mapped areas. The Conetoe soils are well drained, and the Tarboro soils are somewhat excessively drained. These soils are on low ridges. Some areas of wet soils in depressions smaller than 4 acres are shown on the map with a special symbol. The included soils make up about 10 to 15 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, longleaf pine, red maple, water oak, sweetgum, southern red oak, blackgum, and white oak. The common understory plants include blueberry, bitter gallberry, redbay, greenbrier, flowering dogwood, turkey oak, blackjack oak, waxmyrtle, sassafras, grape, sweetbay, Virginia creeper, sourwood, sweet pepperbush, and threeawn grass. Droughtiness is the main limitation for woodland use and management.

The principal crops on this soil are tobacco, corn, soybeans, and wheat. Watermelons are also grown in a few areas. The main limitations for crops are leaching of plant nutrients and droughtiness. Wind erosion is a hazard. A common pasture forage is coastal bermudagrass.

Seasonal wetness, seepage, and rare flooding of low-lying areas limit the use of this soil as sites for buildings and sanitary facilities. Drainage systems that include open ditches and tile are used in some places; however, ditches are difficult to maintain because of ditchbank caving. The hazard of flooding should be determined before planning use and management of specific sites. Summer droughtiness is a limitation in establishing and maintaining lawns and shrubs. The sandy texture is a limitation for recreational uses.

This Seabrook soil is in capability subclass IIIs. The woodland ordination symbol is 9S.

StA—State loamy sand, 0 to 2 percent slopes. This soil is well drained. It is on low ridges on stream terraces along the Neuse River and the larger creeks in the northwestern and southeastern parts of the county. The areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark grayish brown loamy sand 8 inches thick. The subsurface layer is pale brown loamy sand to a depth of 13 inches. The subsoil extends to a depth of 43 inches. It is strong brown sandy clay loam in the upper and middle parts and yellowish brown sandy loam in the lower part. The substratum to a depth of 80 inches is brownish yellow loamy sand and sand.

Permeability of the subsoil and the available water capacity are moderate. The soil ranges from very strongly acid to strongly acid in the surface layer, subsurface layer, and the upper part of the subsoil except where lime has been added. The lower part of the subsoil and the substratum range from very strongly acid to medium acid. The seasonal high water table is 4 to 6 feet below the surface. Low-lying areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Conetoe and Altavista soils. The Conetoe soils are well drained, and they occur at random within the mapped areas. The Altavista soils are moderately well drained and are slightly lower on the landscape than the State soil. Some areas of wet soils in depressions and sandy soils in higher areas smaller than 4 acres are shown on the map with special symbols. The included soils make up about 10 to 15 percent of this map unit.

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

The main crops on this soil are corn, soybeans, tobacco, and wheat. There are no major limitations to the use of this soil for cultivated crops. Pasture forages include coastal bermudagrass, tall fescue, and ladino clover.

Loblolly pine, longleaf pine, southern red oak, laurel oak, hickory, yellow-poplar, red maple, white oak, and water oak are dominant on this soil. The understory plants include flowering dogwood, sourwood, sweetbay, redbay, American holly, blueberry, bitter gallberry, partridgeberry, grape, Virginia creeper, waxmyrtle, Carolina jessamine, and poison-ivy. There are no major limitations for woodland use and management.

Most of this soil has no major limitations for building site development and recreational uses; however, low-lying areas are subject to rare flooding. The hazard of flooding should be determined before planning use and management of specific sites. Wetness and seepage are limitations for sanitary facilities.

This State soil is in capability class I. The woodland ordination symbol is 10A.

SuD—Suffolk loamy sand, 10 to 30 percent slopes. This soil is well drained. It is on side slopes along large drainageways on uplands. The areas are long and narrow and range from 5 to 50 acres.

Typically, the surface layer is gray loamy sand 4 inches thick. The subsurface layer is pale brown loamy sand to a depth of 14 inches. The subsoil extends to a depth of 38 inches. It is strong brown sandy clay loam in the upper part and yellowish brown sandy loam in the lower part. The substratum to a depth of 80 inches is brownish yellow loamy sand and strong brown sandy loam.

Permeability of the subsoil is moderate, and the available water capacity is low. This soil is very strongly acid or strongly acid in the surface layer, subsurface layer, and subsoil except where lime has been added. The substratum ranges from very strongly acid to medium acid. This soil does not have a water table within a depth of 6 feet. Surface runoff is rapid because of steepness of slope, and the soil is very susceptible to erosion.

Included with this soil in mapping are areas of a soil similar to Suffolk soil except that it has a sandy surface layer and subsurface layer that are more than 20 inches thick. Also included are some areas of soils that have a clayey subsoil and areas of wetter soils that are in seepage areas. These soils occur at random within the mapped areas. In a few places, marl is exposed on the lower part of side slopes. The included soils make up 20 to 30 percent of this map unit.

This Suffolk soil is used mainly as woodland. In a few areas, it is used for pasture forages, such as coastal bermudagrass.

The dominant trees on this soil are loblolly pine, white oak, southern red oak, hickory, American beech, red maple, Shumard oak, yellow-poplar, water oak, blackgum, post oak, and sweetgum. The important understory includes flowering dogwood, sourwood, sweetbay, redbay, grape, partridgeberry, bitter gallberry, waxmyrtle, sassafras, Carolina jessamine, Virginia creeper, poison-ivy, and blueberry. There are no major limitations for woodland use and management.

This soil is generally not used as cropland because of slope and the severe hazard of erosion in areas that are not protected by plant cover.

Slope limits the use of this soil as sites for buildings, sanitary facilities, and recreation. Other soil properties are generally favorable for these uses.

This Suffolk soil is in capability subclass VIe. The woodland ordination symbol is 8R.

TaB—Tarboro sand, 0 to 6 percent slopes. This soil is somewhat excessively drained. It is on gently undulating ridges on stream terraces mainly in the central and northwestern parts of the county along the Neuse River, Trent River, and the larger creeks. The areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark grayish brown sand 5 inches thick. The underlying material to a depth of 80 inches is brownish yellow and yellow sand.

Permeability is rapid or very rapid and the available water capacity is low. The soil ranges from strongly acid to slightly acid except where lime has been added. It does not have a water table within a depth of 6 feet. Low-lying areas of this soil are subject to rare flooding. Wind erosion is a hazard in areas that are not protected by vegetation.

Included with this soil in mapping are small areas of Conetoe, Seabrook, and Kureb soils. The Conetoe soils are well drained, and the Kureb soils are excessively drained. These soils occur at random within the mapped areas. The Seabrook soils are moderately well drained and are slightly lower on the landscape than the Tarboro soil. Some areas of wet soils in depressions smaller than 4 acres are shown on the map with a special symbol. The included soils make up about 10 to 15 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, longleaf pine, sweetgum, southern red oak, Shumard oak, post oak, and blackjack oak. The common understory plants include turkey oak, bluejack oak, sourwood, sassafras, redbay, blueberry, waxmyrtle, grape, American beautyberry, threeawn grass, and flowering dogwood. Droughtiness is the main limitation for woodland use and management.

Corn and soybeans are the main crops on this soil. Small acreages are used for watermelons. Droughtiness, leaching of plant nutrients, and wind erosion limit the use of this soil as cropland. Coastal bermudagrass is the common pasture forage.

Except for cutbanks caving, most areas of this soil have no major limitations for building site development. Rare flooding can cause damage in low-lying areas. The hazard of flooding should be determined before planning use and management of specific sites. Seepage is a major limitation for sanitary facilities, and the sandy surface layer is a limitation for recreational uses.

This Tarboro soil is in capability subclass IIIs. The woodland ordination symbol is 7S.

Tc—Torhunta-Urban land complex. This complex consists of Torhunta soil and Urban land. A typical mapped area consists of about 50 percent Torhunta soil and 30 to 40 percent Urban land. Torhunta soil is nearly level and very poorly drained. It is on broad flats and in depressions on uplands. The Urban land is in the cities of New Bern and Havelock. The areas are irregular in shape and range from 10 to 200 acres.

Typically, Torhunta soil has a black fine sandy loam surface layer 12 inches thick. The subsoil is dark grayish brown sandy loam to a depth of 37 inches. The substratum to a depth of 80 inches is grayish brown loamy sand.

Permeability is moderately rapid in the surface layer and subsoil, and rapid in the substratum. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is at or near the surface, and water ponds in depressions except in intensively drained areas.

Urban land consists of areas used for buildings, streets, driveways, and parking lots. These impermeable areas increase surface runoff, causing water to pond in inadequately drained areas (fig. 18).

Included with this complex in mapping are small areas of Pantego and Rains soils. The Rains soils are poorly drained and are slightly higher on the landscape than the Torhunta soil. The Pantego soils are very poorly drained, and they occur at random within the mapped areas. Also included are small cut and fill areas where the natural soil has been altered or covered. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

Wetness limits the use of the Torhunta soil as sites for buildings, sanitary facilities, and recreation. In most places, artificial drainage systems that include open ditches, tile, and land grading for surface drainage were installed as urban development progressed. This has reduced seasonal wetness somewhat. The sandy underlying material causes ditchbank caving, and ditches are difficult to maintain.

Figure 18.—Water ponds in areas of the Torhunta-Urban land complex, and intensive drainage systems are needed for most uses.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Tm—Tomotley fine sandy loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on stream terraces along the Neuse River and the larger creeks in the southeastern, central, and northwestern parts of the county. The areas are irregular in shape and range from 5 to 1,000 acres.

Typically, the surface layer is black fine sandy loam 8 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 11 inches. The subsoil extends to a depth of 41 inches. It is light brownish gray sandy clay loam in the upper part and light gray fine sandy loam in the lower part. The substratum to a depth of 80 inches is light gray loamy sand and sand.

Permeability of the subsoil is moderate. The soil ranges from extremely acid to strongly acid in the surface layer, subsurface layer, and subsoil except where lime has been added. The seasonal high water table is at or near the surface. Water ponds in depressions for brief periods unless the soil has been drained. Low-lying areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Augusta, Roanoke, and Deloss soils. The Augusta soils are somewhat poorly drained and are slightly higher on

the landscape than the Tomotley soil. The Roanoke soils are poorly drained, and they occur at random within the mapped areas. The Deloss soils are very poorly drained and are in depressions. The included soils make up about 10 to 20 percent of this map unit.

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

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

The principal crops on this soil are corn, soybeans, and wheat. Small acreages are used for cabbage and potatoes. Because of wetness, a drainage system that includes open ditches, tile, and land grading for surface drainage is needed. Pasture forages include tall fescue and ladino clover.

Seasonal wetness and rare flooding of low-lying areas limit the use of this soil as sites for buildings, sanitary facilities, and recreation. However, some areas that have intensive drainage systems including tile, open ditches, and land grading for surface drainage have been developed. The hazard of flooding should be determined before planning use and management of specific sites.

This soil is in capability subclass IVw (undrained) and IIIw (drained). The woodland ordination symbol is 10W.

To—Torhunta fine sandy loam. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on uplands. Some of the larger areas of this soil are in the vicinity of Dover and Havelock. The areas are irregular in shape and range from 5 to 2,000 acres.

Typically, the surface layer is black fine sandy loam 12 inches thick. The subsoil is dark grayish brown sandy loam to a depth of 37 inches. The substratum to a depth of 80 inches is grayish brown loamy sand.

Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is at or near the surface. Water ponds in depressions for brief to long periods except where drainage systems have been installed.

Included with this soil in mapping are small areas of Pantego, Murville, Leon, and Rains soils. The Pantego and Murville soils are very poorly drained. Occurring at random within the mapped areas are these soils and some areas of wet soils that have a black surface layer more than 24 inches thick or that have clayey substratum. The Leon and Rains soils are poorly drained and are slightly higher on the landscape than the Torhunta soil. The included soils make up about 10 to 20 percent of this map unit.

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

The dominant trees on this soil are loblolly pine, pond pine, water oak, yellow-poplar, sweetgum, blackgum, swamp chestnut oak, red maple, willow oak, and baldcypress. Hardwoods are dominant in depressions that are ponded for long periods. The common understory plants include redbay, loblolly bay, fetterbush, sweet pepperbush, switchcane, waxmyrtle, bayberry, greenbrier, bitter gallberry, large gallberry, sweetleaf, blueberry, huckleberry, Virginia creeper, honeysuckle, poison-ivy, American holly, Virginia chainfern, titi, cinnamon fern, and honey cup. Wetness is the main limitation for commercial woodland use and management. Areas managed for loblolly pine need ditching and bedding. Fertilizer is also used in many plantations.

Corn, soybeans, and wheat are the major crops on this soil. Wetness is the main limitation; however, this limitation can be reduced by a drainage system that includes land grading to eliminate depressions in which water ponds and by the use of tile and open ditches. The sandy substratum causes ditchbank caving, and ditches are difficult to maintain. Also, suitable outlets may not exist for drainage of depressions. Pasture forages include tall fescue and ladino clover.

Seasonal wetness and ponding in depressions limit the use of this soil as sites for buildings and sanitary facilities. A few areas that have intensive drainage systems, including land grading for surface drainage, open ditches, and tile, have been developed. The sandy substratum causes ditchbank caving, and ditches are difficult to maintain. This soil generally is not used for recreational activities because of wetness.

This Torhunta soil is in capability subclass VIw (undrained) and IIIw (drained). The woodland ordination symbol is 9W.

TuB—Tarboro-Urban land complex, 0 to 6 percent slopes. This complex consists of Tarboro soil and Urban land. A typical mapped area consists of about 50 percent Tarboro soil and 30 to 40 percent Urban land. Tarboro soil is somewhat excessively drained. It is on gently undulating, low ridges on stream terraces of the Neuse and Trent Rivers. The Urban land is in the city of New Bern. The areas are irregular in shape and range from 20 to 200 acres.

Typically, Tarboro soil has a dark grayish brown sand surface layer 5 inches thick. The underlying material to a depth of 80 inches is brownish yellow and yellow sand.

Permeability is rapid or very rapid, and the available water capacity is low. The soil ranges from strongly acid to slightly acid except where lime has been added. It

does not have a water table within a depth of 6 feet. Low-lying areas of this soil are subject to rare flooding. Surface runoff from rooftops and paved areas increases the hazard of flooding in low-lying areas.

Urban land consists of areas covered with buildings, streets, driveways, and parking lots.

Included with this complex in mapping are small areas of Seabrook, State, and Conetoe soils. The Seabrook soils are moderately well drained, and the Conetoe and State soils are well drained. These soils are slightly lower on the landscape than the Tarboro soil. Also included are small cut and fill areas where the natural soil has been altered or covered and the slope has been modified. These areas are commonly adjacent to the Urban land. The included soils make up about 10 to 20 percent of this map unit.

The areas of this Tarboro soil above 12 feet in elevation are limited as sites for buildings only because of caving of cutbanks. Seepage is a major limitation for sanitary facilities, and the sandy surface layer is a major limitation for recreational uses. Droughtiness in the summer can be a problem in establishing and maintaining shrubs. In low-lying areas of this soil, flooding can cause damage. Onsite investigation is needed before planning use and management of specific sites.

This complex has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Ud—Udorthents, loamy. This map unit consists of nearly level to gently sloping borrow areas and landfills. The nature of each area is labeled on the soil map. Some areas are currently active and are unvegetated. Other areas are inactive and have been revegetated. The covering layer is generally shaped for surface drainage in landfill areas. The areas are generally rectangular in shape and range from 10 to 100 acres.

In landfills, the covering layer of soil is typically about 3 feet thick, variable in color, and has a sandy or loamy texture. In borrow areas, the soil is typically loamy or sandy sediment of variable color.

The soil material has little or no organic matter. Permeability is moderate, and the available water capacity is low. Infiltration is moderate, and surface runoff is slow. The soil generally ranges from extremely acid to strongly acid except where lime has been added. Depth to the seasonal high water table is variable.

Most areas are revegetating with native plants, such as loblolly pine, broomsedge, and dogfennel. Closed landfills are planted to grass.

The soil in this map unit generally is not used as sites for buildings or recreational activities. Onsite investigation is needed to properly evaluate and plan the development of specific areas.

This map unit has not been assigned to a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Ur—Urban land. This map unit consists of areas where more than 75 percent of the land is covered by buildings, runways, military facilities, streets, driveways, and parking lots. These areas are in the cities of New Bern and Havelock and at Cherry Point Marine Corps Air Station. The areas range from 5 to 850 acres. Slope ranges from 0 to 2 percent.

The natural soil has been greatly altered by cutting, filling, grading, and shaping. The original landscape, topography, and commonly the drainage pattern have been changed. The soil between facilities is used for lawns, playgrounds, cemeteries, parks, or drainageways.

The major problem on Urban land is excessive surface water runoff from roofs, streets, runways, and parking lots. The runoff increases the hazard of flooding in low-lying areas. Onsite investigation is needed before planning the use and management of specific sites.

Urban land is not assigned a capability subclass. There is no woodland ordination symbol for the soil in this map unit.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Craven County are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

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

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

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

About 70,699 acres, or nearly 15 percent of Craven County, is prime farmland. This farmland occurs throughout the county on uplands and stream terraces mainly in areas near major drainageways. The main crops are corn, soybeans, tobacco, and wheat.

A recent trend in land use in some parts of the county has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are either wet, more erodible, droughty, difficult to cultivate, or less productive than prime farmland.

The following map units, or soils, make up prime farmland in Craven County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 5. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland if the limitations or hazards are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of the corrective measures.

AaA Altavista fine sandy loam, 0 to 2 percent slopes
CrB Craven silt loam, 1 to 4 percent slopes
ExA Exum silt loam, 0 to 2 percent slopes
GoA Goldsboro loamy fine sand, 0 to 2 percent slopes
NoA Norfolk loamy fine sand, 0 to 2 percent slopes
NoB Norfolk loamy fine sand, 2 to 6 percent slopes
On Onslow loamy sand
StA State loamy sand, 0 to 2 percent slopes

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

John Smith, Jr., district conservationist, and Foy Hendrix, conservation agronomist, Soil Conservation Service, helped prepare this section.

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

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

Over 72,000 acres in Craven County was used for crops in 1981, according to data collected by the North Carolina Agricultural Extension Service. Of this, there were 33,456 acres of corn, 32,100 acres of soybeans, 7,623 acres of wheat double-cropped mainly with soybeans, and 6,269 acres of tobacco. In 1977, 2,549 acres was used as pasture or for hay, according to the 1978 North Carolina Land Utilization Survey. Small acreages are used for vegetable, fruit, and berry crops.

Tobacco is commonly grown on soils that have good natural drainage, such as Altavista, Craven, Goldsboro, Norfolk, Onslow, and State soils. Corn, soybeans, and wheat are also grown on the well drained and moderately well drained soils and in artificially drained areas of the somewhat poorly drained, poorly drained, and very poorly drained soils. Many of the soils are well suited to vegetable, fruit, and berry crops. The latest information on growing these crops can be obtained from local offices of the Agricultural Extension Service and the Soil Conservation Service.

The main pasture forages are coastal bermudagrass, tall fescue, and ladino clover. Coastal bermudagrass is on droughty, sandy soils, such as Autryville, Conetoe, Seabrook, and Tarboro soils. A tall fescue-ladino clover mixture is on soils that have adequate available water capacity.

Field drainage. In Craven County, wetness is a problem on about 81 percent of the acreage suitable for farming. The design of the drainage systems used depends on the soil and the crops to be grown. Only limited artificial drainage is needed on the Altavista, Exum, Goldsboro, Onslow, and Seabrook soils, which are moderately well drained. The somewhat poorly drained, poorly drained, and very poorly drained soils require a more extensive drainage system that includes primary canals; a secondary system of parallel field ditches or tile drains, or both; and land grading for surface drainage (fig. 19).

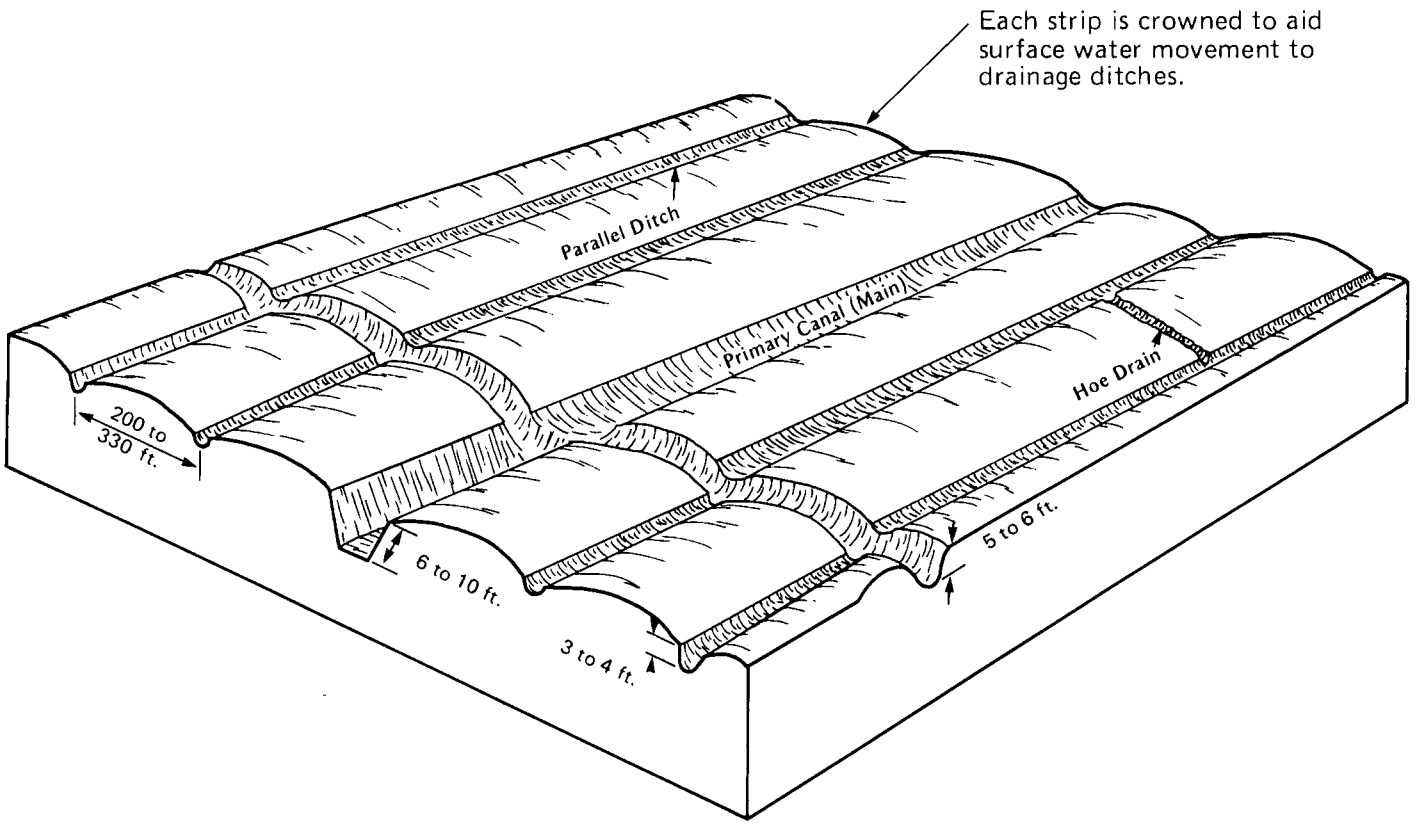

Figure 19.—Artificial drainage systems are commonly used in areas of very poorly drained soils. The distance between ditches varies with the kind of soil and the crops to be grown.

