# LAND AND SOIL RESOURCES OF LOUISIANA, USA

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**ABSTRACT**
For years, researchers have used county or parish soil surveys when conducting fieldwork and research. Such surveys provided researchers with quick, easily accessible information (chemical, physical, taxonomic) in the field. The classification of soils has profound impacts on a variety of soil properties from land use to agronomic productivity. While initial soil survey work in Louisiana is complete, the inventory of soils in Louisiana is dynamic and subject to temporal change. The soil survey staff continues to produce soil series updates and continually works to update soil maps in response to changing land use and concepts of soil survey. For example, soil surveys were published for years on an individual parish basis. Yet such political boundaries do not conform to natural soil or land use patterns. As such, parish soil surveys often resulted in fragmentation of soils data along artificial (political) boundaries. Today, much greater emphasis is placed on mapping soils across parish boundaries using the concept of major land resource areas (MLRAs).

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## 1. GENERAL OCCURRENCE AND FEATURES

Louisiana consists of 112,822 km$^2$ (US Census Bureau, 2000) extending from the gulf coast inland some 610 km. Elevation of the state ranges from 163 m (Driskill Mountain – Bienville Parish) to -2 m (New Orleans)(US Geological Survey, 2008). The state is dissected by numerous river systems, most notably the Mississippi River, Red River and Ouachita River (ATLAS, 2008). These rivers have historically provided a major source of alluvial sediment to the state. Geology of Louisiana consists largely of Pleistocene terraces and Holocene alluvium associated with the major rivers (Figure 1). As flooding has been controlled through a series of dams, levees, etc., new sources of sediment deposition have been cut off and have contributed to subsidence, particularly along the coastline.

The climate of Louisiana is moist and subtropical. Average annual temperatures range from 63°F (17°C) in the northern part of the state to 71°F (22°C) along parts of the coast (Figure 2)(Soil Survey Staff, 2008a). Average annual rainfall ranges from 47 inches (119 cm) in the northwestern part of the state, to 71 inches (180 cm) in isolated areas north of Lake Ponchartrain (Figure 3)(Soil Survey Staff, 2008a). In the winter months, cold fronts advancing from north to south can cause sharp drops in temperatures, to include freezing temperatures throughout much of the state.

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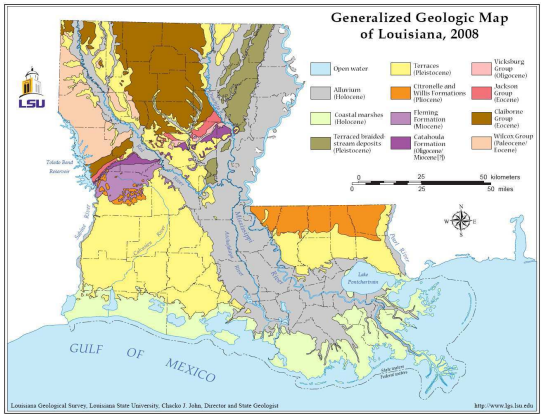


