SOIL SURVEY

SERIES 1956, NO. 1
ISSUED FEBRUARY 1960

Terrebonne Parish

LOUISIANA

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
LOUISIANA AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Terrebonne Parish will serve various groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields, and it will add to the knowledge of soil scientists.

In making this survey, soil scientists walked over the fields and woodlands and explored marsh areas that could be reached only by boat. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noticed differences in growth of crops, weeds, and brush; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming, trees, wildlife, and related uses.

The scientists plotted the boundaries of the soils on aerial photographs. Then, cartographers prepared from the photographs the detailed soil map in the back of this report. Fields, woods, roads, bayous, creeks, and many other landmarks can be seen on the map.

Locating the soils

Use the index to map sheets to locate areas on the large map. The index is a small map of the parish on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map is found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map. Suppose, for example, an area located on the map has the symbol Ca. The legend for the detailed map shows that this symbol identifies Commerce silt loam, level phase. This soil and all others mapped in the parish are described in the section Descriptions of the Soils.

Finding information

Special sections of the report will interest different groups of readers. The introductory part, which mentions climate and physiography, relief, and drainage, and gives some statistics on agriculture, will be of interest mainly to those not familiar with the parish.

Farmers and those who work with farmers can learn about the soils in the section Descriptions of the Soils, and then turn to the section Use and Management of Soils. In this way they first identify the soils on their farm or plantation and then learn how these soils can be managed and what yields can be expected. The soils are grouped by capability units; that is, groups of soils that need similar management and respond in about the same way. For instance, in the section Descriptions of the Soils, Commerce silt loam, level phase, is shown to be in management group I–1 (capability unit I–1). The management this soil needs, therefore, will be stated under the heading, Management Group I–1, in the section Management Groups of Soils, and in table 5.

Soil scientists will find information about how the soils were formed and how they were classified in the section Genesis, Morphology, and Classification of Soils.

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending upon their particular interest.

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Fieldwork for this survey was completed in 1956. Unless otherwise indicated, all statements in the report refer to conditions in the parish at that time. The soil survey of Terrebonne Parish, La., is part of the technical assistance furnished to the Lafourche-Terrebonne Soil Conservation District.

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SOIL SURVEY OF TERREBONNE PARISH, LOUISIANA

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

General Nature of the Area

Terrebonne Parish is in the southern part of Louisiana. Much of the land is at sea level, and areas near the coast are inundated by normal tides of 1.5 feet. During tropical storms, however, large areas of the parish may be flooded to depths of several feet. Some lowland areas are flooded occasionally by the Lower Atchafalaya River.

Fertile alluvial soils occur along the natural levee ridges in the northern part of Terrebonne Parish. These ridges border present streams and former channels. They decrease in height and width as they extend generally to the southeast. The sediments were deposited by the Mississippi River from the fertile areas through which it flows—from the phosphate rocks of Tennessee, the limestones of the Upper Mississippi Valley, and alluvium from the eastern Rocky Mountains and the Great Plains. Some sediments were deposited by the Red River.

The soils in Terrebonne Parish are high in most plant nutrients. Under proper management, the better drained soils produce heavy yields. Sugarcane does well because of the humid, subtropical climate with its long growing season. It was planted by the early settlers and continues to be the major agricultural product in the parish. Other crops are corn, soybeans, pasture grasses, and legumes. Some areas of coastal marshes are suitable for seasonal grazing. Other areas are suited to wildlife. Some of the areas could be reclaimed and used for tilled crops. Trees and forage plants grow in the coastal swamps. These swamps are used by hunters and trappers.

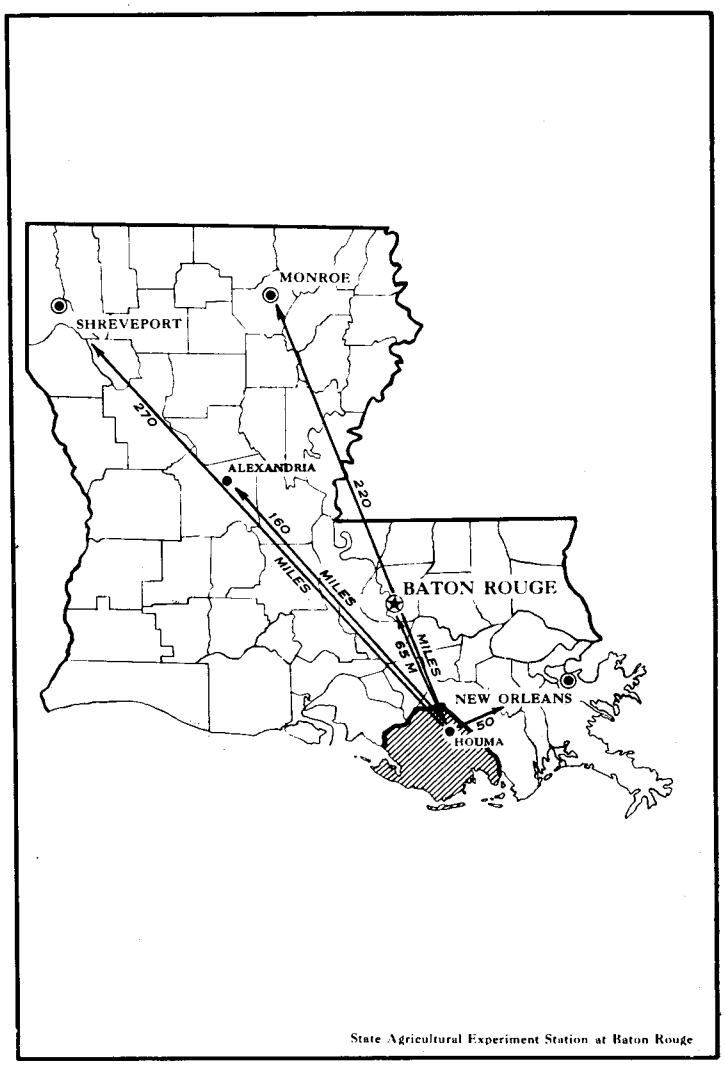

Figure 1.—**Location of Terrebonne Parish in Louisiana.**

Location and Extent

Terrebonne is one of the southernmost parishes in Louisiana. It has the largest total area (land and water) and the second largest land area of all the parishes in the State. The land area is approximately 890,240 acres, or 1,391 square miles (fig. 1).

Terrebonne Parish is bordered on the south by the Gulf of Mexico, on the north and east by Lafourche Parish, and on the west by Assumption and St. Mary Parishes. From the Isles Dernieres in the south to the Lafourche-Parish line north of Schriever is a distance of 51 miles. From Bayou Pointe Au Chien on the eastern boundary to Point Au Fer on the west is 58 miles. Terrebonne Parish is between the parallels of 29° 3′ and 29° 47′ north latitude and the meridians 90° 23′ and 91° 22′ west longitude.

Physiography, Relief, and Drainage

This parish, in the Mississippi River delta, consists of undulating narrow ridges, back-swamp borders of the ridges, and extensive swamps and marshes. The wet coastal marshes and swamps range from sea level to about 3 feet in elevation. They are frequently inundated by overflow from the streams or by tides. These low areas make up about 91 percent of the parish.

The areas suited to crops are on the low natural levee ridges in the northern and eastern parts of the parish. Near Schriever, some of the ridges are 16 feet high, but they become progressively lower and narrower as they extend from north to south.

This coastal parish is an area of slow subsidence. This subsidence is shown by the double islands which were former natural levee ridges, the numerous lakes and bays, the excessively wide channels of streams along the coastline, the submerged reefs, and the wearing away of the coastal islands and coastline *(2)*.[1] In the southeastern and east-central parts of the parish, some narrow natural levee ridges once used for cultivation are now subject to flooding.

Terrebonne Parish is generally poorly drained. The channels of many of the streams, bayous, and canals are at or near the level of the gulf and do not remove water effectively. The Lower Atchafalaya River, the largest active stream, flows along the western border of the parish. It brings sediments from the Mississippi and Red Rivers and distributes them over the western marshes. Other large streams that were once active in building up the natural levee ridges—Bayou Black, Little Bayou Black, Bayou Terrebonne, Bayou du Large, Bayou Grand Caillou, and Bayou Petit Caillou—now carry little drainage water except from their narrow watersheds.

Bayou Black, Bayou Terrebonne, and Little Bayou Black enter the parish from the north and northwest. They follow narrow channels between levee ridges southeasterly to Houma. From Houma the streams generally flow to the south and southwest.

Approximately 10 miles south of Houma, most of the stream channels are at sea level. These streams flow slowly or are stagnant. The direction of their flow is determined by the direction of the winds and the height of the tides in this area. During prolonged periods of high tides, the water in the streams and canals is raised and the surface water cannot flow from the land.

In the southern part of the parish, many bayous end in shallow lakes or bays. Most major stream channels can be traced across the marshes and into the bays, the lakes, and the Gulf of Mexico.

Numerous small and large lakes, bayous, and segments of bayous occur in the coastal marshes. Many canals have been constructed in the marshes and swamps for use in the exploration and production of oil, gas, and sulfur.

The Intracoastal Waterway crosses the northern part of the parish and intersects the Lower Atchafalaya River. Parts of the waterway are occasionally flooded by the Lower Atchafalaya River, and water is impounded in adjacent land areas.

[1] Numbers in italics refer to Literature Cited, p. 43.

Climate

Terrebonne Parish has a mild, humid, subtropical climate. Climatic data from the United States Weather Bureau Station at Houma are given in table 1.

The summers are long and hot. Fall weather is warm and is often without killing frosts. There are a few cool days. The winters are usually mild and cool, but a few days are cold. Spring weather is mild and warm.

The latest killing frost in spring occurred on April 10, 1938; the earliest in fall was on October 25, 1903. Terrebonne Parish has a long growing season. The average frost-free period of 264 days extends from February 27 to November 18.

Rainfall is well distributed throughout the growing season. The rains are generally heavy showers of short duration, although occasional gentle rains occur that last more than a day. Rains of 3 to 6 inches or more in 24 hours occur annually, but such storms are not frequent. Prolonged dry and wet periods are unusual. Occasionally, the spring seasons are too wet and the fall seasons too dry for planting and cultivating sugarcane.

The weather is usually mild enough in February for planting corn and cultivating sugarcane. Usually, by

TABLE 1.—*Temperature and precipitation at Houma, Terrebonne Parish, La.*

[Elevation, 13 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1899)	Wettest year (1942)	Average snowfall
	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
December	56.8	89	15	4.75	4.38	3.56	[3]
January	56.4	88	14	4.50	1.00	1.32	[3]
February	58.8	87	5	4.01	4.15	8.39	.4
Winter	57.3	89	5	13.26	9.53	13.27	.4
March	62.6	90	25	5.44	.26	6.22	[3]
April	68.9	92	28	4.32	2.08	3.46	0
May	74.5	99	42	4.41	1.50	5.05	0
Spring	68.7	99	25	14.17	3.84	14.73	[3]
June	79.9	104	51	6.32	3.37	15.00	0
July	81.3	102	58	7.86	3.17	12.94	0
August	81.3	101	56	7.73	5.70	10.19	0
Summer	80.8	104	51	21.91	12.24	38.13	0
September	78.4	100	43	6.57	1.39	9.08	0
October	70.5	96	30	4.13	4.86	11.00	0
November	61.0	91	21	4.64	1.17	1.32	0
Fall	70.0	100	21	15.34	7.42	21.40	0
Year	69.2	104	5	64.68	33.03	87.53	.4

[1] Average temperature based on a 66-year record, through 1955; highest temperature on a 63-year record and lowest temperature on a 62-year record, through 1952.

[2] Average precipitation based on a 65-year record, through 1955; wettest and driest years based on a 64-year record, in the period 1889–1955; snowfall based on a 56-year record, through 1952.

[3] Trace.

March, all of the better drained soils have become warm, and corn planting is completed between the light showers. In April and May, the finer textured soils that have adequate drainage are planted to corn and the sugarcane is cultivated. By late May, some of the sugarcane and corn can be given a final cultivation.

The heaviest rainfall occurs in summer, but usually not more than 2 or 3 inches fall during a 48-hour period. The weather is generally somewhat dry in the fall, but there is usually enough moisture for planting sugarcane for the next year's crop. The sugarcane harvest starts about the middle of October and is usually completed by January 1.

A southerly or southeasterly breeze from the Gulf of Mexico alleviates the discomfort of the usual high humidity and high temperatures in summer and early in fall. The evenings, nights, and mornings are usually cool throughout the year. Hurricanes occur once or twice in every 3 to 7 years. These destructive winds bring in the waters of the gulf and spread them over large areas of the marshes and lower lying natural levee ridges to depths of 10 feet. The normal daily tides inundate the lower coastal marshes to depths of 12 to 18 inches.

Water Supply

There is an abundant supply of water suitable for livestock in the farming areas. In the northern part of the parish fresh water is obtained from wells 150 to 200 feet deep. The supply is limited and may be contaminated by salt water, especially during droughts.

The supply of water suitable for public use is obtained at Houma from Bayou Black and the Intracoastal Waterway. At the present time, no appreciable amount of surface water is carried by Bayou Black and other smaller streams. During extremely dry seasons and occasionally after storms, salt water enters the Intracoastal Waterway and makes the water too salty for drinking. The surface water is pumped into a reservoir at Houma and is made suitable for drinking at considerable expense. This water system has been enlarged, and a pipeline now carries water from Houma to rural areas in the parish. Most families in rural areas formerly caught rainwater and stored it in cisterns.

Vegetation

Grasses, rushes, sedges, and herbs are the dominant plants in Terrebonne Parish. These plants grow luxuriantly in the coastal marshes. Small forested areas are on the higher natural levee ridges and, in most places, on the subsided areas along the borders of the ridges.

The vegetation of the coastal marsh is affected by the salinity of the soil and water. Near the coastline, in the areas frequently inundated by salty tidewater or by occasional high tides during storms, the dominant vegetation has a salt tolerance of 2 percent or more. Major plants of the salt-water marshes are oystergrass (*Spartina alterniflora*), black rush (*Juncus roemerianus*), and black-mangrove (*Avicennia nitida*).

The landward area, or innermost part of the coastal marsh, is often flooded by fresh water from the swamps and ridges. This area has a dense growth of fresh-water or nearly fresh-water plants, tolerant to less than 0.5 percent salt. The dominant plants in the fresh-water marshes are paille fine (*Panicum hemitomon*), cattail (*Typha latifolia*), delta potato (*Sagittaria lancifolia*), and cutgrass (*Zizaniopsis miliacea*).

Between the areas of salt-water marsh and fresh-water marsh, a broad belt of soils supports plants that are tolerant to brackish water (0.5 to 2 percent salt). The dominant plants of these brackish marshes are couchgrass (*Spartina patens*), big cordgrass (*S. cynosuroides*), and three-cornergrass (*Scirpus olneyi*).

The trees on the higher and better drained soils of the ridges include sweetgum, magnolia, hackberry, mulberry, water oak, and live oak.

Low areas of forest and swamps occur in many places between the fresh-water marsh and the natural levee ridges. These areas are often flooded, and water covers the surface much of the time. The forest trees of these swamps are cypress, tupelo-gum, swamp maple, and ash.

Volunteer grasses on the natural levee ridges are bermudagrass, dallisgrass, johnsongrass, bluestem, vaseygrass, and carpetgrass. St. Augustinegrass grows on some areas of the low natural levee ridges in the southeastern part of the parish.

Settlement, Organization, and Population

Before 1765 few white settlers lived in the area. They were chiefly hunters, trappers, and fishermen from settlements near New Orleans. Some English, French, and Creole farmers lived in scattered communities along the bayous in areas not frequently flooded.

In 1765, French Acadians came into the area (*3*) (*4*). Another group of Acadians arrived later by way of Santo Domingo and established homes on the higher natural levee ridges in the northern part of the parish. After 1790, French refugees from the West Indies (now the Dominican Republic) arrived in New Orleans, and by 1820 many of them had settled along the bayous in this area. In 1822 the population of the area was less than 2,000 (*3*).

The Houma Indians, a Choctaw tribe, probably came into the parish after 1776. Late in the 17th century, this tribe was living in an area that is now part of West Feliciana Parish. After a conflict with the Tunica Indians in 1706 or 1709, the Houmas moved to Bayou St. John, within the present limits of New Orleans (*3*). Later they moved westward to Bayou Lafourche and thence into Terrebonne Parish.

The Indians settled along the navigable bayous. One of their main settlements was on Bayou Terrebonne at the site of the present city of Houma. The principal Indian settlements are now along Bayou Pointe Au Chien and Bayou St. Jean Charles. Others are in the Dulac and Petit Caillou communities. The population of the tribe has increased steadily.

Terrebonne Parish was organized in 1822 (*3*). Its French name fittingly describes the fertile alluvial lands of the parish, although some records state that the parish got its name from that of an early settler—Derbonne. Others state that it was named after the bayou on which it is located.

The first court was held at Bayou Cane, 5 miles northwest of Houma. The parish seat was moved to Houma in 1834.

Houma, the largest city, had a population of 11,505 in 1950. Smaller towns in the parish are Schriever, Gibson, Chacahoula, Theriot, Dulac, Chauvin, and Montegut.

All settlements were located on the higher land along the navigable streams. Most of the population lives in rural areas. In many places, there is a continuous row of houses along each side of the highways that parallel the major streams.

Small settlements or communities have been built up around many of the large plantation headquarters in the parish. These plantation settlements include the dwellings of landowners or operators, tenants and laborers, and outbuildings such as barns, implement sheds, and shops. Many plantation settlements have 10 to 30 dwellings as well as a general store. Large community settlements have been built up around the two sugar mills in the parish.

Industries

The production of raw and refined sugar is the major agricultural industry of Terrebonne Parish. Two large mills provide year-round work for many employees. In 1954 this parish harvested 15,419 acres of sugarcane, or 6 percent of the crop harvested in Louisiana. There are several large gas and oilfields and sulfur mines in the parish.

Commercial fishing and seafood processing bring in large sums each year. A number of plants for processing and canning shrimp, crabmeat, and oysters employ skilled and unskilled labor. There are several meat-packing plants in the parish.

Terrebonne Parish is in the large fur-producing area of southern Louisiana. The annual take of muskrat, mink, otter, raccoon, nutria, and opossum is valued at thousands of dollars. The areas of coastal marsh are a winter feeding ground for wild geese and ducks. Considerable income is derived from hunting and fishing licenses, sports equipment, and transportation.

Many skilled laborers are employed in building and maintaining tugboats, barges, and trawlers, and in other marine construction. Machine and metalworking shops and ironworks repair and build machinery and parts for oil-drilling equipment, boats, motors, and farm equipment. The construction and maintenance of many miles of pipelines for oil, gas, and water is a major enterprise in the parish.

Transportation and Markets

The early travel was by boat along the bayous and other navigable streams. Transportation followed the flow of the streams from north to south. Later, a canal was built between Bayou Terrebonne and Bayou Lafourche. It reduced the distance to eastern markets and the cost of transportation. At the present time, a few settled areas may be reached only by boat.

Land travel was limited during the early days. Travel by foot or horseback was restricted by the many waterways and the lack of bridges. After bridges were built to connect the numerous segments of roads along the crests of the ridges, a system of passable roads was established. Travel by stagecoach then linked Terrebonne Parish with railroad lines to the west and steamship lines to the north. This pattern of roads became the basis of the present highways.

The New Orleans-Opelousas and Great Western Railroad (now the Southern Pacific) was completed through Schriever and Gibson in 1852 and was first used in 1855. In 1872 a branch railroad, now a part of the Southern Pacific Railroad, was built between Schriever and Houma.

Most settlements and towns in the parish can be reached by good shell, gravel, or hard-surfaced highways. The larger towns and settlements are on scheduled bus and truck routes. The old Spanish trail to the west (United States Highway No. 90) crosses the northern part of the parish through Houma to Gibson. Schriever and Houma are connected by hard-surfaced highways along Bayou Terrebonne and Little Bayou Black. Houma is connected with settlements and towns to the south and southeast by hard-surfaced highways that extend for considerable distances along Bayous du Large, Grand Caillou, Petit Caillou, and Terrebonne. Good gravel and shell roads connect with the hard-surfaced highways.

The Intracoastal Waterway is the main artery of inland boat travel between New Orleans and Orange, Texas. It was completed in 1934 and crosses the northern part of the parish. It carries large quantities of freight to and from Houma, which has become an important inland port. Some of the items carried are sugar, sugarcane, sulfur, oil, oil products, oil-well equipment and supplies, seafood, building materials, hardware, and automobiles.

Many streams, lakes, and bays are navigable to the Gulf of Mexico. Miles of canals have been built to carry supplies and equipment to sites of oil and gas exploration. Sulfur is carried by barge to processing plants. Shrimp and fishing fleets, oyster boats, tugs, barges, and pleasure boats are common on the navigable waterways.

An airport at Houma is adequate for private and commercial air traffic. Travel to remote areas is available by seaplane and helicopter.

Cultural Facilities

Each community, village, and city is a cultural center for the surrounding areas. There are churches of many denominations. Education is provided by elementary and high schools, both public and parochial, and a trade school. In 1954, 54 buses and 2 boats transported the children to and from school.

Recreational facilities are available throughout the parish. There are two well-equipped hospitals at Houma. The parish has one weekly and one semiweekly newspaper. Telephone and telegraph services are available to all towns and most rural areas. Fishermen in the gulf and workers in remote areas can be reached by wireless communication that is provided by the major power transmission companies and the oil companies. The parish has one commercial radio station.

Agriculture

Agricultural History of the Parish

The hunters and trappers who first came to the area from settlements at New Orleans saw the Indians raising small plots of beans, squash, potatoes, maize, and peas to supplement their diet of fish and game. The first permanent settlements were made on small farms on Bayous Black, Petit Caillou, and Terrebonne about the middle of the 18th century (*3*). Many of these settle-

Figure 2.—**Sugar fields and factory.**

ments were on French or Spanish land grants, and each had a frontage on a navigable bayou. The early settlers planted corn, rice, indigo, cotton, and sugarcane.

The soils were very productive, but drainage was generally poor except on the narrow natural levee ridges. The lowlands were frequently flooded. In 1828 the parish was submerged except for areas on the higher ridges of the natural levees. To protect the land from overflow by Bayou Lafourche, levees were built along the lower parts of some plantations. In 1901 a dam was built across this bayou at Donaldsonville (in Ascension Parish). It protects large areas of Terrebonne Parish from floodwaters from Bayou Lafourche.

Cotton was the first major crop, but it was superseded by sugarcane after 1794, when the process for granulating sugar was perfected. Sugarcane was introduced into Louisiana about 1725 from Santo Domingo (*8*). On most of the early farms it was processed into coarse brown sugar, sirup, and molasses.

In the late 1820's, larger acreages were planted to sugarcane. The size of the plantations was increased as rapidly as equipment for refining sugar could be obtained. The growth continued in spite of high freight rates, damaging floods, frosts, and tropical storms.

In the early part of the Civil War, a Federal blockade of the sugar-producing islands increased the market for this crop. In the 1861–62 season, 88 sugarhouses in Terrebonne Parish produced 28,839 hogsheads of sugar.

Sugar planting and general farming were disrupted in 1862–63 when the Federal army was in control of New Orleans. Many planters moved to Texas, taking their labor force with them. The scarcity of help for planting, cultivating, and harvesting the sugarcane crop resulted in poor yields, and a consequent loss of markets. In the 1864–65 season, 21 planters produced only 426 hogsheads of sugar (*1*). These conditions prevailed throughout and after the Civil War. The production of sugarcane declined drastically after the war as a result of labor difficulties, competition from Cuba and Hawaii, unfavorable weather, and floods (*8*).

The increased demand for sugar during World War I again expanded the sugarcane industry. This prosperity continued until farm prices collapsed in 1920–21. With increased industrial activity in 1934, sugarcane production resumed its present major role in the agriculture of the parish. At the time of the survey, a minor shift to pasture, forage crops, and beef cattle was taking place because of the Federal acreage allotment program.

Crops

Sugarcane is the principal agricultural crop (fig. 2). Corn is also a major crop, but its acreage is less than that of sugarcane. Other crops are soybeans, rice, garden vegetables, pasture grasses and clovers, and hay. The acreages of crops grown in stated years are given in table 2.

Only 8.6 percent of the parish is used for crops and pasture. The rest consists of swamps and marshes and small areas of poorly drained soils that occur along the borders of the natural levee ridges and are difficult to manage. Sugarcane and corn need a considerable amount of rainfall, but they do not produce good yields where there is an excess of water. To expand the present boundaries of plantations into the wet, poorly drained soils of the backswamp and marsh areas would require levees for flood control, ditches for drainage, and pumps for the removal of drainage water.

Sugarcane and corn are well suited to the warm climate, and yields on the fertile soils are generally good. However, sugarcane does not have time to mature and produce viable seed in the growing season of Terrebonne Parish. Sugarcane is best suited to the better drained soils, although it does well where adequate drainage is provided. Fields on the lowlands require more artificial drainage than those on the natural levee ridges.