In the wetter soils, the area between the ditches is crowned in the middle to allow excess water to run off. In some fields, water furrows, or hoe drains, are used to carry the surface water to the field ditches. Drainage ditches, tile drains, and flashboard risers can be used to control the removal of excess water and subsurface irrigation. By impounding runoff water, they also aid in denitrification, which improves water quality. Land grading is often used to fill in low areas or depressions, to smooth fields, and to make a uniform grade for removing excess rain water. Caving of ditchbanks can be a problem in some coarse-textured soils.

Tillage of wet, loamy soils destroys soil structure, and large clods form (fig. 20), resulting in a poor seedbed. The Bayboro, Craven, Leaf, Lenoir, Meggett, and Roanoke soils are particularly susceptible to clodding. Timing farming operations on the wet organic soils is critical because these soils are subject to becoming waterlogged and untrafficable. Subsidence, exposure of buried logs and wood, and possible ground fires after drainage are also concerns in management of organic soils.

Erosion. Control of water and wind erosion is needed on some soils in Craven County. Water erosion is a hazard on the gently sloping Bragg, Craven, and Norfolk soils and on the moderately steep Suffolk soils. Some short steep slopes along major drainageways and some small, narrow, gently sloping areas of soils near smaller drainageways are also susceptible to erosion. Conservation practices that help control water erosion include grassed waterways (fig. 21), field borders, conservation tillage, crop residue management, diversions, close-growing crops in rotations, and, on some soils, a permanent plant cover. A combination of these practices is generally needed where row crops are grown. In areas of the more poorly drained soils, the use of hoe drains can cause erosion. Drop structures are needed where the hoe drains let out into open ditches to prevent ditchbanks from washing away. Erosion can be reduced on these soils by land grading the fields to reduce the number of hoe drains needed. Controlling erosion improves crop production and water quality and lowers the loss of nutrients.

Figure 20.—Clods form in Craven silt loam, 1 to 4 percent slopes, if the soil is tilled when wet.

Autryville, Conetoe, Seabrook, and Tarboro soils are highly susceptible to wind erosion. These soils are droughty and are subject to leaching of plant nutrients. Many of the other soils in the county have a sandy surface layer, and wind erosion can be a problem in large fields. Leaving crop residue on the surface or growing a cover crop until planting time helps conserve

Figure 21.—This grassed waterway constructed on Craven silt loam, 1 to 4 percent slopes, will help to control runoff and erosion on this soil.

moisture and reduces leaching of plant nutrients. Strips of small grains between rows of tobacco reduces sand blowing on newly planted fields. The establishment of permanent windbreaks between fields also reduces wind erosion.

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

Liming requirements are a major concern to the farmer because the acidity level in the soil affects the availability to plants of many nutrient elements and the activity of beneficial bacteria. Lime neutralizes exchangeable aluminum and thereby counteracts the adverse effects aluminum has on the crops grown in the county.

Liming recommendations are based upon soil test determinations. In soils that have a sandy surface texture, magnesium as well as calcium may be low. A soil test is needed to determine whether calcitic or dolomitic lime should be used. Calcitic lime provides calcium, and dolomitic lime supplies calcium and magnesium. The desired pH levels will vary depending upon soil properties and the crop to be grown. This is considered in the recommendations available through soil testing.

Nitrogen fertilization is required for most crops. However, no soil test is available for predicting nitrogen requirements. Appropriate rates depend upon the crop and the potential productivity of the soil. For example, nitrogen rates for corn on soils that have a yield of 125 to 150 bushels per acre are 140 to 160 pounds of nitrogen per acre. Where the yield is 100 bushels per acre, the rate is 100 to 120 pounds of nitrogen per acre. Where corn follows soybeans, the rates can be reduced by 20 to 30 pounds of nitrogen per acre. Because nitrogen can be readily leached from sandy soils, it may

be necessary to apply nitrogen on these soils more than once during the growing season.

The need for phosphorus and potassium can be predicted from soil tests. Phosphate and potash requirements should be determined by sampling each field. This is necessary because applications of phosphorus and potassium tend to build up in the soil such that fertilizer requirements change over time.

In areas of native vegetation, the organic Croatan and Ponzer soils are extremely acid and much lower in natural fertility than most of the mineral soils in the county. Lime is required to grow crops after these soils are cleared and drained. Nitrogen is a constituent of the organic matter, and some nitrogen is available for plant growth as the organic matter decomposes. However, nitrogen fertilizers are needed just as in the mineral soils. Potassium and phosphorous are low in these organic soils. In Craven County, copper is the only micronutrient that is regularly deficient. Each field should be tested to determine the kind and amount of micronutrients that should be added.

Chemical weed control. The use of herbicides for weed control in crops is a common practice in Craven County. Soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates for these properties were determined for the soils described in this survey. Table 15 shows a general range of organic matter content, and table 14 shows the texture of the soil.

Higher organic matter levels can occur in soil areas that have received high amounts of plant or animal waste. Land development areas currently being brought into cultivation could have higher levels of organic matter in their surface layer than areas of the same soil that have been in cultivation for a long time. Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities. Therefore, organic matter content should be measured or estimated when determining required herbicide rates. The labels of specific herbicides show the application rates based on organic matter content and the surface texture.

Pasture and hayland acreages in Craven County are mostly planted in coastal bermudagrass, tall fescue, and ladino clover. Most coastal bermudagrass areas are used as hayland and are predominantly on soils that have a sandy surface layer, such as Autryville, Conetoe, Seabrook, and Tarboro soils. Soil tests are needed to determine appropriate levels of nitrogen, phosphorus, and potassium required for production of coastal bermudagrass. Nitrogen application requires special attention because each cutting of hay removes signifcant amounts of nitrogen from the field.

A tall fescue and ladino clover mixture is common on soils that have adequate available water capacity, such as Altavista, Arapahoe, Augusta, Bayboro, Craven, Croatan, Deloss, Exum, Goldsboro, Grantham, Leaf, Lenoir, Lynchburg, Meggett, Norfolk, Onslow, Pantego, Rains, State, Tomotley, and Torhunta soils. Applications of lime and fertilizer, as determined by soil tests, are needed for establishment of hayland and pasture. After a good stand is established, only 1 or 2 tons of lime is needed every 3 to 5 years. Since tall fescue grows the most in spring and fall, fertilizer recommendations generally call for applications of nitrogen in February and again in September for best results. Tall fescue grows very little in hot, dry periods of summer. Rotating the livestock among pastures in the summer can prevent their grazing the fescue to a height of less than 3 inches.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major, and generally expensive,

landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

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

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

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

Woodland Management and Productivity

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

Originally, nearly all the area that is now Craven County was forested. In 1974, commercial forest covered about 73 percent, or 333,361 acres, of the county. Farmers owned 104,192 acres; forest products industry, 99,395 acres; Croatan National Forest, 54,239 acres; other public agencies, 6,360 acres; and corporate and individual private landowners, 69,175 acres *(22)*.

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

On the better drained soils, common trees include loblolly pine, longleaf pine, upland oaks, and hickory. Loblolly pine, pond pine, bottom land oaks, sweetgum, blackgum, yellow-poplar, and red maple are common on the more poorly drained soils. In pocosins, the soils are saturated most of the time and are forested with pond pine, redbay, sweetbay, loblolly bay, and blackgum. Baldcypress, swamp tupelo, blackgum, ash, elm, and American hornbeam are dominant on soils that are ponded for long periods. These soils are generally on flood plains or in depressions.

Loblolly pine is an important commercial timber species in the county (fig. 22) because it grows fast, is adapted to the soil and climate, has a high market value, and is easy to establish and manage. Foresters encourage landowners to manage for pine instead of hardwoods on sites that are suited to pine. Quality pines can be produced more rapidly and in greater volume than quality hardwoods. An important preharvest pine management practice is a prescribed burning program for reduction of hardwood competition, improvement of wildlife habitat, protection from wildfire, and more economical reestablishment of pine.

Loblolly pine grows on a wide variety of soils, but it grows best on moist soils that have a deep surface layer and a loamy or clayey subsoil. The highest yields are produced on Leaf, Meggett, Rains, and Tomotley soils that are poorly drained, and on Arapahoe, Bayboro, Deloss, and Pantego soils that are very poorly drained but have been ditched and bedded. Water management practices can protect seedlings from ponded water, reduce competition from other plants, and permit conversion of native stands of pond pine to loblolly pine. Many other soils in the county produce good crops of pine; however, the yield is lower.

The Croatan, Dare, and Ponzer soils in large pocosins are mostly used for pond pine that do not have commercial value. These organic soils are very poorly

Figure 22.—Pine forests are important to the economy of Craven County.

drained and have poor potential for conversion to loblolly pine because of the difficulty of developing adequate drainage, poor soil fertility, high development cost, possibility of ground fires after drainage, and high possibility of stand failure.

Sandy soils that are deep and excessively drained, such as Kureb and Tarboro soils, have very low site quality. The Leon and Murville soils have a weakly cemented subsoil and also have poor site quality.

For the purpose of a forest survey, four commercial forest types have been identified in the county *(22)*.

Loblolly pine (157,637 acres).—This forest type is more than 50 percent loblolly pine. It also has pond pine, longleaf pine, southern red oak, water oak, swamp chestnut oak, Shumard oak, white oak, willow oak, red maple, hickory, sweetgum, blackgum, and yellow-poplar. The soils range from somewhat excessively drained to very poorly drained. Significant acreages of pond pine forest type growing on very poorly drained soils are also included.

Oak-pine (47,928 acres).—Hardwoods make up more than 50 percent of the stand, but pines make up 25 to 50 percent. The hardwood species are the same as those listed in the loblolly pine forest type. The dominant species vary depending on soil drainage. This timber type represents a trend toward hardwood dominance where pine management practices have not been applied. The understory generally consists of hardwood seedlings and saplings and shrubs that are more tolerant of shade than pine. The soils are well drained to very poorly drained.

Oak-gum-maple (119,160 acres).—This type consists of hardwood forests on broad interstream flats, in depressions, and on narrow to broad flood plains. The soils are poorly drained or very poorly drained. Water oak, swamp chestnut oak, willow oak, blackgum,

sweetgum, red maple, and yellow-poplar are on the flats and in depressions. The flood plains are forested with swamp tupelo, baldcypress, American elm, red maple, ash, and American hornbeam.

Longleaf pine (8,636 acres).—This forest type is more than 50 percent longleaf pines. It also has loblolly pine and scattered southern red oak, post oak, turkey oak, blackjack oak, sweetgum, and blackgum. This forest type is mainly on sandy soils that are excessively drained to poorly drained.

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

Table 7 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

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

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

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

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

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber have the yield predicted in cubic feet. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. Site index values shown in table 7 are based on measurements at selected sites in Craven County or other counties or both and are based on published site index tables *(3, 4, 5, 6, 12, 19, and 21)*.

The *productivity* represents an expected volume produced by the most important trees, expressed in cubic feet per acre per year. Cubic feet per acre can be

converted to board feet per acre by multiplying by a factor of about 5.

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

Recreation

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

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

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

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm and is not dusty when dry. Strong slopes can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains and is not dusty when dry.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, are not subject to prolonged flooding during the period of use, and they have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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

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

The soils of Craven County produce a wide variety of plants that provide food, cover, and protection for wildlife. Squirrel, rabbit, fox, quail, mourning dove, and many species of songbirds are abundant. Deer are plentiful throughout the county, and a small number of black bear are in the more remote areas. Furbearers, such as raccoon, mink, muskrat, otter, and opossum, are also abundant. Waterfowl, including mallard, black duck, and wood duck, frequent the Neuse and Trent Rivers and their tributaries.

Craven County offers some interesting contrasts in wildlife habitat because of the varied plant communities, landforms, and land use patterns.

The better drained, productive soils in the county are mainly used as farmland. Many fields are small and provide good edge habitat for quail, rabbit, and dove. Deer, hawks, and many songbirds are also attracted to these areas. Food, nesting cover, brood areas, and resting cover are primary habitat elements that are provided by land use patterns associated with these soils. Areas that have not been cleared generally support good woodland habitat of mixed oaks and pine. Altavista, Autryville, Conetoe, Craven, Exum, Goldsboro, Lenoir, Lynchburg, Norfolk, Onslow, Seabrook, and State soils are in these areas.

The Suffolk soils are on side slopes in narrow bands along the stream corridors. A diverse native plant community with an abundance of oaks and beech is on these soils. This diverse plant community and the location along streams and adjacent to wetlands combine to make Suffolk soils one of the more productive wildlife areas in the county.

The Leon and Kureb soils are characterized by open stands of pine with moderate understory and a ground cover of wiregrass. These soils have low plant diversity and few if any oaks other than scrub oak. Areas of these soils are prime habitat for the red-cockaded woodpecker, an endangered species.

Wet soils make up a large acreage within the county. Habitat values of these wet soils vary greatly depending on the depth and duration of flooding and ponding or the degree of wetness, or both. These factors determine the vegetative community on a given site, and the vegetative community directly influences the wildlife species present.

Most of the acreage of wet soils in the county is in large blocks. Some of these large blocks are being cleared, drained, and converted to cropland; others are being clearcut, drained, and planted to loblolly pine. The Arapahoe, Bayboro, Deloss, Leaf, Pantego, Rains, Tomotley, and Torhunta soils are wet.

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

Other wet soils that have not been extensively cleared or drained are on flood plains and in depressions, pocosins, and marshes.

The flood plains and wet depressions are mostly in forests of ash, blackgum, baldcypress, swamp tupelo, red maple, and other water-tolerant hardwoods. These areas provide excellent wildlife habitat. The Arapahoe, Bayboro, Dorovan, Masontown, Meggett, Muckalee, and Roanoke soils are in these areas.

Some large blocks of very poorly drained soils are in pocosins. Although the carrying capacity for black bear, deer, and other wildlife is not high, these areas serve as escape and cover *(11)*. Large areas of soils in pocosins are in Croatan National Forest, and some of the acreage has been designated a wilderness area by the U.S. Forest Service. The Croatan, Dare, Murville, and Ponzer soils are in pocosins.

Small areas of brackish marsh are along the Neuse and Trent Rivers and the larger creeks. The Lafitte soils in these marshes serve an important role in the ecology of the Neuse Estuary. The marsh plants contribute nutrients to the estuary, benefiting fish and shellfish. They also provide excellent habitat for waterfowl and other wetland wildlife.

Fishery habitat in the county consists of the Neuse and Trent Rivers and their tributaries, and scattered lakes and ponds. The habitat is excellent for many fresh and estuarine species.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

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

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and lespedeza.

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

bluestem, goldenrod, beggarweed, wheatgrass, and grama.

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

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cedar, and juniper.

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

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

The habitat for various kinds of wildlife is described in the following paragraphs.

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

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

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

Engineering

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

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

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

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

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

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

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

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

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to a weakly cemented pan or a very firm dense layer; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

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

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

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

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly

permeable sand and gravel is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively.

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

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

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

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

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

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

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

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

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

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

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of

excavation is affected by a high water table and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil) and the thickness of suitable material. Acidity and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick. All other soils are rated as an improbable source.

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They have little or no gravel and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

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

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

Water Management

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

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

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

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

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

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to a weakly cemented pan or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by depth to a weakly cemented pan, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, and depth to a weakly cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness, slope, and depth to a weakly cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

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

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

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

Engineering Index Properties

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

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

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

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

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

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

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The

estimates are based on test data from the survey area, or from nearby areas, and on field examination.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the soil's adsorption of cations, moisture retention, shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

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

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

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

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

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

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, organic soils. These soils have a very slow rate of water transmission.

Group A/D. A dual hydrologic group given for certain wet, sandy soils that have a high infiltration rate if drained. The first letter applies to the drained condition, and the second letter to the undrained.

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

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

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

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *common* is used when classification as occasional or frequent does not affect interpretations. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May.

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

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

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

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 16 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severely corrosive environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Engineering Index Test Data

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

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

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

Formation of the Soils

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

Factors of Soil Formation

Soil is the product of the combined effects of parent material, climate, plant and animal life, time, and relief. These five factors determine the characteristics of the soil in any of the natural soil bodies. The processes of soil formation include additions of organic and mineral material to the soil as solids, liquids, and gases; losses of this material from the soil; translocation of material from one part of the soil to another; and transformation of mineral and organic substances within the soil *(15)*.

Parent Material

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

The soils in Craven County formed in surficial sediment on the Wicomico and Talbot terraces (Wicomico and Talbot surfaces); alluvium deposited in drainageways; accumulations of organic material in the broad, undissected interstream areas and in drainageways and marshes; and sediment that has an underlying marl formation.

Many differences in the soils of Craven County are attributed to the parent material in which the soils formed. The kinds of parent material, although related, differ in mineral and chemical composition and in particle-size distribution. The soils in Craven County can be grouped according to the parent material in which they formed. The Bayboro, Craven, Leaf, and Roanoke soils formed in fine-textured sediment. The Altavista, Augusta, Deloss, Exum, Goldsboro, Grantham, Lynchburg, Norfolk, Onslow, Pantego, Rains, State, Suffolk, and Tomotley soils formed in moderately fine-textured sediment. The Arapahoe, Autryville, Conetoe, Masontown, Muckalee, and Torhunta soils formed in moderately coarse-textured sediment, and the Kureb, Leon, Murville, Seabrook, and Tarboro soils formed in coarse-textured sediment. The Masontown, Meggett, and Muckalee soils formed in coarse- to fine-textured sediment that contains marl. The marl has a high content of calcium carbonate, and these soils have a high base saturation. The Croatan, Dare, Dorovan, Lafitte, and Ponzer soils formed in accumulations of organic material in wet areas.

Climate

Climate is a major determinant of the kinds of plants and animals living in and on the soil. Craven County has a warm, humid climate. Summers are long and hot, and winters are short and mild. Mild temperatures and abundant rainfall promote rapid decomposition of organic matter, hasten chemical reactions, speed leaching of soluble bases, and increase translocation of the less soluble fine particles in the soil profile *(17)*. Consequently, the soils are acid, strongly leached, and low in natural fertility, except for the soils in marshes and those that formed in sediment containing marl. The soils have a higher content of clay in the B horizon than in the A or C horizon, except for those soils that formed in sand and recent alluvium.

Plant and Animal Life

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

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

Time

The horizons in a soil profile take a long time to develop. Relief changes with time. Some of the differences in the soils in Craven County reflect a difference in age and changes in relief because of natural or geologic erosion. The older soils, such as Goldsboro, Lynchburg, and Rains soils, are on the upland divides. They have well developed horizons and a thick profile. By contrast, the younger soils, such as the Muckalee soils, have almost no horizon development, and the Altavista, State, and Suffolk soils have well developed horizons but only a thin profile.

Relief

The relief in Craven County is largely the result of the dissection of parts of the original, nearly level plains by the Trent and Neuse Rivers and their tributaries. The degree of dissection affects the soil's formation by influencing the depth of the water table and the geologic removal of soil material by slope retreat.

The soils near drainageways are moderately well drained to excessively drained. In these soils, the seasonal high water table is 2 feet to more than 6 feet below the surface. Where the soils are loamy or clayey, they have a light color A or Ap horizon and a bright color Bt horizon. Many of these soils have a thick E horizon. The Altavista, Autryville, Conetoe, Craven, Exum, Goldsboro, Norfolk, Onslow, State, and Suffolk soils have these characteristics. The sandy soils in these areas have a light color A or Ap horizon and bright color to white C horizon. The Kureb, Seabrook, and Tarboro soils have these characteristics.

The soils further from the drainageways and those in broad, nearly level interstream areas and depressions are somewhat poorly drained to very poorly drained. In these soils, the seasonal high water table is at or near the surface. If the soils are loamy or clayey, they have a dark color A or Ap horizon, a gray Bg or Btg horizon, and a gray Cg horizon. The Arapahoe, Bayboro, Deloss, Grantham, Leaf, Lenoir, Lynchburg, Meggett, Pantego, Rains, Roanoke, Tomotley, and Torhunta soils have these characteristics. Sandy soils in these areas, such as the Leon and Murville soils, have a dark color A horizon and a weakly cemented Bh horizon.

The largest interstream areas have an accumulation of organic matter in the most undissected part. Here, the rainfall exceeds both evapotranspiration and the slow flow of water overland to the distant drainageways. The organic Croatan, Dare, and Ponzer soils are in these areas.