**Fig. *1 Generalized geologic map of Louisiana (Louisiana Geological Survey, 2008)***

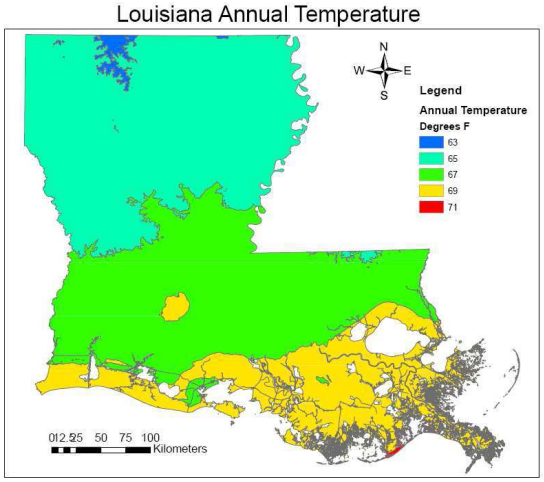


**Fig. 2 *Louisiana annua temperatures (Soil Survey Staff, 2008a)***

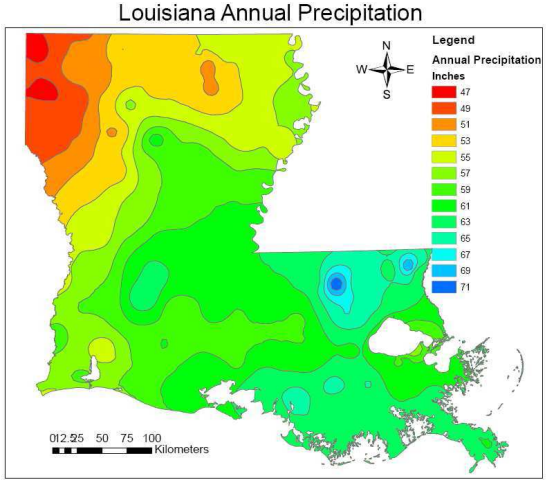


**Fig. 3 *Louisiana annual precipitation (Soil Survey Staff, 2008a).***

## 2. MAJOR LAND RESOURCE AREAS (MLRAS)

A previous guide to classification of soils in Louisiana (Amacher et al., 1989) cited work by Lytle (1968) and Lytle and Sturgis (1962) in defining six major soil areas in Louisiana: coastal plain, flatwoods, coastal prairie, loess hills, recent alluvium and coastal marsh. While these associations remain generally valid, they have been more precisely defined and differentiated by the Soil Survey Staff (2006) into eleven major land resource areas (MLRAs)(Figure 4). It should be noted that the following descriptions and interpretations describe the entire MLRA area, some of which exist beyond the border of Louisiana. The Soil Survey Staff (2006) define the MLRAs of Louisiana as follows:

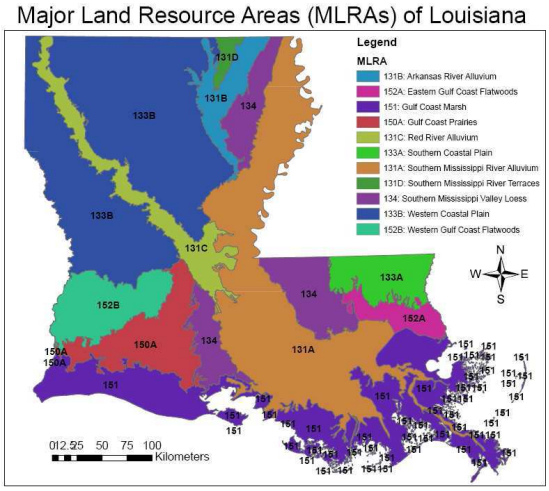


**Fig 4.** ***Major land resource areas of Louisiana (Soil Survey Staff, 2008a)***

### 131B – Arkansas River Alluvium

Louisiana constitutes 33 percent of this MLRA to include the town of Monroe, LA. Parts of Interstate 20 fall within this MLRA.

**Physiography**

This area is in the Mississippi Alluvial Plain Section of the Coastal Plain Province of the Atlantic Plain. It is on the alluvial plains along the lower Arkansas River in Arkansas and the Ouachita River in Louisiana and Arkansas. The landforms in the area are level or depressional to very gently undulating alluvial plains, backswamps, oxbows, natural levees, and terraces. Landform shapes range from convex on natural levees and undulating terraces to concave in oxbows. Landform shapes differentiate water-shedding positions from water receiving positions, both of which affect soil formation and hydrology. Average elevations start at about 50 feet (15 meters) in the southern part of the area and gradually rise to about 250 feet (75 meters) in the northwestern part. Maximum local relief is about 10 feet (3 meters), but relief is considerably lower in most of the area.