TABLE 2.—*Acreage of the principal crops*

Crop	1939	1949	1954
	Acres	*Acres*	*Acres*
Corn for all purposes	19, 052	7, 056	5, 100
Rice threshed	(1)	155	250
Soybeans for all purposes	9, 705	[2] 8, 501	[2] 3, 133
Cowpeas for all purposes except processing	1, 277	263	185
Hay:			
Soybeans	(3)	850	480
Alfalfa	67	52	1, 606
Small grain cut for hay	(1)	108	44
Other hay cut	127	332	882
Sugarcane for sugar	15, 308	19, 233	15, 419
Sugarcane for seed	(1)	1, 371	935
Sugarcane for sirup	240	10	23
Sweetpotatoes	167	[4] 191	[5] 40
Potatoes	2, 998	[4] 649	[5] 582

[1] Data not reported.
[2] Soybeans for hay not included.
[3] Not reported separately.
[4] Farms with less than 15 bushels harvested not included.
[5] Farms with less than 20 bushels harvested not included.

The increase in acreage planted to sugarcane from 1939 to 1949 (table 2) was partly the result of improvements in farm machinery, better artificial drainage, improved varieties of cane, and more efficient use of fertilizers. The decrease in acreage between 1949 and 1954 was primarily brought about by a cut in sugarcane acreage under the Federal acreage allotment program. The reduction in acreage has resulted in the use of the more productive land for cane, and in the diversion of low-lying, poorly drained fields, having uncertain cane yields, to pasture and other crops.

Corn is grown in the cropping system usually after the third year of sugarcane. In 1954, the acreage planted to corn was about one-third that of sugarcane. The acreage planted in corn was approximately 1,950 acres less in 1954 than in 1949. In this period there was an increase in the total acreage in pasture and in the total number of cattle in the parish. Only a small percentage of the corn is sold; the rest is fed to livestock.

Soybeans are usually grown for green manure. In the sugarcane rotation, soybeans or corn commonly follow the third cane crop. A few cowpeas are grown for green manure.

Vetches, Austrian Winter peas, and sourclover (*Melilotus indica*) are planted as winter legumes in some fields of plant cane.

Rice is suited to most soils in the parish if adequate drainage can be established profitably. At the present time, only a small acreage of rice is planted annually. It does not fit into the cropping system commonly used by the sugarcane planter. When irrigated rice is grown on the same field for a few successive years, the soil becomes compact and puddled and is poorly suited to row crops.

Hay is harvested for home use on most farms. Volunteer grasses, such as johnsongrass, dallisgrass, vaseygrass, bermudagrass, and crabgrass, are commonly used for hay. A small acreage of alfalfa and some soybeans and oats are cut for hay.

Garden vegetables are grown on each plantation and are the major crop on many smaller farms. The vegetables include potatoes, sweetpotatoes, tomatoes, sweet corn, beans, onions, melons, squash, and cabbage.

Most farms have some trees that bear fruit and nuts for home use; a few small orchards produce crops for market. The common orchard trees are pecan, fig, orange, pear, and peach.

Pastures

Most plantations have small pastures near the headquarters for work stock and dairy cattle. In recent years, the acreage and quality of pastures have increased, partly as a result of reduced acreages in sugarcane under the Federal acreage allotment program. Before this program, however, many planters had established improved and unimproved pastures on some fields which were difficult to drain when used for sugarcane. According to the 1954 census, there were 430 acres of improved pasture in the parish, and 46,611 acres of unimproved pasture.

The improved pastures are planted to fescue, dallisgrass, bermudagrass, and whiteclover. Ryegrass, oats, and wheat are seeded for winter grazing. Unimproved pastures provide grazing and hay from volunteer grasses and clovers. These include vaseygrass, dallisgrass, bluestem, johnsongrass, carpetgrass, hop clover, and whiteclover. Paille fine, feathergrass, big cordgrass, saltgrass, and couchgrass supply good seasonal grazing in the drier, easily accessible areas of the marshland. St. Augustinegrass is common on the open range on some of the low natural levee ridges in the southeastern part of the parish.

Agricultural Practices

Sugarcane is commonly grown in Terrebonne Parish in a rotation that includes sugarcane for 3 years, followed by corn or summer legumes, or by plowed fallow land. Usually three crops of sugarcane are harvested from one planting—the first crop, or plant cane, and two crops of stubble, or ratoon, cane (fig. 3). Stubble cane is the second, third, or fourth crop that germinates each year from the lowest nodes of the plant cane after the previous year's crop is cut.

In this long cropping system, some fields become badly infested with weeds, particularly johnsongrass. By plowing the fields six or eight times during the summer (fallow plowing), the weeds can be controlled. This method is more effective than frequent tillage of a corn crop following 3 years of sugarcane. Some farmers get good results by following sugarcane with a summer legume and turning it under in the fall for green manure.

In normal years the yield of stubble cane is lower than that of the first crop, or plant cane crop. The decrease is greater for the second crop of stubble cane. Several factors contribute to these decreases, such as (1) poor drainage and aeration after the compaction of the soil by farming machinery; (2) poor stands resulting from plant diseases, insect damage, and winterkilling; and (3) lower availability of plant nutrients.

Good drainage is needed to provide favorable water, air, and plant-root relationships in the soil. Most fields of sugarcane are drained artificially. The intensity of artificial drainage needed in an area depends upon the relief and the rate of gravity flow of the surface water

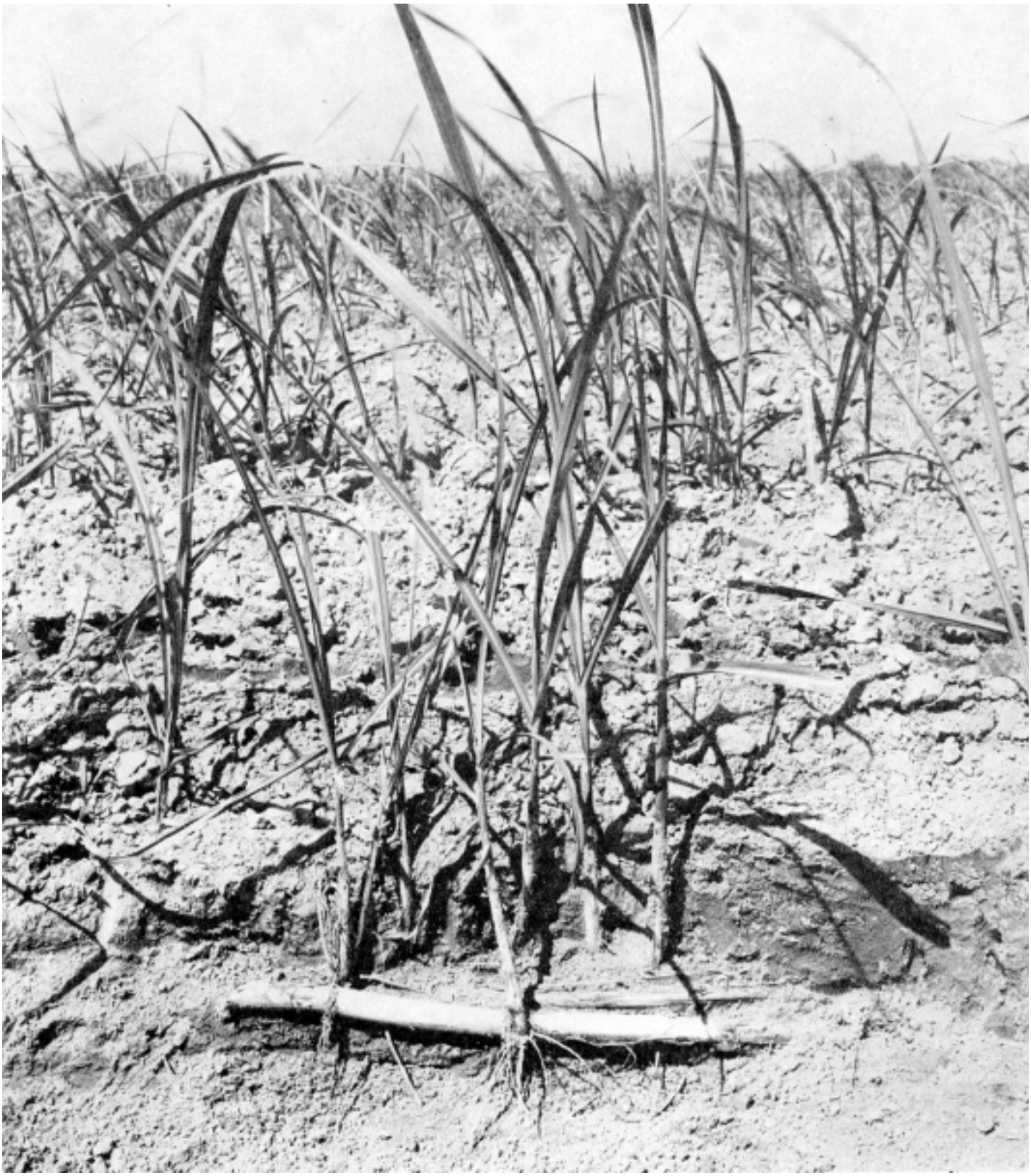

Figure 3.—Sugarcane sprouts from the nodes of old stalks after the joints have been planted on tops of the rows and covered with about 4 inches of soil. Three crops are usually harvested from one planting; first, the plant cane and then two crops of stubble cane.

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Figure 4.—**Planting sugarcane on Mhoon-Sharkey clays: The stalks are dropped into the rows as the cart moves across the field. The workers chop any of the crooked pieces so they will be straight in the row. Johnsongrass borders the lateral ditches on the sides of the cuts.**

from the area and on the texture and permeability of the soils.

Sugarcane is planted on top of rows (fig. 4) spaced 6 feet apart and thrown up 16 to 20 inches high. The rows aid drainage by following the slope. The middle, or space between two rows, acts as a drainage ditch. The fields are laid out in plots or cuts. Each cut contains several rows and is bordered by ditches parallel to the rows (lateral ditches). Drainage water from the cuts is carried to the lateral ditches by quarter drains (fig. 5). These are shallow ditches at right angles to the rows. They are used to remove water that collects at the ends of the rows or in low spots in the cuts. In some areas, the lateral ditches extend from near the crests of the natural levee ridges to the backswamps. In narrow areas where drainage water is carried short distances, the main ditches are generally along the border of the natural levee ridges. Long fields are more effectively drained by using two or more properly spaced main ditches. The main ditches are usually laid out at right angles to the lateral ditches. Drainage water is carried from the area by these wider and deeper ditches. On the better drained soils, the lateral ditches are widely spaced and the cuts are larger. More closely spaced lateral ditches and smaller cuts are generally used for draining the finer textured soils on the back slopes of the ridges.

Cut crowning is often used on the more poorly drained soils on some plantations. In cut crowning, the center of the cut is made higher than the edges by moving the soil toward the center with a grading machine or by plowing. The fall from the center of the cut to the sides is usually 0.3 to 0.5 foot in 100 feet. Adequate drainage is thus provided to the lateral ditches.

Sugarcane is planted late in summer and early in fall. It is fertilized in spring if the stand is favorable. The cane is cultivated at least three times to provide good tilth and to kill weeds.

The sugarcane harvest begins about the second week in October, but the actual date depends upon the size of the crop, the weather, and the amount of sucrose in the plants. The harvest is usually completed by the first of January.

Only a small amount of rice is now grown in Terrebonne Parish. Rice is planted in a rotation consisting of (a) 2 years of rice and 1 year in volunteer vegetation, or

Figure 5.—**Quarter drains for removing excess water are plowed to the lateral ditches at right angles to the rows. The soil thrown into the row middles is removed by hand shoveling.**

(b) 1 year of rice and 1 year in volunteer vegetation. The levees used for irrigating ricefields are 8 to 12 inches high. They are constructed on the contour at points of equal elevation. They are spaced with a fall of 0.2 foot per 100 feet between the levees so that the ricefields can be flooded to a depth of 4 to 6 inches. Drainage systems are needed to remove the irrigation water and any excess rainfall. A grain drill is commonly used to plant the seed and to apply the fertilizer at the same time.

Corn is generally planted in a rotation after 3 years of sugarcane (fig. 6). It is planted on the top of rows that are 6 feet apart. Corn is usually fertilized at planting time. Most cornfields are drained artificially by rows running with the slope of the soil.

Soybeans are often planted with corn, but if planted alone, they are broadcast or drilled on a flat seedbed or two rows of soybeans are planted on top of ridges that are 6 feet apart.

Livestock and Livestock Products

Livestock production does not fit well into the system of intensive sugarcane production. However, the interest in cattle growing is increasing. This change is partly influenced by the reluctance of planters to continue a one-crop economy and by the reduction in sugarcane acreage. A few pioneers in livestock raising in Terrebonne and neighboring parishes have had favorable returns.

Each plantation keeps a few milk cows and small herds of cattle, most of which are grazed in the marshes. In 1952, there were 7 herds of purebred cattle and 26 family-size dairies in the parish.

In 1954, there were 4,083 head of cattle and calves sold, and there were 12,859 cattle and calves in the parish. This parish is very well suited to livestock because the luxuriant grasses and clovers provide year-round grazing.

The number of work stock has decreased because of farm mechanization. Horses and mules decreased from 1,920 in 1940 to 509 in 1954. These numbers represent the mules and riding horses on most plantations.

Most hogs are raised for home use. The number of hogs decreased from 1,605 in 1950 to 716 in 1954.

Types and Sizes of Farms

In 1954 the farms of Terrebonne Parish were classified according to source of income as follows: 41 livestock farms, 6 dairy farms, 16 crop and livestock farms, 15 vegetable farms, 108 farms producing field crops, and 477 miscellaneous and unclassified farms.

Figure 6.—**Lister or "middle-buster" used on old rows of stubble after the third crop of sugarcane has been harvested. Corn or soybeans are then planted in a well-prepared seedbed on the tops of the new rows.**

In 1954, more than 56 percent of the farms were less than 50 acres in size. Many of these small farms are on the narrow natural levee ridges in the south-central and southeastern areas.

The average size farm for the parish increased from 125 acres in 1940 to 177.2 acres in 1954. In 1954, more than 5 percent of the farms were 260 to 1,000 acres, and slightly less than 5 percent were 1,000 acres or more. In 1954 there were 68 fewer farms in the parish than in 1950.

Land Use

Approximately 13 percent of the parish is in farms. Of the land in farms, the area used for crops was 41.2 percent in 1945, 42.6 percent in 1950, and 39.5 percent in 1954.

In 1954, 27.1 percent of the land in farms was cropland harvested, fallow, or idle; 18.9 percent was cropland pastured, other pasture, and improved pasture; 44.2 percent was wooded, and 9.8 percent was classed as miscellaneous land.

Farm Tenure

In 1954, 86.4 percent of the farms were operated by owners or part owners; 1 percent by managers, and 12.6 percent by tenants. About half of the tenants in 1954 paid rent for the farms they operated, and about half paid on a share basis.

The usual arrangement between owner and tenant is that the tenant supplies all of the seed, fertilizer, and labor, and the owner receives one-fourth of the cane and corn crops.

Tenancy in this parish declined from 27.7 percent in 1945 to 12.8 percent in 1950. In 1954, the proportion of tenancy was 12.6 percent.

Farm Equipment and Labor

Farming is highly mechanized in Terrebonne Parish, especially on the large plantations. Most farmers have a large investment in machinery. In 1954, the farm

machinery in this parish included 7 grain combines, 3 cornpickers, 31 pickup hay balers, and 12 forage harvesters. There were 545 tractors on 268 farms. Other equipment included 15 crawler-type tractors and 297 motortrucks. On 459 farms there were 567 automobiles.

Some farmers find it profitable to rent some equipment, such as ditching machines, cane harvesters, and hay balers. Much hand labor is used in sugarcane production.

How a Soil Survey Is Made

The scientist who makes a soil survey examines soils in the field, classifies the soils in accordance with facts that he observes, and maps their boundaries on an aerial photograph or other map.

FIELD STUDY.—On the agricultural soils of this parish, the soil surveyor has dug or bored many holes to see what the soils are like. The holes are not spaced in a regular pattern, but are located according to the lay of the land. The marshes and swamps were surveyed in less detail than the cultivated soils.

In most soils there are several distinct layers, called horizons, which collectively are known as the soil profile. Each layer is studied to see how it differs from others in the profile and to learn the things about this soil that influence its capacity to support plants.

Color is usually related to the amount of organic matter. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots of gray, yellow, and brown in the surface soil or subsoil generally indicate poor drainage and poor aeration.

Texture, or the content of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers and is later checked by laboratory analysis. Texture influences how well the soil retains moisture, plant nutrients, and fertilizer, and the ease or difficulty of cultivating the soil.

Structure, which is the way the individual soil particles are arranged in larger grains and the amount of pore space between grains, gives us clues to the ease or difficulty with which the soil is penetrated by plant roots and by moisture.

Consistence, or the tendency of the soil to crumble or to stick together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation.

Other characteristics observed in the course of the field study and considered in classifying the soil include the following: The depth of the soil over compact layers; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying parent material from which the soil has developed or is being formed; and the acidity or alkalinity of the soil as measured by chemical tests.

CLASSIFICATION.—On the basis of the characteristics observed by the survey team or determined by laboratory tests, soils are classified into phases, types, and series.

As an example of soil classification, consider the Commerce series of Terrebonne Parish:

Series	*Type*	Phase
Commerce	Silt loam	Level phase.
		Nearly level phase.
		Low phase.
	Silty clay loam	Level phase.

Soil series.—Two or more soil types that differ in surface texture, but are otherwise similar in kind, thickness, and arrangement of soil layers, are normally designated as a soil series. In a given area, however, it frequently happens that a soil series is represented by only one soil type. Each series is named for a place near which the soil was first mapped.

Soil type.—Soils similar in kind, thickness, and arrangement of soil layers are classified as one soil type.

Soil phase.—Because of differences other than those of kind, thickness, and arrangement of layers, some soil types are divided into two or more phases. Variation in slope, degree of erosion, depth of the soil over the substratum, or natural drainage are examples of characteristics that suggest dividing a soil type into phases.

The soil phase (or the soil type if it has not been subdivided) is the unit shown on the soil map. It is the unit that has the narrowest range of characteristics. Use and management practices, therefore, can be specified in more detail than for soil series or yet broader groups that contain more variation.

Miscellaneous land types.—Fresh stream deposits and areas of swamps and marshes are not classified by types and series; they are identified by descriptive names, such as Sand beaches or Swamp, clays and mucky clays.

Soil complex.—When two or more soils are so intricately associated in small areas that it is not feasible to show them separately on the soil map, they are mapped together and called a soil complex. An example of a soil complex in Terrebonne Parish is Mhoon-Sharkey clays.

Undifferentiated soil group.—Two or more phases or types that do not occur in regular geographic association may be mapped as a single unit if the difference between them is too slight to justify a separation.

Soil Series and Their Relations

Terrebonne Parish is a part of the delta plain of the Mississippi River. Deposits left on former major deltas of the Mississippi River are in the parish, and the parish therefore has many distributary streams, natural levee ridges along these streams, back-swamp borders along the ridges, swamps, and marshes. Figure 7 shows the relationships of some of the soil series and land types in a part of the parish.

Origin of the Soil Materials

The soil materials that occur in Terrebonne Parish include medium, moderately fine, and fine-textured recent stream alluvium. These materials were deposited by the many distributary streams of several older deltas of the Mississippi River. Some alluvium from the Red River was also deposited in this parish. The older delta systems are buried in part by alluvium deposited by the distributaries of younger delta systems.

From a point near Thibodaux in Lafourche Parish, a fan-shaped arrangement of streams spreads southeastward across Terrebonne Parish. These streams are the former distributary channels of an older delta of the Mississippi River that followed the course of the present Bayou Lafourche and deposited sediments over much of northern, southern, and eastern Terrebonne Parish (*2*). This deposit covered the parish from Bayou Grand Caillou on the west to Bayou Pointe Au Chien on the north and east.

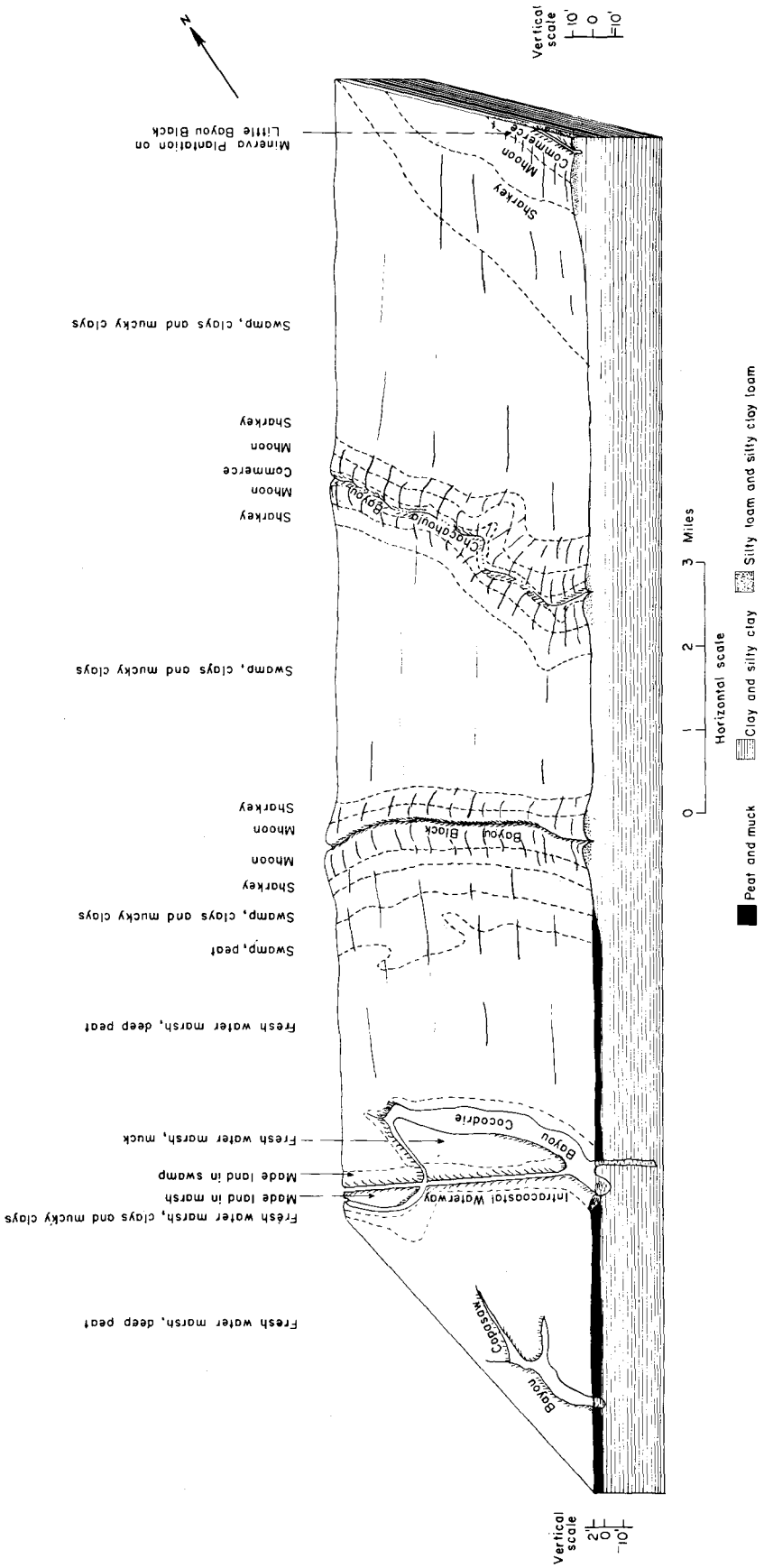

Figure 7.—Diagram showing the relationships of the soils in Terrebonne Parish from Minerva Plantation on Little Bayou Black in sec. 9, T. 16 S., R. 16 E., southwest to Bayou Copasaw in sec. 8, T. 18 S., R. 15 E.

Other distributary streams of this delta are Bayou Petit Caillou, Bayou Terrebonne, Bayou Barré, Bayou St. Jean Charles, and Bayou Blue.

The apex of another fan-shaped arrangement of bayous occurs near Humphreys and Waterproof on Bayou Black. These bayous flow in a southerly and southwesterly direction. They represent another deltaic fan that deposited sediments of the Red and Mississippi Rivers when the Mississippi River flowed in the course of the present Bayou Teche and Bayou Black. The boundaries of this older delta are Bayou Mauvais Bois on the west and traces of Bayou La Cache on the east. Bayou du Large and Bayous DeCade and Chauvin belong to this delta. These streams are part of the Teche-Mississippi River system that has not been buried by later deposits of the Lafourche-Mississippi River delta.

Several bayous in the western part of the parish were distributary streams of an older Mississippi River delta which had its apex near Maringouin in Iberville Parish. These distributary streams were active at the time the Mississippi River followed a course near that of the present Atchafalaya River. Later, they were covered by deposits from more recent deltas, and, with the exception of a few bayous, only traces remain. The bayous in the western part of the parish that were distributaries of this delta system include Carrion Crow, Penchant, Cocodrie, Chacahoula, Piquant, and Tiger. These streams generally flow in a southeasterly direction.

These active distributary streams of the Mississippi River system flowed across what is now Terrebonne Parish and deposited alluvium in the Gulf of Mexico or in the marshes. They built natural levee ridges near their channels when they overflowed their banks. These ridges are the widest and highest in the northern part of the parish. Where these natural levee ridges were deposited on the soft marsh mucks and peats, they have subsided almost to the level of the marsh or below it. Sediments deposited in the gulf have been reworked by waves to form narrow beach ridges and islands. Some sediments were reworked and redeposited as extensions of the coastline, and they formed lakes, bays, and arms of the gulf.