The soils on flood plains and in marshes are at the lowest elevation in the county. These soils are mostly very poorly drained. They are flooded frequently and have a dark color A or O horizon and a gray Cg horizon. The Dorovan, Lafitte, Masontown, and Muckalee soils are in these areas.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(23)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

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

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

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

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

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

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (20)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (23)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Altavista Series

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

Typical pedon of Altavista fine sandy loam, 0 to 2 percent slopes; 3.8 miles northwest of Vanceboro on North Carolina Highway 118 to the intersection with State Road 1478, 0.3 mile north on State Road 1478, and 60 feet east of the road:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; slightly acid; abrupt smooth boundary.
E—7 to 10 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; clear wavy boundary.
BE—10 to 13 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.
Bt1—13 to 23 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium faint strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.
Bt2—23 to 33 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium distinct light brownish gray (2.5YR 6/2) mottles, common medium faint brownish yellow (10YR 6/6) mottles, and few medium faint yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; very strongly acid; clear wavy boundary.
Btg—33 to 40 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles and few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; clear wavy boundary.
BCg—40 to 46 inches; gray (10YR 6/1) sandy loam; many medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; very strongly acid; clear wavy boundary.
C—46 to 76 inches; brownish yellow (10YR 6/6) stratified loamy sand and sandy loam; common medium and coarse distinct light gray (10YR 7/2) mottles and few medium faint strong brown (7.5YR 5/8) mottles; massive; very friable; very strongly acid; gradual wavy boundary.
Cg—76 to 80 inches; light gray (10YR 7/1) coarse sand; common coarse faint yellow (10YR 7/6) mottles; single grained; loose; very strongly acid.

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

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

The E and BE horizons have hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4. They are fine sandy loam or sandy loam. Some pedons do not have an E or BE horizon.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8; or hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8. Mottles that have chroma of 2 or less are within the upper 24 inches of the Bt horizon. The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The Bt and Btg horizons are commonly sandy clay loam or clay loam but range from clay loam to sandy loam and fine sandy loam.

The BCg horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. It is sandy loam, sandy clay loam, or clay loam.

The C horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 3 to 6. The Cg horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. The C and Cg horizons are sandy or loamy sediment.

Arapahoe Series

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

Typical pedon of Arapahoe fine sandy loam; 1.4 miles south of Vanceboro on State Road 1440 to State Road 1443, 1 mile west on State Road 1443, and 100 feet west of road:

A—0 to 16 inches; black (N 2/0) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; clear wavy boundary.
Bg1—16 to 35 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.
Bg2—35 to 41 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium subangular blocky structure; very friable; medium acid; gradual wavy boundary.
Cg1—41 to 56 inches; gray (10YR 5/1) fine sandy loam; massive; very friable; medium acid; clear wavy boundary.
Cg2—56 to 80 inches; gray (10YR 5/1) loamy sand; massive; very friable; neutral.

Arapahoe soils have loamy A and B horizons 24 to 60 inches thick underlain by loamy or sandy sediment. The surface layer, subsoil, and upper part of the substratum range from extremely acid to strongly acid except where lime has been added. The lower part of the substratum ranges from medium acid to mildly alkaline.

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

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

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or hue of 5GY, 5G, or 5BG, value of 4 or 5, and chroma of 1. It is sandy or loamy sediment.

Augusta Series

The Augusta series consists of somewhat poorly drained soils that formed in moderately fine textured sediment. These soils are on stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Augusta fine sandy loam; 1.9 miles east of Bridgeton on North Carolina Highway 55, 0.3 mile northwest on State Road 1614, 0.6 mile north on State Road 1613, and 200 feet east of road:

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

E—7 to 13 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; few fine faint light brownish gray mottles; weak medium granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

BE—13 to 17 inches; yellowish brown (10YR 5/6) fine sandy loam; few medium distinct light brownish gray (10YR 6/2) mottles and few fine faint strong brown mottles; weak medium subangular blocky structure; very friable; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Btg1—17 to 28 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles and common medium faint light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; firm, slightly plastic and slightly sticky; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

Btg2—28 to 36 inches; light gray (10YR 7/2) sandy clay loam; many medium prominent strong brown (7.5YR 5/8) mottles and common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

BCg—36 to 45 inches; light gray (10YR 7/1) fine sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles and few fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; very strongly acid; clear wavy boundary.

Cg—45 to 80 inches; light gray (10YR 7/1) loamy sand; single grained; loose; very strongly acid.

Augusta soils have loamy A, E, and B horizons 40 to 60 inches thick underlain by sandy or loamy sediment. The soils range from very strongly acid to medium acid except where lime has been added.

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

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. It is fine sandy loam or sandy loam. Some pedons do not have an E horizon.

The Btg horizon begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of red, yellow, brown, and gray are common to many. Some pedons have a Bt horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. The Bt and Btg horizons are sandy clay loam or clay loam.

The BCg horizon is similar in color to the Btg horizon and is fine sandy loam, sandy loam, or sandy clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is sandy or loamy sediment.

Autryville Series

The Autryville series consists of well drained soils that formed in moderately coarse textured sediment. These soils are on uplands. Slope ranges from 0 to 6 percent.

Typical pedon of Autryville loamy sand, 0 to 6 percent slopes; 4 miles southwest of New Bern on State Road 1004 to State Road 1144, 0.3 mile west on State Road 1144, 300 feet north of road:

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

E—5 to 29 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium granular structure; very friable; few fine and medium roots; strongly acid; clear wavy boundary.

Bt—29 to 37 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

E'—37 to 42 inches; very pale brown (10YR 7/3) sand; single grained; loose; strongly acid; clear wavy boundary.

Bt'—42 to 61 inches; brownish yellow (10YR 6/6) sandy loam; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

BC—61 to 69 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; very strongly acid; clear wavy boundary.

C1—69 to 75 inches; yellow (10YR 7/6) sand; single grained; loose; very strongly acid; clear wavy boundary.

C2—75 to 80 inches; brownish yellow (10YR 6/6) loamy sand; weak medium granular structure; very friable; very strongly acid.

Autryville soils are bisequul. They have a sandy A horizon and sequences of sandy E horizons and loamy or sandy B horizons more than 60 inches thick. The soils are very strongly acid or strongly acid except where lime has been added.

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

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

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. It is sandy loam, fine sandy loam, or sandy clay loam.

The E' horizon has hue of 10YR, value of 6 to 8, and chroma of 2 to 8; or hue of 2.5Y, value of 6 or 7, and chroma of 4. It is sand, fine sand, loamy fine sand, or loamy sand.

The Bt' horizon is similar in color to the Bt horizon or has hue of 10YR or 2.5Y, value of 6, and chroma of 4; or it is mottled in shades of yellow, brown, red, or gray. This horizon is sandy loam, fine sandy loam, or sandy clay loam.

The BC horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 3 to 8. It is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

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

Bayboro Series

The Bayboro series consists of very poorly drained soils that formed in fine textured sediment on uplands. Slope is less than 1 percent.

Typical pedon of Bayboro mucky loam; 3.2 miles northeast of Vanceboro on State Road 1639, 1.1 miles south on a logging road, and 30 feet east of road:

A—0 to 13 inches; black (5YR 2/1) mucky loam; moderate fine and medium granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Eg—13 to 17 inches; grayish brown (2.5Y 5/2) loam; common medium and coarse distinct very dark grayish brown (10YR 3/2) mottles; weak medium subangular blocky structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Btg1—17 to 33 inches; grayish brown (10YR 5/2) clay loam; common medium and coarse prominent yellowish red (5YR 4/6) mottles and common medium faint very dark grayish brown (10YR 3/2) mottles on faces of peds and along root channels; moderate medium and coarse subangular blocky structure; firm, sticky and plastic; few fine and medium roots and pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—33 to 51 inches; gray (10YR 5/1) clay; common medium and coarse prominent yellowish red (5YR 4/6) mottles along root channels and on faces of peds; weak medium subangular blocky structure; firm, sticky and plastic; few medium roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—51 to 62 inches; gray (10YR 6/1) clay; common medium prominent yellowish red (5YR 4/6) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm, sticky and plastic; common pockets of clay loam and loam; few medium roots; very strongly acid; gradual wavy boundary.

Cg—62 to 72 inches; gray (N 6/0) clay loam; common medium distinct light yellowish brown (10YR 6/4) mottles and common medium prominent yellowish red (5YR 4/6) mottles; massive; firm, sticky and plastic; many pockets and lenses of loam; strongly acid.

Bayboro soils have loamy A and E horizons and a loamy and clayey B horizon 60 to 80 inches thick. The A and E horizons range from extremely acid to strongly acid except where lime has been added. The B and C horizons are very strongly acid or strongly acid.

The A or Ap horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 to 22 inches thick.

The Eg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is loam or fine sandy loam. Some pedons do not have an Eg horizon.

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

The BCg horizon is similar in color to the Btg horizon and is clay, sandy clay, clay loam, or sandy clay loam.

The Cg horizon has hue of 5GY or 5G, value of 5 or 6, and chroma of 1 in addition to the colors of the Btg horizon. It is sandy, loamy, or clayey sediment.

Bragg Series

The Bragg series consists of well drained, modified soil material. The soils are made up of material placed in piles during cutting and filling of coarse to fine textured soils. Slope ranges from 0 to 8 percent.

Typical pedon of Bragg soils, 0 to 8 percent slopes; from North Carolina Highway 101 at Gate 2 of Cherry Point Marine Corps Air Station, 0.5 mile northeast on road along east side of runway, and 100 feet west of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2), light gray (10YR 6/1), and yellow (10YR 7/8) sandy loam; massive; very friable; many bodies of sandy clay loam; very strongly acid; clear irregular boundary.
C1—8 to 34 inches; very dark gray (10YR 3/1), strong brown (7.5YR 5/8), light brownish gray (2.5Y 6/2), and light gray (10YR 6/1) sandy clay loam and sandy loam; massive; friable; extremely acid; abrupt irregular boundary.
C2—34 to 56 inches; dark gray (N 4/0) fine sandy loam and sandy clay loam; massive; friable; neutral; clear irregular boundary.
C3—56 to 66 inches; very dark grayish brown (10YR 3/2), light gray (10YR 6/1), and yellow (10YR 7/8) fine sandy loam; common bodies of sandy clay loam; massive; very friable; neutral.

The fill material ranges in thickness from 20 to 66 inches or more. The filled areas are underlain by sandy, loamy, or clayey soils. The soils range from extremely acid to strongly acid. If they contain lime or marl, the soils range from extremely acid to neutral.

The Ap horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 0 to 8. It is loamy sand, loamy fine sand, fine sandy loam, sandy loam, or sandy clay loam.

The C horizon has hue of 5YR, value of 4 to 6, and chroma of 6 or 8; hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; hue of 10YR, value of 3 to 7, and chroma of 1 to 8; or hue of 2.5Y, value of 5 to 7, and chroma of 2 to 8. The colors are generally contrasting from layer to layer because of the mixing of different color material. The C horizon is a mixture of sand, loamy sand, sandy loam, fine sandy loam, sandy clay loam, clay loam, or sandy clay. The 10- to 40-inch control section averages between 18 and 35 percent clay. Texture is variable below a depth of 40 inches.

Conetoe Series

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

Typical pedon of Conetoe loamy sand, 0 to 5 percent slopes; 4 miles northwest of Washington Forks on State Road 1401 to State Road 1421, 0.3 mile north on State Road 1421, and 20 feet west of road:

Ap—0 to 7 inches; brown (10YR 5/3) loamy sand; weak medium granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.
E—7 to 24 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.
Bt—24 to 35 inches; yellowish brown (10YR 5/8) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.
BC—35 to 40 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; very strongly acid; gradual wavy boundary.
C1—40 to 55 inches; pale yellow (2.5Y 7/4) loamy sand; massive; very friable; very strongly acid; gradual wavy boundary.
C2—55 to 80 inches; very pale brown (10YR 7/3) sand; single grained; loose; strongly acid.

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

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

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

The Bt horizon and BC horizon have hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; or hue of 10YR, value of 5 to 7, and chroma of 4 to 8. The Bt horizon is sandy loam or fine sandy loam, and the BC horizon is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

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

Craven Series

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

Typical pedon of Craven silt loam, 1 to 4 percent slopes; 4 miles northwest of Vanceboro on North Carolina Highway 43, 0.6 mile east on State Road 1644, and 30 feet west of road:

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; very friable; common fine and medium roots; slightly acid; clear smooth boundary.
E—7 to 9 inches; light yellowish brown (10YR 6/4) silt loam; weak medium subangular blocky structure; very friable; few fine and medium roots; very strongly acid; clear wavy boundary.
BE—9 to 12 inches; brownish yellow (10YR 6/6) silty clay loam; moderate fine and medium subangular blocky structure; firm, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine and medium roots; common fine and medium pores; very strongly acid; clear wavy boundary.

Bt1—12 to 22 inches; brownish yellow (10YR 6/6) silty clay; common fine distinct yellowish red (5YR 5/8) mottles; moderate fine angular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Bt2—22 to 36 inches; brownish yellow (10YR 6/6) silty clay; common fine and medium distinct gray (10YR 6/1) mottles and common fine distinct yellowish red (5YR 5/8) mottles; moderate fine and medium angular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; few fine pores; very strongly acid; gradual wavy boundary.

Bt3—36 to 46 inches; light yellowish brown (10YR 6/4) clay; many medium distinct gray (10YR 6/1) mottles, common medium distinct reddish yellow (7.5YR 6/8) mottles, and common fine distinct red (2.5YR 4/8) mottles; weak medium angular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—46 to 54 inches; gray (10YR 6/1) clay; common medium faint pale brown (10YR 6/3) mottles, common fine and medium distinct reddish yellow (7.5YR 6/8) mottles, and common fine prominent red (2.5YR 4/8) mottles; weak medium platy structure; very firm, sticky and plastic; very strongly acid; clear wavy boundary.

C1—54 to 70 inches; brownish yellow (10YR 6/6) fine sandy loam; common lenses and pockets of sandy clay loam; common fine faint reddish yellow mottles and few fine and medium distinct light gray (10YR 7/1) mottles; massive; very friable; very strongly acid; gradual wavy boundary.

C2—70 to 80 inches; brownish yellow (10YR 6/6) loamy sand; common fine and medium reddish yellow (7.5YR 6/8) mottles and few fine and medium distinct light gray (10YR 7/1) mottles; massive; very friable; very strongly acid.

Craven soils have loamy A and E horizons and a clayey and loamy B horizon 40 to 60 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. It is silt loam or loam. Some pedons do not have an E horizon.

The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. The lower part of the Bt horizon has base colors similar to those of the upper part and has few to many mottles of chroma of 2 or less. Some pedons have a Btg horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2, and mottles in shades of red, yellow, or brown. The Bt and Btg horizons are clay loam, silty clay loam, silty clay, or clay.

The BCg horizon commonly has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Some pedons have a BC horizon that has dominant chroma of 3 or more and has mottles in shades of red, gray, yellow, or brown. The BCg and BC horizons are silty clay loam, clay loam, silty clay, clay, sandy clay, or sandy clay loam.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6. It is sandy, loamy, or clayey sediment.

Croatan Series

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

Typical pedon of Croatan muck; in the Croatan National Forest, 4.7 miles southwest of Croatan on State Road 1100, 400 feet northwest on a forest trail, and 25 feet south of trail:

Oa1—0 to 13 inches; black (10YR 2/1) broken face and rubbed muck; 30 percent fiber, about 8 percent rubbed; moderate medium granular structure; very friable; many fine, medium, and coarse roots; extremely acid; clear smooth boundary.

Oa2—13 to 28 inches; black (10YR 2/1) broken face and rubbed muck; l5 percent fiber, about 5 percent rubbed; massive; very friable; common fine roots; 51 percent mineral; extremely acid; gradual smooth boundary.

2A—28 to 35 inches; very dark gray (10YR 3/1) mucky sandy loam; massive; very friable; extremely acid; clear wavy boundary.

2Cg1—35 to 42 inches; dark gray (10YR 4/1) sandy loam, common pockets of sandy clay loam; massive; extremely acid; gradual wavy boundary.

2Cg2—42 to 56 inches; gray (10YR 5/1) sandy clay loam, few pockets of sandy loam; massive; friable, slightly sticky and slightly plastic; common partly decayed roots; very strongly acid; gradual wavy boundary.

2Cg3—56 to 80 inches; dark gray (10YR 4/1) stratified layers of sandy loam and sandy clay loam; massive; friable; extremely acid.

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

The organic horizon has hue of 7.5YR to 5Y, value of 2 or 3, and chroma of 1 to 2; or it is neutral and has

value of 2 or 3. The Oa1 or Op horizon consists of a dense root mat and decaying organic material that has granular structure. The lower part of the organic horizon is massive and has fewer roots than the Oa1 or Op horizon.

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

Dare Series

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

A typical pedon of Dare muck; 1.6 miles east from New Bern on North Carolina Highway 55, 2.75 miles south on State Road 1600, and 500 feet west of road:

Oa1—0 to 8 inches; black (10YR 2/1) broken face and rubbed muck; about 40 percent fiber, less than 10 percent rubbed; moderate medium granular structure; very friable, slightly sticky; many fine and medium roots; few medium pieces of charcoal; extremely acid; clear smooth boundary.

Oa2—8 to 36 inches; black (10YR 2/1) broken face and rubbed muck; about 25 percent fiber, less than 2 percent rubbed; massive; very friable, slightly sticky, greasy and paste-like; few fine roots; common buried stumps, logs, and wood fragments; extremely acid; gradual smooth boundary.

Oa3—36 to 60 inches; dark reddish brown (5YR 2/2) broken face and rubbed muck; about 20 percent fiber, less than 1 percent rubbed; massive; slightly sticky; very greasy and paste-like; common buried stumps, logs, and wood fragments; extremely acid; clear wavy boundary.

2A—60 to 70 inches; black (10YR 2/1) mucky loamy sand; massive; very friable; extremely acid; gradual wavy boundary.

2Cg—70 to 80 inches; very dark grayish brown (10YR 3/2) sand; single grained; loose; extremely acid.

Dare soils have a highly decomposed organic horizon 51 to 108 inches thick. The soils are extremely acid throughout. Buried logs, stumps, and wood fragments make up as much as 25 percent of the soil volume.

The organic surface layer has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 5YR, value of 2, and chroma of 1; or it is neutral and has value of 2. This layer is a dense root mat and organic matter with granular structure.

The organic subsurface tier has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 5YR or 2.5YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2. At least 10 inches of the subsurface tier has hue of 5YR or 2.5YR. The organic material is paste-like and has a greasy feel when wet. If drained and aerated, the organic material forms blocky structure. When this material dries over a short period, it hardens and does not rewet.

The underlying mineral horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4; hue of 7.5YR or 5YR, value of 3 or 4, and chroma of 2 to 4; or hue of 5GY or 5G, value of 4 to 6, and chroma of 1. The mineral horizon is sandy sediment. Thin layers of loamy material are in some pedons.

Deloss Series

The Deloss series consists of very poorly drained soils that formed in moderately fine textured sediment. These soils are on stream terraces. Slope is less than 2 percent.

Typical pedon of Deloss fine sandy loam; 0.5 mile north from Bridgeton on U.S. Highway 17, 1.7 miles northeast on State Road 1615, 0.2 mile east on a path, and 30 feet north of path:

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; clear smooth boundary.

A—9 to 19 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

Btg—19 to 45 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles and few medium prominent red (2.5YR 5/8) mottles; weak medium subangular blocky structure; friable; slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

BCg—45 to 58 inches; light brownish gray (10YR 6/2) fine sandy loam; massive; very friable; strongly acid; clear wavy boundary.

Cg—58 to 80 inches; light gray (10YR 7/2) loamy sand; massive; very friable; strongly acid.

Deloss soils have loamy A and B horizons 40 to 60 inches thick underlain by sandy or loamy sediment. The A horizon ranges from extremely acid to strongly acid except where lime has been added. The B horizon ranges from very strongly acid to slightly acid.

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

Some pedons have an Eg horizon that has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The Btg horizon has hue of 10YR, value of 2 to 6, and chroma of 1 or 2; hue of 2.5Y, value of 4 to 6, and chroma of 2; or it is neutral and has value of 3 to 5. This horizon is sandy clay loam or clay loam.

The BCg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2; or it is neutral and has value of 4 to 6. The BCg horizon is fine sandy loam, sandy clay loam, or sandy loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 4 to 6, and chroma of 1; or it is neutral and has value of 4 to 7. The Cg horizon is sandy or loamy sediment.

Dorovan Series

The Dorovan series consists of very poorly drained soils that formed in thick beds of organic material. These soils are on flood plains. Slope is less than 1 percent.

Typical pedon of Dorovan muck, frequently flooded; 10 miles north of New Bern on State Road 1400 to State Road 1482, 1 mile north on State Road 1482, and 25 feet west of road:

Oa1—0 to 15 inches; very dark brown (10YR 2/2) broken face and rubbed muck; 40 percent fiber, about 15 percent rubbed; massive; very friable, nonsticky; many fine, medium, and coarse roots; strongly acid; diffuse smooth boundary.

Oa2—15 to 80 inches; black (10YR 2/1) broken face and rubbed muck; 30 percent fiber, about 5 percent rubbed; massive; very friable, nonsticky; many fine and medium roots; strongly acid.

Dorovan soils have an organic horizon 51 to 80 inches or more thick. The soils range from extremely acid to strongly acid.

The organic horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. Buried logs, stumps, and wood fragments are in the lower part of the organic horizon.

The Dorovan soil in Craven County is a taxadjunct to the Dorovan series because most pedons are somewhat less acid than allowed in the Dorovan series. This difference does not significantly affect the use, management, and behavior of this soil.

Exum Series

The Exum series consists of moderately well drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Exum silt loam, 0 to 2 percent slopes; 6.5 miles south of New Bern on State Road 1111, and 50 feet northeast of the intersection of State Road 1111 and State Road 1110:

A—0 to 6 inches; grayish brown (10YR 5/2) silt loam; weak fine and medium granular structure; very friable; many fine roots; strongly acid; abrupt wavy boundary.

E—6 to 11 inches; pale brown (10YR 6/3) silt loam; few fine faint brown mottles; weak medium granular structure; very friable; few medium roots; strongly acid; clear wavy boundary.

Bt1—11 to 19 inches; brown (10YR 5/3) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common fine pores; few faint clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt2—19 to 38 inches; yellowish brown (10YR 5/4) silt loam; common fine and medium distinct light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg—38 to 60 inches; light gray (10YR 7/1) silty clay loam; common fine distinct brownish yellow (10YR 6/8) mottles and common fine prominent red (2.5YR 4/8) mottles; moderate medium and coarse angular blocky structure; firm, slightly sticky and slightly plastic; few fine pores; common faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—60 to 80 inches; light gray (10YR 7/1) silty clay; common medium distinct reddish yellow (7.5YR 6/8) mottles and few fine prominent red (2.5YR 4/6) and dark gray (N 3/0) mottles; weak medium angular blocky structure; very firm, sticky and plastic; very strongly acid.