**Geology**

Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the U.S. Alluvial

deposits from flooding and lateral migration of the Arkansas and Ouachita Rivers typically lie above the bedrock. These sediments are sandy to clayey fluvial deposits of Holocene to late Pleistocene age and are many meters thick. The geologic surfaces are identified as the Arkansas Lowlands, which extend from the Yazoo Basin up the Arkansas River to the margin of the Coastal Plain, and the parts of the Tensas Basin west of Macon Ridge. The deposits on both of these surfaces are of Holocene age. In some areas late Pleistocene terrace deposits are within several meters of the present surfaces, but they do not crop out in the MLRA.

**Soils**

The dominant soil orders in this MLRA are Vertisols, Alfisols, Inceptisols, and Entisols. The soils in the area have a thermic soil temperature regime. They dominantly have an aquic soil moisture regime, smectitic clay mineralogy, and mixed sand and silt fraction mineralogy. They are very deep and generally are poorly drained to well drained and loamy or clayey. Nearly level Epiaquerts (Perry series), Vertic Hapludolls (Desha series), and Vertic Epiaquepts (Portland series) dominate the Holocene-age alluvial flats and backswamps. Nearly level to gently sloping Eutrudepts (Coushatta series), Udifluvents (Roxana series), and Vertic Epiaquepts (Latanier series) dominate the recent Holocene-age natural levees. Nearly level to gently undulating, sandy Udifluvents (Bruno series) and Udipsamments (Crevasse series) dominate the recent Holoceneage levee splays and point bars. Nearly level to gently undulating Epiaqualfs (Hebert series), Hapludalfs (Rilla and Sterlington series), and Argiudolls (Caspiana series) dominate the Holocene-age natural levees along the older meander scars.

**Biological Resources**

This area once consisted entirely of bottom-land hardwood deciduous forest and mixed hardwood and cypress swamps. The major tree species in the native plant communities in the areas of bottom-land hardwoods formerly were and currently are water oak, Nuttall oak, cherrybark oak, native pecan, red maple, sweetgum, eastern cottonwood, and hickory. The major tree species in the native plant communities in the swamps formerly were and currently are cypress, water tupelo, water oak, green ash, red maple, and black willow. The important native understory species are palmetto, greenbrier, wild grape, and poison ivy in the areas of bottom-land hardwoods and buttonbush, lizardtail, waterlily, water hyacinth, sedges, and rushes in the swamps. Some of the major wildlife species in this area are whitetailed deer, feral hogs, red fox, coyote, rabbit, gray squirrel, American alligator, water turtles, water snakes, frogs, otters, beavers, armadillo, crawfish, wild turkey, mourning doves, ducks, and geese. Fishing is mainly in oxbow lakes, rivers, and bayous. The species of fish in the area include largemouth bass, smallmouth bass, catfish, drum, bluegill, gar, and yellow perch.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 70%
Grassland – private, 2%
Forest – private, 22%; Federal, 1%
Urban development – private, 1%
Water – private, 3%
Other – private, 1%

Farms and scattered tracts of forested wetlands make up nearly all of this area. The farms produce mainly cash crops. Cotton, soybeans, milo, and corn are the main crops. In

many areas furrow irrigation is used during droughty parts of the growing season. Throughout the area, catfish are produced commercially on farm ponds that are contained by levees. Migratory waterfowl are harvested throughout the area. Hardwood timber is harvested on some forested wetlands, and most forested areas are managed for wildlife. About 15 percent of this MLRA is not protected from flooding, and flooding occurs occasionally or frequently in these unprotected areas. Levees protect nearly all of the cropland from flooding. Most of the forested wetlands are not protected from flooding. Networks of drainage canals and ditches help to remove excess surface water from the cropland. The major resource concerns are control of surface water, management of soil moisture, and maintenance of the content of organic matter and productivity of the soils. Conservation practices on cropland generally include nutrient management, crop residue management, and alternative tillage systems, especially no-till systems. In many areas land leveling or shaping optimizes the control of surface water. Other major cropland management practices are control of competing vegetation and insects through aerial or ground spraying of herbicides and insecticides and fertility management programs that make use of chemical fertilizers.