Large, broad, flat areas of sediments in the northern part of the parish are at lower elevations than the natural levee ridges. These are the back-swamp borders of the ridges. They are deposits of fine-textured alluvium that was carried considerable distances from stream channels during times of stream overflow. These fine-textured sediments—silty clays and clays—settled out of the floodwaters in the still water of the basins between the ridges and along the borders of the ridges. Natural drainage is poor in these back-swamp areas. They are catch basins for most of the runoff from the natural levee ridges. During high tides, the soils of the back swamps are flooded in some places and runoff is impounded in parts of the catch basins.

Swamps with an organic surface layer occur along the borders of the natural levee ridges near the fresh-water marshes. Organic soils of the swamps have surface layers of peat and muck that are underlain by fine-textured alluvium. These swamps occur mainly in the northern part of the parish at elevations that are slightly lower than the soils of the low areas bordering the natural levee ridges and slightly higher than the marshes.

Most of land area of Terrebonne Parish is coastal marsh. This wet area, at or only slightly above sea level, has been built up to its present elevation by stream alluvium and by accumulations of organic materials. The alluvium deposited near the coastline is reworked and redeposited by salty water waves and tides. In most places the coastal marsh is covered by recently accumulated organic materials that are classified as muck and peat (*6*).

Sections of the coastal marsh are under the dominant influence of water that contains different amounts of salt. Each area differs from the others in the amount of salt in the soil and in the soil and water combination. The kinds of plants growing on them are tolerant to varying degrees of salinity. Thus these areas are known as fresh-water, brackish-water, and salt-water marshes.

Soil Associations

A soil association is a characteristic pattern of soils that can be shown on a map. Most associations consist of different, or even of contrasting, soils that lie near each other in a more or less uniform pattern. Four soil associations in Terrebonne Parish are shown on the colored map in the back of this report. Outlined on the map is the area shown in figure 7.

The soil association map shows soils in a general way only. To find the kind of soil at any place in a field or on a plantation, it is necessary to look at the detailed soil map.

Mhoon-Commerce Association

This association occupies most of the narrow ridges of the natural levees. The soils are for the most part level or nearly level. Some near the stream channels have slopes as steep as 3 percent. Most of them are silt loam, silty clay loam, or silty clay. Nearly all the soils have been cleared and farmed for more than 75 years.

Mhoon soils are imperfectly drained; that is, they have mottled subsoils that are wet during part of each year. Those used for crops are artificially drained. Commerce soils lie on ridges a little higher than Mhoon soils, or on stream-facing slopes, and are moderately well drained. They can be farmed without artificial drainage. The association includes some areas of Cypremort soils on the ridges. They are a little more sandy, more leached, and more acid than the Commerce soils. There are also some areas of the imperfectly drained, acid Baldwin soils on the ridges and of the poorly drained, dark-colored Sharkey soils in the low places. The Cypremort and Baldwin soils are older than the other soils of this association.

Sharkey-Swamp Association

This association consists of the dark-colored, poorly drained Sharkey soils of the lower borders of the natural levee ridges, and also of adjoining areas of swamp soils. They are made up of slack-water clays. Some of the Sharkey soils are used for row crops. Artificial drainage is needed wherever crops are grown. The area is larger than that of the Mhoon-Commerce association.

Swamp Association

Forested soils of the swamps are usually wet and are frequently flooded to a depth of a few inches to 1 or 2 feet. The swamps occupy areas between the coastal marshes and the Sharkey-Swamp association of the lower areas bordering the natural levees. Over half of the soils are clays and mucky clays; the rest are peats and mucks.

Marsh Association

The coastal marshes in this association cover most of the land area of Terrebonne Parish. Large areas of these soils have a peat and muck surface layer, 2 to 5 feet thick, over alluvial clays and silty clays. This association occurs on a broad plain about level with the gulf, and the soils are frequently flooded. Areas on the landward side receive floodwaters from the fresh-water streams and have a dense cover of fresh-water or nearly fresh-water plants. Near the coast, the areas of salt-water marsh support a luxuriant growth of plants that have a salt tolerance of 2 to nearly 5 percent.

A broad belt of brackish peat and muck soils extends east and west across the parish between the salt-water and fresh-water marshes. The vegetation in this brackish-marsh area is tolerant to 0.5 to 2 percent of salt. These are the good trapping areas of the parish.

In general, the peat and muck soils of the marshes are too soft for grazing animals. Many are inaccessible. Mucky clays and clays of the fresh-water marsh and brackish marsh are used for seasonal grazing where they are easily accessible.

Descriptions of the Soils

In this section, a general description of the soil series and detailed descriptions of the soil types, phases, and land types are given.

The acreage and proportionate extent of the soils are listed in table 3, and their location and distribution are shown on the maps in the back of this report.

The important characteristics of each soil series are summarized in table 4.

TABLE 3.—*Acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Baldwin silty clay and silty clay loam	774	0.1
Brackish marsh, clays and mucky clays	42,595	4.8
Brackish marsh, deep peat	43,765	5.0
Brackish marsh, muck	5,470	.6
Brackish marsh, peat	96,275	11.0
Commerce silt loam, level phase	3,562	.4
Commerce silt loam, low phase	802	.1
Commerce silt loam, nearly level phase	651	.1
Commerce silty clay loam, level phase	554	.1
Cypremort silt loam and very fine sandy loam	268	(1)
Fresh water marsh, clays and mucky clays	29,684	3.3
Fresh water marsh, deep peat	207,442	23.3
Fresh water marsh, muck	14,809	1.7
Fresh water marsh, peat	55,011	6.2
Made land, arable	2,025	.2
Made land in marsh	2,253	.3
Made land in swamp	1,799	.2
Mhoon silt loam	9,980	1.1
Mhoon silt loam, low phase	411	.1
Mhoon silty clay loam	24,117	2.7
Mhoon silty clay loam, low phase	4,686	.1
Mhoon-Sharkey clays	7,087	.8
Mhoon-Sharkey clays, low phases	793	.1
Salt water marsh, clays and mucky clays	106,163	12.0
Salt water marsh, peat	63,335	7.1
Sand beaches	3,080	.3
Sharkey clay	28,430	3.2
Sharkey clay, low phase	30,691	3.5
Shell beaches	566	.1
Swamp, clays and mucky clays	55,899	6.3
Swamp, deep peat	2,075	.2
Swamp, muck	16,335	1.8
Swamp, peat	28,853	3.2
Total	890,240	100.0

[1] Less than 0.1 percent.

Baldwin series

These imperfectly or somewhat poorly drained soils have developed on terraces from stratified medium- and fine-textured sediments deposited by the Mississippi and Red Rivers. Elevations range from 4 to 6 feet above the gulf. Baldwin soils are slightly lower than Cypremort soils, with which they are associated, and higher than the Sharkey soils; Swamp, clays and mucky clays; and Swamp, muck. They are more acid and have developed better profiles than the Mhoon soils.

Small areas of Baldwin soils are cultivated, but their principal uses are for forest and pastures of volunteer grasses and clovers. The original vegetation on the Baldwin soils consisted of prairie grasses and scattered areas of mixed hardwoods.

Baldwin silty clay and Baldwin silty clay loam are combined in a single mapping unit because of the small area of Baldwin soils in Terrebonne Parish.

Baldwin silty clay and silty clay loam (Ba).—These soils are on low terraces in the northwestern part of the parish. They are on the older natural levee ridges in narrow areas that parallel Bayou Black for about 7 miles. Slopes are less than 1 percent.

The water table is moderately low. It is 24 inches below the surface in areas having an elevation of 5 feet. Runoff and internal drainage are slow. The soils contain moderate amounts of organic matter and mineral plant nutrients. The moisture range for suitable tillage is medium to narrow. Soil-moisture and soil-air relationships are good, and the soils are suitable for cultivated crops and pasture.

The surface soil is very dark grayish brown and slightly acid to strongly acid to depths of 8 or 10 inches. This layer is underlain to depths of 24 to 30 inches by a mottled brown, grayish-brown, and yellowish-brown medium acid to neutral clay subsoil that has a strong blocky structure. The substratum is stratified silt loam, silty clay loam, and clay. It is neutral to mildly alkaline in reaction.

Representative profile of Baldwin silty clay:

0 to 4 inches, very dark grayish-brown [2] plastic clay; strong fine granular structure; medium acid.
4 to 8 inches, dark-gray plastic clay, mottled dark yellowish brown; strong medium platy structure; slightly acid.
8 to 16 inches, dark-gray plastic clay; mottled very dark grayish brown and yellowish brown; strong medium blocky structure; neutral.

[2] Names of the soil colors are those adopted by the U. S. Department of Agriculture, Bureau of Plant Industry, Soils, and Agricultural Engineering, Division of Soil Survey, in 1948. Colors given are for moist soils unless otherwise stated.

16 to 30 inches, mottled grayish-brown and dark yellowish-brown plastic clay; a few, small, prominent mottles of dark reddish brown; strong fine blocky structure; neutral.
30 to 42 inches, gray, mottled dark-brown, plastic clay; contains a few, fine, prominent mottles of reddish brown; weak fine blocky to massive structure; neutral.

The surface soil ranges from strongly acid to slightly acid and the subsoil ranges from medium acid to mildly alkaline.

Use and management.—This soil is in management group IIIw–1. Most areas are in forest or in pastures of volunteer grasses and clovers. Small areas in sugarcane and corn produce good yields.

Most areas of this soil will produce good yields of cultivated crops if they are adequately drained and properly fertilized. Soil tilth, aeration, and drainage can be improved by including pastures in the cropping system and turning under legume crops for green manure.

Brackish marsh

An area of Brackish marsh, 4 to 10 miles wide, extends east and west across the parish. It is between the freshwater marshes to the north and the salt-water marshes to the south. It supports a dense growth of marsh plants that are tolerant to 0.5 to 2 percent of salt. The dominant vegetation includes couchgrass, three-cornergrass, leafy three-square (*Scirpus robustus*), big cordgrass, sand rush (*Fimbristylis castaena*), and salt marshgrass (*Distichlis spicata*).

Brackish marsh, clays and mucky clays (Bb).—This land type is composed of dark-colored, fine-textured alluvium. It occurs in level, poorly drained areas of the coastal marsh in the southwestern, south-central, and southeastern parts of the parish. The largest areas are along the shore of Four League Bay. Some areas occur on low, narrow natural levee ridges along the larger streams in the southeastern and south-central parts of the parish.

Brackish marsh, clays and mucky clays, is often inundated by salty or brackish water. Elevations range from a few inches to a foot or more above the gulf. This land type occurs at slightly higher elevations than the associated Brackish marsh, peat, and at slightly lower elevations than Mhoon silty clay loam, low phase, and Commerce silt loam, low phase.

The amount of salt in the water permeating the soil ranges from 0.6 to 1.81 percent. The marsh plants and their height of growth are couchgrass, 24 to 30 inches; three-cornergrass, 24 to 36 inches; big cordgrass, 4 to 8 feet; salt marshgrass, 12 to 24 inches; leafy three-square, 24 to 30 inches; and sand rush, 36 inches.

Representative profile:

0 to 10 inches, black mucky clay; contains about 20 percent of coarse and fine parts of present and recent vegetation; neutral.
10 to 24 inches, very dark gray mucky clay; contains about 15 percent of medium and fine, fibrous, recent plant parts; neutral.
24 to 48 inches, very dark gray, massive, plastic clay; moderately alkaline.
48 to 108 inches, dark-gray, massive, plastic clay; moderately alkaline.
108 to 132 inches, dark-gray, massive, plastic clay; contains shell fragments; moderately alkaline.

The surface layer ranges from muck to clay, from very dark brown to black, and from 10 to 24 inches in thickness. The substratum ranges from clay to silty clay and from gray to very dark gray. In places thin and thick lenses of fine sand occur at depths of 5 to 9 feet below the surface. The surface layer is neutral to mildly alkaline, and the substratum is neutral to moderately alkaline.

Use and management.—This mapping unit belongs in management group Vw–2. It is subject to inundation and is not suited to cultivated crops. Accessible areas are suitable for grazing during dry periods. Excellent grazing is provided seasonally if this soil is protected from burning and overgrazing.

Brackish marsh, muck (Bc).—The surface layer of this land type consists of well-decomposed organic materials usually mixed with peat. It ranges from 20 to 40 inches in thickness and is underlain by dark-gray clay. The clay sediments were deposited by the distributary streams of the Mississippi River. These sediments have been reworked in part by waves and tides.

Brackish marsh, muck, occurs in the southeastern, south-central, and southwestern parts of the parish on the shores of bays and lakes. In the southeastern part of the parish, it borders the natural levee ridges of Brackish marsh, clays and mucky clays, Commerce silt loam, low phase, and Mhoon silty clay loam, low phase. Narrow natural levee ridges of this land type along a few bayous are slightly higher than the associated Brackish marsh, peat.

This land type occupies areas of the coastal marsh that are influenced mainly by brackish water. It supports a luxuriant growth of grasses, sedges, and rushes that are tolerant to 0.5 to 2 percent of salt. It is 1 to 2 feet above the level of the gulf and is often flooded by tidewater to depths of 6 to 18 inches. Water stands 2 to 4 inches deep over the surface most of the time. During tropical storms the high tides sometimes flood this land type to depths of 4 to 10 feet.

The salt content of the water from the water-saturated surface layers ranges from 0.56 to 1.04 percent. The marsh plants growing on Brackish marsh, muck, and their height are as follows: Couchgrass, 18 to 30 inches; three-cornergrass, 24 to 36 inches; salt marshgrass, 18 to 24 inches; and sawgrass (*Mariscus jamaicensis*), 36 to 40 inches.

Representative profile:

0 to 8 inches, very dark brown muck matrix; a mat of the present vegetation makes up 30 percent of the soil layer; neutral.
8 to 14 inches, very dark gray strong fine granular muck matrix; contains about 20 percent of medium and fine fibrous peat; neutral.
14 to 24 inches, very dark brown moderate fine granular muck matrix; contains about 25 percent of medium and fine fibrous peat; neutral.
24 to 30 inches, very dark gray strong fine granular muck; mildly alkaline.
30 to 42 inches, very dark gray, plastic, mucky clay; moderately alkaline.
42 to 132 inches, stratified gray and very dark gray, massive, plastic clay; moderately alkaline.

The surface soil ranges from very dark brown to black in color and from muck to peaty muck in texture. The substratum layers are dark gray to very dark gray. In places lenses of fine sand occur at depths of 5 feet to more than 11 feet below the surface. The surface layers are slightly acid to mildly alkaline, and the substratum is neutral to moderately alkaline.

Use and management.—This land type is in management group VIII–2. The total area is small; it is used principally for trapping and hunting. Because Brackish marsh, muck, is wet and often flooded, it is not suitable for tilled

TABLE 4.—*Characteristics*

Soil series	Parent material	Position	Relief	Elevation	Drainage
				Feet	
Commerce	Slightly acid to moderately alkaline, medium-textured alluvium from the Mississippi River.	Natural levees	Level to gently sloping	3–16	Moderately well drained.
Mhoon	Slightly acid to moderately alkaline, stratified medium- and fine-textured alluvium from the Mississippi River.	Natural levees	Level to nearly level	2–13	Somewhat poorly drained.
Sharkey	Slightly acid to moderately alkaline, fine-textured Mississippi River alluvium.	Back swamps	Flat to depressed	2–7	Poorly drained
Baldwin	Strongly acid to mildly alkaline, stratified medium- and fine-textured mixed alluvium from the Red and Mississippi Rivers.	Older natural levees	Level to nearly level	4–6	Somewhat poorly drained.
Cypremort	Medium acid to mildly alkaline, medium-textured alluvium from the Red and Mississippi Rivers.	Older natural levees	Level to nearly level	5–7	Moderately well drained.

crops or improved pasture. Small areas that are accessible produce excellent forage plants, but they are generally too soft to support grazing animals.

Brackish marsh, peat (Bd).—This land type differs from Brackish marsh, muck, in having a peat or mucky peat surface layer. It is inundated frequently by brackish or salty water. The presence of floodwaters for long periods has prevented extensive oxidation of the organic residues, and a moderately thin layer of medium, fine, and coarse fibrous peat has accumulated at the surface. The peat is underlain at moderately shallow depths by dark-colored alluvial clays and mucky clays that have been influenced or reworked by brackish-water or salt-water tides and waves.

Brackish marsh, peat, occurs in broad, level areas of the coastal marsh. Elevations range from near the level of the gulf to 2 feet above it. Large areas are in the southern, southeastern, and southwestern parts of the parish. This land type is slightly lower than the associated Brackish marsh, clays and mucky clays, and slightly higher than the Brackish marsh, deep peat.

The water in the surface layer ranges from 0.57 to 1.68 percent in content of salt. A rank growth of marsh plants tolerant of 0.5 to 2.0 percent salt is a characteristic on this soil. The predominant plants and the height to which they grow are as follows: Couchgrass, 18 to 30 inches; three-cornergrass, 24 to 36 inches; salt marshgrass, 12 to 30 inches; and glasswort (*Salicornia perennis*), 10 to 24 inches. Couchgrass and three-cornergrass are favorite foods of muskrats.

Representative profile:

0 to 14 inches, very dark brown, medium and fine fibrous mucky peat; medium acid.
14 to 20 inches, dark reddish-brown and very dark brown, medium and fine fibrous peat; strongly acid.
20 to 30 inches, black fine granular muck matrix; contains 15 percent of medium and fine fibrous peat; slightly acid.
30 to 84 inches, dark-gray, massive, plastic clay; neutral.
84 to 108 inches, pale grayish-brown fine sand lenses in gray clay; mildly alkaline.

The surface layer of Brackish marsh, peat, includes peat and peaty muck materials. It ranges from dark reddish brown to very dark brown or very dark gray in color and from 12 to 30 inches in thickness. The peat is underlain by dark-colored, massive, plastic clay. The substratum ranges from clay to mucky clay and from black to very dark gray. In places thin and thick lenses of fine sand occur at depths of 7 to 9 feet below the surface. The surface layer is strongly acid to neutral, and the substratum is neutral to mildly alkaline.

Use and management.—This land type is in management group VIII–2. It is not suited to tilled crops or improved pasture. During dry spells, the small, easily accessible fringe areas can be used for seasonal grazing. It comprises one of the major areas for hunting and trapping in the coastal marshes. By providing good management for wildlife, the value of this land type for hunting and trapping can be increased.

Brackish marsh, deep peat (Be).—This land type has a thicker peat surface layer than Brackish marsh, peat, and it is at slightly lower elevations. It occurs in level to depressed areas that range from near the level of the gulf to a foot or more above it. Large areas are in the eastern and southeastern parts of the parish. The soil is frequently inundated to depths of 12 to 18 inches by brackish or salty tidewaters. Most of the time, water stands at the surface or is 2 to 4 inches over the organic surface layer.

The salt content of the water from Brackish marsh, deep peat, ranges from 1.25 to 1.56 percent. The plants

of the soil series

Surface soil			Substratum		Consistence when wet
Color	Texture	Thickness	Color	Texture	
		Inches			
Brown, dark grayish brown.	Silt loam	6–10	Grayish brown mottled with yellowish brown and gray.	Silty clay loam	Friable.
Dark grayish brown, very dark grayish brown.	Silt loam, silty clay loam.	4–10	Mottled dark grayish brown, dark gray, yellowish brown, and gray.	Silt loam, silty clay loam, and silty clay.	Slightly plastic.
Black, very dark gray, very dark brown, dark brown.	Clay, silty clay	4–12	Gray or dark gray mottled with yellowish brown and brown.	Clay	Plastic.
			Subsoil		
Very dark grayish brown.	Silty clay, silty clay loam.	5–10	Gray mottled with yellowish brown and brownish yellow; very dark gray mottled yellowish brown.	Silty clay or clay	Slightly plastic to plastic.
Brown	Silt loam, very fine sandy loam.	8–10	Brown or dark grayish brown mottled with yellowish brown.	Silty clay loam	Friable.

and their height of growth are as follows: Couchgrass, 24 to 30 inches; three-cornergrass, 24 to 30 inches; salt marshgrass, 12 to 24 inches; and sand rush, 36 inches.

Representative profile:

0 to 6 inches, very dark brown muck matrix; contains 50 percent of coarse and medium fibrous vegetation.
6 to 16 inches, very dark brown, coarse and fine fibrous peat; slightly acid.
16 to 42 inches, very dark brown, medium and fine fibrous mucky peat; slightly acid.
42 to 60 inches, dark-gray, massive, plastic clay; mildly alkaline.
60 to 120 inches, dark olive-gray fine sand; moderately alkaline.

The surface layer is very dark brown, dark brown, or black in color and a peat or peaty muck in texture. The thickness of the organic surface layer ranges from 36 to 78 inches but is usually 36 inches. The peat and mucky peat are underlain by dark-gray or very dark gray clay. Thin lenses of muck or mucky clay occur in the substratum at depths of 4 feet and below. Thin and thick strata of dark olive-gray fine sand are below 5 feet in places. The organic surface layer is strongly acid to neutral, and the substratum is neutral to moderately alkaline.

Use and management.—Brackish marsh, deep peat, is in management group VIII–2. It is best suited to wildlife and recreation. This land type usually provides plenty of forage, and the water is favorable for muskrats. Muskrat houses are common in areas of couchgrass and three-cornergrass. There is an abundance of forage, but grazing is very limited because of the soft, unstable footing for livestock. Management practices should include protecting the area from storm tides and maintaining the salinity conditions favorable for muskrats.

Commerce series

These moderately well drained soils of the bottom lands are developing in medium-textured, slightly acid to moderately alkaline Mississippi River alluvium. The stratified silt loam, silty clay loam, and very fine sandy loam sediments were deposited at the crests of the nearly level and undulating natural levee ridges.

These soils occur on ridges in the northern, northeastern, eastern, and southeastern parts of the parish. Small areas are on narrow stream-facing slopes that have gradients of 2 to 3 percent.

In general, the Commerce soils are somewhat higher than the associated Mhoon soils. Throughout the parish, the elevation of the soils varies proportionately with the width of the natural levee ridges. In the northern part, the Commerce soils are 7 to 16 feet above the level of the gulf, and the natural levee ridges are 1.5 to 3.5 miles wide. In the southeastern part, the natural levee ridges of Commerce soils are associated with the distributary streams flowing into and through the area of coastal marsh soils. Here, the natural levee ridges have subsided, by their own weight, below the surface of the soft muck and peat soils or to an elevation a few feet or inches above them. In this subsided area, the Commerce soils range from near-marsh level to 3 or 4 feet above the gulf and are on ridges 0.1 mile or less in width.

Except for small areas of Cypremort soils, the Commerce soils are the best drained soils in the parish. They are slightly acid to moderately alkaline, whereas the Cypremort soils are medium to slightly acid. The Commerce soils are younger and less leached than the Cypremort soils. Soil horizons are less sharply defined in the Commerce than in the Cypremort soils. Commerce soils have a

lower water table and are more permeable than the associated Mhoon soils.

The Commerce soils have a brown, friable, slighly acid surface soil 6 to 10 inches thick. It is underlain by friable silty clay loam that is grayish brown, mottled with yellowish brown, and is neutral to mildly alkaline. At depths of 24 to 30 inches and below, the material is mottled gray and brown friable silty clay loam, silt loam, or very fine sandy loam that is mildly to moderately alkaline. The moderately low water table is usually in this mottled layer.

The soils are well supplied with minerals and contain moderate amounts of organic matter. Soil-moisture and soil-air relationships are very favorable for crops on the silt loam and silty clay loam types. These soils are cleared and used for cultivated crops.

Commerce soils on the subsided levee ridges are not so well suited to cultivated crops as the other areas of Commerce soils. These areas are often flooded during storms. Subsurface drainage is poor, and runoff through the artificial drainage systems is frequently impeded when the level of water in neighboring coastal-marsh soils is high. Where accessible, these low areas have been cleared and used for cultivated crops. Because of crop failures, however, most areas are now in pasture, hay, and forest.

The forest vegetation of the Commerce soils includes live oak, water oak, red oak, white oak, sweetgum, hackberry, myrtle, and other hardwoods.

Commerce silt loam, level phase (Ca).—This is a brown, moderately well drained soil of the Mississippi River bottom lands. It is developing on stratified lenses of silt loam, silty clay loam, and very fine sandy loam. It occurs on level or nearly level natural levee ridges along the courses of the present streams and former stream channels in the northern and eastern parts of the parish. Elevations range from 5 to 16 feet above the gulf, well above the normal overflow from streams and tides. This soil occurs at about the same elevation as Commerce silty clay loam, level phase; it is slightly higher than the associated imperfectly drained Mhoon soils.

Commerce silt loam, level phase, is well supplied with mineral plant nutrients and contains low to medium amounts of organic matter. Some mineral plant nutrients and organic matter have been lost in places because of intensive cultivation. Soil tilth is good, and soil-moisture and soil-air relationships favor the development of plant roots. The soil holds enough moisture for crops except during the infrequent prolonged dry periods.