Exum soils have loamy A and E horizons and a loamy and clayey B horizon more than 60 inches thick. The soils are very strongly acid or strongly acid except where lime has been added.

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

The E horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 2 to 4. It is silt loam or loam. Some pedons do not have an E horizon.

The Bt horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 3 to 8. Mottles that have chroma of 1 or 2 are within 30 inches of the surface. The Bt horizon to a minimum depth of 40 inches is loam, clay loam, silt loam, or silty clay loam. Some pedons have a Btg horizon that has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow, brown, or red. The Btg horizon is loam, clay loam, silty clay loam, or silt loam. Below a depth of 40 inches, it can be silty clay or clay.

The BCg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is loam, sandy clay loam, clay loam, silty clay loam, silt loam, silty clay, or clay.

Some pedons have a C horizon that is similar in color to the BCg horizon and is loamy, silty, or clayey sediment.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Goldsboro loamy fine sand, 0 to 2 percent slopes; 3.5 miles north of Washington Forks on State Road 1401, 0.25 mile north of Bachelor Creek Bridge, and 75 feet east of road:

Ap—0 to 10 inches; grayish brown (10YR 5/2) loamy fine sand; weak medium granular structure; very friable; common fine roots; neutral; abrupt smooth boundary.

BE—10 to 13 inches; brownish yellow (10YR 6/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; slightly acid; clear smooth boundary.

Bt1—13 to 24 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear smooth boundary.

Bt2—24 to 39 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium faint reddish yellow (7.5YR 6/8) mottles and common fine and medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; very strongly acid; gradual wavy boundary.

Bt3—39 to 62 inches; light yellowish brown (10YR 6/4) sandy clay loam; many medium faint light brownish gray (10YR 6/2) mottles and common fine and medium distinct yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; very strongly acid; gradual wavy boundary.

BCg—62 to 72 inches; light brownish gray (2.5Y 6/2) sandy clay loam; many medium faint pale brown (10YR 6/3) mottles and few fine prominent red (2.5YR 5/6) mottles; weak medium subangular blocky structure; few pockets and lenses of clay loam; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg—72 to 80 inches; light brownish gray (2.5Y 6/2) clay loam; many medium faint pale brown (10YR 6/3) mottles and few fine prominent red (2.5YR 5/6) mottles; weak medium platy structure; friable, slightly sticky and slightly plastic; very strongly acid.

Goldsboro soils have a sandy A horizon and loamy B horizon 60 to 80 inches thick. The soils are very strongly acid or strongly acid except where lime has been added.

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

Some pedons have an E horizon that has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. This horizon is loamy fine sand or loamy sand.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. Mottles that have chroma of 1 or 2 are within 30 inches of the surface. Some pedons have a Btg horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2 and has mottles in shades of yellow, brown, or red. The Bt and Btg horizons are sandy clay loam.

The BCg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles are in shades of yellow, brown, or red. The BCg horizon is sandy loam, fine sandy loam, or sandy clay loam.

The Cg horizon is similar in color to the BCg horizon and is sandy, loamy, or clayey sediment.

Grantham Series

The Grantham series consists of poorly drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope is less than 2 percent.

Typical pedon of Grantham silt loam; 6.5 miles south of New Bern on State Road 1111, 0.75 mile west on State Road 1110, and 30 feet south of road:

A—0 to 5 inches; black (10YR 2/1) silt loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Eg—5 to 10 inches; light brownish gray (10YR 6/2) silt loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

Btg—10 to 60 inches; gray (10YR 6/1) silt loam; common fine and medium distinct yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

BCg—60 to 72 inches; gray (10YR 6/1) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg—72 to 80 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; massive; friable, slightly sticky and slightly plastic; very strongly acid.

Grantham soils have loamy A, E, and B horizons more than 60 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is silt loam or loam.

The Btg and BCg horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. They are silt loam, loam, silty clay loam, or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 4 to 6, and chroma of 1; or it is neutral and has value of 4 to 7. This horizon is loamy, silty, or clayey sediment.

Kureb Series

The Kureb series consists of excessively drained soils that formed in coarse textured sediment. These soils are on uplands and stream terraces. Slope ranges from 0 to 6 percent.

Typical pedon of Kureb sand, 0 to 6 percent slopes; 5.9 miles north of Bridgeton on U.S. Highway 17, 0.9 mile north on State Road 1434, 1.5 miles west on State Road 1435, 0.2 mile south on a trail, and 20 feet west of trail:

A—0 to 5 inches; gray (10YR 6/1) sand; single grained; loose; common fine, medium, and coarse roots; many white uncoated sand grains; very strongly acid; clear irregular boundary.

E—5 to 18 inches; light gray (10YR 7/1) uncoated sand; single grained; loose; slightly acid; abrupt irregular boundary.

C/Bh—18 to 35 inches; brownish yellow (10YR 6/6) sand; single grained; loose; common weakly cemented and brittle bands and nodules of dark brown (10YR 3/3) and dark reddish brown (5YR 3/2) sand; slightly acid; gradual irregular boundary.

C1—35 to 68 inches; very pale brown (10YR 7/4) sand; single grained; loose; slightly acid; clear wavy boundary.

C2—68 to 80 inches; light gray (10YR 7/2) sand; single grained; loose; slightly acid.

Kureb soils have sand horizons 80 inches or more thick. The soils range from very strongly acid to neutral.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1. It contains many light gray or white uncoated sand grains.

The E horizon is uncoated sand that has hue of 10YR, value of 7 or 8, and chroma of 1 or 2.

The C part of the C/Bh horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. The Bh part has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 8. In this horizon, the C part is loose sand and the Bh part is bands and nodules of weakly cemented and brittle sand. The underlying C1 and C2 horizons have hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 to 8. They are loose sand.

The Kureb soil in Crave County is a taxadjunct to the Kureb series because the content of weatherable minerals is greater than allowed in the Kureb series. This difference does not significantly affect the use, manangement, and behavior of this soil.

Lafitte Series

The Lafitte series consists of very poorly drained soils that formed in thick beds of organic material. These soils are in marshes. Slope is less than 1 percent.

Typical pedon of Lafitte muck, frequently flooded; at New Bern on the west side of the Trent River, 200 feet west of U.S. Highway 70 bridge:

Oa1—0 to 15 inches; black (10YR 2/1) broken face and rubbed muck; 50 percent fiber, about 10 percent rubbed; massive; very friable; many fine and medium roots; slightly acid; clear smooth boundary.

Oa2—15 to 38 inches; black (10YR 2/1) broken face and rubbed muck; 35 percent fiber, about 5 percent rubbed; massive; very fluid; slight sulfur odor; moderately alkaline; gradual smooth boundary.

Oa3—38 to 54 inches; very dark brown (10YR 2/2) broken face and rubbed muck; 40 percent fiber, about 5 percent rubbed; massive; very fluid; slight sulfur odor; moderately alkaline; abrupt wavy boundary.

2A—54 to 72 inches; very dark grayish brown (10YR 3/2) sandy loam; massive; very friable; moderately alkaline.

Lafitte soils have organic horizons 51 to 80 inches thick. The soils range from slightly acid to moderately alkaline. Salt concentration generally ranges from 5 to 10 parts per thousand.

The organic horizon has hue of 10YR, value of 2, and chroma of 1 or 2; or hue of 7.5YR, value of 3, and chroma of 2. The Oe or Oa1 horizon consists of a dense root mat and decaying organic matter. The lower part of the organic horizon has fewer roots and is continuously saturated.

The 2A horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2. It is loam, sandy loam, or loamy sand. Some pedons do not have a 2A horizon.

The 2Cg horizon has hue of 5Y to 5GY, value of 4 or 5, and chroma of 1. It is sandy, loamy, or clayey sediment.

Leaf Series

The Leaf series consists of poorly drained soils that formed in fine textured sediment. These soils are on uplands. Slope is less than 2 percent.

Typical pedon of Leaf silt loam; 1.5 miles north of Vanceboro on U.S. Highway 17 to State Road 1641, 0.3

mile north on U.S. Highway 17, and 100 feet east of highway:

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.
Btg1—8 to 36 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg2—36 to 55 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; moderate fine angular and subangular blocky structure; very firm, sticky and plastic; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
BCg—55 to 72 inches; gray (10YR 5/1) silty clay loam; few fine prominent yellowish red (5YR 4/6) mottles; massive; very firm, sticky and plastic; very strongly acid; abrupt wavy boundary.
Cg—72 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse faint dark grayish brown (10YR 4/2) mottles; massive; very friable; very strongly acid.

Leaf soils have a loamy A horizon and clayey and loamy B horizon 60 to 80 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

Some pedons have an Eg horizon that has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2; or it is neutral and has value of 5 or 6. The Eg horizon is silt loam or loam.

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

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

The Cg horizon has hue of 5Y, 5GY, or 5G, value of 4 to 6, and chroma of 1, in addition to the colors of the Btg horizon. It is sandy, loamy, or clayey sediment.

Lenoir Series

The Lenoir series consists of somewhat poorly drained soils that formed in fine textured sediment. These soils are on uplands. Slope ranges from 0 to 2 percent

Typical pedon of Lenoir silt loam; 3 miles north of Vanceboro on North Carolina Highway 43, 0.3 mile north of the intersection with State Road 1644, and 50 feet southwest of North Carolina Highway 43:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.
E—5 to 8 inches; light yellowish brown (10YR 6/4) silt loam; common medium faint brownish yellow (10YR 6/8) mottles and few fine faint light gray mottles; moderate medium granular structure; very friable; common fine and medium roots; very strongly acid; gradual wavy boundary.
BE—8 to 12 inches; brownish yellow (10YR 6/6) silt loam; common medium faint very pale brown (10YR 7/3) mottles, common medium distinct strong brown (7.5YR 5/6) mottles, and few fine faint light gray mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.
Bt—12 to 18 inches; brownish yellow (10YR 6/6) clay; common medium faint very pale brown (10YR 7/3) mottles, common fine and medium distinct light gray (10YR 7/2) mottles, and few fine distinct red (2.5YR 4/8) mottles; moderate coarse prismatic primary structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg—18 to 45 inches; gray (10YR 6/1) clay; common medium distinct brownish yellow (10YR 6/8) mottles, common medium faint grayish brown (10YR 5/2) mottles, and few fine prominent yellowish red (5YR 5/8) mottles; moderate coarse prismatic primary structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots and pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.
BCg—45 to 72 inches; gray (10YR 6/1) clay; common medium distinct brownish yellow (10YR 6/8) mottles and common medium faint grayish brown (10YR 5/2) mottles; weak fine and medium angular blocky structure grading to weak medium platy in the lower part; very firm, sticky and plastic; very strongly acid; clear wavy boundary.
Cg—72 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse distinct light yellowish brown (10YR 6/4) mottles; massive; very friable; very strongly acid.

Lenoir soils have loamy A and E horizons and a clayey and loamy B horizon 60 to 80 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

The E and BE horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. They are silt loam or loam. Some pedons do not have an E or BE horizon.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Some pedons do not have a Bt horizon. The Btg hrozion begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of red, yellow, brown, or gray are common to many. The Bt and Btg horizons are clay, clay loam, silty clay loam, or silty clay.

The BCg horizon is similar in color to the Btg horizon and is clay, sandy clay, clay loam, or sandy clay loam.

The Cg horizon, in addition to the colors of the Btg horizon, has hue of 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

Leon Series

The Leon series consists of poorly drained soils that formed in coarse textured sediment. These soils are on uplands and stream terraces. Slope ranges from 0 to 5 percent.

Typical pedon of Leon sand; 1.2 miles north of Bridgeton on North Carolina Highway 55 to State Road 1600, 1,000 feet southeast on State Road 1600, and 200 feet southwest of road:

A—0 to 7 inches; black (10YR 2/1) sand; many uncoated white (10YR 8/1) sand grains; weak fine and medium granular structure; very friable; common fine and medium roots; extremely acid; clear wavy boundary.

E—7 to 21 inches; light brownish gray (10YR 6/2) uncoated sand; single grained; loose; few fine and medium roots; very strongly acid; abrupt wavy boundary.

Bh1—21 to 31 inches; black (10YR 2/1) sand; massive; weakly cemented, brittle; thick organic coatings on sand grains; few fine and medium roots and pores; very strongly acid; gradual wavy boundary.

Bh2—31 to 49 inches; very dark brown (10YR 2/2) sand; massive; very weakly cemented, slightly brittle; thin organic coatings on sand grains; few uncoated sand grains; few fine and medium roots and pores; strongly acid; clear wavy boundary.

C—49 to 72 inches; pale brown (10YR 6/3) sand; single grained; loose; strongly acid.

Leon soils have sand horizons 72 inches or more thick. The soils range from extremely acid to strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2 to 4. This horizon is less than 8 inches thick. Many uncoated sand grains mixed with sand grains coated with organic matter cause a salt and pepper appearance.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2; or it is neutral and has value of 5 to 8.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. This horizon is sand or fine sand but may have a loamy feel and appearance because of the organic matter content. It is weakly cemented and brittle. Some pedons have several sequences of A2 and Bh horizons.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 to 3. It is sand or fine sand.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope is 0 to 2 percent.

Typical pedon of Lynchburg fine sandy loam; 2 miles southwest of Cayton on State Road 1002 and 300 feet south of road:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

E—9 to 14 inches; pale brown (10YR 6/3) fine sandy loam; common medium distinct very dark grayish brown (10YR 3/2) mottles and few medium distinct yellowish brown (10YR 5/6) mottles; weak medium granular structure; very friable; common fine roots; medium acid; clear smooth boundary.

Bt—14 to 19 inches; pale brown (10YR 6/3) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles and common fine faint light brownish gray mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

Btg—19 to 65 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/6) mottles and common fine and medium distinct yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

BCg—65 to 74 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles and few fine distinct yellowish red (5YR 5/8) mottles; massive; very friable; very strongly acid; gradual wavy boundary.

Cg—74 to 80 inches; light brownish gray (10YR 6/2) loamy fine sand; common medium faint very pale brown (10YR 7/3) mottles; massive; very friable; very strongly acid.

Lynchburg soils have loamy A, E, and B horizons 60 to 80 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

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

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6. Some pedons do not have a Bt horizon. The Btg horizon begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2, and common to many mottles in shades of yellow, brown, red, or gray. The Bt and Btg horizons are sandy clay loam or clay loam.

The BCg horizon is similar in color to the Btg horizon and is sandy clay loam, sandy loam, sandy clay, clay loam, or fine sandy loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

Masontown Series

The Masontown series consists of very poorly drained soils that formed in moderately coarse textured alluvium. These soils are on flood plains. Slope is less than 2 percent.

Typical pedon of Masontown mucky fine sandy loam, in an area of Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded; 1 mile east of Fort Barnwell on North Carolina Highway 55 to State Road 1259, 1.5 miles south on State Road 1259 to bridge, and 100 feet east of road on north side of creek:

A1—0 to 20 inches; black (10YR 2/1) mucky fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; medium acid; gradual wavy boundary.

A2—20 to 60 inches; black (10YR 2/1) fine sandy loam; massive; very friable; common fine roots; slightly acid; abrupt wavy boundary.

Cg—60 to 80 inches; light brownish gray (10YR 6/2) sand; single grained; loose; neutral.

Masontown soils have a dark color, loamy A horizon more than 24 inches thick underlain by sandy or loamy alluvium. The soils range from medium acid to mildly alkaline throughout.

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

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 2; or it is neutral and has value of 4 to 7. This horizon is sandy loam, fine sandy loam, silt loam, loam, loamy sand, or sand. Thin strata of finer texture are in some pedons, but the soil between depths of 10 and 40 inches averages 10 to 18 percent clay.

Meggett Series

The Meggett series consists of poorly drained soils that formed in fine textured sediment. These soils are on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Meggett sandy loam; 1.3 miles north of Dover on State Road 1262, 50 feet west of the road, and 75 feet north of a canal:

Ap—0 to 8 inches; very dark brown (10YR 2/2) sandy loam; moderate medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

Eg—8 to 14 inches; light brownish gray (10YR 6/2) sandy loam; weak medium granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

Btg—14 to 36 inches; dark gray (10YR 4/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles and common medium faint gray (10YR 5/1) mottles; weak medium and coarse subangular blocky structure; very firm, sticky and plastic; few fine roots; common fine pores; many distinct clay films on faces of peds; neutral; clear smooth boundary.

BCg—36 to 48 inches; gray (10YR 6/1) sandy clay; common medium distinct dark gray (10YR 4/1) mottles; massive; firm, sticky and plastic; few fine pores; mildly alkaline; abrupt smooth boundary.

Cg—48 to 80 inches; greenish gray (5GY 5/1) sandy clay; common coarse distinct very dark gray (5Y 3/1) clay filling old root holes; massive; firm, sticky and plastic; common medium and coarse decayed old roots; common medium and coarse shell fragments; moderately alkaline; gradual smooth boundary.

Meggett soils have loamy A and E horizons and a clayey and loamy B horizon 40 to 60 inches thick. The soils range from very strongly acid to slightly acid in the A and E horizons except where lime has been added. The B horizon ranges from slightly acid to moderately alkaline.

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

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is sandy loam. Some pedons do not have an E horizon.

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

The BCg horizon has hue of 5GY or 5G, value of 4 to 6, and chroma of 1 and has colors similar to those of the Btg horizon. The BCg horizon is sandy clay or sandy clay loam.

The Cg horizon has hue of 5GY or 5G, value of 4 to 6, and chroma of 1. It is sandy, loamy, or clayey sediment. Some pedons have a few to many shell fragments.

Muckalee Series

The Muckalee series consists of poorly drained soils that formed in moderately coarse textured alluvium. These soils are on flood plains. Slope is less than 2 percent.

Typical pedon of Muckalee sandy loam, in an area of Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded; 3 miles north of Vanceboro on North Carolina Highway 43, 0.35 mile north of the intersection of State Road 1646 and North Carolina Highway 43, and 300 feet east of a bridge:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear wavy boundary.

Cg1—5 to 22 inches; dark gray (10YR 4/1) sandy loam; few fine distinct dark reddish brown organic stains; massive; very friable; few fine roots; neutral; gradual wavy boundary.

Cg2—22 to 46 inches; gray (10YR 6/1) loamy sand; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint pale brown (10YR 6/3) mottles; thin lenses and small pockets of dark gray (N 4/0) sandy clay loam; massive; very friable; neutral; gradual wavy boundary.

Cg3—46 to 80 inches; gray (5Y 6/1) loamy sand; common medium distinct brown (10YR 5/3) streaks; massive; very friable; neutral.

Muckalee soils have a loamy A horizon underlain by a loamy or sandy C horizon. The soils range from strongly acid to slightly acid in the A horizon and from medium acid to neutral in the Cg horizon.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. It is less than 7 inches thick. A buried A horizon occurs 3 to 5 feet below the surface in many pedons.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, and has few to many mottles in shades of gray, brown, or yellow. This horizon is sandy loam or loamy sand that has thin strata of sandy clay loam, clay loam, or sand. The weighted average clay content between depths of 10 and 40 inches is 10 to 18 percent.

Murville Series

The Murville series consists of very poorly drained soils that formed in coarse textured sediment. These soils are on uplands and stream terraces. Slope is less than 1 percent.

Typical pedon of Murville mucky loamy sand; on North Carolina Highway 55, 0.4 mile northeast of the Neuse River Bridge at Bridgeton, 50 feet southeast of the highway.

A—0 to 10 inches; black (N 2/0) mucky loamy sand; weak fine granular structure; very friable; common clean sand grains; loamy feel and appearance from organic matter; many fine and medium roots; extremely acid; clear wavy boundary.

Bh—10 to 36 inches; dark reddish brown (5YR 2/2) sand; massive; weakly cemented, brittle; thick organic coating on sand grains; few uncoated grains; few fine roots; common fine pores; extremely acid; gradual wavy boundary.

C—36 to 80 inches; dark brown (7.5YR 3/2) sand; single grained; very friable; extremely acid.

Murville soils have sandy A and B horizons 30 to more than 50 inches thick underlain by a sandy or loamy C horizon. The soils have a loamy feel and appearance because of the high organic matter content. They range from extremely acid to strongly acid.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 inches or more thick. Some pedons have an intermittent E horizon several inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is sand, fine sand, loamy sand, or loamy fine sand. It is weakly to strongly cemented and brittle.

The C horizon has hue of 5YR to 10YR, value of 3 to 7, and chroma of 1 to 4. It typically is sandy sediment, but in some pedons, the sediment is loamy.

Norfolk Series

The Norfolk series consists of well drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope ranges from 0 to 6 percent.

Typical pedon of Norfolk loamy fine sand, 2 to 6 percent slopes; 6 miles northwest of New Bern on State Road 1401, 0.25 mile west of the junction of State Road 1401 and State Road 1400 on State Road 1401, 100 feet south of road:

Ap—0 to 7 inches; brown (10YR 5/3) loamy fine sand; weak fine and medium granular structure; very friable; common fine roots; neutral; clear smooth boundary.

E—7 to 14 inches; very pale brown (10YR 7/4) loamy fine sand; weak medium granular structure; very friable; few fine roots; neutral; clear smooth boundary.

Bt1—14 to 25 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.
Bt2—25 to 44 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; very strongly acid; gradual wavy boundary.
Bt3—44 to 56 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium faint pale brown (10YR 6/3) mottles and few fine distinct red (2.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; very strongly acid; gradual wavy boundary.
BC—56 to 80 inches; very pale brown (10YR 7/4) sandy clay loam; common medium faint light gray (10YR 7/2) mottles and common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid.

Norfolk soil has sandy A and E horizons and a loamy B horizon 60 to 80 inches or more thick. The soils are very strongly acid or strongly acid except where lime has been added.

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

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

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The BC horizon is similar in color to the Bt horizon, and it has mottles in shades of yellow, gray, brown, or red. The BC horizon is sandy loam, fine sandy loam, sandy clay loam, or clay loam.

The C horizon is commonly mottled in shades of red, gray, brown, or yellow. It is sandy, loamy, or clayey sediment.

Onslow Series

The Onslow series consists of moderately well drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope ranges from 0 to 3 percent.