Representative profile:

0 to 5 inches, dark grayish-brown friable silt loam; moderate fine granular structure; slightly acid.
5 to 9 inches, dark grayish-brown very compact silty clay loam; massive to moderate thick platy structure; slightly acid plowsole layer.
9 to 18 inches, grayish-brown, mottled with yellowish brown and dark grayish brown, friable silty clay loam; weak to moderate medium subangular blocky structure; neutral.
18 to 30 inches, grayish-brown, mottled yellowish-brown, friable silty clay loam; weak subangular blocky structure; moderately alkaline.
30 to 42 inches, mottled gray and yellowish-brown friable silty clay loam with thin lenses of silty clay; moderately alkaline.

The surface soil ranges from strong brown to dark grayish brown. The plowsole commonly occurs in the lower surface soil and upper subsoil and is 3 to 6 inches thick. The color of the plowsole layer ranges from grayish brown to gray, the color depending on the length of time this very slowly permeable material has been undisturbed.

Use and management.—This soil is in management group I–1. All areas have been planted to row crops for 75 to 100 years. Commerce silt loam, level phase, produces good yields of sugarcane, corn, soybeans, and truck crops. It is easily tilled and requires only simple management to remove excess surface water. The planters consider it one of the best soils in the parish. It is suited to all crops grown in the parish except irrigated rice.

Excess water is easily removed from the surface by running the rows with the slope of the soil. Widely spaced open ditches divert the runoff and carry it through lower areas to the back swamps. The lower soils are thus protected from overwash.

The usual succession of crops is sugarcane for 3 years, followed by corn or soybeans or by plowed fallow land. Nitrogen is used on sugarcane and corn. Increased yields of corn and sugarcane have been obtained by applying more nitrogen and complete fertilizer mixtures.

Soil tilth and drainage are improved and crop yields are better if improved pasture is included in the rotation for 2 or 3 years or legume crops are plowed under for green manure. This soil is well suited to pasture and hay.

Commerce silt loam, nearly level phase (Cb).—This soil occurs along the bayous in the northern and northeastern parts of the parish at slightly lower elevations than Commerce silt loam, level phase, and Commerce silty clay loam, level phase. It has slopes of 1 to 3 percent. It is in small areas in narrow slopes between the stream channels and the crests of natural levee ridges. Elevations range from 5 to 10 feet above the gulf, well above normal stream and tide overflow.

The soil is moderately well drained. Runoff and internal drainage are medium. Soil-moisture and soil-air relationships, as well as soil tilth, are generally good. The content of organic matter is fair. The soil is well supplied with mineral plant nutrients. The surface soil is slightly acid, and the substratum is neutral to moderately alkaline.

Use and management.—This soil is in management group IIe–1. All areas are used for row crops, including sugarcane, corn, soybeans, and garden vegetables. The yields are generally good, although they are somewhat lower than those on Commerce silt loam, level phase.

Commerce silt loam, nearly level phase, is easily tilled. It is favored by planters because it does not require artificial drainage. The common practice of running the rows down the slope has resulted in soil losses and has reduced the content of organic matter and mineral plant nutrients.

Nitrogen fertilizers are commonly applied to sugarcane and corn; some complete fertilizers are used on corn. Yields may be increased by using more nitrogen and the right kind and amount of complete fertilizers, contour cultivation, and cropping sequences that include improved pasture and legume crops turned under for green manure. This soil is well suited to pasture and hay crops, but it is too permeable for rice.

Commerce silty clay loam, level phase (Cd).—This soil has a somewhat finer textured surface layer than Commerce silt loam, level phase. It is moderately well drained and occurs in small areas on the natural levee ridges along streams in the northern and northeastern

parts of the parish. This soil is on level and nearly level slopes of less than 1 percent. Elevations are about the same as for the associated Commerce silt loam, level phase, but are slightly greater than those of the associated Mhoon soils. They range from 5 to 15 feet above gulf level. Runoff and internal drainage are medium.

The water table is fairly low (20 to 24 inches below the surface) and soil-moisture and soil-air relationships are favorable for most crops grown in the area. This soil contains fair amounts of organic matter and large amounts of mineral plant nutrients. Tilth is generally good. The surface soil is slightly acid, and the substratum is neutral to moderately alkaline.

Use and management.—Commerce silty clay loam, level phase, is in management group I–1. Although the total area is small, this soil is agriculturally important and has been used for cultivated crops for about 100 years. The crops grown are sugarcane, corn, soybeans, and garden vegetables. Yields are generally good. Pasture and hay are produced on small areas. The soil is very productive, easily tilled, readily drained, and suited to intensive use.

Nitrogen fertilizer is commonly used on sugarcane and corn. Yields of these crops may be increased by heavier applications of nitrogen and complete fertilizers. Legume crops should be turned under for green manure when practicable in the sugarcane rotation. Increased yields of sugarcane and corn are obtained if these crops follow a well-sodded improved pasture. This soil is well suited to pasture and hay, but is too permeable for rice.

Commerce silt loam, low phase (Cc).—This soil occurs on areas near the level of the gulf where free water in the soil is occasionally 12 to 24 inches below the surface. The water level depends on the amount of water on the adjacent coastal marshes. Relief is level to undulating, and slopes are 1 percent or less.

This soil is on the low, narrow natural levee ridges along the distributary streams that extend into the marshes in the southeastern part of the parish. These natural levee ridges have subsided where the organic soils are soft; they now range from nearly marsh level to about 3 feet above the gulf. A few areas have elevations of 5 feet. The ridges are 0.1 mile or less in width; they gradually narrow toward the south, where they are buried beneath the marshes.

Runoff is slow to very slow, and internal drainage is medium to slow. The water table is more shallow in this soil than in Commerce silt loam, level phase. This low phase cannot be drained by gravity when water stands at the end of rows during periods of high water on associated soils. During the infrequent tropical storms, tidal waters cover some areas of this soil to depths of several feet.

Commerce silt loam, low phase, contains moderate amounts of organic matter and mineral plant nutrients. Tilth is generally good. The soil is neutral to moderately alkaline.

Representative profile:

0 to 6 inches, brown friable silt loam; moderate fine granular structure; neutral.
6 to 16 inches, mottled brown, yellowish-brown, and grayish-brown friable silty clay loam; weak subangular blocky structure; mildly alkaline.
16 to 20 inches, brown, mottled yellowish brown, friable silt loam; weak subangular blocky to massive structure; mildly alkaline.
20 to 42 inches, gray, mottled yellowish brown, friable silt loam; moderately alkaline.

Below 16 inches the substratum ranges from silt loam to very fine sandy loam and in places is stratified silt loam, silty clay loam, and very fine sand.

Use and management.—This soil is in management group IIIw–3. It occurs in long narrow areas, many of which are accessible only by boat. Commerce silt loam, low phase, is very fertile and easy to till. However, because of its inaccessibility, frequent high water level, and occasional floods, it is not commonly used for cultivated crops unless it is protected by levees and drained with pumps.

Small areas are planted to sugarcane and corn. Moderate to good yields are produced during seasons when the water level is unusually low. Because it is not practical to pump-drain this soil and construct levees to protect it from floods, Commerce silt loam, low phase, is best suited to native pasture, forest, and truck and corn crops.

Cypremort series

These brown, moderately well drained soils occur in the northwestern part of the parish on low terraces developed from older alluvium deposited by the Red and Mississippi Rivers. They have developed to the extent that distinct differences exist among the various horizons in the soil profile.

Cypremort soils are more acid and have better developed profiles than soils of the Commerce series. They differ from the Baldwin soils in having brown instead of very dark grayish-brown surface soil and in having friable silty clay loam instead of clay subsoil.

The original cover was prairie grasses and scattered areas of hardwood trees. The principal uses are pasture and forest.

Because Cypremort soils are not extensive in Terrebonne Parish, the silt loam and very fine sandy loam types have been mapped as a single unit.

Cypremort silt loam and very fine sandy loam (Ce).—The moderately well drained soils in this mapping unit occur on long narrow areas at the crest of the natural levees of Bayous Black and L'Ourse. These areas extend for about 4 miles along Bayou Black. These soils are 5 to 7 feet above the gulf and are slightly higher than the associated Baldwin and Sharkey soils. Relief is level to undulating, and slopes have a gradient of 1 percent or less. Small areas have slopes of 2 to 3 percent. Runoff is generally slow and internal drainage is medium.

The soils in this unit contain fair amounts of organic matter. They have a smaller amount of mineral plant nutrients than the Commerce soils. The water table is moderately low, and moisture- and soil-air relationships favor plant growth. These soils can be tilled within a wide moisture range. They can be used continuously for row crops and pasture.

Representative profile of Cypremort very fine sandy loam:

0 to 8 inches, brown friable very fine sandy loam; moderate fine granular structure; medium acid.
8 to 18 inches, brown, mottled yellowish brown, compact silty clay loam; moderate medium blocky and moderate thick platy structure; medium acid.
18 to 28 inches, slightly plastic silty clay or silty clay loam; mottled dark gray and dark brown; weak medium blocky structure; medium acid.
28 to 42 inches, friable silt loam and silty clay loam; mottled yellowish brown and brown; weak subangular blocky structure; slightly acid.

42 to 50 inches, stratified very dark brown silty clay and brown, mottled gray, silt loam and silty clay loam; slightly acid.

Use and management.—This soil is in management group I–1. Cypremort silt loam and very fine sandy loam soils are not extensive in this parish. They are in native pasture and forest. These soils are well suited to cultivated crops, but the areas are generally narrow and some are inaccessible.

Under good management, which includes fertilization with nitrogen or complete fertilizers, these soils produce good yields of sugarcane and corn. They are not suited to rice but are well suited to pasture and hay.

Fresh water marsh

Areas of marshlands that are on the landward border of the marshes are affected by fresh water from rainfall and by runoff from higher areas. These marsh soils contain less than 0.5 percent of salt, and the plants growing on them are tolerant of fresh or nearly fresh water. The dominant cover is paille fine; common reed (*Phragmites communis*); cattail; bulrush (*Scirpus validus*); cutgrass; and delta potato.

Fresh water marsh, clays and mucky clays (Fa).—This land type consists of large areas of dark-colored mucky clay and clay sediments of the Mississippi River. These sediments have been deposited along bayous as low natural levee ridges and levee ridge borders in the areas of fresh-water marsh.

This land type is poorly drained and often flooded. It is on level or undulating relief at elevations ranging from about sea level to 3 feet above the gulf. In the eastern and southeastern parts of the parish, it occurs along the borders of the slightly higher Mhoon silty clay loam, low phase; Sharkey clay, low phase; and Swamp, clays and mucky clays. In the western, southwestern, and central parts of the parish, this land type occurs as low natural levee ridges and ridge borders, only a few inches above Fresh water marsh, muck, and Fresh water marsh, deep peat.

This land type supports a dense growth of marsh plants that are tolerant to fresh or nearly fresh water. The major plants and their approximate height are as follows: Paille fine, 30 to 48 inches; giant (or common) reed, 12 to 15 feet; cutgrass, 36 inches; delta potato, 30 to 36 inches; leafy three-square, 36 inches; cattail, 8 feet; and wild cowpea vines (*Vigna repens*).

Representative profile:

0 to 14 inches, dark-gray, plastic, mucky clay; contains 20 percent of coarse and medium fibrous recent plant materials; slightly acid.
14 to 30 inches, dark-gray mucky clay; contains 5 percent of coarse fibrous plant materials; neutral.
30 to 132 inches, dark-gray plastic clay; moderately alkaline.

The surface layer ranges from mucky clay to clay in texture, from dark gray to black or very dark brown in color, and from 12 to 30 inches in thickness. Frequently, the surface layer contains a mat of coarse fibrous recent plant materials that make up 5 to 20 percent of the layer. Thin layers of muck or mucky peat, 2 to 6 inches thick, cover the surface in places. The substratum is gray or very dark gray in color. Thin lenses of muck or mucky clay commonly occur 4 to 12 feet below the surface. The surface layer is slightly acid to strongly acid and the substratum is neutral to moderately alkaline.

Included with this land type are areas of mud flats along the Lower Atchafalaya River that are composed of silt loam and silty clay loam.

Use and management.—This land type is in management group Vw–1. Because it is frequently flooded, it is not suited to cultivated crops. Most areas of Fresh water marsh, clays and mucky clays, are suited to seasonal grazing. If it has levee protection and pump drainage, this land type can be used for cultivated crops and pasture.

Fresh water marsh, muck (Fb).—The surface layer of this land type consists of moderately shallow, well-decomposed organic residues ranging from muck to peaty muck. It is underlain by silty clay and clay alluvium of the Mississippi River.

Fresh water marsh, muck, borders the landward areas of the coastal marsh. It is on broad flat areas that range in elevation from near the level of the gulf to 2 feet above it. It receives runoff from the swamps and natural levee ridges. Water stands at surface level or 2 to 4 inches over the surface most of the time. This land type is protected from the salt water tides by an area 10 to 25 miles wide that has many bodies of water and low natural levee ridges.

Fresh water marsh, muck, occurs in the northern, northwestern, north-central, and west-central parts of the parish. It is at slightly lower levels than the associated Swamp, clays and mucky clays. Medium and small areas of Fresh water marsh, muck, occur as low natural levee ridges along bayous in the southeastern and southwestern parts of the parish. In the northern part of the parish, between Little Bayou Black and Bayou Terrebonne, there is an area of Fresh water marsh, muck, which was once the site of a drainage reclamation project.

The dominant cover includes paille fine, 24 to 36 inches tall; cattail, 8 feet; bulrush, 7 feet; and common reed, 10 to 12 feet.

Representative profile:

0 to 8 inches, black, friable, strong fine granular muck; contains 15 percent of medium and coarse fibrous recent organic accumulations; slightly acid.
8 to 16 inches, black or very dark brown, strong fine granular muck; contains 15 percent of dark-brown coarse and fine fibrous peat; slightly acid.
16 to 36 inches, black, friable silty muck; contains 20 percent of very dark brown medium and fine fibrous peat; medium acid.
36 to 108 inches, black, massive, plastic clay and silty clay; mildly alkaline.
108 to 152 inches, dark-gray, massive, plastic clay; mildly alkaline.

The surface layer of this land type ranges from 18 to 36 inches in thickness. The organic layers are black to dark reddish brown and generally contain large amounts of peaty materials. The clay substratum ranges from gray to very dark gray and is slightly acid to moderately alkaline in reaction.

Use and management.—This land type is in management group Vw–1. It is usually wet, is often flooded, and is not suited to cultivated crops unless drained. Fresh water marsh, muck, is firm enough in most places to provide suitable footing for grazing animals. The present uses are seasonal grazing on accessible areas and trapping and hunting. Selected areas may be used for cultivated crops and pasture if protected from flooding by levees and pump drained.

Fresh water marsh, peat (Fc).—This land type has a moderately thin (12- to 30-inch) surface layer of unde-

composed or partly decomposed organic residues. The surface layer is underlain by clay and silty clay sediments deposited by the Mississippi River.

Fresh water marsh, peat, occurs as broad flats and slightly depressed areas in the northern half of the parish. It is well removed from the influence of salt water. It receives the runoff from higher areas; some of it is frequently inundated by the overflow from fresh-water streams. Fresh water stands at or over the surface of this land type most of the time, and the decomposition of organic materials is restricted.

In the west-central part of the parish, large areas of this land type are associated with the slightly higher Swamp, clays and mucky clays; Fresh water marsh, clays and mucky clays; Fresh water marsh, muck; and the soils of the natural levee ridges. In the east-central part, Fresh water marsh, peat, occurs in depressions bordering the low, narrow natural levee ridges.

The principal vegetation is common reed, 8 to 10 feet high; cattail, 7 feet; sawgrass, 36 inches; bulrush, 6 feet; and cutgrass, 36 inches.

Representative profile:

0 to 10 inches, very dark gray, medium and fine fibrous peat; contains about 10 percent of muck and 15 percent of recently accumulated organic debris; slightly acid.
10 to 20 inches, black, medium and coarse fibrous peat; slightly acid.
20 to 30 inches, very dark gray, fine granular muck with thin lenses of dark-gray clay; contains 10 percent of coarse and fine fibrous peat; neutral.
30 to 72 inches, very dark gray, slightly plastic, mucky clay with thin lenses of gray clay; moderately alkaline.
72 to 126 inches, very dark gray plastic clay; shell fragments below 108 inches; moderately alkaline.
126 to 144 inches, black plastic clay stratified with thin (2- to 6-inch) lenses of black muck; moderately alkaline.

The organic surface layer ranges from black to dark reddish brown, from peaty muck to peat, and from strongly acid to mildly alkaline.

Use and management.—This land type is in management group VIII–1. It is commonly used for hunting and trapping. The easily accessible areas are used for seasonal grazing. The peat and mucky peat surface layers make poor footing for grazing animals except in limited areas and during extended dry seasons. A small area that has been reclaimed by dikes and pump drainage provides excellent improved pasture. The reclaimed area subsided 1.5 feet in 2 years, and the reaction changed from slightly acid to strongly acid. The present cost of protecting large areas of Fresh water marsh, peat, from storm tides is prohibitive.

Fresh water marsh, deep peat (Fd).—This land type has a thicker surface layer than Fresh water marsh, peat. The organic layer is 3 to 5 feet thick. Fresh water marsh, deep peat, occurs 12 to 20 miles inland from the Gulf of Mexico in broad areas about level with the gulf. It is well protected from tidewater except during occasional tropical storms.

Large areas occur in the northern, north-central, west-central, and western parts of the parish at elevations of less than 2 feet. In general, this land type is bordered on the north by Fresh water marsh, peat, and on the south by large areas of Brackish marsh, peat, and Brackish marsh, deep peat. Most of the time, water stands at the surface or at 3 to 4 inches over the surface of Fresh water marsh, deep peat.

Typical plants and their height of growth are paille fine, 24 to 30 inches; cattail, 8 feet; bulrush, 7 feet; delta potato, 36 inches; sawgrass, 36 to 42 inches; and common reed, 10 to 12 feet.

Representative profile:

0 to 8 inches, black muck matrix; contains 30 percent of recently accumulated coarse fibrous organic materials; medium acid.
8 to 24 inches, black, coarse and medium fibrous peat; strongly acid.
24 to 48 inches, black muck matrix; contains 60 percent of coarse and fine fibrous peat; strongly acid.
48 to 108 inches, very dark gray, massive, plastic clay; moderately alkaline.
108 to 132 inches, dark-gray plastic clay with thin (2- to 6-inch) lenses of gray fine sand; mildly alkaline.
132 to 156 inches, black and very dark brown, strong fine granular muck; neutral.

The average thickness of the organic surface layer is 36 inches. The color of the surface soil ranges from black to dark reddish brown, the texture from peat to peaty muck, and the reaction from strongly acid to slightly acid. The substratum is gray to very dark gray and is mildly to moderately alkaline. Thin strata of muck and mucky clay occur in places at depths of 5 feet or more. Fine sand occurs in several locations at depths of 9 feet and below.

Use and management.—This land type is in management group VIII–1. The surface layer of deep peat is generally too soft to support the weight of grazing animals. Hunting and trapping are the best uses.

Made land

This land type consists of excavated materials from marshy and swampy areas of Terrebonne Parish. Accessible areas, if properly cared for, can be used for agriculture.

Made land, arable (Ma).—This miscellaneous land type includes silty clays and clays that have been pumped or excavated from bayous and canals during their construction and maintenance. The excavated materials are above normal overflow and can be used for agriculture. Made land, arable, is 2 to 5 feet above Sharkey and Mhoon soils, with which it is associated. Drainage is imperfect, and water runs slowly from the surface. The clays and silty clays are gray to dark gray and are slightly acid to mildly alkaline.

The largest areas are along the Intracoastal Waterway in the northeastern part of the parish. Areas of 10 to 15 acres occur in the north and northeast.

Use and management.—Made land, arable, is in management group IIw–1. The total area is small. The largest areas are not easily accessible and are used for pasture and forest. Small, easily accessible areas are used for sugarcane and corn. The yields are similar to those produced on Mhoon-Sharkey clays.

Made land in marsh (Mb).—This land type is similar to Made land, arable, but it occurs at lower elevations and has a dense cover of fresh-water marsh plants. Small areas are in the north-central and northeastern parts of the parish along the Intracoastal Waterway. These narrow areas of clay and silty clay were dredged or pumped from the canal when it was built and during its maintenance. The clay and silty clay materials are at slightly higher elevations than the associated Fresh water marsh, peat.

Use and management.—Made land in marsh is in management group Vw–1. It has a small total area, but it can

be used for crops if pump drained and protected by levees. Most areas are reached only by boat; the easily accessible areas are used for seasonal grazing.

Made land in swamp (Mc).—The soil material in this mapping unit includes clays and silty clays that have been pumped or excavated from the swamps during the construction of canals. Small and large areas occur in the northern, northeastern, and north-central parts of the parish along the Intracoastal Waterway. Elevations range from the level of the swamp to 3 or 4 feet above it. Trees growing on this land type include cypress, swamp maple, tupelo-gum, bay, and willow. Small areas are covered with volunteer grasses.

Use and management.—Made land in swamp is in management group Vw–1. The total area is small, and most of it is used for forest. The easily accessible areas provide some grazing during dry seasons. If cleared, pump drained, and protected from floods by levees, this land type may be used for cultivated crops and improved pasture.

Mhoon series

These imperfectly drained soils of the bottom lands are developing in slightly acid to moderately alkaline, stratified silt loam, silty clay loam, and silty clay sediments. They occur on sites well above the present normal overflow from streams. The stratified sediments were deposited on and near the crests of the natural levee ridges during the overflow from distributary streams and crevasse channels of the several delta systems of the Mississippi River. Mhoon soils commonly occur on level to nearly level relief, although small areas near stream channels have slopes of 3 percent.

Mhoon soils are closely associated with the higher lying Commerce soils and the lower Sharkey soils in the northern and northeastern parts of the parish. They are made up of stratified layers of medium- and fine-textured sediments, whereas the Sharkey soils are made up of thick beds of clay. The surface soil of Mhoon soils is dark grayish brown; that of the Sharkey soils is dark gray or dark brown. Mhoon soils are not so well drained as Commerce soils.

Runoff and permeability are slow. In the northern and northeastern parts of the parish, the Mhoon soils are 5 to 13 feet in elevation and the water table is 14 to 20 inches below the surface. These areas are readily drained by the gravity flow of water. In the southeastern and eastern parts of the parish, Mhoon soils occur on the narrow natural levees at elevations of 2 to 4 feet, only slightly above the adjacent marsh and swamp soils. Here Mhoon soils are difficult to drain because the water level is influenced by the depth of water over the adjacent marshes and swamps.

Mhoon soils are easy to till. Soil-moisture and soil-air relationships are favorable for plant growth except in the low areas. The soils contain moderate amounts of organic matter and mineral plant nutrients.

Most areas of Mhoon soils are artificially drained. They are in row crops, and the yields are usually good. Some areas of the low-lying Mhoon soils are used for crops, although they are generally in forest or pastures of volunteer grasses. Forest trees include hackberry, live oak, water oak, hickory, ash, maple, and sweetgum. There is an undergrowth of vines and shrubs.

Mhoon silt loam (Md).—This soil is developing in stratified medium- and light-textured sediments deposited by the distributary streams of the delta systems of the Mississippi River. It occurs at elevations of 5 to 13 feet on the crests of the natural levee ridges in the northeastern, northern, and eastern parts of the parish. This soil has level and undulating slopes of 1 percent or less. It is associated with Mhoon silty clay loam but is slightly higher.

This soil contains moderate amounts of organic matter and mineral plant nutrients. Runoff and internal drainage are slow. The water table is 14 to 20 inches below the surface. The moisture range for suitable tillage is moderately wide. Soil-moisture and soil-air relationships are favorable for row crops if the areas are artificially drained.

Representative profile:

0 to 6 inches, dark grayish-brown friable silt loam; moderate fine granular structure; mildly alkaline.
6 to 10 inches, dark grayish-brown compact silt loam; moderate thin and medium platy structure; mildly alkaline; plowsole.
10 to 16 inches, grayish-brown, mottled brown and yellowish-brown, friable silty clay loam; massive to weak coarse blocky structure; mildly alkaline.
16 to 30 inches, gray, mottled dark grayish-brown, plastic silty clay; massive structure; mildly alkaline.
30 to 42 inches, gray, mottled dark yellowish-brown and dark-brown, plastic clay; massive structure; mildly alkaline.

The surface soil ranges from slightly acid to moderately alkaline. The substratum ranges from mildly alkaline to moderately alkaline. Thin lenses of silty clay and clay occasionally occur in the lower substratum.

Use and management.—Mhoon silt loam is in management group IIw–1. Most areas are drained by constructing the rows with the slope. Sugarcane, corn, and soybeans are grown. Open ditches divert runoff from this soil through lower lying areas.

Nitrogen fertilizer is commonly used on sugarcane and corn. Complete fertilizer mixtures are applied to corn and rice. Crop yields are generally good.

The yields of sugarcane and corn can be increased by heavier applications of nitrogen or complete fertilizer mixtures. Soil tilth, aeration, drainage, and crop yields are improved by turning under green-manure crops and by including improved pastures in the cropping systems. Mhoon silt loam is well suited to pasture and rice.

Mhoon silt loam, low phase (Me).—This soil occurs on level and undulating areas on the narrow, subsided natural levee ridges along bayous in the southeastern part of the parish. These areas are affected by floodwaters in adjacent marshes and swamps. When high tides occur during strong southerly winds or tropical storms, this soil is flooded or free water rises to shallow depths below the surface. Elevations are lower than those of Mhoon silt loam and range from the level of the marsh to as much as 4 feet above the gulf. This soil is slightly lower than Commerce silt loam, low phase, with which it is associated.

This soil generally has good tilth. It contains moderate amounts of organic matter and is well supplied with mineral plant nutrients. Soil-air and soil-moisture relationships are favorable for row crops only during the infrequent dry seasons. Artificial drainage is effective only when the water level is low in the neighboring areas. Frequently the water level over the adjacent marshes

and swamps is at the ends of the field rows, and artificial drainage by gravity is therefore not possible.

Representative profile:

0 to 6 inches, very dark grayish-brown friable silt loam; strong medium and fine granular structure; slightly acid.
6 to 12 inches, dark grayish-brown compact silty clay; moderate medium subangular blocky and weak medium platy structure; slightly acid.
12 to 28 inches, plastic silty clay, mottled gray, grayish brown, and yellowish brown; moderate to weak medium blocky structure; neutral.
28 to 45 inches, gray, mottled light brownish gray, friable silty clay loam; contains lenses of silt loam and silty clay; massive structure; moderately alkaline.

The gray mottling, which shows the influence of a high water table, is 12 to 18 inches below the surface. The surface color ranges from very dark grayish brown to dark gray.

Use and management.—This soil is in management group IIIw–3. It is very fertile; but because it has a high water table and is subject to occasional floods, it cannot be used continuously for row crops. It is well suited to pasture, hay, and trees.

Most areas are used for volunteer grass pasture and forest at the present time. Small areas are planted to sugarcane and corn. These crops produce good yields during dry seasons. The cost of constructing and maintaining structures to protect these narrow areas from storm tides makes this undertaking impractical.

Mhoon silty clay loam (Mf).—This soil is similar to Mhoon silt loam, but it has a finer textured surface soil and is in lower positions. Mhoon silty clay loam is an imperfectly drained soil of the bottom lands. It occurs on the backslopes of the natural levee ridges in association with the lower Sharkey soils and at lower elevations than Mhoon silt loam.

Large and small areas of this soil occur along the bayous in the northern, eastern, northeastern, and southeastern parts of the parish. The general relief is level or undulating. A few small areas have slopes of 1 to 3 percent.

Elevations of Mhoon silty clay loam are in direct proportion to the width of the natural levee ridges. In the northern part of the parish, the ridges are 3.2 miles wide and the elevations range from 5 to 10 feet. In the eastern and southeastern areas, the ridges are 0.2 to 0.5 mile wide and the elevations range from 4 to 6 feet.

Runoff and internal drainage are generally slow. The soil is well supplied with mineral plant nutrients and contains moderate amounts of organic matter. The surface soil can be tilled within a moderate range of moisture. The water table is fairly high.

Use and management.—This soil is in management group IIw–1. Most areas have been drained and are now used for sugarcane, corn, soybeans, and pasture. This soil is well suited to rice. Suitable drainage for row crops is provided by row drainage and diversion ditches.

Narrow inaccessible ridges of Mhoon silty clay loam are forested or in pastures of volunteer grasses. Nitrogen fertilizer is used on some row crops, and the yields are generally good.

Higher yields of sugarcane and corn are obtained by the following practices: (1) Construction of row drainage according to the slope; (2) use of heavier applications of nitrogen and complete fertilizer mixtures where needed; and (3) use of green-manure crops wherever possible. Sugarcane and corn have better yields if they follow well-sodded improved pasture.

Gently sloping areas of Mhoon silty clay loam should be cultivated on the contour. This practice reduces the losses of soil and plant nutrients and generally results in higher crop yields.

Mhoon silty clay loam, low phase (Mg).—This soil differs from Mhoon silt loam, low phase, in the texture of the surface soil. It occurs on very narrow subsided natural levee ridges at elevations ranging from about 2 feet to as much as 3 feet in the southeastern part of the parish. Most areas are at lower elevations than Mhoon silt loam, low phase.

Mhoon silty clay loam, low phase, is affected by fluctuations in the water table in the nearby marshes and by occasional inundations by high tides during storms. This soil is easily tilled. It contains moderate amounts of organic matter and other plant nutrients. The water table is usually high, and moisture and air relations are not generally favorable for row crops.

Use and management.—This soil is in management group IIIw–3. Mhoon silty clay loam, low phase, is generally in volunteer grass pasture or forest. Only small areas, usually those that are larger and higher, are planted to sugarcane and corn. The yields are good during dry seasons or when low tides prevail. This soil is very well suited to improved pasture and hay crops.

Like Mhoon silt loam, low phase, this soil can be drained by gravity only during those infrequent periods when the water level is low in the adjoining areas. It is not practical to build dikes for flood protection along the narrow areas of this soil.

Mhoon-Sharkey clays (Mh).—This complex of soils consists of Mhoon silty clay and clay, and Sharkey clay, shallow phase. These dark-colored, stratified soils of the bottom lands of the Mississippi River occur in large and small areas about 4 to 10 feet above the level of the gulf. They are well above the normal overflow from streams and tides. Most areas of Mhoon-Sharkey clays are on the back slopes of natural levee ridges in the northern, eastern, and northeastern parts of the parish. Mhoon-Sharkey clays are associated with the somewhat lower Sharkey clay and with the higher Mhoon silty clay loam.

In this complex, Sharkey clay, shallow phase, has a clay surface layer which is underlain at depths of 16 to 24 inches by friable silt loam, silty clay loam, or very fine sandy loam. It is better drained than Sharkey clay.

Mhoon-Sharkey clays have level and undulating relief; the slopes are less than 1 percent. These imperfectly drained to somewhat poorly drained soils occur on sites that can be drained by gravity, but the water is removed slowly. Permeability is slow to very slow.

The soils in this complex have slightly acid to mildly alkaline surface soils and neutral to moderately alkaline substrata. They contain a moderately large amount of organic matter and are well supplied with mineral plant nutrients. The soils of this complex are difficult to work because they are usually too wet or too dry. The water table is generally about 16 or 20 inches below the soil surface.

Representative profile of Mhoon silty clay:

0 to 8 inches, very dark grayish-brown plastic silty clay moderate medium to fine granular structure; slightly acid.

8 to 12 inches, dark grayish-brown plastic clay; contains a few mottles of yellowish brown; moderate to weak medium blocky structure; slightly acid.
12 to 18 inches, grayish-brown plastic silty clay, mottled yellowish brown; moderate medium blocky structure; neutral.
18 to 42 inches, grayish-brown, mottled yellowish brown and gray, friable silt loam; contains thin lenses of silty clay and clay; neutral.

Representative profile of Sharkey clay, shallow phase:

0 to 4 inches, very dark gray plastic clay; moderate to strong fine blocky structure; slightly acid.
4 to 12 inches, dark-gray, mottled yellowish brown and dark reddish brown, plastic clay; moderate medium blocky structure; mildly alkaline.
12 to 18 inches, dark-brown friable silt loam; contains a few distinct mottles of dark yellowish brown; weak subangular blocky structure; moderately alkaline.
18 to 48 inches, dark-gray and gray friable silt loam mottled with dark yellowish brown; contains thin lenses of silty clay loam; moderately alkaline.

Use and management.—Mhoon-Sharkey clays are in management group IIIw–1. Most areas are artificially drained and planted to sugarcane, corn, and soybeans. Small areas are in forest and native grasses. The soils are drained for sugarcane and corn by running the rows with the direction of the slope. Overwash by runoff from higher areas is prevented by constructing diversion ditches along the cuts or field plots.

Nitrogen fertilizer is applied to sugarcane and corn; complete fertilizer mixtures are commonly applied to corn. Crop yields are good. These soils are suited to rice and pasture.

Artificial drainage is necessary to provide favorable aeration and soil-moisture relations if Mhoon-Sharkey clays are used for row crops.

The yields may be increased by improving the soil drainage. Such improvement includes more accurate construction of rows with the soil slope and the closer spacing of adequate-sized diversion ditches. Other improvements needed to increase yields are heavier applications of nitrogen or complete fertilizer mixtures and returning more crop residues and green-manure crops to the soil.

Mhoon-Sharkey clays, low phases (Mk).—This soil complex includes areas of Mhoon silty clay and Sharkey clay, shallow phase, that are 2 to 4 feet above the level of the gulf. The soils occupy low, narrow, natural levee ridges in the eastern and southeastern parts of the parish. The ridges range from 100 feet to more than 200 feet in width and are slightly above the marshes and swamps.

Mhoon-Sharkey clays, low phases, are subject to flooding by the tides. The soils are poorly drained. They are fertile and well supplied with organic matter and other plant nutrients. However, the high water table and the frequency of floods make them unsuited to row crops. Rice can be grown, but it is not now practical to protect these long, narrow areas from high tidewaters caused by storms.

Use and management.—Mhoon-Sharkey clays, low phases, are in management group Vw–1. They are mostly in forest and native pasture and are best suited to these uses. Many narrow areas, extending for long distances along the bayous, are accessible by boat. The accessible areas, if pump drained and protected by levees, can be used for tilled crops.

Salt water marsh

Along the shores of the Gulf of Mexico in southern Terrebonne Parish are areas of marsh having a luxuriant growth of plants tolerant to salt water. These salt-water marsh soils extend inland from the gulf for a mile, in the southwestern part of the parish, and to a maximum of 20 miles inland from Isles Dernieres northward to the natural levee ridge of Bayou du Large.

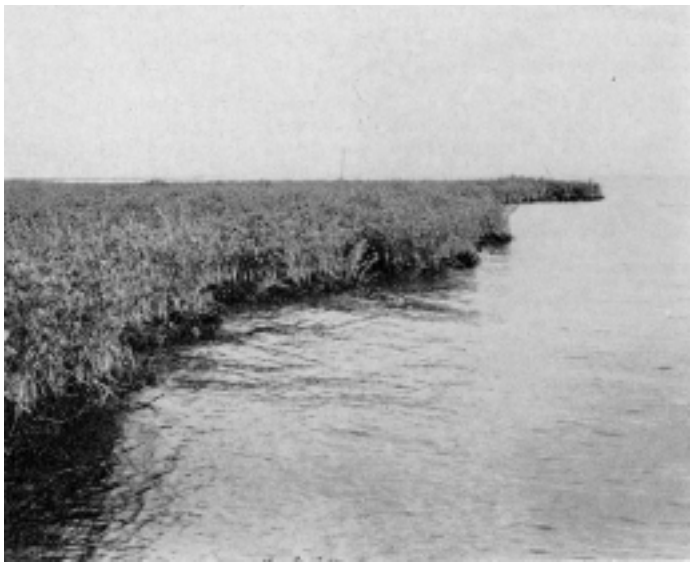

Figure 8.—**Salt water marsh, clays and mucky clays, show the effects of waves and tides along the shoreline. The cover of black-mangrove does little to control erosion on vertical slopes.**

The marsh herbs, grasses, rushes, and shrubs have a salt tolerance ranging from 2 to 5 percent. These plants include oystergrass, saltwort (*Batis maritima*), glasswort (*Salicornia* sp.), salt marshgrass, black rush (*Juncus roemerianus*), and black-mangrove.

Salt water marsh, clays and mucky clays (Sa).—This mapping unit consists of alluvial sediments deposited by the distributary streams of the Mississippi River and reworked by waves and tides. The largest areas are along the Gulf of Mexico on the shores of bays and lakes and of many of the islands. Low natural levee ridges of Salt water marsh, clays and mucky clays, occur along the channels of streams flowing into or through the salt-water marsh in the southern part of the parish.

Salt water marsh, clays and mucky clays, occurs at near-gulf level, where it is frequently flooded to depths of several inches by normal tides. This land type is occasionally covered to depths of several feet by salt water carried inland by strong southerly winds or storm winds. It is only a few inches higher than the associated Salt water marsh, peat.

Many small islands of this land type along the irregular coastline have been reduced in size by subsidence and by erosion due to the action of waves (fig. 8). Several feet of mucky clay and clay now cover former surface layers of peat and muck on many of these islands and along the bay shores.

The water from the surface layers has a salt content between 2.13 and 4.98 percent. The vegetation has a salt tolerance of more than 2 percent. The plants growing on this soil type and their height are oystergrass, 18 to 24 inches; black rush, 24 to 48 inches; saltwort, 12 to 14 inches; salt marshgrass, 8 to 24 inches; glasswort, 8 to 24 inches; and black-mangrove, 12 to 36 inches (fig. 9).

Figure 9.—**Black-mangrove growing on an area of Salt water marsh, clays and mucky clays, along Flat Bayou.**

Most areas producing black-mangrove and saltwort are clay soils and are slightly higher than the areas producing oystergrass and black rush.

Representative profile:

0 to 16 inches, very dark gray, plastic, mucky clay; coarse fibrous recent plant materials make up about 20 percent of the layer; neutral.
16 to 24 inches, black clay or silty clay; contains about 15 percent of coarse plant materials of recent origin; neutral.
24 to 42 inches, black clay; contains thin lenses of black fine granular muck; mildly alkaline.
42 to 84 inches, dark-gray, massive, plastic clay; moderately alkaline.
84 to 120 inches, gray or olive-gray fine sand; moderately alkaline.

The surface layer ranges from mucky clay or mucky silty clay to clay in texture. It is from 10 to 36 inches thick but is usually about 16 inches. Its color ranges from dark reddish brown to very dark brown, very dark gray, or black, and its reaction ranges from slightly acid to moderately alkaline. Many of the islands and lake shores have clay surface layers. The substratum is massive plastic clay with occasional thin lenses of muck or mucky clay below 48 inches. It is gray or very dark gray and ranges from neutral to moderately alkaline. Fine sand occurs 7 to 11 feet below the surface in places.

Use and management.—This mapping unit is in management group VIII–2. Because of its salt content, the hazards of frequent flooding, and inaccessibility, it is not suited to cultivated crops or pasture. It is currently used for recreation and as sites for oil and gas wells, oil storage tanks, and sulfur mines. Most of the platforms used for drying shrimp are on this land type. Its best uses are for waterfowl feeding grounds, fishing, recreation, and specialized commercial purposes.

Salt water marsh, peat (Sb).—This mapping unit is closer to the Gulf of Mexico than Brackish marsh, peat. It also contains more salt and supports plants more tolerant to salt.

Salt water marsh, peat, occurs in a wide belt along the southern part of the parish. It extends inland from the associated Salt water marsh, clays and mucky clays, and is at slightly lower elevations.

A normal tide of 18 inches along the gulf coast is frequently carried inland by moderate to strong southerly winds and deposited over Salt water marsh, peat. Snails on the oystergrass and black rush, 18 to 24 inches above the soil surface, indicate the usual depth of salt water over large areas of this land type.

The salt content in the water from this soil ranges from 1.8 to 2.95 percent. The common marsh plants and their height are oystergrass, 12 to 30 inches; salt marshgrass, 12 to 42 inches; black rush, 36 to 52 inches; and glasswort, 18 to 24 inches.

Representative profile:

0 to 12 inches, very dark brown, medium and coarse fibrous peat; 20 percent of the mass is coarse, fibrous, recent plant materials; neutral.
12 to 24 inches, black, medium and coarse fibrous peat; contains 20 percent of muck; neutral.
24 to 48 inches, black muck, oozy and soft when wet; contains 20 percent of fine fibrous peat; mildly alkaline.
48 to 84 inches, dark-gray, massive, plastic clay; moderately alkaline.
84 to 156 inches, dark-gray plastic clay; contains thin lenses of fine sand; moderately alkaline.

The peaty muck or mucky peat surface layer is black, dark reddish brown, or very dark brown. The organic layer ranges from 24 to 60 inches in thickness but averages 36 inches. The massive plastic clay substratum has thin lenses of muck or mucky clay in places. In a few areas, thin and thick strata of fine sand occur at 7 to more than 11 feet below the surface. The surface layer is usually neutral but may be medium acid, and the substratum ranges from neutral to moderately alkaline.

Use and management.—Salt water marsh, peat, is in management group VIII–2. This land type is best suited to fishing, hunting, and recreation. It is used as a refuge for waterfowl and for the production of oil, gas, and sulfur.

Sand beaches

Sand beaches occur on a number of islands along the southern border of Terrebonne Parish. Among these islands in the Gulf of Mexico are Timbalier Island, Brush Islands, and Isles Dernieres. Wine Island, a small sandy island west of Timbalier Island, was under water at the time this survey was made.

Large areas of Sand beaches are bare, especially on the crests and those sections facing the gulf. The vegetation is scattered in small areas. It includes couchgrass, buckbrush (*Baccharis halimifolia*), marsh elder (*Iva frutescens*), leafy three-square, and seaside goldenrod (*Solidago mexicana*).

Sand beaches (Sc).—These beaches have been built up to heights of 5 or 6 feet by sediments carried by wind and waves. High waves caused by moderate southerly winds and by windstorms wash over the islands and deposit fine sand and shells. Some of these sediments have been eroded from other beaches, and others have been picked up by waves from the floor of the gulf.

Sand beaches range from 0.02 to 1 mile in width. They are constantly changing shape and are gradually being moved northward by waves and strong windstorms. On some of the larger islands, the beach is advancing into the inner rim of Salt water marsh, clays and mucky clays.

Sand beaches are made up of grayish-brown clean sand, mixed in places with shell fragments. They contain 2- to 4-inch lenses that are composed mainly of fragments of

fine shells. Sand dunes 2 to 3 feet high and 5 to 14 feet in diameter occur on some of these beaches.

Use and management.—Sand beaches are in management group VIII–3. Although they are distant from populated areas and often flooded, they are best suited to recreation. Brown pelicans nest on the inner side of some of the islands.

Sharkey series

The Sharkey series consists of dark-colored soils of the bottom lands. They are developing in slightly acid to moderately alkaline clay sediments carried by the distributary streams of the several delta systems of the Mississippi River. These fine-textured sediments were deposited in depressions, such as shallow lakes and embayments, along the borders of the natural levee ridges. These sites support a luxuriant growth of moisture-tolerant trees and an undergrowth of marsh plants. The soils are dark colored and contain moderate amounts of organic matter as a result of repeated deposits of clays and organic residues.

Sharkey soils occur in large flat areas in the eastern, northeastern, northern, and southeastern parts of the parish. Elevations range from 2 to 7 feet above the gulf. Natural drainage is poor. Runoff and internal drainage are slow to very slow. On the drier areas at elevations of 4 feet or more, the water table is commonly 16 to 24 inches below the surface. Areas that are 3 feet or less above the level of the gulf are often flooded. In these areas the water table is 6 to 14 inches below the surface during long dry seasons or periodic low tides. The height of water in or over the Sharkey soils in low areas generally depends on the depth of water in the neighboring swamps.

Sharkey soils occur in lower sites than the associated better drained Mhoon soils. Other differences are that the Mhoon soils have dark grayish brown instead of very dark gray surface soils and are made up of stratified layers of silt loam, silty clay loam, and silty clay instead of thick beds of clay. Sharkey soils are darker, better drained, and slightly higher than the associated Swamp, clays and mucky clays.

The surface layer of the Sharkey soil is clay or silty clay in texture, very dark gray, black, or dark brown in color, and slightly acid to neutral in reaction. It ranges from 4 to 12 inches in thickness. The mottled dark-brown and gray plastic clay substratum is 16 to 28 inches below the soil surface and is neutral to mildly alkaline. The upper substratum layer is underlain by gray or gray mottled brown, neutral to alkaline plastic clay.

Sharkey clay, shallow phase, has a clay surface layer underlain by stratified medium- and fine-textured sediments at depths below 18 to 24 inches. Areas of this soil are included with Mhoon-Sharkey clays and Mhoon-Sharkey clays, low phases.

Sharkey soils are very fertile. They produce good crop yields when moisture is favorable for plant growth and for planting, cultivating, and harvesting. Intensive artificial drainage is needed to produce profitable yields of row crops and good pasture. Protection from overflow and pump drainage are necessary if low areas are used for row crops.

Tilth is generally poor, and the soils are difficult to work when wet or dry. Sharkey soils generally contain enough moisture for crops and frequently have too much.

The forest cover of the Sharkey soils is cypress, water tupelo or tupelo-gum, red or swamp maple, ash, and swamp bay (*Persea palustris*).

Sharkey clay (Sd).—This poorly drained soil occurs along the lower borders of the natural levee ridges in the northern and northeastern parts of the parish. Areas are flat and undulating and are 2 to 7 feet above the level of the gulf. Runoff and internal drainage are slow to very slow.

Sharkey clay contains moderate to high amounts of phosphorus, potassium, calcium, and magnesium and moderate amounts of organic matter. Tilth is generally poor, and the soil is hard to work because it is usually either too wet or too dry. Artificial drainage is needed on all areas used for row crops. Pasture and hay crops are more productive on properly drained areas. Both drainage and irrigation structures are required if this soil is planted to rice.

The surface soil is a dark-gray to dark-brown, slightly acid to mildly alkaline, plastic clay that is 6 to 12 inches thick. The lower 4 or 5 inches of the surface soil commonly is a compacted or puddled layer that has a platy structure. This layer has been compacted by heavy farm machinery.

The substratum layer to depths of 16 to 24 inches is mottled gray and brown strong blocky clay, neutral to moderately alkaline in reaction. This layer is underlain by gray or gray mottled brown, massive, plastic, neutral to alkaline clay to depths of 48 inches or more.

Representative profile:

0 to 3 inches, very dark gray plastic clay; strong fine granular structure; slightly acid.
3 to 8 inches, very dark gray plastic clay; moderate to strong fine granular structure; slightly acid.
8 to 16 inches, very dark gray plastic clay; mottled yellowish brown; moderate medium and fine blocky and moderate coarse platy structure; neutral.
16 to 20 inches, very dark gray plastic clay; mottled dark brown; strong medium and fine blocky structure; moderately alkaline.
20 to 42 inches, gray plastic clay; mottled yellowish brown; moderate to strong medium and fine blocky structure; moderately alkaline.

The gray mottlings occurring at depths of 16 to 24 inches below the surface indicate the usual height of the water table.

Use and management.—This soil is in management group IIIw–2. Most areas are artificially drained and used for row crops, pasture, and rice. If used for tilled crops, the rows are constructed with the fall of the land and the middle of each row serves as a drainage ditch. Closely spaced open ditches along the sides of the cuts or small field plots help to drain these areas and to divert the runoff from higher soils. Quarter drains are used to drain depressed areas in the small field plots. If rice is planted on Sharkey clay, structures for gravity drainage, contour levees, and supply systems for irrigation water are necessary.

If properly drained, this soil is well suited to sugarcane, corn, and soybeans. It does not produce row crops so well as the better drained Commerce and Mhoon soils. Sharkey clay is very well suited to irrigated rice and pasture. Nitrogen is commonly the only fertilizer used on sugarcane. Nitrogen and complete fertilizer mixtures are used on some corn and rice crops.

Legume crops turned under for green manure and pasture in the rotation improve soil drainage, tilth, aeration, and structure and make this soil more desirable for row crops.

Sharkey clay, low phase (Se).—This soil occurs at 2 to 4 feet above the level of the gulf. It is frequently flooded by runoff from higher soils, by tides, and by water from catch basins in the swamps. Sharkey clay, low phase, has a higher water table and more restricted drainage and is more likely to be flooded than Sharkey clay. It differs from Swamp, clays and mucky clays, in having thicker dark-colored surface and substrata layers, and in having a better surface soil and substratum structure.

This is a fertile soil that contains moderate to large amounts of phosphorus, potassium, calcium, magnesium, and organic matter.

Representative profile:

0 to 3 inches, very dark gray plastic clay; strong fine granular structure; neutral.
3 to 5 inches, very dark gray plastic clay; strong coarse platy and moderate fine blocky structure; neutral.
5 to 12 inches, dark-gray plastic clay mottled with yellowish brown and dark brown; strong coarse platy and weak coarse blocky structure; neutral.
12 to 18 inches, gray plastic clay mottled with yellowish brown and dark brown; weak coarse blocky structure; neutral.
18 to 42 inches, gray plastic clay; 10 to 40 percent mottled yellowish brown; weak coarse blocky structure; mildly alkaline.

The surface soil ranges from very dark gray to black in color and from slightly acid to mildly alkaline in reaction. The substratum is neutral to moderately alkaline. The dominant gray color indicates the height of a recent water table, which was 6 to 12 inches below the soil surface.

Use and management.—This soil is in management group Vw–1. Most areas are in forest, although some small areas are used for pasture and cultivated crops. Crop yields are generally low. Artificial drainage and flood protection are necessary before row crops can be successfully grown. If protected from floods by levees and drained by pumping, large areas of this soil in the northern and northeastern parts of the parish can be used for row crops, pasture, and rice.

It is not practical at this time to reclaim the narrow areas that occur in the eastern and southeastern parts of the parish. These areas are affected by high tides during storms.

Shell beaches

Shell beaches consist of shells and shell fragments from the floor of the Gulf of Mexico that have been deposited along parts of the coastline. The most continuous area extends along the Gulf of Mexico from Jack Stout Bay westward to include Point Au Fer. Several small shell beaches occur on islands in the southern and southeastern parts of the coastline.

Shell beaches (Sf).—Shell beaches are 2 to 6 feet above the level of the gulf and are 0.02 to 0.05 mile wide. They are 2 to 3 feet higher than the associated alluvial clays and mucky clays.