Typical pedon of Onslow loamy sand; 4.6 miles east of Havelock on North Carolina Highway 101 to Ferry Road, 3 miles north to U.S. Forest Service Road 132, 1.1 miles east to U.S. Forest Service Road 143, 1.8 miles south on U.S. Forest Service Road 143, and 25 feet west of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.
E/Bh—8 to 13 inches; brownish yellow (10YR 6/6) loamy sand (E part); common medium faint pale brown (10YR 6/3) mottles; weak medium granular structure; very friable; few fine roots; common weakly cemented and brittle very dark grayish brown (10YR 3/2) nodules 0.25 to 0.75 inch in diameter (Bh part); medium acid; clear wavy boundary.
Bt1—13 to 24 inches; light yellowish brown (10YR 6/4) sandy clay loam; common fine and medium faint yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.
Bt2—27 to 45 inches; pale brown (10YR 6/3) sandy clay loam; many medium faint light brownish gray (10YR 6/2) mottles and common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; very strongly acid; gradual wavy boundary.
BCg—45 to 65 inches; mottled light gray (10YR 7/2), light yellowish brown (10YR 6/4), and yellowish brown (10YR 5/8) sandy loam; common lenses and pockets of sandy clay loam; weak medium subangular blocky structure; very friable; very strongly acid; clear wavy boundary.
Cg—65 to 80 inches; light brownish gray (10YR 6/2) sand; single grained; loose; strongly acid.

Onslow soils have sandy A and E/Bh horizons and a loamy B horizon 60 to 72 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

The E part of the E/BH horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6. The Bh part of the E/Bh horizon makes up about 15 to 35 percent of the horizon and consists of weakly to strongly cemented brittle nodules. It has hue of 10YR to 5YR, value of 3 to 5, and chroma of 2 to 8.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. Mottles that have chroma of 2 or less are at a depth of 18 to 30 inches. Some pedons have a Btg horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The Bt and Btg horizons are sandy clay loam, clay loam, sandy loam, or fine sandy loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy, loamy, or clayey sediment.

The Onslow soil in Craven County is a taxadjunct to the Onslow series because in most pedons, the clay

content at a depth of 40 to 60 inches decreases more than 20 percent from its maximum, and skeletans are not present. These differences do not significantly affect the use, management, and behavior of this soil.

Pantego Series

The Pantego series consists of very poorly drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope is less than 2 percent.

Typical pedon of Pantego fine sandy loam; 1.25 miles west on U.S. Highway 70 from the intersection of State Road 1256 and U.S. Highway 70 in Cove City, 750 feet north of road:

A—0 to 15 inches; black (10YR 2/1) fine sandy loam; very friable; weak medium granular structure; many fine roots; medium acid; clear smooth boundary.

Btg—15 to 48 inches; dark gray (10YR 4/1) sandy clay loam; common medium faint very dark gray (10YR 3/1) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

BCg—48 to 62 inches; gray (10YR 5/1) sandy clay; common medium prominent yellowish red (5YR 5/8) mottles, common medium distinct strong brown (7.5YR 5/8) mottles, and common medium faint very dark gray (10YR 3/1) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.

Cg—62 to 80 inches; gray (10YR 5/1) sandy clay; few fine distinct strong brown (7.5YR 5/8) mottles; massive; firm, sticky and plastic; common pockets of sandy clay loam; very strongly acid.

Pantego soils have a loamy A horizon and loamy and clayey B horizon 60 to 80 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

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

The Btg and BCg horizons have hue of 10YR to 5Y, value of 3 to 7, and chroma of 1 or 2; or they are neutral and have value of 3 to 7. These horizons are sandy clay loam, clay loam, or sandy clay. The upper 20 inches of the Btg horizon contains 18 to 35 percent clay and less than 30 percent silt.

The BCg horizon is similar in color to the Btg horizon and is sandy clay loam, sandy clay, clay loam, fine sandy loam, or sandy loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 4 to 7, and chroma of 1; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

Ponzer Series

The Ponzer series consists of very poorly drained soils that formed in moderately thick beds of organic material underlain by moderately coarse to moderately fine textured sediment. These soils are on stream terraces. Slope is less than 1 percent.

Typical pedon of Ponzer muck; 2.2 miles west from Vanceboro on North Carolina Highway 118, 1 mile south on State Road 1444, 1.3 miles west on State Road 1448, and 30 feet south of road:

Oe—0 to 5 inches; very dark brown (10YR 2/2) broken face and rubbed muck; 80 percent fiber, about 30 percent rubbed; moderate medium granular structure; very friable; many fine and medium roots; extremely acid; clear wavy boundary.

Oa1—5 to 30 inches; black (10YR 2/1) broken face and rubbed muck; 50 percent fiber, about 5 percent rubbed; massive; very friable; common fine roots; about 20 percent mineral grains; extremely acid; diffuse wavy boundary.

Oa2—30 to 40 inches; black (10YR 2/1) broken face and rubbed muck; 40 percent fiber, about 1 percent rubbed; massive; very friable; few fine roots; about 60 percent mineral grains; extremely acid; clear wavy boundary.

2A—40 to 48 inches; black (10YR 2/1) mucky fine sandy loam; massive; very friable; extremely acid; clear wavy boundary.

2Cg1—48 to 54 inches; very dark grayish brown (10YR 3/2) sandy loam; massive; very friable; extremely acid; clear wavy boundary.

2Cg2—54 to 80 inches; brown (10YR 4/3) loamy sand; single grained; loose; very strongly acid.

Ponzer soils have a highly decomposed organic horizon 16 to 51 inches thick. The organic material is extremely acid except where lime has been added. Buried logs, stumps, and wood fragments make up as much as 10 percent of the organic material. The underlying mineral horizon ranges from extremely acid to mildly alkaline.

The organic horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The Oa1 and Oe horizons consist of a dense root mat and decaying organic matter that has granular structure. The lower part of the organic horizon has fewer roots and is massive.

The underlying mineral horizon has hue of 10YR to 5Y, value of 2 to 6, and chroma of 1 to 3. The lower part of this horizon can have hue of 5GY or 5G, value of 4 to 6, and chroma of 1. The mineral horizon is loamy in at least the upper 12 inches and is sandy, loamy, or clayey sediment below that.

Rains Series

The Rains series consists of poorly drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope is less than 2 percent.

Typical pedon of Rains fine sandy loam; 8 miles west of New Bern on North Carolina Highway 55 to State Road 1425, 2 miles northeast on State Road 1425, and 20 feet east of road:

A—0 to 7 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; abrupt wavy boundary.

Eg—7 to 12 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

BEg—12 to 16 inches; gray (10YR 6/1) fine sandy loam; common fine and medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

Btg—16 to 41 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; very strongly acid; gradual wavy boundary.

BCg—41 to 66 inches; gray (10YR 6/1) sandy clay loam; many medium distinct brownish yellow (10YR 6/8) mottles and few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure becoming weaker with depth; friable, slightly sticky and slightly plastic; common pockets and lenses of loamy sand; very strongly acid; gradual wavy boundary.

Cg—66 to 80 inches; gray (10YR 6/1) sandy clay loam; few fine prominent yellowish red (5YR 5/8) mottles and few fine distinct brownish yellow (10YR 6/6) mottles; massive; friable; very strongly acid.

Rains soils have loamy A, E, and B horizons 60 to 80 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. This horizon is less than 10 inches thick.

The Eg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is fine sandy loam or sandy loam. Some pedons do not have an Eg horizon.

The Btg and BCg horizons have hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or they are neutral and have value of 4 to 7. The Btg horizon is sandy clay loam or clay loam. In some pedons, the lower part of the Btg horizon is sandy clay. The BCg horizon is sandy loam, sandy clay loam, or sandy clay.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

Roanoke Series

The Roanoke series consists of poorly drained soils that formed in fine textured sediment. These soils are on stream terraces. Slope is less than 2 percent.

Typical pedon of Roanoke fine sandy loam; 8.7 miles west of Vanceboro on North Carolina Highway 118, 0.6 mile northeast on State Road 1462, and 30 feet southeast of road:

Ap—0 to 8 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

Eg—8 to 11 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; abrupt wavy boundary.

BEg—11 to 15 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Btg—15 to 41 inches; gray (10YR 6/1) clay; common fine and medium prominent strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; abrupt wavy boundary.

Cg1—41 to 47 inches; light brownish gray (10YR 6/2) fine sandy loam; few medium distinct brownish yellow (10YR 6/6) mottles; massive; very friable; strongly acid; clear wavy boundary.

Cg2—47 to 80 inches; light brownish gray (2.5Y 6/2) loamy sand; single grained; loose; strongly acid.

Roanoke soils have a loamy A horizon and loamy and clayey B horizon 40 to 60 inches thick. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. This horizon is less than 10 inches thick.

The Eg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is fine sandy loam or loam. Some pedons do not have an Eg horizon.

The Btg and BEg horizons have hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or they are neutral and have value of 5 to 7. The Btg and BEg horizons are clay, silty clay, or clay loam.

Some pedons have a BCg horizon that has colors similar to those of the Btg horizon. The BCg horizon is sandy clay loam, clay loam, or clay.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; hue of 5GY, value of 5 or 6, and chroma of 1; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

Seabrook Series

The Seabrook series consists of moderately well drained soils that formed in coarse textured sediment. These soils are on stream terraces. Slope is 0 to 2 percent.

Typical pedon of Seabrook loamy sand; 1.8 miles north of Askin on U.S. Highway 17, 2.1 miles southwest on trail, 20 feet south of trail, and 40 feet south of railroad:

A—0 to 6 inches; dark brown (10YR 4/3) loamy sand; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

C1—6 to 32 inches; light yellowish brown (10YR 6/4) loamy sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

C2—32 to 58 inches; very pale brown (10YR 7/3) sand; common medium faint light gray (2.5Y 7/2) mottles; single grained; loose; medium acid; gradual wavy boundary.

Cg—58 to 80 inches; light gray (2.5Y 7/2) sand; common medium faint very pale brown (10YR 7/3) mottles; single grained; loose; slightly acid.

Seabrook soils have sandy horizons 80 inches or more thick. The soils range from very strongly acid to slightly acid except where lime has been added. Few to common small concretions are in some pedons.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 8. The Cg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Mottles or base colors that have chroma of 2 or less occur within 40 inches of the surface. The C and Cg horizons are sand, loamy sand, loamy fine sand, or fine sand.

State Series

The State series consists of well drained soils that formed in moderately fine textured sediment. These soils are on stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of State loamy sand, 0 to 2 percent slopes; 6 miles north of North Harlowe on State Road 1700 to a private road 0.1 mile east of Long Creek, 0.3 mile north on the private road, and 30 feet east of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; common fine and medium roots; slightly acid; abrupt wavy boundary.

E—8 to 13 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; common fine and medium roots; slightly acid; clear wavy boundary.

Bt—13 to 38 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common fine pores; very strongly acid; gradual wavy boundary.

BC—38 to 43 inches; yellowish brown (10YR 5/6) sandy loam; weak medium granular structure; very friable; very strongly acid; gradual wavy boundary.

C1—43 to 53 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; medium acid; gradual wavy boundary.

C2—53 to 70 inches; brownish yellow (10YR 6/8) sand; common thin lenses of strong brown (7.5YR 5/6) loamy sand and very pale brown (10YR 7/4) sand; single grained; medium acid.

State soils have sandy A and E horizons and loamy B horizon 35 to 60 inches thick underlain by sandy or loamy sediment. The soils are very strongly acid or strongly acid in the A, E, and the upper part of the B horizon except where lime has been added. The lower part of the B horizon and the C horizon range from very strongly acid to medium acid.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 3 to 8. It is loamy sand or loamy fine sand. Some pedons do not have an E horizon.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. It is sandy clay loam.

The BC horizon has colors similar to the Bt horizon, or it is mottled in shades of red, yellow, or brown. The BC horizon is sandy loam or fine sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. It is sandy or loamy sediment.

Suffolk Series

The Suffolk series consists of well drained soils that formed in moderately fine textured sediment. These soils are on uplands. Slope ranges from 10 to 30 percent.

Typical pedon of Suffolk loamy sand, 10 to 30 percent slopes; 5 miles north of main gate of Cherry Point Marine Corps Air Station, 0.1 mile beyond base swimming pool, and 150 feet south of road:

A—0 to 4 inches; gray (10YR 5/1) loamy sand; weak fine and medium granular structure; very friable;

common fine, medium, and coarse roots; very strongly acid; clear wavy boundary.
E—4 to 14 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; abrupt wavy boundary.
Bt—14 to 30 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.
BC—30 to 38 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.
C1—38 to 70 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; few small pockets of uncoated sand; occasional lenses or pockets of sandy loam increasing in abundance with depth; very strongly acid; gradual wavy boundary.
C2—70 to 80 inches; strong brown (7.5YR 5/6) sandy loam; massive; very friable; very strongly acid.

Suffolk soils have sandy A and E horizons and a loamy B horizon 30 to 48 inches thick underlain by sandy or loamy sediment. The soils are very strongly acid or strongly acid in the A, E, and B horizons except where lime has been added. The C horizon ranges from very strongly acid to medium acid.

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

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

The Bt and BC horizons have hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Bt horizon is sandy clay loam or clay loam, and the BC horizon is sandy loam or fine sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 8; or it is mottled in shades of red, yellow, brown, or gray. This horizon is sandy or loamy sediment.

Tarboro Series

The Tarboro series consists of somewhat excessively drained soils that formed in coarse textured sediment. These soils are on stream terraces. Slope ranges from 0 to 6 percent.

Typical pedon of Tarboro sand, 0 to 6 percent slopes; 10 miles north of New Bern on State Road 1400 to State Road 1482, 0.1 mile north on State Road 1482, and 50 feet east of road:

A—0 to 5 inches; dark grayish brown (10YR 4/2) sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.
C1—5 to 30 inches; brownish yellow (10YR 6/6) sand; single grained; loose; medium acid; diffuse wavy boundary.
C2—30 to 80 inches; yellow (10YR 7/6) sand; single grained; loose; slightly acid.

Tarboro soils have sandy horizons 80 inches or more thick. The soil ranges from strongly acid to slightly acid except where lime has been added.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8; or hue of 7.5YR, value of 5 to 7, and chroma of 6 or 8. Colors generally are paler with increasing depth. The C horizon is sand or loamy sand.

Tomotley Series

The Tomotley series consists of poorly drained soils that formed in moderately fine textured sediment. These soils are on stream terraces. Slope is less than 2 percent.

Typical pedon of Tomotley fine sandy loam; 3.8 miles north of North Harlowe on State Road 1700 and 25 feet east of the road:

A—0 to 8 inches; biack (10YR 2/1) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.
Eg—8 to 11 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.
Btg—11 to 33 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.
BCg—33 to 41 inches; light gray (10YR 7/2) fine sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.
Cg1—41 to 47 inches; light gray (10YR 7/2) loamy sand; common medium distinct brownish yellow (10YR 6/6) mottles; massive; very friable; very strongly acid; clear wavy boundary.
Cg2—47 to 80 inches; light gray (10YR 7/1) sand; single grained; loose; medium acid.

Tomotley soils have loamy A, E, and B horizons 40 to 60 inches thick underlain by sandy or loamy sediment. The soils range from extremely acid to strongly acid in the A, E, and B horizons except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. This horizon is less than 10 inches thick.

The Eg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The Btg and BCg horizons have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or they are neutral and have value of 4 to 7. The Btg horizon is sandy clay loam or clay loam, and the BC horizon is sandy clay loam or fine sandy loam.

The Cg horizon has the same colors as those of the Btg horizon and in addition can have hue of 5GY, value of 6, and chroma of 1. The Cg horizon is sandy, loamy, or clayey sediment.

Torhunta Series

The Torhunta series consists of very poorly drained soils that formed in moderately coarse textured sediment. These soils are on uplands. Slope is less than 2 percent.

Typical pedon of Torhunta fine sandy loam; at Dover, 0.2 mile east of the intersection of State Road 1270 and State Road 1005, 125 feet south of State Road 1005:

A—0 to 12 inches; black (N 2/0) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Bg—12 to 37 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium subangular blocky structure; very friable; common fine roots; very strongly acid; gradual wavy boundary.

Cg—37 to 80 inches; grayish brown (10YR 5/2) loamy sand; massive; very friable; few fine roots; very strongly acid.

Torhunta soils have loamy A and B horizons 20 to 50 inches thick underlain by sandy or loamy sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 to 24 inches thick.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2; or it is neutral and has value of 4 to 6. This horizon is sandy loam or fine sandy loam.

The Cg horizon has the same colors as those of the Bg horizon; or it has hue of 5GY or 5G, value of 4 to 6, and chroma of 1. The Cg horizon is sandy or loamy sediment.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e. clay coatings, clay skins.

Clayey. Containing more than 35 percent clay and having a texture of clay loam, silty clay loam, silty clay, sandy clay, or clay.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Iron oxide is a common compound in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky. When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops.

Control section. The part of the soil on which classification is based. The thickness varies among

different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured and free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Somewhat excessively drained soils are sandy and rapidly pervious and free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Evapotranspiration. The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and from transpiration by plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers of lower case letter that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, 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, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interstream Area. The nearly level land between drainageways in relatively undissected parts of Coastal Plain uplands, low marine terraces, and stream terraces where the soils are dominantly, poorly, or very poory drained.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy. Intermediate in texture between sandy and clayey material and having a texture of sandy loam, loam, silt loam, sandy clay loam, silty clay loam, or clay loam. The clay content is less than 35 percent.

Low strength. The soil is not strong enough to support loads.

Marl. Soft and unconsolidated calcuim carbonate, usually mixed with varying amounts of clay, shell fragments, or other impurities.

Marsh. Periodically wet or continually flooded areas with the surface not deeply submerged. These areas are dominantly covered with sedges, cattails, rushes or other hydrophytic (water loving) plants. Subgroups are:

Freshwater.—Lowland areas bordering rivers, creeks, and lakes that are flooded with fresh water and dominated by halophobic (salt intolerant) plants.

Salt.—Lowland areas bordering coastal islands, sounds, bays, and sloughs that are flooded with salt water and dominated by halophytic (salt tolerant) plants.

Tidal.—Lowland areas bordering rivers, creeks, and sloughs, and traversed by interlacing channels that are periodically inundated by high tides with either saltwater or brackish water and dominated by halophytic (salt tolerant) plants.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil).

No-till planting. A method of planting crops with no seed bed preparation except when opening a thin slice of the soil and placing the seed at the desired depth.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Organic soil. Soil that is at least 20 percent organic matter, by weight, if the mineral material contains no clay, or at least 30 percent if the mineral material contains more than 60 percent clay.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (I square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Pocosin. A waterlogged land in large flat interstream areas that are elevated above the distant flood plains. Soils are typically high in organic matter and vegetated by plants that are tolerant of extreme wetness.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandy. Containing a high percentage of sand and having a texture of sand or loamy sand.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material

Seasonal high water table. The highest level of a saturated zone (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Skeletans. Coatings of light-color, low luster silica flour or silica dust, adhering to the natural surface in soil material.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 vertical feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent

material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsidence. A term applied to soils that experience a pronounced reduction in volume when drained due to the removal of water, shrinkage of organic materials, and the oxidation of organic compounds. Usually associated with soils that have a high organic matter content.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the A and B horizons.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Sand.—Soil material that contains 85 percent or more sand; the percentage of silt plus 1.5 times the percentage of clay does not excede 15.

Loamy sand.—Soil material that contains at the upper limit 85 to 90 percent sand, and the percentage of silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit it contains not less than 70 to 85 percent sand, and the percentage of silt plus twice the percentage of clay does not excede 30.

Sandy loam.—Soil material that contains either 20 percent clay or less and the percentage of silt plus twice the percentage of clay excedes 30, and 52 percent or more sand; or less that 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Silt loam.—Soil material that contains 50 percent or more silt and 12 to 27 percent clay (or) 50 to 80 percent silt and less than 12 percent clay.

Silt.—Soil material that contains 80 percent or more silt and less than 12 percent clay.

Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more sand.

Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.

Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.

Sandy clay.—Soil material that contains 35 percent or more clay and 45 percent or more sand.

Silty clay.—Soil material that contains 40 percent or more clay and 40 percent or more silt.