The shells are piled up on the southwestern and southern sides of the islands. Shell beaches are made up mainly of oystershells and fragments of oystershells.

Use and management.—Shell beaches are barren. They are in management group VIII–3.

Swamp soils

Swamp soils occur in frequently flooded forest areas in the back swamps which border the natural levee ridges in the northern, northwestern, and northeastern parts of the parish. These soils include clay and silty clay sediments deposited primarily by the Mississippi River. They commonly occur on the landward border of the fresh-water marsh and are not generally affected by brackish and salty tidewaters. They are slightly lower than the associated Sharkey soils and slightly higher than the marshes. Small areas of swamp occur along bayous in the eastern and western parts of the parish.

Organic materials that vary in thickness and degree of decomposition are on the surface of large areas of swamp soils. These materials are debris left by many generations of swamp trees and marsh plants. Swamp soils in which the organic matter is so decomposed that the original plant remains cannot be identified are classified as Swamp, muck. The swamp mucks contain various amounts of mineral soil materials.

Some organic residues have accumulated in the swamps in sites where air was excluded and oxidation and decay were limited. These organic materials are only slightly decomposed, and the resulting material is classified as Swamp, peat, and Swamp, deep peat.

Swamp soils occur on areas that range in elevation from near-gulf level to 5 feet. In large areas of the swamp, water stands at the surface or 1 or 2 feet above it most of the time.

Swamp soils are poorly drained, subject to frequent overflow, and unsuitable for cultivated crops.

The present forest growth includes tupelo-gum, cypress, swamp maple, bay, and ash. Frequently, there is an undergrowth of marsh plants, including paille fine, delta potato, cutgrass, cattail, and common lizardtail (*Saururus cernuus*).

Swamp, clays and mucky clays (Sg).—This mapping unit is poorly drained and medium to slightly acid. It consists of fine-textured alluvium from the Mississippi River. It occurs in level and depressed areas along the borders of the natural levee ridges at elevations that range from 2.5 to 4 feet above the gulf. It is often flooded by runoff, particularly when natural drainage is restricted by tidewater over neighboring marshlands. Water is frequently impounded on some areas by high tides. Swamp, clays and mucky clays, is slightly lower than the associated Sharkey soils and 0.5 to 2 feet higher than the associated marsh soils and the other swamp soils.

Representative profile:

0 to 4 inches, black mucky clay; slightly plastic when wet, moderate medium granular when dry; contains 15 percent of fine fibrous plant remains; slightly acid.
4 to 12 inches, dark-gray, massive, plastic clay; contains 5 percent of fine fibrous plant remains; slightly acid.
12 to 30 inches, gray, massive, plastic clay; dark reddish-brown oxidized material around root channels; fine- and medium-sized roots are common; mildly alkaline.
30 to 42 inches, gray, massive, plastic clay; contains a few distinct mottles of yellowish brown; moderately alkaline.

The surface layer is gray or black in color and mucky clay or clay in texture. It ranges from 6 to 10 inches in thickness. In many places a 2- to 5-inch surface layer of muck or mucky peat overlies the mucky clay. The clay substratum is gray or very dark gray. The surface layer

ranges from medium acid to neutral, and the substratum from neutral to moderately alkaline. Most areas contain moderately low amounts of organic matter, but they are well supplied with mineral plant nutrients.

Use and management.—This soil is in management group Vw–1. Most of it is in forest; small areas are in volunteer grass pasture. Forest production can be increased by proper management. Small areas may be cleared and used for pasture.

Swamp, muck (Sh).—This mapping unit consists of swampy forested areas that have a moderately thin (14 to 30 inches) muck surface layer. It is underlain by gray clay and silty clay alluvium, mainly of Mississippi River origin.

Swamp, muck, occurs along the landward border of the marshes, well removed from brackish and salt-water tides. It is in the northern, northwestern, eastern, and southeastern parts of the parish, mostly along the back-swamp borders of natural levee ridges. It is frequently flooded by runoff from the ridges. Elevations range from 2 to 4 feet.

This soil type is closely associated with the lower Fresh water marsh, peat, and the slightly higher Swamp, clays and mucky clays. Swamp, muck, commonly borders the depression areas of Swamp, peat. Large areas are often covered with 1 or 2 feet of water.

A dense to thin stand of tupelo-gum, cypress, swamp maple, ash, and bay trees grows on Swamp, muck. Most of the marketable timber has been harvested, and the present trees are generally small.

Representative profile:

0 to 18 inches, black friable muck; contains 10 to 15 percent of coarse and fine fibrous peat; strong fine granular structure; slightly acid.
18 to 42 inches, gray plastic clay; 10 percent mottled with yellowish brown; massive structure; neutral.

The surface layer is muck or peaty muck. It ranges from dark reddish brown to black in color and from medium acid to neutral in reaction. The clay substratum is gray or dark gray. Thin and thick lenses of muck and mucky peat occur in a few areas at depths of 5 to 11 feet.

Use and management.—Swamp, muck, is in management group Vw–1. It is low and often flooded and is therefore not suited to cultivated crops or pasture. Some areas provide limited grazing and forage during dry seasons.

Small areas on the higher elevations have been drained, in part, by large ditches of the parishwide drainage system. Although the water table is noticeably lower in these places, the present cost of additional draining and clearing such areas for cultivated crops is prohibitive.

The main uses of Swamp, muck, are for forest production, hunting, and trapping.

Swamp, peat (Sk).—This land type occurs in swampy forested areas. It has a shallow (20 to 30 inches) surface layer of undecomposed or partly decomposed organic materials. The surface layer is underlain by gray clay and silty clay sediments that were deposited mainly by the Mississippi River.

Swamp, peat, occurs at elevations of 2 to 3 feet along the landward border of the marshes; it is not affected by brackish or salty tidal water. In most places it borders the higher natural levee ridges, in flat or depressed areas that are frequently flooded by runoff from the ridges. Large areas occur in the eastern, north-central, and northwestern parts of the parish. Small and narrow areas are along the bayous in the western and southwestern parts.

Swamp, peat, is lower than the associated Swamp, muck, Swamp, clays and mucky clays, and Mhoon silty clay loam, low phase. It ranges from a few inches to a foot higher than Fresh water marsh, deep peat, and Fresh water marsh, clays and mucky clays.

From 1 to 2 feet of water stands on the surface most of the time. During dry seasons the water table is 6 inches below the surface of small areas near canals of the parish-wide drainage system.

Forests consist of tupelo-gum, cypress, swamp maple, and some ash and bay trees.

Representative profile:

0 to 24 inches, very dark reddish-brown woody peat; medium granular and coarse fragmental structure; slightly acid.
24 to 60 inches, very dark gray, massive, plastic clay; moderately alkaline.

The peat or mucky peat surface layer is very dark reddish brown to black. It commonly has a medium to coarse fragmentary or granular structure and contains fibers and fragments of wood. In open forested areas, where the undergrowth of marsh plants is luxuriant, the peat is coarse and fine and fibrous.

The surface layer ranges from moderately acid to neutral, and the substratum, from slightly acid to moderately alkaline. The substratum is gray or very dark gray. In a few places lenses of peat and muck occur in the clay substratum at depths of 5 feet and below.

Use and management.—Swamp, peat, is in management group Vw–3. It is often flooded and is not suited to cultivated crops. Only small areas are dry enough for natural reseeding to trees. Swamp, peat, is best suited to its present uses, which are forest production from the present stand of trees and hunting and trapping.

Swamp, deep peat (Sm).—This soil type differs from Swamp, peat, in having a thicker organic surface layer of peat or mucky peat overlying clay and silty clay sediments. This surface layer is 3 to 5 feet deep.

Swamp, deep peat, occurs in a few large areas in the eastern and northwestern parts of the parish, but the total acreage is small. It occupies depressions along with Swamp, muck, and Swamp, peat. Swamp, deep peat, is slightly higher than the associated Fresh water marsh, deep peat. It is flooded to depths of 1 or 2 feet most of the time.

Representative profile:

0 to 12 inches, dark reddish-brown woody peat; strong fine and medium fragmental and granular; medium acid.
12 to 36 inches, very dark brown strong fine granular woody peat; contains 20 percent of coarse and fine fibrous peat; slightly acid.
36 to 96 inches, dark-gray, massive, plastic clay; mildly alkaline.
96 to 156 inches, dark reddish-brown, coarse and fine fibrous peat; moderately alkaline.

The surface layer is dark reddish brown or black in color and medium acid to neutral in reaction. The substratum ranges from gray to dark gray in color, from soft to firm in consistence, and from neutral to moderately alkaline in reaction.

Use and management.—Swamp, deep peat, is in management group Vw–3. It is frequently flooded and is not suited to cultivated crops or pasture. It is too

wet for natural or artificial seeding of trees. Swamp, deep peat, is best suited to its present uses, which are forest production, hunting, and trapping.

Use and Management of Soils

Most of the soils of Terrebonne Parish are wet, subject to flooding, and unsuitable for row crops. Only 8.5 percent of the acreage of the soils in this parish is used for cultivated crops. The natural drainage and the effectiveness of the artificial drainage determine whether the soils can be used successfully for row crops.

Some of the soils best suited to sugarcane are now idle or are used for pasture. Other soils now used for sugarcane produce variable or low yields and are better suited to rice and improved pasture.

Under the Federal acreage allotment program for sugarcane, part of the acreage of each sugarcane plantation has been taken from the normal sugarcane cropping system. These surplus acres should be used for other suitable crops.

The following is a discussion of some of the characteristics of the soils that affect use and management.

Drainage and permeability.—In this parish, the best drained and most permeable soils are in a narrow area on the crests of the natural levee ridges. Water penetrates the soils at a moderate rate, but there is usually enough moisture available for crops. These soils may be used for row crops with a minimum amount of artificial drainage.

In general, soils on the back slopes of the natural levee ridges are slowly permeable, and artificial drainage is necessary. They are at elevations that permit water to run off at a moderate rate. When used for tilled crops, the soils are drained by laying off the rows with the slope of the fields. The middle of each row functions as a drainage ditch. Ditches to carry the drainage water to the back-swamp areas are constructed along the fields or cuts. Both the drainage water and runoff are diverted through lower lying cuts by these lateral ditches (fig. 10).

Soils of the back-swamp areas are level or depressed, poorly drained, and slowly permeable. Areas of these soils bordering the natural levee ridges are usually above the swamps and marshes and are not frequently flooded. These areas are high enough to be drained by gravity. However, water is removed from them more slowly than from soils at higher elevations, and the lateral ditches should be spaced closer on these fine-textured soils. The soils drain slowly, and the water table is generally not far below the surface. These soils are well suited to rice and pasture. Large areas of back-swamp soils, however, are occasionally flooded. They are at such low elevations that they cannot be drained by gravity flow. These soils may be used for crops if they are protected from floods and are drained by pumps. They are best suited to rice and pasture.

Soils of the low natural levee ridges are in the southeastern and southern parts of the parish, slightly above the swamps and marshes. They may be drained effectively by gravity if the water level is low in the neighboring swamps and marshes. These soils cannot be used intensively for row crops without the protection of levees and drainage. They are best suited to pasture, corn, and truck crops.

Slope and erosion.—Small areas of soils near the crests of natural levee ridges have slopes of 1 to 3 percent. These areas may be used for row crops, with no appreciable soil losses, if the rows are run on the contour across the slope of the soil. The usual practice of running the rows down the slope provides good drainage, but it causes some loss of surface soil and plant nutrients.

Texture and tilth.—Texture influences the ease with which the plow layer can be worked, the length of time a soil remains wet after rains, and the amount of water that penetrates and is held by the soil. The silt loam and silty clay loam soils of the natural levee ridges are easily tilled. Water passes through them readily, but usually enough moisture is retained for plants. These soils dry out soon after rains. In these lighter textured soils, the relationship of soil, air, moisture, and plant roots is generally favorable for row crops.

The fine-textured soils of the back slopes and back-swamp areas are hard to till. Water penetrates very slowly, and the water table is usually high. These soils dry out slowly after rains and become very hard when dry. They need artificial drainage to provide favorable moisture and aeration for the roots of row crops. These soils are suitable for rice, sugarcane, and pasture.

A plowsole, or traffic pan, occurs in most soils used for row crops. This compacted layer of the surface soil, 4 to 6 inches thick, commonly occurs in the middle of the rows (fig. 11). It develops particularly in soils planted to sugarcane as a result of repeated packing of the soil by tractor wheels during planting, tilling, and harvesting the cane under a system of 3-year sugarcane rotations. Water stands in the compacted middle of the row for long periods during winter (fig. 12). The plowsole is broken up and drainage is restored by deep plowing down the middle of the rows.

Plant nutrients.—Most of the arable soils in Terrebonne Parish contain moderate to large amounts of phosphorus, potassium, magnesium, and calcium. Nitrogen is needed for the best yields of most row crops. However, the fields where heavy crops of green manure have been turned under do not usually require nitrogen. Some fertilizers are used on most crops.

The soils generally contain low to moderate amounts of organic matter. Green-manure crops add organic matter and increase crop yields on the coarser textured soils. They aid in improving soil structure, tilth, and drainage and increase the productivity of the fine-textured soils.

The usual practice for fertilizing sugarcane is to apply 40 to 60 pounds of nitrogen per acre to plant cane and 60 pounds to stubble cane. Applications of 200 to 300 pounds of a complete fertilizer are made on fields that are deficient in phosphorus and potassium. The yields of sugarcane are usually increased if potash and phosphate fertilizers are applied on the somewhat leached, coarser textured soils of the natural levee ridges.

Corn is commonly fertilized with 100 to 200 pounds per acre of a complete fertilizer mixture and sidedressed with 50 pounds of nitrogen. Rice is usually fertilized with 200 to 400 pounds per acre of a complete fertilizer. On fields where a thick growth of plants has been turned under, however, rice is sometimes planted without fertilizer. Soybeans are not always fertilized, but the usual application is 100 to 200 pounds of a complete fertilizer.

Figure 10.—**Water from heavy rain standing in the row middles and quarter drains on a field of stubble cane on the back slope of a natural levee ridge.**

Native pasture grasses are not usually fertilized. However, on the medium-textured, better drained soils, complete fertilizers are applied to improved pastures.

Most of the fertilizer purchased in Terrebonne Parish is nitrogen fertilizer. The use of anhydrous ammonia and aqua ammonia fertilizers has increased rapidly in recent years.

For the most efficient use of fertilizers, soil samples may be sent to the Louisiana State University Soils Laboratory for analysis.[3] The Louisiana Agricultural Experiment Station will furnish up-to-date recommendations on the kinds and amounts of fertilizer needed for specific crops. The county agent or the local representative of the Lafourche-Terrebonne Soil Conservation District will help you plan the best use and management of your soils.

[3] Mailing address: Louisiana State University Soils Laboratory, Agricultural Center Building, L. S. U. University Station, Baton Rouge, La.

Capability Groups

Capability grouping is a system of classification used to show the relative suitability of soils for crops, grazing, forestry, and wildlife. It is a practical grouping based on the needs and limitations of the soils, on the risks of damage to them, and also on their response to manage-

Figure 11.—**The row middles have been compacted by heavy machinery on this soil. A preemergence spray is applied as a weed killer as the seeds germinate. The sugarcane in the background will be ready for harvest in a month or two.**

ment. There are three levels above the soil mapping unit in this grouping. They are the capability unit, subclass, and class.

The capability unit, which can also be called a management group of soils, is the lowest level of capability grouping. A capability unit is made up of soils similar in kind of management they need, in risk of damage, and in general suitability for use.

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter symbol "e" indicates that the main limiting factor is risk of erosion if the plant cover is not maintained; "w" means excess water that retards plant growth or interferes with cultivation. In some parts of the country there are subclasses "s" and "c". The letter "s" is used for soils that are shallow, droughty, or unusually low in fertility and "c" for soils that are limited chiefly by a climate that is too cold or too dry.

The broadest grouping, the land capability class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but may be of different kinds, as shown by the subclass. All the land classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops.

Class I soils are those that have the widest range of use and the least risk of damage. They are level, or nearly level, productive, well drained, and easy to work. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

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Figure 12.—**Loading cane in the mud: Rainy weather, poor drainage, and muddy fields slow down the harvest. If mud gets into the juice, the crop may be refused at the mill.**

Class II soils can be cultivated regularly, but do not have quite so wide a range of suitability as class I soils. Some class II soils are gently sloping; consequently, they need moderate care to prevent erosion. Other soils in class II may be slightly droughty or slightly wet, or somewhat limited in depth.

Class III soils can be cropped regularly but have a narrower range of use. These need even more careful management.

In class IV are soils that have greater natural limitations than those in class III, but they can be cultivated for some crops under very careful management. There are no class IV soils in Terrebonne Parish.

In classes V, VI, and VII are soils that normally should not be cultivated for annual or short-lived crops, but they can be used for pasture or range, for woodland, or for wildlife. In Terrebonne Parish no soils are placed in class VI or VII.

Class V soils are nearly level and gently sloping but are droughty, wet, low in fertility, or otherwise unsuitable for cultivation.

Class VI soils are not suitable for crops because they are steep, or droughty, or otherwise limited, but they give fair yields of forage or forest products. Some soils in class VI can, without damage, be cultivated enough so that fruit trees or forest trees can be set out or pasture crops seeded.

Class VII soils provide only poor to fair yields of forage or forest products and have characteristics that limit them severely for these uses.

In class VIII are soils that have practically no agricultural use. Some of them have value as watersheds and wildlife habitats, or for scenery.

Following are the management groups of soils in Terrebonne Parish, arranged by capability classes and subclasses.

Class I.—Soils that have few limitations for use.
- Management group I–1.—Deep, moderately permeable, level or undulating soils.

Class II.—Soils that have some limitations that reduce the choice of plants or require some conservation practices.
- Subclass IIe.—Soils likely to erode if not protected.
  - Management group IIe–1.—Deep, moderately permeable, nearly level soils.
- Subclass IIw.—Soils somewhat limited by poor drainage and slow permeability.
  - Management group IIw–1.—Deep, level, slowly permeable soils.

Class III.—Soils that have severe limitations that reduce the choice of plants or require special conservation practices, or both.
- Subclass IIIw.—Soils severely limited by excess water.
  - Management group IIIw–1.—Deep, somewhat poorly drained, slowly permeable soils.
  - Management group IIIw–2.—Deep, poorly drained, very slowly permeable soils.
  - Management group IIIw–3.—Deep, moderately well to somewhat poorly drained soils that are subject to occasional flooding.

Class V.—Soils that have limitations, other than erosion hazard, that limit their use to permanent cover.
- Subclass Vw.—Wet soils that can be used for pasture or woodland.
  - Management group Vw–1.—Poorly drained soils that are frequently flooded by fresh water but provide firm footing for grazing animals and swamp areas capable of natural reseeding to trees that also provide firm footing for grazing animals.
  - Management group Vw–2.—Poorly drained, waterlogged soils that are frequently flooded by brackish water.
  - Management group Vw–3.—Organic soils of the swamps that are frequently flooded and too soft for grazing or browsing.

Class VIII.—Soils not suitable for production of crops, grasses, or woody plants.
- Management group VIII–1.—Organic soils of the freshwater marshes, usually wet and often flooded, and not suited to grazing.
- Management group VIII–2.—Organic soils and mucky clays and clays of the salt-water marshes and organic soils of the brackish-water marshes.
- Management group VIII–3.—Deep unstable sands and sandy loams of the beaches.

Management groups of soils

Soils within a mangement group (capability unit) that have about the same kinds of limitations for use, that are suited to similar crops, and that have similar yields are placed in a management group. The soils in a group require about the same fertilizers, and water control, tillage, and other management practices are similar.

Suitable crops, cropping systems, tillage requirements, and water-control practices are suggested in table 5 for the management groups that contain the major agricultural soils. In the text, management practices, cropping systems, and yields are discussed for all of the management groups.

MANAGEMENT GROUP I–1

The soils in this group are Commerce silt loam, level phase, Commerce silty clay loam, level phase, and Cypremort silt loam and very fine sandy loam. They are the most productive soils in the parish for row crops and pasture. These fertile, moderately well drained soils occur on level and undulating areas at the crests of the natural levee ridges. They contain moderately low amounts of organic matter. Water readily penetrates these soils, but enough moisture is usually retained for plants. Excess surface water is removed by the flow of gravity. These soils require a minimum amount of artificial drainage.

Present use and management.—The soils of management group I–1 are used for sugarcane, corn, soybeans, and truck crops. Nitrogen is commonly applied to all crops.

The cropping system generally used on the soils in this group is sugarcane for 3 years, followed by soybeans and corn, or by plowed land left fallow. Under average management, green-manure crops are planted only occasionally and the supply of organic matter is therefore low. Plant cane is usually fertilized with 40 to 50 pounds of nitrogen per acre, and stubble cane, with 60 pounds. Corn is fertilized with 200 pounds of complete fertilizer and sidedressed with 50 pounds of nitrogen.

The yields per acre under this management are in the order of 24 tons of plant cane, 20 tons of first-stubble cane, 18 tons of second-stubble cane, and 45 bushels of corn. From 100 to 200 pounds of complete fertilizer are generally applied to improved pastures.

Suitable use and management.—These soils are well suited to improved pasture but are too permeable for rice. Some areas do not have enough phosphorus and potassium for sugarcane. Soil tests are needed to determine how much and what kinds of fertilizers should be applied to crops and pasture.

Under good management, cropping systems are used that will add organic matter to the soils and improve their moisture relationships. Sugarcane for 3 years, followed by 3 years of improved pasture, is a very good rotation on farms where this cropping system is economically feasible. The usual crop rotation of 3 years of sugarcane should be followed by legumes for green manure wherever possible. Green-manure crops improve the soil structure and the moisture relationships.

Under good management and following the recommendations of the Louisiana Agricultural Experiment Station and the U. S. Department of Agriculture Sugar Plant Field Station, plant cane is fertilized with 60 pounds of nitrogen per acre, and stubble cane with 80 to 100 pounds. Where the soil tests show a deficiency of phosphorus and potassium, additional applications of 25 to 40 pounds of phosphorus pentoxide and 40 to 60 pounds of potash are beneficial. In experiments on sugarcane under this management, the yields per acre were in the order of 34 tons of plant cane, 30 tons of first-stubble cane, and 26 tons of second-stubble cane.

Corn is fertilized with 400 to 500 pounds of complete fertilizer per acre and sidedressed with 50 to 80 pounds of nitrogen. The yields under this management are 65 to 90 bushels per acre.

Improved pastures produce good to excellent yields if fertilized with 40 to 60 pounds of nitrogen per acre, and if phosphate and potash are applied to areas that are deficient in these nutrients, as shown by soil tests.

MANAGEMENT GROUP IIe–1

Commerce silt loam, nearly level phase, is the only soil in this management group. It requires more intensive management for conserving soil moisture, surface soil, and plant nutrient materials than the soils in management group I–1.

TABLE 5.—*Suitable crops, suggested cropping systems,*

Management group and soil	Suitable crops	Suggested cropping systems
I–1 Commerce silt loam, level phase. Commerce silty clay loam, level phase. Cypremort silt loam and very fine sandy loam.	Sugarcane, corn, soybeans, truck crops, alfalfa, clover, dallisgrass, bermudagrass, fescue.	Sugarcane 3 years, followed by corn and summer legumes. Sugarcane 3 years, followed by legumes. Sugarcane 3 years, improved pasture 3 years.
IIe–1 Commerce silt loam, nearly level phase.	Sugarcane, corn, soybeans, truck crops, alfalfa, clover, dallisgrass, bermudagrass, fescue.	Sugarcane 3 years, followed by corn and summer legumes. Sugarcane 3 years, followed by legumes. Sugarcane 3 years, improved pasture 3 years.
IIw–1 Mhoon silt loam. Mhoon silty clay loam. Made land, arable.	Sugarcane, corn, rice, soybeans, alfalfa, clover, dallisgrass, bermudagrass, fescue.	Sugarcane 3 years, followed by corn and legumes. Sugarcane 3 years, improved pasture 3 years. Rice 2 years, pasture 2 years.
IIIw–1 Mhoon-Sharkey clays. Baldwin silty clay and silty clay loam.	Sugarcane, corn, rice, soybeans, alfalfa, clover, dallisgrass, bermudagrass, fescue.	Sugarcane 3 years, followed by corn and legumes. Sugarcane 3 years, improved pasture 3 years. Rice 2 years, pasture 2 years.
IIIw–2 Sharkey clay.	Rice, sugarcane, corn, alfalfa, clover, dallisgrass, bermudagrass.	Sugarcane 3 years, improved pasture 3 years. Rice 2 years, pasture 2 years. Sugarcane 3 years, followed by summer legumes, and then by plant cane and winter legumes.
IIIw–3 Commerce silt loam, low phase. Mhoon silt loam, low phase. Mhoon silty clay loam, low phase.	Corn, truck crops, sugarcane, clover, dallisgrass, bermudagrass, volunteer grasses.	Improved pasture 3 years, corn 2 years. Improved pasture 3 years, volunteer grass pasture 2 years. Corn and truck crops 3 years, volunteer grass pasture 2 years.

This fertile soil occurs on slopes of 1 to 3 percent, at or near the crests of the natural levee ridges. It contains moderate amounts of plant nutrients. The content of organic matter is generally low. Water goes into the soil at a moderate rate, but much of the surface water runs off.

Present use and management.—This soil produces very good yields of sugarcane, corn, soybeans, truck crops, and pasture. Rice is not suited to this permeable soil.

Under average management, the rows are run down the slope, and as a result the losses of surface soil and plant nutrients are heavy. Depletion of the supply of organic matter lowers the available moisture-holding capacity of the soil, and the crops do not get enough moisture during occasional long, dry periods.

The usual crop rotation is sugarcane for 3 years, followed by corn or soybeans, or by plowed land left fallow. The same fertilizer applications are used on this soil as on those of group I–1, but the yields are somewhat lower.

Suitable use and management.—If Commerce silt loam, nearly level phase, is to be used for cultivated crops, the rows should be on the contour or across the slope to prevent erosion and to increase the intake of surface water. A crop rotation that includes sugarcane followed by improved pasture or a system in which green-manure crops are incorporated with the soil for 1 or 2 years would increase organic matter and improve the moisture relations of the soil. Soil fertility can be maintained or built up by use of green-manure crops. Good fertilizer practices for this soil are like those suggested for group I–1, but this soil produces slightly lower yields.

MANAGEMENT GROUP IIw–1

The soils of this group are Mhoon silt loam, Mhoon silty clay loam, and Made land, arable. These imperfectly and somewhat poorly drained soils occur in level and nearly level areas on the crests and back slopes of the natural levee ridges. Slopes are 1 percent or less. Water penetrates the upper layers at a moderate rate, but the substrata layers are slowly permeable.

Present use and management.—These soils are used for sugarcane, corn, soybeans, and improved pasture. Rice is grown in a few small areas.

When used for row crops, the soils in group IIw–1 are artificially drained by row drainage and widely spaced lateral ditches. In this system, the rows follow the slope and the middle of each row serves as a drainage ditch. Open ditches, or laterals, are constructed parallel to the fields or cuts. They receive the drainage water from the rows and carry it to the back-swamp areas or to the main drainage ditches.

The usual cropping system for soils in management group IIw–1 is sugarcane for 3 years, followed by idle plowed fallow land, or by corn or soybeans. Occasionally, legume crops are added to the soil for green manure. In some fields, the middle of the row is plowed to break up the plowsole layer, usually after the second crop of sugarcane.

The usual applications of fertilizer are 40 to 50 pounds of nitrogen per acre to plant cane and 60 pounds to stubble cane. Corn is fertilized with 200 pounds of complete fertilizer and sidedressed with 50 pounds of nitrogen.

and supplementary practices for management groups

Tilth and tillage requirements	Water-control practices	
	For row crops	For rice
Good tilth easily maintained; cultivation possible under wide range of moisture conditions.	Row direction for drainage; green-manure crops to increase water-holding capacity.	Not recommended.
Good tilth easily maintained; cultivation possible under wide range of moisture conditions.	Contour cultivation; green-manure crops to increase water-holding capacity.	Not recommended.
Moderately wide moisture range for good tilth. Green-manure crops for tilth improvement.	Run rows with soil slope for quick effective runoff; use widely spaced open ditches.	Construct levees on contour; provide for application and removal of irrigation water.
Narrow moisture range for suitable tilth. Green-manure crops for tilth improvement.	Run rows with soil slope; use moderately spaced open ditches.	Construct levees on contour; provide for application and removal of irrigation water.
Very narrow moisture range for suitable tilth. Legume crops for tilth and structure improvement; break plowsole.	Run rows with soil slope; use closely spaced lateral ditches; practice cut-crowning.	Construct levees on contour; provide for application and removal of irrigation water.
Tilth moderately good. Green-manure crops for tilth improvement.	Run rows with soil slope; use moderately spaced lateral ditches.	Not generally recommended for rice; suitable irrigation water not available in some areas.

The yields per acre under this management are in the order of 24 tons of plant cane, 20 tons of first-stubble cane, 16 tons of second-stubble cane, and 45 to 55 bushels of corn.

Rice is grown in a rotation consisting of 2 years of rice and 2 years of volunteer vegetation, or 1 year of rice and 1 year in volunteer cover. The usual yields are 12 to 15 barrels per acre.

Improved pastures usually receive some complete fertilizer.

Suitable use and management.—Drainage should be improved on these soils to increase the yields of row crops. The rows should be laid out carefully to provide for adequate removal of surface water and to prevent water from standing in the middle of the rows for long periods. Annual plowing of the row middles will break up the plowsole and improve drainage and aeration.

A good cropping system for the soils in management group IIw–1 is 3 years in sugarcane, followed by 3 years of improved pasture. However, this system may not be practical on all farms. A rotation of 3 years of sugarcane, with a legume planted in the plant cane and used for green manure, will improve soil drainage, structure, and tilth.

On fields where 60 pounds of nitrogen are applied per acre to plant cane, and 80 to 100 pounds to stubble cane, the acre yields that can be expected are in the order of 33 tons of plant cane, 28 tons of first-stubble cane, and 22 tons of second-stubble cane. Applications of 25 to 40 pounds per acre of phosphorus pentoxide and 40 to 60 pounds of potash have increased the yields of sugarcane and sugar in some areas. If specific crops are to be planted, soil samples should be analyzed to determine which areas are deficient in phosphorus and potassium.

Under good management, corn fertilized with 400 to 500 pounds per acre of complete fertilizer and sidedressed with 60 pounds of nitrogen will yield 65 to 90 bushels per acre.

These soils are well suited to rice. The yields may be increased by using better crop rotations and larger amounts of fertilizer. A good rotation is 2 years of rice followed by 2 or 3 years of improved pasture, and then rice. If the rice is fertilized with 60 pounds of nitrogen per acre at time of planting and sidedressed later with 50 pounds of nitrogen, it yields 20 to 30 barrels per acre.

For improved pastures, it is a good practice to apply 50 pounds of nitrogen per acre at planting time and a sidedressing of 50 pounds of nitrogen. Phosphate and potash fertilizers should be applied to improved pasture in areas where these nutrients are deficient.

MANAGEMENT GROUP IIIw-1

The soils of this group are the poorly drained and somewhat poorly drained Mhoon-Sharkey clays and Baldwin silty clay and silty clay loam. The surface soils are generally fine textured, and water goes into them slowly. The upper part of the substratum is slowly permeable, and the lower part is moderately permeable. These soils occur on level and nearly level areas; artificial drainage is needed if they are used for row crops. They contain moderate amounts of plant nutrients and organic matter.

Present use and management.—The soils are used for sugarcane, corn, soybeans, and pasture. They produce moderately good yields.

The usual management practices, including use of fertilizers, are the same for these soils as for those of group IIw–1, but the yields are generally somewhat poorer, especially for row crops.

Suitable use and management.—Good management practices are similar to those for group IIw–1. However, these soils have poorer soil tilth, are more difficult to work, and are somewhat less productive. More intense artificial drainage, with lateral ditches at moderately spaced intervals, is needed to prevent water from standing too long in the row middles.

MANAGEMENT GROUP IIIw-2

Sharkey clay is the only soil in this group. It is fine textured and poorly drained. It occurs on level and nearly level relief in the border areas of the natural levee ridges.

This soil is inherently fertile. It is well supplied with plant nutrients and contains moderate amounts of organic matter. Sharkey clay receives much runoff from higher areas and has a fairly high water table. Nevertheless, the soil is high enough above the swamps and marshes to shed water. Complete artificial drainage is needed to produce good yields of row crops.

Present use and management.—Areas of this soil planted to row crops are usually drained by running the rows with the slope, and by spacing lateral ditches closer together than in the coarser textured soils. Occasionally, legume crops are turned under for green manure, and the compacted row middle is broken up after the second sugarcane crop is harvested.

The cropping system generally used is sugarcane for 3 years, followed by corn, or by plowed land left fallow. Nitrogen is generally the only fertilizer used for sugarcane; 40 to 50 pounds are applied per acre to each sugarcane crop. From 100 to 200 pounds of complete fertilizer are commonly applied to corn. The yields per acre under the usual management are in the order of 21 tons of plant cane, 18 tons of first-stubble cane, 14 tons of second-stubble cane, and 45 to 65 bushels of corn.

When the soil of this management group is planted to rice, 200 pounds of complete fertilizer are used. Some fields are not fertilized, especially if rice follows a rank growth of volunteer vegetation. The usual rotation is 2 years of rice and 1 or 2 years in volunteer vegetation. The normal acre yields of rice are 15 to 20 barrels.

Some fields receive small amounts of complete fertilizers to establish improved pasture, but only a few pastures are fertilized annually.

Suitable use and management.—Management practices that will improve the tilth, structure, and drainage are needed when Sharkey clay is used for row crops. The rows should be laid out to remove surface water at a moderate rate. Water should be prevented from standing for long periods in the middle of the row. Lateral ditches should be constructed at closer intervals on this soil than on the coarser textured soils. Cut-crowning may be needed to drain some fields or cuts adequately. How far artificial drainage may be extended into the back-swamp areas depends, in most places, on the elevations of the areas flooded by runoff or by the normal tides. Gravity drainage is effective in most places at elevations of 4 feet or more.

A good cropping system for this soil is sugarcane for 3 years, followed by 3 years of improved pasture. On small farms, where this cropping system is not practical, 3 years of sugarcane may be followed by corn or legumes. Under good management, legumes are turned under for green manure as often as feasible.

With good management, including application of 60 pounds of nitrogen per acre to plant cane and 80 to 100 pounds to stubble cane, expected average acre yields are in the order of 30 tons of plant cane, 24 tons of first-stubble cane, and 20 tons of second-stubble cane.

Under good management, corn receives 50 pounds of nitrogen per acre at planting time and a sidedressing of 50 pounds of nitrogen. Yields are 75 to 85 bushels per acre.

Rice yields are increased by applications of 300 to 400 pounds per acre of complete fertilizer and a sidedressing of 50 pounds of nitrogen. Under this management, rice may be expected to yield 20 to 30 barrels per acre.

Improved pastures yield better if the soil is adequately drained and properly fertilized. Most pastures respond to applications of nitrogen. Phosphate and potash fertilizers should be applied to pastures if soil tests show that these nutrients are deficient.

MANAGEMENT GROUP IIIw-3

The soils of this management group are Commerce silt loam, low phase, Mhoon silt loam, low phase, and Mhoon silty clay loam, low phase. These moderately well drained and imperfectly drained soils are very fertile. They occur on low natural levee ridges in the southeastern and east-central parts of the parish and are flooded occasionally by storm tides. Since these soils are on low narrow levee ridges that extend into the frequently flooded swamp and marsh areas, they have a fairly high water table. High water in adjacent wet areas often floods the ends of rows and thus limits the effectiveness of artificial drainage.

Present use and management.—No single cropping system is used on all areas of these soils. Many fields have been retired from cultivation for several years and are now in native pasture. Some fields are planted to sugarcane for a few years, or until damage caused by high tides makes this practice unprofitable. Many small farms on these soils produce corn and vegetables, chiefly for home use.

Drainage follows the direction of the row in all areas that are used for row crops. Green-manure crops are used only occasionally. When conditions are favorable for crop production, the average fertilizer practices and crop yields for these soils are similar to those for the soils in group IIw–1.

Suitable use and management.—Under natural conditions, the soils of this management group cannot be used continuously for profitable yields of row crops, although good crops of sugarcane and corn are produced occasionally. They may be used for continuous cultivation if protected by levees and drained by pumping.

Many of the ridges on which the soils of this management group occur are too narrow for growing row crops, but they are used as sites for the dwellings of trappers, fishermen, and workers in oilfields, and as homesites on small farms.

Because the soils of this management group are occasionally flooded, they are best suited to pastures and to opportune crops such as corn and truck crops. Soil

samples should be analyzed to determine the amounts and kinds of fertilizers needed to establish improved pastures.

MANAGEMENT GROUP Vw-1

This group of low, frequently flooded and water-logged soils and land types includes areas suited to forest and those suited only to water-tolerant sedges, rushes, herbs, and grasses.

Sharkey clay, low phase, Mhoon-Sharkey clays, low phases, and Made land in swamp are usually forested. They are better suited to pasture, trees, and wildlife than to cultivated crops. Most areas are favorable sites for the natural reseeding of trees.

Fresh water marsh, clays and mucky clays, Fresh water marsh, muck, and Made land in marsh are land types that are also low and often flooded. These areas are better suited to native grass pasture and wildlife than to trees and cultivated crops. Some areas can be used for seasonal grazing.

Some areas of these land types and soils are in sites that are not flooded by the occasional high tides caused by tropical storms. These areas can be used for cultivated crops and improved pasture if they are protected by levees and drained by pumps.

MANAGEMENT GROUP Vw-2

Only Brackish marsh, clays and mucky clays, is in this management group. This land type consists of poorly drained, fine-textured soils that are about level with the gulf. These soils are frequently flooded by brackish water and are generally too wet and too salty for improved pasture, trees, or cultivated crops. They produce, however, abundant native grass forage, but the kinds of plants are somewhat limited. The grazing is excellent on accessible areas during dry seasons. These soils provide favorable refuge and food for some fur-bearing animals.

Good management practices include controlled grazing, controlled burning, and water-control structures to keep the water at levels favorable for wildlife.

MANAGEMENT GROUP Vw-3

Swamp, peat, and Swamp, deep peat, are in this management group. They occur in level or depressed sites. Water stands at or over the surface most of the time. The moderately thin (12- to 30-inch) and thick (36- to 60-inch) peat surface layers are generally soft and provide poor footing for grazing animals. These soils are covered with a thick to open stand of cypress, tupelo-gum, swamp maple, bay, and other water-loving trees.

Swamp, peat, and Swamp, deep peat, are not suited to cultivated crops or pasture. These land types are generally covered with water and only a few small areas are suitable for natural or artificial reseeding. They are best suited to forest, but good management is needed to maintain and to improve the present stand of trees.

MANAGEMENT GROUP VIII-1

In this management group are Fresh water marsh, peat, and Fresh water marsh, deep peat. These wet, frequently flooded, organic soils of the marshes are not suitable for crops, improved pasture, or forest.

Easily accessible areas furnish some seasonal grazing, but footing for livestock is unstable. Small areas of Fresh water marsh, peat, have been protected from flooding by levees; they are pump drained and planted to improved pasture. Very good pasture has been produced on this land when it is reclaimed. The cost of reclaiming large areas, however, may be prohibitive. Subsidence, flooding, and undesirable acidity after reclamation account for the failure of most drainage reclamation projects in the coastal marshes.

The land types in management group VIII–1 are best suited to wildlife and recreation.

MANAGEMENT GROUP VIII-2

This management group includes Brackish marsh, peat, Brackish marsh, muck, Brackish marsh, deep peat, Salt water marsh, clays and mucky clays, and Salt water marsh, peat. These land types are wet and frequently flooded. They contain moderate amounts of salt and are not suited to crops, improved pasture, or forest. They provide an abundance of native grass forage, but most areas are too inaccessible and have unstable, soft footing for grazing animals. Small, easily accessible areas furnish some seasonal grazing. The land types in this management group are best suited to wildlife and recreation.

MANAGEMENT GROUP VIII-3

In this management group are Sand beaches and Shell beaches. Sediments which make up the beaches are frequently picked up and redeposited by waves from the Gulf of Mexico. They are generally barren of vegetation or have a few scattered plants. These beaches are not suitable for growing useful plants. Their best use is for recreation.

Genesis, Morphology, and Classification of Soils

Factors of Soil Formation

Soil is produced by soil-forming processes acting on materials deposited or accumulated by geologic agencies. The characteristics of a soil at any given point are determined by (1) the type of the parent material; (2) the present and former influences of climate; (3) the plant and animal life in and on the soil; (4) the relief, or lay of the land; and (5) the length of time that the forces of soil development have acted upon the soil material.

Parent material

The parent materials of the soils in Terrebonne Parish include slightly acid to moderately alkaline alluvium from the Mississippi River mixed with some alluvium from the Red River. These alluvial sediments were left by the distributary streams of several deltas of the Mississippi River. The oldest delta deposits have been buried, in part, by deposits from successively younger deltas.

The alluvium was derived from widely separated and different geologic sources. The sediments came from the phosphatic soils of Tennessee, from the limestone soils and limestone of the upper Mississippi River Valley, and from the Permian "Red Beds" of Texas and Oklahoma. By comparing the chemical composition of the soils and colloids of the Mississippi River bottom, it is concluded that most of the alluvial materials came from the eastern slopes of the Rocky Mountains and from the Great Plains area (*5*).

Silt loam and silty clay loam were deposited on the natural levee ridges that parallel the streams; clay and silty clay sediments were left on the back-swamp borders of the ridges and in areas of marsh and swamp.

Most of the soils at an elevation of 4 feet or more are not flooded by normal tides and stream overflow. The only stream alluvium now being deposited to any extent consists of moderate quantities of silty clay and clay left by the Lower Atchafalaya River. These sediments are deposited in the marshes and swamps in the southwestern part of Terrebonne Parish.

The major streams that flow into and through the marshes deposit small amounts of clay and silty clay and build low, narrow natural levee ridges along their channels. Sediments carried by these streams include small amounts of alluvium from the narrow watersheds and larger amounts received from the marshes during high tides.

Considerable quantities of fine-textured sediments come from areas along the shore, from the shallow lakes and bays, and from the shallow bottom of the Gulf of Mexico. These reworked sediments are spread over coastal areas of the marshes by waves, tides, and tidal channels.

In general, the coarser textured alluvium is moderately leached of carbonates and other readily soluble salts. Water percolates through the clays very slowly, and most of the soluble salts are retained.

Small areas of older alluvium occur on the narrow natural levee ridges in the northwestern part of the parish. They are more acid and, through leaching, have lost more carbonates and other salts than the younger alluvium.

Climate

Terrebonne Parish has a humid, subtropical, marine climate. The average rainfall is 64.68 inches. The average summer temperature is 80.8° F., and the average winter temperature is 57.3°. Plants thrive in this climate, but because of the long periods of hot weather, large amounts of organic matter accumulate only in the flooded or partly flooded marshes and swamps. In this area of high rainfall, most of the arable soils are leached of bases to various degrees. Except for the marshes, where temperature and rainfall are slightly higher, the climate of the parish is fairly uniform. Differences among soils in the parish, therefore, are not attributed to differences in climate.

Vegetation

Trees, shrubs, grasses, micro-organisms, earthworms, and other forms of life that live in and on the soil contribute to its formation. In Terrebonne Parish the living organisms that affect soil development are influenced greatly by climate, topography, and time. Vegetation grows luxuriantly in this area. However, the topography and the resulting drainage cause variations in the kinds of vegetation and the amounts of accumulated organic matter.

The wet and frequently flooded marshes have a cover of water-loving grasses, sedges, rushes, herbs, and shrubs. Moderately thin to thick layers of peats and mucks have accumulated on the surface of large areas in the marshes.

Peat is formed when plants die and fall into the water, or when the vegetation is covered with water. Air is thus excluded, and oxidation and decay are stopped or retarded. The decay of the organic materials under water is influenced largely by fungi and anaerobic bacteria. Accumulations of the undecomposed, or partly decomposed, organic materials in which the original plant parts can be identified are classified as peat.

Muck is formed in wet sites where the organic materials are exposed to air long enough to decompose the plant tissues, although the accumulations are protected from complete oxidation by water standing at or over the surface for long periods. The resulting muck is finely divided and generally has a strong fine granular structure. Most of the mucks contain various amounts of mineral soil.

The swamps of Terrebonne Parish have a dense growth of cypress and tupelo-gum trees. Marsh plants commonly grow in open areas of the swamps. The peats and mucks of the swamps generally are accumulations of woody organic materials derived from the remains of trees. However, some swamp soils have organic surface layers developed both from marsh and from swamp vegetation.

The better drained areas of the parish (the natural levee ridges) had a cover of sweetgum, water oak, live oak, pecan, hackberry, and other hardwoods, and the undergrowth was shrubs, vines, and canes. Some areas of the ridges were covered with tall prairie grasses.

Because of the youth of the land surface, only the major differences in native vegetation have influenced the soils to any great extent. The amount of organic matter that has accumulated in the surface soil is associated with the differences in soil drainage and oxidation. Smaller amounts of organic matter have accumulated in the surface layers of the better drained soils than in those of the more poorly drained soils.

Relief

Terrebonne Parish, a part of the broad delta of the Mississippi River, is generally level. Most of the land area is in marshes and swamps on a flat plain lying at about the level of the gulf. This broad plain slopes imperceptibly toward the gulf. It is broken by low narrow ridges and by bays and lakes and their slightly elevated shorelines. The higher natural levee ridges and the lowlands between the ridges cover a minor area in the northern part of the parish. These ridges are 4 to 16 feet high. They are generally level or have slopes of 1 percent or less. A few narrow areas along the streams have slopes of 1 to 3 percent. The fine texture of the soils, the flatness of the land, and the low elevations above the gulf contribute to poor drainage, which is characteristic of most of the parish.

Time

In general, the soils of Terrebonne Parish are young. Time has been too short for distinct horizons to have developed. Small areas of older alluvium from the Red and Mississippi Rivers, however, have been influenced by soil-forming processes long enough to have developed faintly to moderately differentiated horizons.

Morphology and Composition

The soils of Terrebonne Parish in general are not strongly developed, as is evidenced by their weak horizonation. All of the soils have one faint to distinct horizon; only a few have moderately well developed horizons.

Chemical and physical processes that have resulted in soil horizon differentiation in this parish include (1) accu-

mulation of organic matter, (2) leaching and movement of readily soluble salts, (3) movement of clay minerals from the surface horizons to the subsoil horizons, and (4) reduction and movement of iron. Accumulation of organic matter and leaching are the two processes which have resulted in horizon differentiation to a slight or moderate degree in all soils. All four processes have been active in soil horizon differentiation of the Baldwin soils.

Various amounts of organic matter have accumulated in the surface layer of all soils in the parish to form the A_1 and A_2 horizons. The organic accumulations range from the humus of the Cypremort, Baldwin, Commerce, Mhoon, and Sharkey soils to the peats and mucks of the marshes and swamps.

Some of the soils of the parish have been moderately leached, as is indicated by the transfer in the profile of carbonates and more soluble salts. Others have been slightly leached. The carbonates and other more readily soluble salts have been moved to lower horizons in the better drained soils or completely out of them. Salts have been leached only from the upper soil layers of most of the poorly drained soils, for their fine texture slows movement of water through them. In general, the permanently wet soils of the marshes and swamps have been leached very little. However, areas of organic soils are readily leached during unusual and extended dry periods or when they are artificially drained.

Some of the older soils have developed horizons, because clay minerals have been moved from the A horizon and have accumulated at lower depths. The B horizons in the Baldwin and Cypremort soils were formed by the accumulation of clay minerals. The downward movement of clay minerals and their accumulation in lower horizons is not expressed, or only faintly expressed, in the younger soils.

The reduction of iron oxides and the formation of a gray-colored gleyed layer is an important process in horizon differentiation. Iron in the reduced state occurs in all the poorly drained and somewhat poorly drained soils of the parish. In the reduced state, the iron may move downward or completely out of the soil profile. Segregated iron has been observed in some horizons as brownish-yellow mottles or concretions. The reduction of iron oxides and the resulting gleyed horizon is common in the deeper layers of the moderately well drained soils.

The comparative effects of the several processes in horizon differentiation can be illustrated by detailed profile descriptions; therefore, representative profiles are described in the following pages. The location of each is given. The processes in horizon differentiation that influenced each profile are discussed. Laboratory data are listed in tables 6, 7, and 8 for numbered samples of the representative soils.

Commerce silt loam.—This moderately well drained soil is the best soil in the parish for crops, but it is not extensive. It is made up of the medium-textured sediments that were deposited along stream channels when the streams overflowed their banks. After a succession of such deposits, narrow ridges of this soil material were built up next to the stream channels.

Profile of Commerce silt loam located at Waterproof on Bayou Black, sec. 65, T. 17 S., R. 16 E.:

A_{1p} 0 to 10 inches, dark grayish-brown (10YR 4/2)[4] and dark-brown (10YR 4/3) friable silt loam; moderate medium granular structure; slightly acid.

[4] Symbols in parentheses are Munsell coordinates (hue, value, and chroma) of the colors observed. The colors given are for moist soil unless otherwise stated.

TABLE 6.—*Analytical data* [1] *for representative cultivated soils* [2]

Soil type and sample number	Horizon	Depth	pH	Exchangeable cations (milliequivalent per 100 grams of soil)						Base saturation
				Ca	Mg	K	Na	H	Total	
		Inches								*Percent*
Commerce silt loam:										
618	A_{1p}	0–10	6.4	9.3	1.9	0.2	0.2	2.8	14.5	81
619	A_{1an}	10–16	6.8	10.6	4.1	.3	.2	2.2	17.4	87
620	C_1	16–36	6.9	7.7	2.2	.1	.3	1.4	11.7	88
621	C_2	36–40	7.0	14.3	7.5	.2	.2	1.6	23.8	93
Mhoon silty clay loam:										
615	A_{1p}	0–6	6.8	15.6	4.1	.5	.5	1.1	21.8	95
616	A_{1an}	6–10	6.7	15.8	4.6	.3	.7	1.0	22.4	96
617	C_g	10–36	7.0	17.2	5.6	.4	.6	.6	24.4	98
Sharkey clay:										
661	A_{1p}	0–3	6.2	39.6	14.9	.9	.4	3.1	58.9	95
662	A_{12p}	3–8	5.9	38.2	14.3	.8	.5	4.4	58.2	92
663	A_{13}	8–16	6.3	40.8	14.8	.8	.8	3.2	60.4	95
664	C_1	16–20	7.2	41.0	15.8	.9	1.5	.4	59.6	99
665	C_{2g}	20–36	7.3	39.1	14.6	.8	1.6	.4	56.5	99

[1] Chemical methods:
pH of 1:1 soil paste on pH meter.
Exchangeable Ca, Mg, K, Na by ammonium acetate displacement and flame photometer determination.
Exchangeable H by barium acetate displacement and titration with base.
Total by summation of cations.
Base saturation by calculation.