Clay.—Soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data recorded in the period 1951-77 at New Bern, North Carolina]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	56.7	33.7	45.2	78	12	87	3.89	2.30	5.31	8	0.7
February---	59.2	34.9	47.1	80	13	68	4.07	2.81	5.22	7	1.2
March------	66.0	40.8	53.4	86	22	189	3.72	2.44	4.87	8	0.5
April------	76.1	49.1	62.6	93	30	378	2.98	1.61	4.09	6	0.0
May--------	82.4	57.6	70.1	96	38	623	4.19	2.76	5.48	8	0.0
June-------	87.5	64.9	76.2	99	48	786	5.00	2.62	6.93	8	0.0
July-------	89.9	68.8	79.4	99	55	911	7.69	4.14	10.58	11	0.0
August-----	88.9	68.6	78.8	97	55	893	7.07	3.99	9.57	10	0.0
September--	84.3	62.9	73.6	95	45	708	6.02	3.39	8.15	7	0.0
October----	75.4	52.4	63.9	89	29	431	3.12	1.07	4.75	5	0.0
November---	66.6	41.8	54.2	82	22	147	3.10	1.37	4.50	5	0.0
December---	58.5	35.2	46.8	78	14	104	3.66	1.68	5.27	6	0.0
Yearly:											
Average--	74.3	50.9	62.6	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	11	---	---	---	---	---	---
Total----	---	---	---	---	---	5,325	54.51	47.84	61.17	89	2.4

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-77
at New Bern, North Carolina]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 22	April 6	April 20
2 years in 10 later than--	March 14	March 30	April 14
5 years in 10 later than--	February 26	March 18	April 2
First freezing temperature in fall:			
1 year in 10 earlier than--	November 11	October 28	October 22
2 years in 10 earlier than--	November 17	November 3	October 27
5 years in 10 earlier than--	November 30	November 14	November 4

TABLE 3.--GROWING SEASON

[Data recorded in the period 1951-77
at New Bern, North Carolina]

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	243	213	190
8 years in 10	254	222	199
5 years in 10	276	240	215
2 years in 10	297	259	231
1 year in 10	308	268	240

TABLE 4.--PLANT LIST

Common Name	Scientific Name
Alabama supplejack	Berchemia scandens
American beautyberry	Callicarpa americana
American beech	Fagus grandifolia
American hornbeam	Carpinus caroliniana
arrowhead	Sagittaris sp.
baldcypress	Taxodium distichum
bayberry	Myrica heterophylla
big cordgrass	Spartina cynosuroides
bitter gallberry	Ilex glabra
black needlerush	Juncus roemerianus
black willow	Salix nigra
blackgum	Nyssa sylvatica
blackjack oak	Quercus marilandica
blueberry	Vaccinium sp.
bluejack oak	Quercus incana
brackenfern	Pteridium aquilinum
Carolina jessamine	Gelsemium sempervirens
cattail	Typha sp.
cinnamon fern	Osmunda cinnamomea
climbing hempweed	Mikania scandens
climbing hydrangea	Decumaria barbara
fetterbush	Lyonia lucida
flowering dogwood	Cornus florida
grape	Vitus sp.
green ash	Fraxinus pennsylvanica
greenbrier	Smilax sp.
hickory	Carya sp.
honey cup	Zenobia pulverulenta
honeysuckle	Lonicera sp.
huckleberry	Gaylussacia sp.
large gallberry	Ilex coriacea
laurel oak	Quercus laurilfolia
lizardstail	Saururus cernuus

TABLE 4.--PLANT LIST--Continued

Common Name	Scientific Name
loblolly-bay	Gordonia lasianthus
loblolly pine	Pinus taeda
longleaf pine	Pinus palustris
netted chainfern	Woodwardia areolata
partridgeberry	Mitchella repens
Pennsylvania smartweed	Polygonum pennsylvanicum
persimmon	Diospyros virginiana
pitcherplant	Sarracenia sp.
poison-ivy	Rhus radicans
pond pine	Pinus serotina
post oak	Quercus stellata
red chokeberry	Aronia arbutifolia
red maple	Acer rubrum
redbay	Persea borbonia
river birch	Betula nigra
rose mallow	Hibiscus moschentos
royal fern	Osmunda regalis
saltgrass	Distichlis spicata
sassafras	Sassafras albidum
sawgrass	Cladium jamaicense
seashore mallow	Kosteletskya virginica
sedges	Cyperaceae
Shumard oak	Quercus shumardii
sourwood	Oxydendrum arboreum
southern red oak	Quercus falcata
southern sugar maple	Acer saccharum floridanum
sphagnum moss	Sphagnum
sundew	Drosera sp.
swamp chestnut oak	Quercus michauxii
swamp tupelo	Nyssa sylvatica biflora
sweet pepperbush	Clethra alnifolia
sweetbay	Magnolia virginiana
sweetgum	Liquidambar styraciflua

TABLE 4.--PLANT LIST--Continued

Common Name	Scientific Name
sweetleaf	Symplocos tinctoria
switchcane	Arundinaria tecta
threeawn grass	Aristida sp.
titi	Cyrilla racemiflora
turkey oak	Quercus laevis
Virginia chainfern	Woodwardia virginica
Virginia creeper	Parthenocissus quinquefolia
Virginia willow	Itea virginica
water oak	Quercus nigra
waxmyrtle	Myrica cerifera
white oak	Quercus alba
willow oak	Quercus phellos
winged sumac	Rhus coppalina
yellow-poplar	Liriodendron tulipfera

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AaA	Altavista fine sandy loam, 0 to 2 percent slopes	9,116	2.0
AcA	Altavista-Urban land complex, 0 to 2 percent slopes	456	0.1
Ag	Augusta fine sandy loam	5,871	1.3
Ap	Arapahoe fine sandy loam	11,733	2.5
AuB	Autryville loamy sand, 0 to 6 percent slopes	5,626	1.2
Ba	Bayboro mucky loam	13,908	3.0
BrB	Bragg soils, 0 to 8 percent slopes	1,121	0.2
CnB	Conetoe loamy sand, 0 to 5 percent slopes	6,943	1.5
CrB	Craven silt loam, 1 to 4 percent slopes	18,265	3.9
CT	Croatan muck	24,740	5.3
DA	Dare muck	19,611	4.2
De	Deloss fine sandy loam	11,796	2.5
DO	Dorovan muck, frequently flooded	8,069	1.7
ExA	Exum silt loam, 0 to 2 percent slopes	2,311	0.5
GoA	Goldsboro loamy fine sand, 0 to 2 percent slopes	24,714	5.3
Gr	Grantham silt loam	2,281	0.5
GuA	Goldsboro-Urban land complex, 0 to 2 percent slopes	991	0.2
KuB	Kureb sand, 0 to 6 percent slopes	916	0.2
La	Leaf silt loam	51,664	11.1
Lc	Lynchburg-Urban land complex	316	0.1
Le	Lenoir silt loam	21,599	4.7
LF	Lafitte muck, frequently flooded	2,609	0.6
Ln	Leon sand	5,964	1.3
Ly	Lynchburg fine sandy loam	18,973	4.1
Me	Meggett sandy loam	2,509	0.5
MM	Masontown mucky fine sandy loam and Muckalee sandy loam, frequently flooded	27,874	6.0
Mu	Murville mucky loamy sand	8,739	1.9
NoA	Norfolk loamy fine sand, 0 to 2 percent slopes	2,724	0.6
NoB	Norfolk loamy fine sand, 2 to 6 percent slopes	7,031	1.5
NuB	Norfolk-Urban land complex, 0 to 6 percent slopes	1,073	0.2
On	Onslow loamy sand	3,046	0.7
Pa	Pantego fine sandy loam	29,750	6.4
PO	Ponzer muck	5,672	1.2
Pt	Pits	576	0.1
Ra	Rains fine sandy loam	42,341	9.1
Rc	Rains-Urban land complex	768	0.2
Ro	Roanoke fine sandy loam	1,608	0.4
Sc	Seabrook-Urban land complex	712	0.2
Se	Seabrook loamy sand	11,409	2.5
StA	State loamy sand, 0 to 2 percent slopes	3,492	0.8
SuD	Suffolk loamy sand, 10 to 30 percent slopes	4,080	0.9
TaB	Tarboro sand, 0 to 6 percent slopes	10,165	2.2
Tc	Torhunta-Urban land complex	325	0.1
Tm	Tomotley fine sandy loam	11,765	2.5
To	Torhunta fine sandy loam	11,564	2.5
TuB	Tarboro-Urban land complex, 0 to 6 percent slopes	943	0.2
Ud	Udorthents, loamy	680	0.1
Ur	Urban land	1,450	0.3
	Water areas less than 40 acres	4,111	0.9
	Total	464,000	100.0

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management that includes artificial drainage where needed. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Soil-Urban land units are not shown in this table because they are not used for the production of crops and pasture]

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat	Improved bermudagrass	Grass-clover
		Bu	Bu	Lbs	Bu	AUM*	AUM*
AaA---------- Altavista	IIw	125	40	3,000	55	---	11.0
Ag---------- Augusta	IIIw	125	40	2,800	55	---	11.0
Ap**---------- Arapahoe	IIIw	135	45	---	55	---	12.0
AuB---------- Autryville	IIs	75	25	2,200	35	9.0	---
Ba**---------- Bayboro	IIIw	130	45	---	55	---	---
BrB---------- Bragg	IIIe	---	---	---	---	6.0	---
CnB---------- Conetoe	IIs	75	25	2,200	35	9.0	---
CrB---------- Craven	IIIe	105	35	2,500	45	---	10.0
CT**---------- Croatan	IVw	125	40	---	50	---	12.0
DA---------- Dare	VIIw	---	---	---	---	---	---
De**---------- Deloss	IIIw	135	45	---	55	---	12.0
DO---------- Dorovan	VIIw	---	---	---	---	---	---
ExA---------- Exum	IIw	125	45	3,000	55	---	11.0
GoA---------- Goldsboro	IIw	125	40	3,000	55	---	11.0
Gr**---------- Grantham	IIIw	130	45	---	55	---	11.0
KuB---------- Kureb	VIIs	---	---	---	---	3.5	---
La**---------- Leaf	IVw	110	35	---	45	---	9.0
Le---------- Lenoir	IIIw	110	35	2,200	45	---	10.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat	Improved bermudagrass	Grass-clover
		Bu	Bu	Lbs	Bu	AUM*	AUM*
LF---------- Lafitte	VIIIw	---	---	---	---	---	---
Ln---------- Leon	IVw	50	---	---	---	9.0	---
Ly---------- Lynchburg	IIw	125	40	2,800	55	---	11.0
Me---------- Meggett	IVw	110	40	---	50	---	10.0
MM: Masontown------	VIIw	---	---	---	---	---	---
Muckalee------	Vw	---	---	---	---	---	---
Mu---------- Murville	Vw	---	---	---	---	---	---
NoA---------- Norfolk	I	115	40	3,000	55	---	10.5
NoB---------- Norfolk	IIe	110	35	2,900	50	---	10.0
On---------- Onslow	IIw	115	40	2,700	50	---	11.0
Pa**---------- Pantego	IIIw	135	45	---	55	---	12.0
PO**---------- Ponzer	IVw	135	45	---	55	---	12.0
Pt. Pits							
Ra**---------- Rains	IIIw	130	40	---	55	---	11.0
Ro**---------- Roanoke	IIIw	110	35	---	50	---	9.0
Se---------- Seabrook	IIIs	75	25	2,200	35	9.0	---
StA---------- State	I	115	40	3,000	55	---	10.5
SuD---------- Suffolk	VIe	---	---	---	---	---	8.5
TaB---------- Tarboro	IIIs	50	20	---	---	6.0	---
Tm**---------- Tomotley	IIIw	130	40	---	55	---	11.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Improved bermudagrass	Grass-clover
		Bu	Bu	Lbs	Bu	AUM*	AUM*
To**---------- Torhunta Ud. Udorthents	IIIw	135	45	---	55	---	12.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** The capability subclass and yields shown are for drained conditions. See map unit for the capability subclass for undrained conditions.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[The soils suitable for production of commericial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
AaA---------- Altavista	9W	Slight	Moderate	Slight	Loblolly pine--------	91	133	Loblolly pine.
					Longleaf pine--------	84	110	
					Sweetgum------------	84	90	
					White oak------------	---	---	
					Red maple------------	---	---	
					Yellow-poplar--------	---	---	
					Southern red oak-----	---	---	
					Blackgum-------------	---	---	
					Water oak------------	---	---	
Ag---------- Augusta	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Sweetgum------------	90	106	
					White oak------------	80	62	
					Southern red oak-----	80	86	
					Water oak------------	---	---	
					Longleaf pine--------	---	---	
					Yellow-poplar--------	---	---	
					Red maple------------	---	---	
					Blackgum-------------	---	---	
Ap---------- Arapahoe	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	95	142	Loblolly pine. 3/
					Sweetgum------------	---	---	
					Red maple------------	---	---	
					Baldcypress----------	---	---	
					Pond pine------------	85	75	
					Yellow-poplar--------	---	---	
					Blackgum-------------	---	---	
					Willow oak-----------	---	---	
					Swamp chestnut oak---	---	---	
					Water oak------------	---	---	
AuB---------- Autryville	7S	Slight	Moderate	Moderate	Loblolly pine--------	77	105	Loblolly pine, longleaf pine.
					Longleaf pine--------	---	---	
					Southern red oak-----	---	---	
					Shumard oak----------	---	---	
					Hickory--------------	---	---	
					Sweetgum------------	---	---	
					Red maple------------	---	---	
					White oak------------	---	---	
					Post oak-------------	---	---	
Ba---------- Bayboro	8W	Slight	Severe	Severe	Sweetgum------------	94	119	Loblolly pine. 3/
					Yellow-poplar--------	---	---	
					Baldcypress----------	---	---	
					Red maple------------	---	---	
					Willow oak-----------	---	---	
					Water oak------------	---	---	
					Swamp chestnut oak---	---	---	
					Blackgum-------------	---	---	
BrB---------- Bragg	---	Slight	Slight	Moderate	Loblolly pine--------	---	---	Longleaf pine, loblolly pine.
					Longleaf pine--------	---	---	
					Red maple------------	---	---	
					Blackgum-------------	---	---	
					Sweetgum------------	---	---	
					Yellow-poplar--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
CnB---------- Conetoe	8S	Slight	Moderate	Moderate	Loblolly pine--------	80	110	Loblolly pine.
					Longleaf pine--------	65	67	
					Southern red oak-----	---	---	
					Post oak------------	---	---	
					White oak-----------	---	---	
					Hickory-------------	---	---	
					Sweetgum------------	---	---	
					Red maple-----------	---	---	
					Shumard oak----------	---	---	
CrB---------- Craven	8W	Slight	Moderate	Slight	Loblolly pine--------	85	120	Loblolly pine.
					Longleaf pine--------	67	72	
					Water oak-----------	---	---	
					Sweetgum------------	---	---	
					White oak-----------	---	---	
					Southern red oak-----	---	---	
					Red maple-----------	---	---	
					Blackgum------------	---	---	
					Yellow-poplar--------	---	---	
					Post oak------------	---	---	
CT---------- Croatan	2W	Slight	Severe	Severe	Pond pine-----------	55	33	
					Loblolly bay---------	---	---	
					Baldcypress----------	---	---	
					Sweetgum------------	---	---	
					Blackgum------------	---	---	
					Sweetbay------------	---	---	
					Red maple-----------	---	---	
DA---------- Dare	---	Slight	Severe	Severe	Pond pine-----------	---	---	
					Loblolly bay---------	---	---	
					Sweetbay------------	---	---	
De---------- Deloss	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	96	145	Loblolly pine.
					Pond pine-----------	77	63	
					Willow oak----------	---	---	
					Red maple-----------	---	---	
					Water oak-----------	---	---	
					Swamp chestnut oak---	---	---	
					Blackgum------------	---	---	
					Yellow-poplar--------	---	---	
					Sweetgum------------	---	---	
DO---------- Dorovan	7W	Slight	Severe	Severe	Blackgum------------	70	95	Baldcypress.
					Baldcypress----------	---	---	
					Swamp tupelo---------	---	---	
					Green ash-----------	---	---	
					American elm---------	---	---	
					Sweetgum------------	---	---	
					Red maple-----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
ExA---------- Exum	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Longleaf pine--------	77	94	
					Sweetgum------------	90	106	
					Yellow-poplar--------	100	107	
					Southern red oak-----	---	---	
					White oak------------	---	---	
					Water oak------------	---	---	
					Red maple------------	---	---	
					Blackgum------------	---	---	
GoA---------- Goldsboro	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Longleaf pine--------	77	94	
					Sweetgum------------	90	106	
					Southern red oak-----	---	---	
					White oak------------	---	---	
					Water oak------------	---	---	
					Red maple------------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum------------	---	---	
Gr---------- Grantham	9W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	86	123	Loblolly pine. 3/
					Sweetgum------------	---	---	
					Water oak------------	---	---	
					Blackgum------------	---	---	
					Red maple------------	---	---	
					Willow oak-----------	---	---	
					Yellow-poplar--------	---	---	
					Pond pine------------	---	---	
					Swamp chestnut oak---	---	---	
KuB---------- Kureb	3S	Slight	Severe	Severe	Longleaf pine--------	52	40	Longleaf pine.
					Loblolly pine--------	---	---	
La---------- Leaf	9W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	90	131	Loblolly pine. 3/
					Sweetgum------------	90	106	
					Water oak------------	---	---	
					Blackgum------------	---	---	
					Red maple------------	---	---	
					Yellow-poplar--------	---	---	
					Pond pine------------	---	---	
					Willow oak-----------	---	---	
					Swamp chestnut oak---	---	---	
Le---------- Lenoir	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Water oak------------	---	---	
					Blackgum------------	---	---	
					Red maple------------	---	---	
					Yellow-poplar--------	---	---	
					Sweetgum------------	---	---	
					Southern red oak-----	---	---	
					White oak------------	---	---	
					Swamp chestnut oak---	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
Ln---------- Leon	4W	Slight	Moderate	Moderate	Longleaf pine--------	58	52	Longleaf pine.
					Loblolly pine--------	---	---	
					Pond pine----------	---	---	
					Water oak----------	---	---	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
					Sweetgum-----------	---	---	
Ly---------- Lynchburg	9W	Slight	Moderate	Slight	Loblolly pine--------	86	123	Loblolly pine.
					Yellow-poplar--------	92	93	
					Sweetgum-----------	90	106	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
Me---------- Meggett	11W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	100	154	Loblolly pine. 3/
					Pond pine----------	75	61	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
					Sweetgum-----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak---------	---	---	
					Baldcypress--------	---	---	
					Water oak----------	---	---	
					Yellow-poplar--------	---	---	
MM:								
Masontown---------	12W	Slight	Severe	Severe	Sweetgum-----------	111	176	Sweetgum, American sycamore, eastern cottonwood.
					Swamp tupelo-------	---	---	
					Green ash----------	---	---	
					Baldcypress--------	---	---	
					Water oak----------	103	101	
					American elm-------	---	---	
					Willow oak---------	---	---	
					Swamp chestnut oak---	---	---	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
Muckalee----------	7W	Slight	Severe	Severe	Sweetgum-----------	90	106	Sweetgum, American sycamore, eastern cottonwood.
					Water oak----------	90	86	
					Green ash----------	85	57	
					Swamp chestnut oak---	---	---	
					Swamp tupelo-------	---	---	
					Blackgum-----------	---	---	
					Red maple----------	---	---	
					Baldcypress--------	---	---	
					American elm-------	---	---	
					Willow oak---------	---	---	
Mu---------- Murville	2W	Slight	Severe 1/	Severe 1/	Pond pine----------	50	28	Loblolly pine. 3/
					Red maple----------	---	---	
					Loblolly bay-------	---	---	
					Blackgum-----------	---	---	
					Sweetbay-----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
NoA, NoB---------- Norfolk	9A	Slight	Slight	Slight	Loblolly pine--------	86	123	Loblolly pine.
					Longleaf pine--------	68	74	
					Post oak------------	---	---	
					Water oak-----------	---	---	
					Yellow-poplar--------	---	---	
					Southern red oak-----	---	---	
					White oak-----------	---	---	
					Shumard oak----------	---	---	
					Hickory-------------	---	---	
					American beech-------	---	---	
On---------- Onslow	7A	Slight	Slight	Slight	Loblolly pine--------	76	103	Loblolly pine.
					Longleaf pine--------	67	72	
					Southern red oak-----	---	---	
					Water oak-----------	---	---	
					Sweetgum------------	---	---	
					Red maple-----------	---	---	
					Post oak------------	---	---	
					White oak-----------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum------------	---	---	
Pa---------- Pantego	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	98	149	Loblolly pine. 3/
					Pond pine-----------	73	57	
					Water oak-----------	---	---	
					Red maple-----------	---	---	
					Blackgum------------	---	---	
					Sweetgum------------	---	---	
					Yellow-poplar--------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	
PO---------- Ponzer	3W	Slight	Severe	Severe	Pond pine-----------	60	39	
					Baldcypress---------	---	---	
					Sweetgum------------	---	---	
					Blackgum------------	---	---	
					Sweetbay------------	---	---	
					Redbay--------------	---	---	
					Loblolly bay--------	---	---	
					Red maple-----------	---	---	
Ra---------- Rains	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	94	140	Loblolly pine.
					Sweetgum------------	90	106	
					Pond pine-----------	---	---	
					Red maple-----------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum------------	---	---	
					Water oak-----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
Ro---------- Roanoke	9W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	90	131	Loblolly pine. 3/
					Pond pine----------	---	---	
					Blackgum----------	---	---	
					Red maple----------	---	---	
					Sweetgum----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
					Yellow-poplar--------	---	---	
					Willow oak----------	---	---	
Se---------- Seabrook	9S	Slight	Moderate	Moderate	Loblolly pine--------	87	125	Loblolly pine, longleaf pine.
					Longleaf pine--------	70	79	
					Red maple----------	---	---	
					Sweetgum----------	---	---	
					Water oak----------	---	---	
					Southern red oak-----	---	---	
					Blackgum----------	---	---	
					White oak----------	---	---	
StA---------- State	10A	Slight	Slight	Slight	Loblolly pine--------	95	142	Loblolly pine.
					Southern red oak-----	85	101	
					Yellow-poplar--------	100	107	
					Longleaf pine--------	---	---	
					Southern red oak-----	---	---	
					Laurel oak----------	---	---	
					Hickory----------	---	---	
					Red maple----------	---	---	
					White oak----------	---	---	
					Water oak----------	---	---	
SuD---------- Suffolk	8R	Moderate	Moderate	Moderate	Loblolly pine--------	82	114	Loblolly pine.
					Southern red oak-----	70	61	
					American beech-------	---	---	
					White oak----------	---	---	
					Hickory----------	---	---	
					Red maple----------	---	---	
					Shumard oak----------	---	---	
					Yellow-poplar--------	---	---	
					Water oak----------	---	---	
					Post oak----------	---	---	
					Blackgum----------	---	---	
					Sweetgum----------	---	---	
TaB---------- Tarboro	7S	Slight	Moderate	Moderate	Loblolly pine--------	71	95	Loblolly pine, longleaf pine.
					Longleaf pine--------	---	---	
					Southern red oak-----	---	---	
					Sweetgum----------	---	---	
					Blackjack oak--------	---	---	
					Post oak----------	---	---	
					Shumard oak----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/ac/yr$	
Tm---------- Tomotley	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	94	140	Loblolly pine. 3/
					Sweetgum----------	90	106	
					Pond pine----------	---	---	
					Blackgum----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
To---------- Torhunta	9W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	90	131	Loblolly pine. 3/
					Sweetgum----------	90	106	
					Pond pine----------	---	---	
					Red maple----------	---	---	
					Water oak----------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	
					Baldcypress----------	---	---	