[2] Analyzed by B. N. Driskell, associate agronomist, Louisiana Agricultural Experiment Station, Baton Rouge, La.

TABLE 7.—*Available (weak acid soluble [1]) nutrients and organic-matter content [2] of designated horizons of representative soil types [3]*

Soil type and sample number	Horizon	Depth	Ca	Mg	K	P	Organic matter
		Inches	*p. p. m.*	*p. p. m.*	*p. p. m.*	*p. p. m.*	*Percent*
Commerce silt loam:							
618	A_{1p}	0–10	1, 793	250	120	228	1. 59
619	A_{1an}	10–16	2, 194	500	128	148	. 78
Mhoon silty clay loam:							
615	A_{1p}	0–6	2, 596	525	184	236	1. 83
616	A_{1an}	6–10	2, 737	563	120	199	1. 73
Sharkey clay:							
661	A_{1p}	0–3	5, 103	1, 763	384	81	3. 15
662	A_{12p}	3–8	4, 108	1, 716	345	69	3. 09

[1] Soluble in 0.1 normal HCl with 1:25 ratio and 30 minutes equilibrium.

[2] Dry combustion method with carbon chain apparatus.

[3] Analyzed by B. N. Driskell, associate agronomist, Louisiana Agricultural Experiment Station, Baton Rouge, La.

TABLE 8.—*Chemical analyses [1] of representative soil types [2]*

Soil type and laboratory number	Horizon	Depth	SiO_2	TiO_2	Fe_2O_3	Al_2O_3	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	Ignition loss	Total
		Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Commerce silt loam:														
618	A_{1p}	0–10	77. 46	0. 68	2. 32	9. 42	0. 03	0. 94	0. 59	2. 20	2. 22	0. 10	3. 57	99. 53
619	A_{1an}	10–16	75. 62	. 74	3. 82	11. 65	. 05	1. 01	1. 24	2. 31	2. 01	. 09	1. 47	100. 01
620	C_1	16–36	78. 67	. 77	2. 76	9. 52	. 03	1. 04	. 91	2. 23	2. 12	. 08	1. 18	99. 31
621	C_2	36–40	71. 09	. 76	4. 15	14. 62	. 06	1. 09	1. 42	2. 44	2. 07	. 11	2. 27	100. 08
Mhoon silty clay loam:														
615	A_{1p}	0–6	73. 97	. 72	3. 24	11. 41	. 05	. 99	. 89	2. 46	1. 84	. 08	3. 81	99. 46
616	A_{1an}	6–10	73. 92	. 73	3. 27	12. 04	. 05	1. 03	1. 06	2. 35	2. 12	. 11	3. 21	99. 83
617	C_g	10–36	72. 30	. 76	4. 09	13. 99	. 05	1. 04	. 95	2. 46	1. 97	. 13	1. 95	99. 69
Sharkey clay:														
661	A_{1p}	0–3	59. 02	. 83	6. 55	18. 86	. 07	1. 19	1. 68	2. 69	1. 05	. 15	7. 74	99. 83
662	A_{12p}	3–8	59. 24	. 83	6. 65	18. 82	. 06	1. 17	1. 88	2. 63	1. 39	. 13	7. 55	100. 35
663	A_{13}	8–16	58. 32	. 83	7. 40	18. 05	. 07	1. 20	1. 66	2. 58	1. 47	. 14	7. 62	99. 34
664	C_1	16–20	58. 60	. 86	6. 70	20. 56	. 13	1. 21	2. 01	2. 63	1. 43	. 11	6. 32	100. 56
665	C_{2g}	20–36	61. 76	. 86	6. 96	19. 86	. 13	1. 39	1. 89	2. 77	1. 63	. 09	2. 74	100. 08

[1] Chemical methods: Sodium carbonate fusion followed by gravimetric determination for SiO_2, TiO_2, Fe_2O_3, Al_2O_3, MnO, CaO, MgO.

Hydrofluoric-nitric acid decomposition followed by flame photometer determination for K_2O, Na_2O, and colorimetrically for P_2O_5; ignition loss at 675° C.

[2] Analyzed by B. N. Driskell, Louisiana Agricultural Experiment Station.

A_{1an} 10 to 16 inches, dark grayish-brown (10YR 4/2) silty clay loam and silty clay with mottles of dark gray (10YR 4/1), dark yellowish brown (10YR 4/4), and dark brown (10YR 4/3); compact and firm when dry, slightly plastic when wet; moderate medium to thin platy structure; slightly acid.

C_1 16 to 36 inches, friable silt loam, with mottles of brown and yellowish brown (10YR 5/3 and 5/4, 5/6, and 5/8); weak medium and fine subangular blocky structure; neutral.

C_2 36 to 40 inches, dark grayish-brown (10YR 4/2) silty clay and silty clay loam with mottles of grayish brown (10YR 5/2) and brown (10YR 4/3); slightly plastic when wet, slightly hard when dry; weak medium subangular blocky structure; contains thin (2- to 6-inch) lenses of silt loam, fine sandy loam, and clay; moderately alkaline.

This soil is in the early stages of development, and the differentiation in soil horizon is faint. Some organic matter has accumulated in the upper layers. These layers have been leached of carbonates and other readily soluble salts and are acid. The unleached lower soil layers are mildly alkaline. The A_{1an} layer has been compacted by farm machinery.

Mhoon silty clay loam.—This soil of the bottom lands is made up of medium-textured and fine-textured sediments that were left on the back slopes of the natural levee ridges. Mhoon soils are the most extensive soils used for crops in the parish. Generally they are well above normal overflow and are readily drained by gravity.

A representative profile of Mhoon silty clay loam from sec. 95, T. 17 S., R. 16 E., ¾ mile east of Minors Canal at Waterproof:

A_{1p} 0 to 6 inches, dark grayish-brown (10YR 4/2) silty clay loam; slightly hard when dry, slightly plastic when wet; moderate fine granular structure; slightly acid.

A_{1an} 6 to 10 inches, dark-gray (10YR 4/1) and gray (10YR 5/1) silty clay or silty clay loam; hard when dry, compact and firm when moist; moderate thick platy structure; mildly alkaline.

C_g 10 to 36 inches, friable silty clay loam mottled with dark grayish brown (10YR 4/2), dark gray (10YR 4/1), gray (10YR 5/1), and dark yellowish brown (10YR 4/4); weak medium subangular blocky structure; moderately alkaline.

Evidences of the faint horizon differentiation in this soil are the moderate accumulation of organic matter in the surface layer and the moderate leaching of salts from it. The somewhat poor drainage and usually high water table have caused a reduction of iron oxides, or gleying,

in the lower soil layer. This soil is generally somewhat less leached than the better drained and more permeable Commerce soils.

Sharkey clay.—This soil is widely distributed throughout the parish. It occurs on the higher parts of the back swamps that border the natural levee ridges. Sharkey clay has formed primarily from recent clay alluvium that has poor drainage.

The profile described was taken from an area of Sharkey clay located in sec. 57, T. 18 S., R. 18 E.:

A_{1p} 0 to 3 inches, very dark gray (10YR 3/1) clay; very hard when dry, plastic when wet; moderate fine granular structure; contains many small roots; slightly acid.

A_{12p} 3 to 8 inches, very dark gray (10YR 3/1) clay; very hard when dry, plastic when wet; moderate fine granular structure; contains many small roots; slightly acid.

A_{13} 8 to 16 inches, very dark gray (10YR 4/1) clay; plastic when wet; contains a few, small, distinct mottles of yellowish brown (10YR 5/4); moderate medium and fine blocky structure; slightly acid.

C_1 16 to 20 inches, dark gray (10YR 4/1) clay; many, coarse, faint mottles of dark brown (10YR 3/3 and 3/4); plastic when wet, very hard when dry; strong medium and fine blocky structure; neutral.

C_{2g} 20 to 36 inches+, gray (10YR 6/1) clay; contains medium-sized distinct mottles of yellowish brown (10YR 5/4); very hard when dry, plastic when wet; moderate to strong medium and fine blocky structure; neutral to mildly alkaline.

The accumulation of organic matter and the resulting darker color of the A_1 horizon are evidences of a slight horizon differentiation in Sharkey clay. Other evidences are a slight leaching of salts from the upper soil horizons, an increase in pH from the surface downward, and the reduction of iron, or gleying, in the lower horizon.

The results of the laboratory analyses are consistent with field observations in that they also indicate a low degree of horizonation. The data (table 7) show that the content of organic matter in Sharkey clay is moderately high in the surface horizon and decreases gradually with depth. Values for exchangeable calcium, magnesium, and potassium are high throughout the profile (table 6). The high exchange capacity further indicates that the dominant clay mineral is montmorillonite.

Horizon differentiation, which is expressed only slightly in Sharkey clay, indicates that the clay sediments have been exposed to weathering for a very short time. The clay soils resist weathering and restrict the movement of materials from one horizon to another.

The dark color of the C_1 horizon indicates some downward movement of soil materials containing moderate amounts of organic matter. Montmorillonitic clay shrinks and cracks when drying and expands when wet. Dark-colored soil materials from the upper horizons fill the cracks to depths of 2 or 2½ feet during the process of shrinking and swelling. As a result the dark-colored surface soil is mixed with the lighter colored soil of the lower horizons. In the soil profile described, the very dark gray material from the upper horizons has been mixed with the C_1 horizon to depths of 16 to 20 inches below the surface.

Classification of Soils in Higher Categories

The soils of Terrebonne Parish have been classified into soil series, types, phases, and miscellaneous land types in the section, Descriptions of the Soils. Under the general classification now in use (*9*), the soils are placed in broader groupings for study and for comparison with the soils of other parishes in the State and with soils of other States.

In the highest category of classification are the zonal, intrazonal, and azonal orders. In the zonal order are soils that have developed distinct, genetically related horizons that show the influence of climate and living organisms in their formation. The intrazonal order consists of soils having genetically related horizons that have developed through the dominant influence of some local factor of relief, parent material, or time over the normal effects of climate and living organisms. Soils that do not have distinct, genetically related horizons are in the azonal order.

The great soil groups in the parish, listed by orders, are as follows:

Zonal	Gray-Brown Podzolic soils.
Intrazonal	Low-Humic Gley soils.
	Humic Gley soils.
	Grumusols.
	Bog soils.
Azonal	Alluvial soils.

Only the Cypremort series is in the zonal order in Terrebonne Parish. A full profile description of a typical Cypremort soil is given in an earlier section of this report.

Horizons are evident in the Cypremort soil, but their degree of development ranges from distinct to faint. The horizons are genetically related and reflect the influences of climate and living organisms, although age, or time, has also influenced the degree of horizon differentiation. This soil is only slightly older than the azonal soils and may be best classified as an intergrade to the azonal order.

The Cypremort soil is further classified in the Gray-Brown Podzolic great soil group, but it has some of the characteristics of the Prairie group (not mapped in the parish). Gray-Brown Podzolic soils have thin, dark A_1 horizons, brown A_2 horizons, brown or yellowish-brown finer textured B horizons, and lighter colored and coarser textured C horizons.

The Prairie soils have thick, dark A_1 horizons and brown or mottled B horizons that grade into lighter colored and coarser textured C horizons. Prairie soils have developed in humid temperate climates under tall prairie grasses.

According to information from early settlers, the vegetation on the Cypremort soil was tall grasses and scattered forest. Most areas, however, have been cultivated for more than 100 years, and any evidence of a thick A_1 horizon has been lost. The plow layer may now include both the A_1 and A_2 horizons.

The A horizon contains more organic matter and is darker than the B and C horizons. The B horizon contains more clay and is finer in texture than the A and C horizons. The B horizon has a well-developed soil structure; clay coatings are on most surfaces of the structural particles, or peds. The finer texture and the clay coatings are evidence of some downward movement of silicate clay minerals from the A horizon and an accumulation in the B horizon. The decrease in acidity from the surface downward indicates the leaching of easily soluble carbonates and salts. The soil is medium acid for about 24 inches, but below this depth the reaction is usually slightly acid to neutral. This change in soil reaction indicates that Cypremort soil is only slightly older than the Commerce soils of the azonal order.

Soils of the Baldwin and Sharkey series, as well as the organic and mineral soils of the swamps and marshes, are

classified in the intrazonal order. These soils are poorly to somewhat poorly drained. All show in their morphology the effects of gleying and the accumulation of organic matter. The Sharkey soils also show the effects of marked shrinking and swelling with changing moisture content, as indicated earlier. The intrazonal soils in this parish are placed in great soil groups on the basis of the degree of gleying, the accumulation of organic matter at the surface, and the extent of mixing and churning of materials in the profile.

Inasmuch as Baldwin soils contain moderate rather than large amounts of organic matter in the A horizons, they are classified as Low-Humic Gley soils (*9*). The Low-Humic Gley group includes poorly or somewhat poorly drained soils lacking prominent A_1 horizons, but having strongly gleyed B and C horizons with little textural differentiation.

The Baldwin soils are somewhat poorly drained, contain fair to moderate amounts of organic matter in the A_2 horizon, and have a gleyed C horizon. However, like the Cypremort, the vegetation on the Baldwin soils was formerly tall prairie grasses and scattered forest. Baldwin soils do not have the thick A_1 horizon typical of Prairie soils. They do have a brownish or mottled B horizon and the lighter colored and coarser textured C horizon. The B horizon of the Baldwin soils is finer textured than that of the A or C horizon. Clay films on the well-developed, strong structural particles of the B horizon indicate the accumulation of silicate clay minerals that have moved downward from the A horizon. The A horizon is leached of easily soluble carbonates and other salts and is strongly to slightly acid. Further evidences of leaching are the medium acid to neutral reaction of the B horizon and the neutral to mildly alkaline C horizon. The dark-gray color of the B_2 horizon indicates the possibility of some former churning by swelling and cracking of the clays, as in the Sharkey soils. A detailed profile description of a typical Baldwin soil is given in the section, Descriptions of the Soils.

The Sharkey soils have some of the qualifications of Grumusols and others of the Low-Humic Gley group. Because of the mixing of the surface layers during swelling, shrinking, and cracking of the montmorillonitic clays, the Sharkey soils are classified as Grumusols, as defined by Oakes and Thorp (*7*), but they intergrade to Low-Humic Gley soils.

The clays and mucky clays of the swamps and marshes (not classified by soil series in this survey) have the characteristics of the Humic Gley group. These soils are poorly drained. The surface horizons are usually thick

TABLE 9.—*Chemical analyses of representative clays, peats, and mucks from the coastal marshes* [1]

Land type and laboratory number	Depth	Organic matter	pH	Water-soluble cations				Water-soluble salts			
				Ca	Mg	K	Na × 10^3	Na_2CO_3	Na_2SO_4	NaCl	Total salts
Fresh water marsh, clays and mucky clays:	*Inches*	*Percent*		*p.p.m.*	*p.p.m.*	*p.p.m.*	*p.p.m.*	*Percent*	*Percent*	*Percent*	*Percent*
43	0–14	24. 5	5. 8	--------	--------	250	29. 1	0. 12	0. 20	0. 73	1. 05
44	14–24	27. 7	5. 2	--------	--------	199	22. 4	. 11	. 43	. 43	. 97
Fresh water marsh, muck:											
92	0–8	40. 7	6. 2	768	1, 127	513	5. 9	. 32	. 04	1. 56	1. 92
93	8–16	47. 7	6. 8	428	1, 524	390	6. 0	. 16	. 17	1. 65	1. 98
Fresh water marsh, peat:											
55	0–16	63. 2	6. 0	--------	--------	78	. 5	. 03	. 06	. 23	. 32
56	16–42	69. 4	6. 0	--------	--------	60	. 5	(2)	. 01	. 20	. 21
Brackish marsh, clays and mucky clays:											
322	0–12	64. 6	6. 6	784	1, 661	756	12. 0	. 20	. 63	2. 43	3. 26
323	12–24	--------	7. 1	1, 637	3, 530	1, 005	28. 1	. 19	1. 43	6. 44	8. 06
471	0–20	8. 6	7. 4	468	411	393	11. 6	. 06	. 26	2. 34	2. 66
472	20–48	--------	7. 9	526	779	472	10. 5	. 03	. 92	1. 96	2. 91
Brackish marsh, muck:											
298	0–12	24. 5	5. 9	956	2, 179	952	19. 6	. 15	1. 25	3. 89	5. 29
299	12–24	54. 1	6. 6	1, 724	5, 232	1, 845	47. 1	. 23	2. 05	9. 84	12. 12
269	0–8	34. 9	6. 2	1, 008	2, 808	525	27. 9	. 23	. 73	6. 37	7. 33
270	8–20	41. 6	5. 7	1, 396	4, 144	1, 500	35. 8	. 21	1. 60	8. 44	10. 25
Brackish marsh, peat:											
451	0–16	56. 6	6. 6	2, 672	5, 969	2, 040	60. 4	. 25	. 50	14. 75	15. 50
452	16–34	36. 1	6. 8	2, 995	4, 810	1, 725	44. 2	. 17	3. 27	6. 54	9. 98
Salt water marsh, clays and mucky clays:											
352	0–5	6. 9	7. 0	623	1, 612	791	18. 5	. 12	. 01	4. 58	4. 71
353	5–16	7. 3	7. 3	679	2, 265	1, 335	26. 7	. 13	. 52	5. 93	6. 58
237	0–10	12. 6	7. 1	598	2, 108	1, 035	23. 8	. 18	. 63	4. 94	5. 75
238	10–28	7. 2	7. 7	376	1, 569	873	16. 3	. 09	. 48	3. 63	4. 20
Salt water marsh, peat:											
76	0–10	28. 5	7. 3	1, 152	3, 520	1, 340	27. 1	. 15	. 01	8. 25	8. 41
77	10–72	34. 8	7. 2	--------	--------	2, 430	56. 7	. 57	. 03	13. 93	14. 53

[1] Analyses by B. N. Driskell, associate agronomist, Louisiana Agricultural Experiment Station. [2] Trace.

TABLE 10.—*Chemical analyses of water samples collected from the clays, peats, and mucks listed in table 9*

Land type and laboratory number	pH	Water-soluble cations				Water-soluble salts			
		Ca	Mg	K	$Na \times 10^3$	Na_2CO_3	Na_2SO_4	NaCl	Total salts
Fresh water marsh, clays and mucky clays:		*p. p. m.*	*p. p. m.*	*p. p. m.*	*p. p. m.*	*Percent*	*Percent*	*Percent*	*Percent*
43		32	259	15	0. 02	0. 02	0	0. 32	0. 34
Fresh water marsh, muck:									
92		17	81	23	. 16	. 01	0	. 11	. 12
Fresh water marsh, peat:									
55		13	45	289	. 36	. 02	0	. 18	. 20
Brackish marsh, clays and mucky clays:									
322	7. 5	64	385	91	1. 06	. 03	0	. 75	. 78
471	7. 2	61	782	150	2. 15	. 03	. 03	1. 53	1. 59
Brackish marsh, muck:									
298	6. 9	73	568	161	1. 59	. 03	. 02	1. 20	1. 25
269		84	665	229	1. 96	. 03	0	1. 41	1. 44
Brackish marsh, peat:									
451	6. 7	124	711	183	1. 83	. 03	. 02	1. 40	1. 45
Salt water marsh, clays and mucky clays:									
352	7. 9	319	2, 565	612	5. 75	. 04	. 27	4. 96	5. 27
237		207	1, 783	450	4. 58	. 08	0	3. 61	3. 69
Salt water marsh, peat:									
76		295	741	206	2. 81	. 04	. 01	1. 93	1. 98

and commonly contain moderate to high amounts of organic matter. The soils are generally dark gray to depths of 6 to 13 feet. They have little indication of horizon differentiation except the darker color of the organic layer and the lighter color of the waterlogged, or gleyed, layer. The depth to the gleyed layer ranges from a few inches to several feet from the surface. Some areas of these soils that are low in organic matter have characteristics of the Low-Humic Gley group.

The organic soils of the swamps and marshes have a high content of organic matter and are classified as Bog soils. They are usually wet and waterlogged. The moderately thin to thick surface layer of mucks and peats is underlain by clays and silty clays, which are dark gray to very dark gray to depths of 6 to 12 feet from the surface. The gleyed gray clay layers commonly are below the dark-gray clay.

The azonal order in Terrebonne Parish includes soils of the Commerce and Mhoon series. These soils lack genetically related horizons or have only faintly distinguishable horizons. They are classed as Alluvial soils of the azonal order. However, the somewhat poorly drained Mhoon soils show some reduction and transfer of iron and therefore have the gray, gleyed layer characteristic of the Low-Humic Gley group. These soils lack well-developed horizons because the sediments from which they are developing have been in place a comparatively short time.

Laboratory Data on Coastal Marshes

Chemical analyses of representative land types of the coastal marshes are given in table 9, and laboratory analyses of samples of water taken from these soils are listed in table 10.

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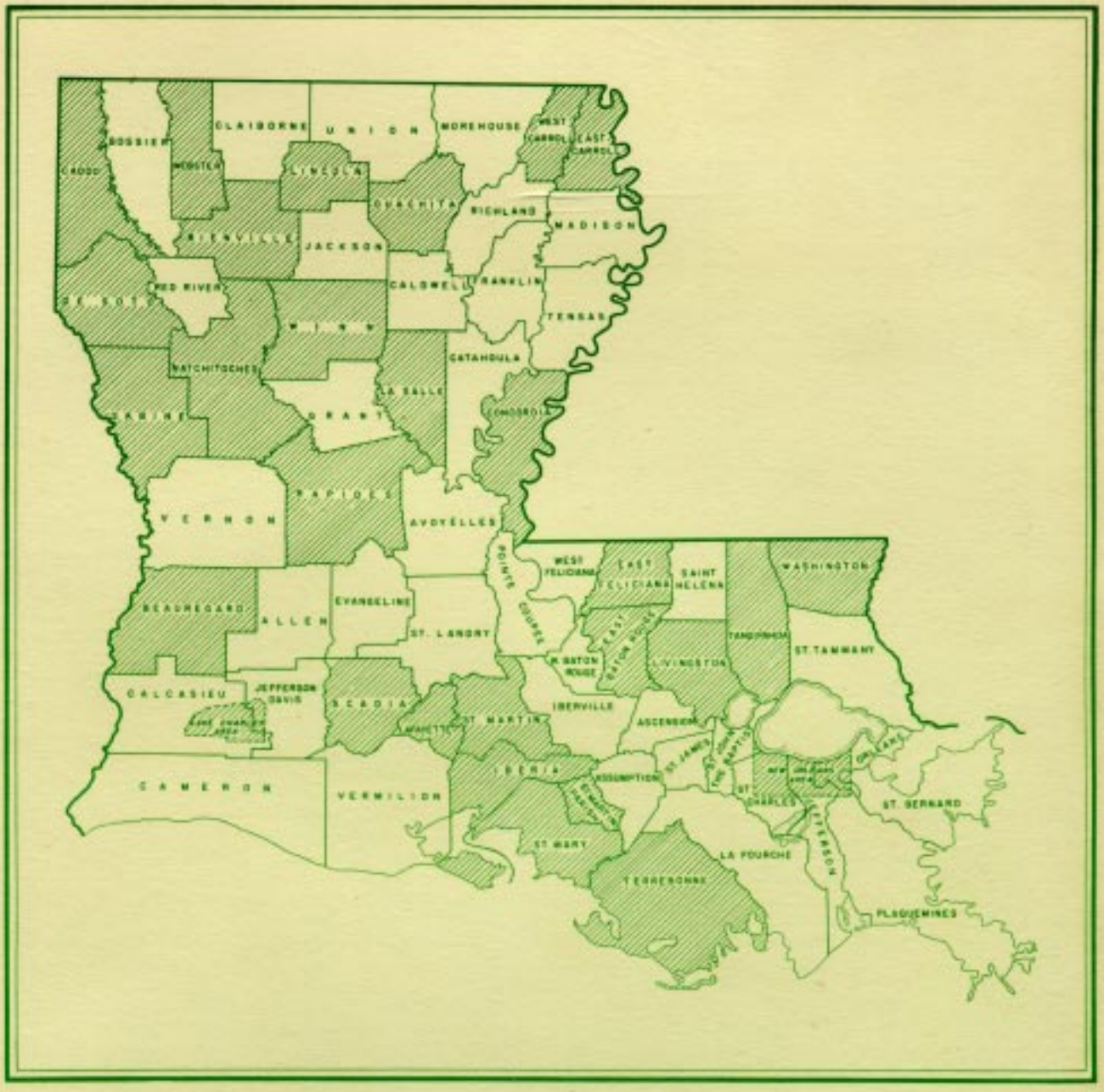

Areas surveyed in Louisiana shown by shading.