1/ Equipment use is moderately restricted and seedling mortality is moderate only in areas that have been adequately drained.
2/ Potential productivity is attainable only in areas that have been adequately drained.
3/ Trees named are suitable for planting only in areas that have been adequately drained.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaA---------- Altavista	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AcA: Altavista----------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
Ag---------- Augusta	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Ap---------- Arapahoe	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
AuB---------- Autryville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Ba---------- Bayboro	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
BrB---------- Bragg	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
CnB---------- Conetoe	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
CrB---------- Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Slight.
CT---------- Croatan	Severe: ponding, excess humus.	Severe: ponding, excess humus, too acid.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: too acid, ponding.
DA---------- Dare	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: excess humus, ponding.
De---------- Deloss	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
DO---------- Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
ExA---------- Exum	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight----------	Slight.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GoA---------- Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Slight.
Gr---------- Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GuA: Goldsboro----------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Slight.
Urban land.					
KuB---------- Kureb	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
La---------- Leaf	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Lc: Lynchburg----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.					
Le---------- Lenoir	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LF---------- Lafitte	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.
Ln---------- Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Ly---------- Lynchburg	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
Me---------- Meggett	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MM: Masontown----------	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Muckalee----------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Mu---------- Murville	Severe: flooding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
NoA---------- Norfolk	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
NoB---------- Norfolk	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NuB: Norfolk	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
On Onslow	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Pa Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
PO Ponzer	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Pt. Pits					
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Rc: Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.					
Ro Roanoke	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sc: Seabrook	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Severe: droughty.
Urban land.					
Se Seabrook	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Severe: droughty.
StA State	Slight	Slight	Slight	Slight	Slight.
SuD Suffolk	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
TaB Tarboro	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Tc: Torhunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.					
Tm Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
To---------- Torhunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TuB: Tarboro----------	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Urban land.					
Ud. Udorthents					
Ur. Urban land					

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated. The ratings are based on the undrained condition for poorly drained and very poorly drained soils]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AaA---- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
AcA: Altavista----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
Ag---- Augusta	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ap*---- Arapahoe	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
AuB---- Autryville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ba*---- Bayboro	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BrB---- Bragg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnB---- Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrB---- Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CT*---- Croatan	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DA---- Dare	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
De*---- Deloss	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DO---- Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
ExA---- Exum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GoA---- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Gr*---- Grantham	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
GuA: Goldsboro----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
KuB---------- Kureb	Very poor.	Poor	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
La*---------- Leaf	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Lc: Lynchburg----------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.										
Le---------- Lenoir	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LF---------- Lafitte	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Ln---------- Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
Ly---------- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Me*---------- Meggett	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
MM: Masontown----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Muckalee----------	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Mu---------- Murville	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NoA, NoB---------- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NuB: Norfolk----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
On---------- Onslow	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pa*---------- Pantego	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
PO---------- Ponzer	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Pt. Pits										
Ra*---------- Rains	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Rc: Rains	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Urban land.										
Ro---------- Roanoke	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Sc: Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
Se---------- Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
StA---------- State	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SuD---------- Suffolk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaB---------- Tarboro	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Tc: Torhunta	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Urban land.										
Tm*---------- Tomotley	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
To*---------- Torhunta	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
TuB: Tarboro	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Urban land.										
Ud. Udorthents										
Ur. Urban land										

* Artificially drained areas of these soils have a higher potential for use as habitat for openland and woodland wildlife than is shown in this table. The potential for wetland wildlife habitat is lower.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaA---------- Altavista	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AcA: Altavista--------	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.						
Ag---------- Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
Ap---------- Arapahoe	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
AuB---------- Autryville	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
Ba---------- Bayboro	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
BrB---------- Bragg	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
CnB---------- Conetoe	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
CrB---------- Craven	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
CT---------- Croatan	Severe: excess humus, ponding.	Severe: ponding, wetness, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding.
DA---------- Dare	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, low strength.	Severe: excess humus, ponding.
De---------- Deloss	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
DO---------- Dorovan	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ExA---------- Exum	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
GoA---------- Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Gr---------- Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
GuA: Goldsboro--------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Urban land.						
KuB---------- Kureb	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
La---------- Leaf	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
Lc: Lynchburg--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.						
Le---------- Lenoir	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LF---------- Lafitte	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: excess humus, ponding, flooding.
Ln---------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Ly---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Me---------- Meggett	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness, low strength.	Severe: wetness.
MM: Masontown--------	Severe: cutbanks cave, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding.
Muckalee---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Mu---------- Murville	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.
NoA---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
NoB---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
NuB: Norfolk----------	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
Urban land.						
On---------- Onslow	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Pa---------- Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
PO---------- Ponzer	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, excess humus.
Pt. Pits						
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Rc: Rains----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.						
Ro---------- Roanoke	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Sc: Seabrook---------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Urban land.						
Se---------- Seabrook	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
StA---------- State	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: low strength.	Slight.
SuD---------- Suffolk	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TaB---------- Tarboro	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
Tc: Torhunta---------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.						
Tm---------- Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
To---------- Torhunta	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TuB: Tarboro----------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
Urban land.						
Ud. Udorthents						
Ur. Urban land						

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaA---------- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
AcA: Altavista----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
Urban land.					
Ag---------- Augusta	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
Ap---------- Arapahoe	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
AuB---------- Autryville	Slight----------	Severe: seepage.	Severe: wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Ba---------- Bayboro	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
BrB---------- Bragg	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
CnB---------- Conetoe	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
CrB---------- Craven	Severe: wetness, percs slowly.	Moderate: slope.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CT---------- Croatan	Severe: ponding, percs slowly.	Severe: seepage, ponding, excess humus.	Severe: ponding, excess humus, seepage.	Severe: seepage, ponding.	Poor: ponding, excess humus.
DA---------- Dare	Severe: ponding, percs slowly.	Severe: flooding, ponding, excess humus, wetness.	Severe: seepage, ponding, excess humus.	Severe: ponding.	Poor: excess humus, ponding.
De---------- Deloss	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
DO---------- Dorovan	Severe: flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.
ExA---------- Exum	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
GoA---------- Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Gr---------- Grantham	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
GuA: Goldsboro----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Urban land.					
KuB---------- Kureb	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
La---------- Leaf	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Lc: Lynchburg----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
Le---------- Lenoir	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
LF---------- Lafitte	Severe: flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, seepage, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
Ln---------- Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Ly---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Me---------- Meggett	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MM: Masontown	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
Muckalee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Mu--- Murville	Severe: ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
NoA, NoB--- Norfolk	Moderate: wetness.	Moderate: seepage.	Severe: wetness.	Slight---	Slight.
NuB: Norfolk	Moderate: wetness.	Moderate: seepage.	Severe: wetness.	Slight---	Slight.
Urban land.					
On--- Onslow	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
Pa--- Pantego	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
PO--- Ponzer	Severe: ponding, percs slowly.	Severe: flooding, excess humus, ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Pt. Pits					
Ra--- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
Rc: Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
Urban land.					
Ro--- Roanoke	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Sc: Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sc: Urban land.					
Se---------- Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
StA---------- State	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, thin layer.
SuD---------- Suffolk	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope, thin layer.
TaB---------- Tarboro	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Tc: Torhunta---------- Urban land.	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Tm---------- Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
To---------- Torhunta	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
TuB: Tarboro---------- Urban land.	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
UD. Udorthents					
Ur. Urban land					

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AaA---------- Altavista	Fair: wetness, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
AcA: Altavista----------	Fair: wetness, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
Ag---------- Augusta	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ap---------- Arapahoe	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
AuB---------- Autryville	Good----------	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy.
Ba---------- Bayboro	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
BrB---------- Bragg	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
CnB---------- Conetoe	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
CrB---------- Craven	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
CT---------- Croatan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness, too acid.
DA---------- Dare	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
De---------- Deloss	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
DO---------- Dorovan	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: excess humus, wetness.
ExA---------- Exum	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
GoA---------- Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Gr Grantham	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
GuA: Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Urban land.				
KuB Kureb	Good	Probable	Improbable: too sandy.	Poor: too sandy.
La Leaf	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Lc: Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
Le Lenoir	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LF Lafitte	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Ln Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Ly Lynchburg	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Me Meggett	Poor: wetness, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
MM: Masontown	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Muckalee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Mu Murville	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
NoA, NoB Norfolk	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
NuB: Norfolk	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Urban land.				

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
On---------- Onslow	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Pa---------- Pantego	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
PO---------- Ponzer	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Pt. Pits				
Ra---------- Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Rc: Rains----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
Ro---------- Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Sc: Seabrook----------	Fair: wetness.	Probable----------	Improbable: too sandy.	Fair: too sandy, small stones.
Urban land.				
Se---------- Seabrook	Fair: wetness.	Probable----------	Improbable: too sandy.	Fair: too sandy, small stones.
StA---------- State	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
SuD---------- Suffolk	Fair: slope.	Probable----------	Improbable: too sandy.	Poor: slope.
TaB---------- Tarboro	Good----------	Probable----------	Improbable: too sandy.	Poor: too sandy.
Tc: Torhunta----------	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
Urban land.				
Tm---------- Tomotley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
To---------- Torhunta	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
TuB: Tarboro----------	Good----------	Probable----------	Improbable: too sandy.	Poor: too sandy.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
TuB: Urban land.				
Ud. Udorthents				
Ur. Urban land				

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
AaA---- Altavista	Moderate: seepage.	Moderate: wetness.	Moderate: deep to water.	Favorable----	Wetness----	Favorable.
AcA: Altavista----	Moderate: seepage.	Moderate: wetness.	Moderate: deep to water.	Favorable----	Wetness----	Favorable.
Urban land.						
Ag---- Augusta	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness.
Ap---- Arapahoe	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness----	Wetness.
AuB---- Autryville	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
Ba---- Bayboro	Slight----	Severe: ponding.	Severe: slow refill.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
BrB---- Bragg	Slight----	Moderate: piping.	Severe: no water.	Deep to water	Favorable----	Favorable.
CnB---- Conetoe	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy----	Droughty.
CrB---- Craven	Moderate: seepage.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Erodes easily, wetness.	Erodes easily, percs slowly.
CT---- Croatan	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Percs slowly, subsides, ponding.	Ponding----	Ponding, percs slowly.
DA---- Dare	Slight----	Severe: excess humus, ponding.	Slight----	Percs slowly, subsides, ponding.	Percs slowly, ponding.	Ponding, percs slowly.
De---- Deloss	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness.
DO---- Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding----	Wetness.
ExA---- Exum	Slight----	Moderate: piping, wetness.	Moderate: slow refill.	Favorable----	Erodes easily, wetness.	Erodes easily.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
GoA---------- Goldsboro	Moderate: seepage.	Moderate: piping, wetness.	Moderate: slow refill, cutbanks cave.	Favorable------	Wetness--------	Favorable.
Gr---------- Grantham	Slight---------	Severe: wetness.	Moderate: slow refill.	Favorable------	Erodes easily, wetness.	Wetness, erodes easily.
GuA: Goldsboro--------	Moderate: seepage.	Moderate: piping, wetness.	Moderate: slow refill, cutbanks cave.	Favorable------	Wetness--------	Favorable.
Urban land.						
KuB---------- Kureb	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
La---------- Leaf	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.
Lc: Lynchburg--------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness.
Urban land.						
Le---------- Lenoir	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly---	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
LF---------- Lafitte	Severe: seepage.	Severe: excess humus, ponding.	Moderate: salty water.	Ponding, flooding, subsides.	Ponding--------	Wetness, excess salt.
Ln---------- Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy, soil blowing.	Wetness, droughty.
Ly---------- Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness.
Me---------- Meggett	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.
MM: Masontown--------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, too sandy.	Wetness.
Muckalee---------	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, too sandy.	Wetness, droughty.
Mu---------- Murville	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, too sandy.	Wetness, droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
NoA---------- Norfolk	Moderate: seepage.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable------	Favorable.
NoB---------- Norfolk	Moderate: seepage, slope.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable------	Favorable.
NuB: Norfolk----------	Moderate: seepage, slope.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable------	Favorable.
Urban land.						
On---------- Onslow	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable------	Wetness--------	Favorable.
Pa---------- Pantego	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness.
PO---------- Ponzer	Moderate: seepage.	Severe: ponding.	Slight---------	Percs slowly, subsides.	Ponding, percs slowly.	Ponding, percs slowly.
Pt. Pits						
Ra---------- Rains	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness.
Rc: Rains----------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness.
Urban land.						
Ro---------- Roanoke	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.
Sc: Seabrook---------	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy, soil blowing.	Droughty.
Urban land.						
Se---------- Seabrook	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy, soil blowing.	Droughty.
StA---------- State	Moderate: seepage.	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Favorable------	Favorable.
SuD---------- Suffolk	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
TaB---------- Tarboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
Tc: Torhunta---------	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave--	Wetness--------	Wetness.
Urban land.						
Tm---------- Tomotley	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Favorable------	Wetness--------	Wetness.
To---------- Torhunta	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave--	Wetness--------	Wetness.
TuB: Tarboro----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
Urban land.						
Ud. Udorthents						
Ur. Urban land						

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils have Unified classifications and USDA textures that are supplementary to those shown. In general, the dominant classifications and textures are shown and the others are inferred]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AeA---------- Altavista	0-13	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	13-46	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	46-80	Variable---------	---	---	---	---	---	---	---	---	---
AcA: Altavista-------	0-13	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	13-46	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	46-80	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											
Ag---------- Augusta	0-17	Fine sandy loam	SM, SM-SC, ML	A-2, A-4	0	95-100	90-100	50-98	30-60	<25	NP-7
	17-36	Sandy clay loam, clay loam, loam.	CL, CL-ML, SC	A-4, A-6, A-7	0	95-100	95-100	75-100	40-80	20-45	5-25
	36-45	Fine sandy loam, sandy loam,	SM, SM-SC	A-2, A-4,	0	95-100	95-100	70-99	20-49	<25	NP-5
	45-80	Variable---------	---	---	---	---	---	---	---	---	---
Ap---------- Arapahoe	0-16	Fine sandy loam	SM	A-2, A-4	0	100	100	80-100	20-49	<30	NP-3
	16-56	Fine sandy loam, loam, sandy loam.	SM	A-2, A-4	0	100	100	70-100	20-49	---	NP
	56-80	Stratified sand to loamy sand.	SM, SP-SM	A-2, A-3, A-4	0	100	100	65-100	5-45	<30	NP-4
AuB---------- Autryville	0-29	Loamy sand-------	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	29-37	Sandy loam, sandy clay loam, fine sandy loam.	SM	A-2	0	100	100	50-100	15-30	<25	NP-3
	37-42	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	42-61	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-100	20-49	<30	NP-10
Ba---------- Bayboro	0-17	Mucky loam-------	SM, ML, CL-ML	A-4	0	100	100	75-100	45-65	<20	NP-7
	17-62	Clay loam, sandy clay, clay.	CL, CH	A-7	0	100	100	85-100	55-95	41-70	20-40
	62-72	Variable---------	---	---	---	---	---	---	---	---	---
BrB---------- Bragg	0-8	Sandy loam-------	SM	A-2, A-4	0-3	98-100	95-100	50-80	13-40	<20	NP-3
	8-56	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-4, A-6	0-3	95-100	95-100	60-95	39-60	16-40	3-18
	56-66	Variable---------	---	---	---	---	---	---	---	---	---
CnB---------- Conetoe	0-24	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	100	50-95	5-30	---	NP
	24-35	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	50-95	20-40	<30	NP-10
	35-80	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-95	4-30	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CrB--------- Craven	0-9	Silt loam--------	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
	9-54	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	54-80	Variable---------	---	---	---	---	---	---	---	---	---
CT--------- Croatan	0-28	Muck----------	PT	---	---	---	---	---	---	---	---
	28-42	Sandy loam, fine sandy loam, mucky sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-85	25-49	<30	NP-10
	42-56	Loam, clay loam, sandy clay loam.	CL, SM, ML, SC	A-4, A-6	0	100	100	75-100	36-95	<36	NP-15
	56-80	Variable---------	---	---	---	---	---	---	---	---	---
DA--------- Dare	0-60	Muck----------	PT	---	0	---	---	---	---	---	NP
	60-80	Stratified mucky sand to loamy sand.	SM, SP-SM	A-2, A-3	0	100	90-100	60-80	5-30	---	NP
De--------- Deloss	0-19	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-2, A-4	0	100	100	70-95	30-65	<35	NP-7
	19-58	Sandy clay loam, clay loam, fine sandy loam.	SM-SC, SC, CL-ML, CL	A-4, A-6, A-7	0	100	100	75-98	36-70	18-45	4-22
	58-80	Variable---------	---	---	---	---	---	---	---	---	---
DO--------- Dorovan	0-15	Muck----------	PT	---	0	---	---	---	---	---	---
	15-80	Muck----------	PT	---	0	---	---	---	---	---	---
ExA--------- Exum	0-11	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
	11-60	Loam, silt loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
	60-80	Variable---------	---	---	---	---	---	---	---	---	---
GoA--------- Goldsboro	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	50-95	13-30	---	NP
	10-62	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-100	25-55	16-37	4-18
	62-72	Sandy clay loam, clay loam.	SC, CL, CL-ML, CH	A-4, A-6, A-7-6	0	95-100	90-100	65-95	36-70	25-55	6-32
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
Gr--------- Grantham	0-10	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	55-85	<30	NP-7
	10-72	Loam, silt loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	100	90-100	60-95	22-49	8-30
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
GuA:											
Goldsboro-------	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	50-95	13-30	---	NP
	10-62	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-100	25-55	16-37	4-18
	62-72	Sandy clay loam, clay loam.	SC, CL, CL-ML, CH	A-4, A-6, A-7-6	0	95-100	90-100	65-95	36-70	25-55	6-32
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											
KuB--------- Kureb	0-80	Sand----------	SP, SP-SM	A-3	0	100	100	60-100	0-7	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
La---------- Leaf	0-8	Silt loam--------	ML, CL	A-4, A-6	0	100	95-100	85-100	50-90	30-40	5-15
	8-72	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	75-95	42-65	20-38
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
Lc: Lynchburg-------	0-14	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	14-74	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	16-40	4-18
Urban land.											
Le---------- Lenoir	0-12	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	20-35	4-10
	12-72	Clay, silty clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
LF---------- Lafitte	0-54	Muck----------	PT	---	0	---	---	---	---	---	---
	54-72	Variable---------	---	---	---	---	---	---	---	---	---
Ln---------- Leon	0-21	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	21-49	Sand, fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	49-72	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
Ly---------- Lynchburg	0-14	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	14-74	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	16-40	4-18
	74-80	Variable---------	---	---	---	---	---	---	---	---	---
Me---------- Meggett	0-14	Sandy loam-------	SM	A-2, A-4	0	100	90-100	85-100	13-41	---	NP
	14-48	Clay, sandy clay, clay loam.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-60	20-30
	48-80	Variable---------	---	---	---	---	---	---	---	---	---
MM: Masontown-------	0-20	Mucky fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	60-75	<35	NP-7
	20-60	Fine sandy loam, loam, silt loam.	SM, SM-SC, ML	A-4	0	100	95-100	70-100	40-90	<30	NP-7
	60-80	Loamy sand, sand, sandy loam.	SM, SP-SM	A-2, A-3, A-5	0	100	95-100	50-75	5-40	---	NP
Muckalee--------	0-5	Sandy loam-------	ML, SC, SM, SM-SC	A-2, A-4	0	95-100	90-100	50-95	30-60	<30	NP-10
	5-80	Sandy loam, loamy sand.	SM	A-2, A-4	0	95-100	80-100	60-90	20-40	<20	NP-3
Mu---------- Murville	0-10	Mucky loamy sand	SM, SP-SM	A-2-4, A-3	0	100	100	85-100	5-30	---	NP
	10-36	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	85-100	5-20	---	NP
	36-80	Loamy sand, sand.	SP-SM, SP	A-2, A-3	0	100	100	80-100	3-20	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NoA, NoB--------- Norfolk	0-14	Loamy fine sand	SM	A-2	0	95-100	92-100	50-95	13-30	---	NP
	14-80	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-63	20-38	4-15
NuB: Norfolk---------	0-14	Loamy fine sand	SM	A-2	0	95-100	92-100	50-95	13-30	---	NP
	14-80	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-63	20-38	4-15
Urban land.											
On--------------- Onslow	0-13	Loamy sand-------	SM, SP-SM	A-2, A-3, A-4	0	100	95-100	60-100	5-38	---	NP
	13-65	Sandy clay loam, sandy loam, clay loam.	SC, CL, SC, ML	A-2, A-4, A-6	0	100	95-100	60-100	30-55	<30	NP-17
	65-80	Variable---------	---	---	---	---	---	---	---	---	---
Pa--------------- Pantego	0-15	Fine sandy loam	SM, SM-SC, CL, ML	A-2, A-4	0	100	95-100	60-95	25-75	<35	NP-10
	15-48	Sandy clay loam, sandy loam, clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2	0	100	95-100	80-100	30-80	20-40	4-16
	48-62	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	100	95-100	90-100	36-80	25-49	11-24
	62-80	Variable---------	---	---	---	---	---	---	---	---	---
PC--------------- Ponzer	0-40	Muck-------------	PT	---	---	---	---	---	---	---	---
	40-54	Sandy loam, sandy clay loam, mucky fine sandy loam.	SM, ML, SC, CL	A-2, A-4, A-6	0	100	100	60-95	30-95	<40	NP-20
	54-80	Variable---------	---	---	---	---	---	---	---	---	---
Pt. Pits											
Ra--------------- Rains	0-16	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	16-41	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	41-66	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	16-40	3-18
	66-80	Variable---------	---	---	---	---	---	---	---	---	---
Rc: Rains----------	0-16	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	16-41	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	41-66	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	16-40	3-18
	66-80	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ro---------- Roanoke	0-11	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	85-100	80-100	45-85	25-55	<25	NP-7
	11-15	Clay loam, loam.	CL	A-6, A-7	0	95-100	85-100	80-100	80-95	35-45	14-20
	15-41	Clay, silty clay, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	41-80	Variable----------	---	---	---	---	---	---	---	---	---
Sc:											
Seabrook--------	0-6	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	6-80	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
Urban land.											
Se---------- Seabrook	0-6	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	6-80	Loamy sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
StA---------- State	0-13	Loamy sand-------	SM, SM-SC	A-2, A-1	0	95-100	95-100	45-75	15-30	<18	NP-6
	13-38	Sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	8-22
	38-70	Stratified sand to fine sandy loam.	SM, SM-SC, SP-SM	A-1, A-2, A-3, A-4	0	85-100	75-100	40-90	5-50	<25	NP-7
SuD---------- Suffolk	0-14	Loamy sand-------	SM, SM-SC	A-1, A-2, A-4	0	95-100	90-100	40-85	15-40	<18	NP-6
	14-38	Sandy clay loam, clay loam, sandy loam.	SC, CL	A-2, A-6	0	95-100	90-100	50-95	25-75	20-40	10-25
	38-80	Loamy sand, sandy loam, sand.	SP, SM, SM-SC	A-1, A-2, A-3, A-4	0	75-100	75-100	30-80	3-50	<18	NP-7
TaB---------- Tarboro	0-30	Sand----------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	85-100	40-99	8-35	---	NP
	30-80	Sand, loamy sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
Tc:											
Torhunta--------	0-12	Fine sandy loam	SM	A-2, A-4	0	100	95-100	70-96	20-49	<25	NP-4
	12-37	Sandy loam, fine sandy loam.	SM, SM-SC	A-2, A-4	0	100	95-100	70-92	20-40	<25	NP-7
	37-80	Loamy sand, sand, sandy loam.	SM, SP-SM, SM-SC	A-2, A-3	0	100	95-100	65-92	5-35	<25	NP-4
Urban land.											
Tm---------- Tomotley	0-11	Fine sandy loam	SM	A-2, A-4	0	98-100	95-100	75-98	25-50	<30	NP-7
	11-41	Fine sandy loam, sandy clay loam, clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	75-98	30-70	20-40	6-18
	41-80	Variable----------	---	---	---	---	---	---	---	---	---
To---------- Torhunta	0-12	Fine sandy loam	SM	A-2, A-4	0	100	95-100	70-96	20-49	<25	NP-4
	12-37	Sandy loam, fine sandy loam.	SM, SM-SC	A-2, A-4	0	100	95-100	70-92	20-40	<25	NP-7
	37-80	Loamy sand, sand, sandy loam.	SM, SP-SM, SM-SC	A-2, A-3	0	100	95-100	65-92	5-35	<25	NP-4

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TuB:											
Tarboro---------	0-30	Sand----------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	85-100	40-99	8-35	---	NP
	30-80	Sand, coarse sand, loamy sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
Urban land.											
Ud.											
Udorthents											
Ur.											
Urban land											

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
AaA----------	0-13	10-24	1.30-1.50	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.24	5	.5-3
Altavista	13-46	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.24		
	46-80	---	---	---	---	---	----------	----		
AcA:										
Altavista-------	0-13	10-24	1.30-1.50	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.24	5	.5-3
	13-46	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.24		
	46-80	---	---	---	---	---	----------	----		
Urban land.										
Ag----------	0-17	5-20	1.30-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.20	4	.5-2
Augusta	17-36	20-35	1.30-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24		
	36-45	3-18	1.35-1.55	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		
	45-80	---	---	---	---	---	----------	----		
Ap----------	0-16	8-18	1.45-1.60	2.0-6.0	0.11-0.15	3.6-5.5	Low----------	0.15	5	5-10
Arapahoe	16-56	8-18	1.45-1.60	2.0-6.0	0.10-0.14	3.6-7.8	Low----------	0.15		
	56-80	3-18	1.40-1.65	2.0-20	0.05-0.14	5.6-7.8	Low----------	0.10		
AuB----------	0-29	2-10	1.60-1.70	>6.0	0.04-0.09	4.5-5.5	Low----------	0.10	5	.5-1
Autryville	29-37	10-25	1.40-1.60	2.0-6.0	0.08-0.13	4.5-5.5	Low----------	0.10		
	37-42	2-8	1.60-1.70	>6.0	0.03-0.08	4.5-5.5	Low----------	0.10		
	42-61	10-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.17		
Ba----------	0-17	8-20	1.00-1.40	0.6-2.0	0.20-0.26	3.6-5.5	Low----------	0.10	---	10-20
Bayboro	17-62	35-65	1.20-1.40	0.06-0.2	0.14-0.18	4.5-5.5	Moderate-----	0.32		
	62-72	---	---	---	---	---	----------	----		
BrB----------	0-8	5-25	1.50-1.70	2.0-6.0	0.06-0.12	3.6-7.3	Low----------	0.20	5	0-2
Bragg	8-56	15-45	1.30-1.60	0.2-0.6	0.10-0.15	3.6-7.3	Low----------	0.28		
	56-66	---	---	---	---	---	----------	----		
CnB----------	0-24	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.15	5	.5-2
Conetoe	24-35	10-22	1.40-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.15		
	35-80	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10		
CrB----------	0-9	6-20	1.30-1.55	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.37	5	.5-2
Craven	9-54	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.32		
	54-80	---	---	---	---	---	----------	----		
CT----------	0-28	---	0.40-0.65	0.06-6.0	0.35-0.45	<4.5	Low----------	----	---	25-60
Croatan	28-42	8-20	1.40-1.60	0.2-6.0	0.10-0.15	3.6-6.5	Low----------	----		
	42-56	10-35	1.40-1.60	0.2-2.0	0.12-0.20	3.6-6.5	Low----------	----		
	56-80	---	---	---	---	---	----------	----		
DA----------	0-60	---	0.40-0.65	0.06-0.2	0.20-0.26	3.6-4.4	Low----------	----	---	20-95
Dare	60-80	2-12	1.60-1.70	6.0-20	0.04-0.09	3.6-6.0	Low----------	0.15		
De----------	0-19	5-20	1.30-1.50	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.24	5	2-9
Deloss	19-58	18-35	1.30-1.60	0.6-2.0	0.12-0.18	3.6-6.5	Low----------	0.24		
	58-80	---	---	---	---	---	----------	----		
DO----------	0-15	---	0.25-0.40	0.6-2.0	0.25-0.50	3.6-5.5	Low----------	----	---	20-80
Dorovan	15-80	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-5.5	Low----------	----		20-80

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
ExA	0-11	6-18	1.30-1.50	2.0-6.0	0.15-0.20	4.5-5.5	Low	0.37	5	.5-2
Exum	11-60	18-35	1.30-1.40	0.2-0.6	0.15-0.20	4.5-5.5	Low	0.37		
	60-80	---	---	---	---	---	---	---		
GoA	0-10	2-8	1.55-1.75	6.0-20.0	0.06-0.11	4.5-5.5	Low	0.17	5	.5-2
Goldsboro	10-62	18-35	1.30-1.50	0.6-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	62-72	20-35	1.30-1.40	0.2-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	72-80	---	---	---	---	---	---	---		
Gr	0-10	6-18	1.30-1.50	2.0-6.0	0.13-0.20	3.6-5.5	Low	0.37	5	2-4
Grantham	10-72	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.43		
	72-80	---	---	---	---	---	---	---		
GuA:										
Goldsboro	0-10	2-8	1.55-1.75	6.0-20.0	0.06-0.11	4.5-5.5	Low	0.17	5	.5-2
	10-62	18-35	1.30-1.50	0.6-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	62-72	20-35	1.30-1.40	0.2-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	72-80	---	---	---	---	---	---	---		
Urban land.										
KuB	0-80	0-3	1.60-1.80	6.0-20	<0.05	4.5-7.3	Low	0.10	5	<.5
Kureb										
La	0-8	12-25	1.30-1.50	0.06-0.2	0.20-0.22	3.6-5.5	Low	0.32	4	1-3
Leaf	8-72	35-60	1.30-1.50	<0.06	0.18-0.21	3.6-5.5	High	0.32		
	72-80	---	---	---	---	---	---	---		
Lc:										
Lynchburg	0-14	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low	0.20	5	.5-5
	14-74	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
	74-80	---	---	---	---	---	---	---		
Urban land.										
Le	0-12	6-20	1.30-1.50	0.6-2.0	0.14-0.18	3.6-5.5	Low	0.37	5	2-4
Lenoir	12-72	35-60	1.30-1.50	0.06-0.2	0.13-0.15	3.6-5.5	Moderate	0.32		
	72-80	---	---	---	---	---	---	---		
LF	0-54	---	0.05-0.25	2.0-6.0	0.18-0.45	6.1-8.4	Low	---	---	30-70
Lafitte	54-72	---	---	---	---	---	---	---		
Ln	0-21	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low	0.10	5	.5-4
Leon	21-49	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low	0.15		
	49-72	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	Low	0.10		
Ly	0-14	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low	0.20	5	.5-5
Lynchburg	14-74	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
	74-80	---	---	---	---	---	---	---		
Me	0-14	5-20	1.10-1.30	2.0-6.0	0.10-0.15	4.5-6.5	Low	0.24	5	2-8
Meggett	14-48	40-60	1.50-1.75	0.06-0.2	0.13-0.18	6.1-8.4	High	0.32		
	48-80	---	---	---	---	---	---	---		
MM:										
Masontown	0-20	10-18	1.00-1.30	2.0-6.0	0.20-0.26	5.6-7.8	Low	0.10	5	8-20
	20-60	10-18	1.20-1.50	2.0-6.0	0.12-0.20	5.6-7.8	Low	0.20		
	60-80	2-18	1.40-1.60	2.0-20	0.02-0.12	5.6-7.8	Low	0.10		
Muckalee	0-5	10-25	---	0.6-2.0	0.09-0.15	5.1-7.3	Low	0.20	5	---
	5-80	5-20	---	0.6-2.0	0.08-0.12	5.6-8.4	Low	0.20		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
Mu	0-10	2-8	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	Low	0.10	5	9-20
Murville	10-36	2-8	1.60-1.75	2.0-6.0	0.05-0.09	3.6-5.5	Low	0.10		
	36-80	2-8	1.60-1.75	6.0-20	0.04-0.17	3.6-5.5	Low	0.10		
NoA, NoB	0-14	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-5.5	Low	0.20	5	.5-2
Norfolk	14-80	18-35	1.30-1.45	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.24		
NuB:										
Norfolk	0-14	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-5.5	Low	0.20	5	.5-2
	14-80	18-35	1.30-1.45	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.24		
Urban land.										
On	0-13	2-8	1.60-1.75	>6.0	0.07-0.11	3.6-5.5	Low	0.17	4	.5-2
Onslow	13-65	15-35	1.30-1.50	0.6-2.0	0.12-0.17	3.6-5.5	Low	0.24		
	65-80	---	---	---	---	---	---	---		
Pa	0-15	5-15	1.40-1.60	2.0-6.0	0.10-0.20	3.6-5.5	Low	0.15	5	4-10
Pantego	15-48	18-35	1.30-1.40	0.6-2.0	0.12-0.20	3.6-5.5	Low	0.28		
	48-62	18-40	1.25-1.40	0.6-2.0	0.15-0.20	3.6-5.5	Low	0.28		
	62-80	---	---	---	---	---	---	---		
PO	0-40	---	0.40-0.65	0.06-6.0	0.35-0.45	3.6-4.4	Low	---	---	20-80
Ponzer	40-54	5-25	1.30-1.60	0.2-6.0	0.10-0.24	3.6-7.8	Low	0.24		
	54-80	---	---	---	---	---	Low	---		
Pt.										
Pits										
Ra	0-16	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.20	5	1-6
Rains	16-41	18-35	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	41-66	15-45	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		
	66-80	---	---	---	---	---	---	---		
Rc:										
Rains	0-16	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.20	5	1-6
	16-41	18-35	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	41-66	15-45	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		
	66-80	---	---	---	---	---	---	---		
Urban land.										
Ro	0-11	10-18	1.20-1.50	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28	4	1-3
Roanoke	11-15	20-35	1.20-1.50	0.2-0.6	0.16-0.19	3.6-5.5	Moderate	0.24		
	15-41	35-60	1.35-1.65	0.06-0.2	0.10-0.19	3.6-5.5	Moderate	0.24		
	41-80	---	---	---	---	---	---	---		
Sc:										
Seabrook	0-6	2-8	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low	0.10	5	.5-2
	6-80	2-10	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low	0.10		
Urban land.										
Se	0-6	2-8	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low	0.10	5	.5-2
Seabrook	6-80	2-10	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low	0.10		
StA	0-13	2-8	1.35-1.45	2.0-6.0	0.06-0.09	4.5-5.5	Low	0.28	5	<1
State	13-38	18-35	1.35-1.50	0.6-2.0	0.14-0.19	4.5-5.5	Low	0.28		
	38-70	2-15	1.35-1.50	>2.0	0.02-0.10	4.5-6.0	Low	0.17		
SuD	0-14	4-10	1.40-1.50	2.0-20	0.05-0.10	4.5-5.5	Low	0.24	4	.5-1
Suffolk	14-38	10-33	1.40-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	38-80	4-10	1.40-1.50	2.0-20	0.04-0.10	4.5-6.0	Low	0.17		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
TaB----------	0-30	3-8	1.60-1.75	6.0-20	0.05-0.09	5.1-6.5	Low----------	0.10	5	.5-1
Tarboro	30-80	2-7	1.60-1.75	>20	0.02-0.06	5.1-6.5	Low----------	0.10		
Tc:										
Torhunta--------	0-12	5-18	1.35-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15	5	3-10
	12-37	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15		
	37-80	2-18	1.45-1.65	6.0-20	<0.05	3.6-5.5	Low----------	0.10		
Urban land.										
Tm----------	0-11	5-20	1.30-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20	5	1-6
Tomotley	11-41	18-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.20		
	41-80	---	---	---	---	---	----------	----		
To----------	0-12	5-18	1.35-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15	5	3-10
Torhunta	12-37	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15		
	37-80	2-18	1.45-1.65	6.0-20	<0.05	3.6-5.5	Low----------	0.10		
TuB:										
Tarboro---------	0-30	3-8	1.60-1.75	6.0-20	0.05-0.09	5.1-6.5	Low----------	0.10	5	.5-1
	30-80	2-7	1.60-1.75	>20	0.02-0.06	5.1-6.5	Low----------	0.10		
Urban land.										
Ud.										
Udorthents										
Ur.										
Urban land										

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
AaA---------- Altavista	C	None-------	---	---	1.5-2.5	Apparent	Dec-Mar	---	---	Moderate	Moderate.
AcA: Altavista-----	C	None-------	---	---	1.5-2.5	Apparent	Dec-Mar	---	---	Moderate	Moderate.
Urban land.											
Ag---------- Augusta	C	None-------	---	---	1.0-2.0	Apparent	Dec-Mar	---	---	High-----	Moderate.
Ap---------- Arapahoe	B/D	Rare-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
AuB---------- Autryville	A	None-------	---	---	>5.0	---	---	---	---	Low------	High.
Ba---------- Bayboro	D	None-------	---	---	+1-1.0	Apparent	Dec-May	---	---	High-----	High.
BrB---------- Bragg	C	None-------	---	---	>6.0	---	---	---	---	Moderate	High.
CnB---------- Conetoe	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
CrB---------- Craven	C	None-------	---	---	2.0-3.0	Apparent	Dec-Apr	---	---	High-----	High.
CT---------- Croatan	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	4-10	18-24	High-----	High.
DA---------- Dare	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	6-20	36-60	High-----	High.
De---------- Deloss	B/D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
DO---------- Dorovan	D	Frequent---	Very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	4-10	10-30	High-----	High.
ExA---------- Exum	C	None-------	---	---	2.0-3.0	Apparent	Dec-Mar	---	---	Moderate	High.
GoA---------- Goldsboro	B	None-------	---	---	2.0-3.0	Apparent	Dec-Mar	---	---	Moderate	High.
Gr---------- Grantham	D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
GuA: Goldsboro-----	B	None-------	---	---	2.0-3.0	Apparent	Dec-Mar	---	---	Moderate	High.
Urban land.											

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
KuB---------- Kureb	A	None-------	---	---	>6.0	---	---	---	---	Low------	Low.
La---------- Leaf	D	None-------	---	---	0.5-1.5	Apparent	Dec-Apr	---	---	High-----	Moderate.
Lc: Lynchburg-----	C	None-------	---	---	1.0-1.5	Apparent	Dec-Mar	---	---	High-----	High.
Urban land.											
Le---------- Lenoir	D	None-------	---	---	1.0-2.0	Apparent	Dec-Apr	---	---	High-----	High.
LF---------- Lafitte	D	Frequent---	Brief to very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	15-30	>51	High-----	Moderate.
Ln---------- Leon	B/D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
Ly---------- Lynchburg	C	None-------	---	---	1.0-1.5	Apparent	Dec-Mar	---	---	High-----	High.
Me---------- Meggett	D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	Moderate.
MM: Masontown-----	D	Frequent---	Long---	Nov-Apr	+1-0.5	Apparent	Nov-Apr	---	---	Moderate	Moderate.
Muckalee------	D	Frequent---	Brief	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	---	---	High-----	Moderate.
Mu---------- Murville	A/D	Rare-------	---	---	+1-1.0	Apparent	Jan-Dec	---	---	High-----	Moderate.
NoA, NoB------- Norfolk	B	None-------	---	---	4.0-6.0	Apparent	Jan-Mar	---	---	Moderate	High.
NuB: Norfolk-------	B	None-------	---	---	4.0-6.0	Apparent	Jan-Mar	---	---	Moderate	High.
Urban land.											
On---------- Onslow	B	None-------	---	---	1.5-3.0	Apparent	Dec-Mar	---	---	High-----	High.
Pa---------- Pantego	B/D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
PO---------- Ponzer	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	9-12	18-24	High-----	High.
Pt. Pits											
Ra---------- Rains	B/D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	High.
Rc: Rains---------	B/D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	High.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
Rc: Urban land.											
Ro---------- Roanoke	D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
Sc: Seabrook------	C	None-------	---	---	2.0-4.0	Apparent	Dec-Mar	---	---	Low------	Moderate.
Urban land.											
Se---------- Seabrook	C	None-------	---	---	2.0-4.0	Apparent	Dec-Mar	---	---	Low------	Moderate.
StA---------- State	B	None-------	---	---	4.0-6.0	Apparent	Dec-Mar	---	---	Moderate	High.
SuD---------- Suffolk	B	None-------	---	---	>6.0	---	---	---	---	Moderate	High.
TaB---------- Tarboro	A	None-------	---	---	>6.0	---	---	---	---	Low------	Moderate.
Tc: Torhunta------	C	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
Urbanland.											
Tm---------- Tomotley	B/D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	High.
To---------- Torhunta	C	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
TuB: Tarboro-------	A	None-------	---	---	>6.0	---	---	---	---	Low------	Moderate.
Urban land.											
Ud. Udorthents											
Ur. Urban land											

TABLE 17.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth (in inches) *	Classification		Grain-size distribution							Liquid limit	Plasticity index	Moisture density	
	AASHTO	Unified	Percentage smaller than--				Percentage smaller than--					Maximum dry density	Optimum moisture
			No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
										Pct		Lb/ft^3	Pct
Bayboro mucky loam: (S77NC-49-35)													
A 0-13	A-4(0)	SM	**	**	**	47	23	6	4	---	NP	---	---
Btg1 17-33	A-7-6(20)	CL	100	100	100	93	59	43	36	42	20	99	21
Cg 62-72	A-6(20)	CL	100	100	100	91	53	41	34	40	21	103	19
Craven silt loam: (S77NC-49-1)													
Ap 0-7	A-4(3)	ML	100	100	98	88	54	20	11	28	4	100	18
Bt1 12-22	A-7-6(38)	CH	100	100	100	96	80	62	53	68	43	94	27
C1 54-70	A-2-4(0)	SM-SC	100	98	84	24	21	19	18	25	7	118	13
Kureb sand: (S77NC-49-12)													
A 0-5	A-3(0)	SP	100	100	80	2	1	1	1	---	NP	99	18
C/Bh 18-35	A-3(0)	SP	100	100	82	3	3	1	1	---	NP	103	15
C2 68-80	A-3(0)	SP	100	100	84	2	1	1	1	---	NP	104	15
Leaf silt loam: (S77NC-49-26)													
Ap 0-8	A-4(6)	ML	100	100	98	84	43	17	8	35	7	92	23
Btg1 8-36	A-7-6(36)	CH	100	100	99	95	69	54	46	56	34	100	21
Cg 72-80	A-4(0)	SM	100	100	94	42	25	16	12	---	NP	121	11
Murville mucky loam sand: (S77NC-49-28)													
A 0-10	A-2-4(0)	SM	100	100	86	27	15	7	3	---	NP	78	27
Bg 10-36	A-2-4(0)	SM	100	100	86	18	12	7	5	---	NP	94	22
C 36-80	A-3(0)	SP-SM	100	100	84	5	3	2	2	---	NP	104	15

* Location of pedon sampled is the same as that given for the typical pedon in "Soil Series and Their Morphology."

** Entries were omitted because of erroneous values.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Arapahoe	Coarse-loamy, mixed, nonacid, thermic Typic Humaquepts
Augusta	Fine-loamy, mixed, thermic Aeric Ochraquults
Autryville	Loamy, siliceous, thermic Arenic Paleudults
Bayboro	Clayey, mixed, thermic Umbric Paleaquults
Bragg	Fine-loamy, siliceous, acid, thermic Typic Udorthents
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Craven	Clayey, mixed, thermic Aquic Hapludults
Croatan	Loamy, siliceous, dysic, thermic Terric Medisaprists
Dare	Dysic, thermic Typic Medisaprists
Deloss	Fine-loamy, mixed, thermic Typic Umbraquults
*Dorovan	Dysic, thermic Typic Medisaprists
Exum	Fine-silty, siliceous, thermic Aquic Paleudults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Grantham	Fine-silty, siliceous, thermic Typic Paleaquults
*Kureb	Thermic, uncoated Spodic Quartzipsamments
Lafitte	Euic, thermic Typic Medisaprists
Leaf	Clayey, mixed, thermic Typic Albaquults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Masontown	Coarse-loamy, siliceous, nonacid, thermic Cumulic Humaquepts
Meggett	Fine, mixed, thermic Typic Albaqualfs
Muckalee	Coarse-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Murville	Sandy, siliceous, thermic Typic Haplaquods
Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults
*Onslow	Fine-loamy, siliceous, thermic Spodic Paleudults
Pantego	Fine-loamy, siliceous, thermic Umbric Paleaquults
Ponzer	Loamy, mixed, dysic, thermic Terric Medisaprists
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Roanoke	Clayey, mixed, thermic Typic Ochraquults
Seabrook	Mixed, thermic Aquic Udipsamments
State	Fine-loamy, mixed, thermic Typic Hapludults
Suffolk	Fine-loamy, siliceous, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Tomotley	Fine-loamy, mixed, thermic Typic Ochraquults
Torhunta	Coarse-loamy, siliceous, acid, thermic Typic Humaquepts

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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