**152A – Eastern Gulf Coast Flatwoods**

Louisiana constitutes 8 percent of this MLRA and Hammond and Covington, LA. A number of national wildlife refuges, state parks and a few state forests are found in this MLRA.

**Physiography**

Almost all of this area is in the East Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. This MLRA is a nearly level, low coastal plain crossed by many large streams. Elevation ranges from sea level to 80 feet (0 to 25 meters). Local relief is generally 10 to 20 feet (3 to 6 meters).

**Geology**

Pleistocene-age terraces consisting of ancient Mississippi River deposits of unconsolidated fine sand, which grades to coarser sand and gravel at depth, are at the surface in the western end of this area in Louisiana. Recent silt, sand, and gravel deposits fill the valleys along most of the major rivers in the area.

**Soils**

The dominant soil orders in this MLRA are Alfisols, Ultisols, Entisols, Spodosols, and Histosols. The soils in the area dominantly have a thermic or hyperthermic soil temperature regime, an aquic or udic soil moisture regime, and siliceous mineralogy. They generally are deep or very deep; are somewhat poorly drained to very poorly drained; and are loamy, mucky, or sandy. Alaquods (Chaires and Leon series) and Psammaquents (Scranton series) formed in sandy marine sediments on flats and in depressions. Haplosaprists formed in organic deposits in swamps and depressions (Dorovan and Pamlico series) and in marshes and swamps (Lafitte and Maurepas series). Sulfihemists (Handsboro series) and Sulfaquents (Axis series) formed in saltwater and brackish water marshes. Quartzipsamments (Newhan and Corolla series) and Psammaquents (Duckston series) formed on dunes and in interdunal swales on barrier islands. Glossaqualfs (Guyton series) and Hydraquents (Arat and Levy series) formed in alluvium on flood plains. Endoaqualfs (Meadowbrook and Wekiva series) and Albaqualfs (Tooles series) formed in loamy marine sediments on flats and flood plains and in depressions. Endoaquults (Myatt series) and Paleudults (Stough series) formed in mixed fluvial and marine sediments on flats and stream terraces. Paleaquults (Plummer and

Bayou series) and Paleudults (Escambia and Ocilla series) formed in loamy and sandy sediments on marine terraces.

**Biological Resources**

This area supports pine forest vegetation and freshwater, brackish water, and saltwater marsh vegetation. Longleaf pine and slash pine are the major trees. Chalky bluestem, Indiangrass, and several species of panicum make up the understory. Palmetto, gallberry, and waxmyrtle are the dominant woody shrubs. Roseau, common reed, bulltongue, maidencane, cutgrass, and alligatorweed characterize the freshwater and intermediate water vegetation. Marshhay cordgrass, saltgrass, and Olney bulrush characterize the brackish water vegetation. Saltgrass, marshhay cordgrass, smooth cordgrass, and black needlerush are included in the saltwater vegetation. Some of the major wildlife species in this area are whitetailed deer, feral hog, gray fox, red fox, bobcat, raccoon, skunk, opossum, otter, rabbit, squirrel, turkey, bobwhite quail, and mourning dove. The species of fish in the area include largemouth bass, channel catfish, bullhead catfish, bluegill, redear sunfish, spotted sunfish, warmouth, black crappie, chain pickerel, gar, bowfin, sucker, spotted trout, croaker, striped mullet, flounder, and red drum.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 1.3%
Grassland – private, 1.9%
Forest – private, 55.6%; Federal, 11.5%
Urban development – private, 10.4%
Water – private, 12.0%; Federal, 3.0%
Other – private, 4.3%

Very little of this dominantly forested area is in farms. Much of it is in large holdings owned by pulp and paper companies. Pulpwood and lumber are the principal forest products. Some of the forestland is grazed. Some areas are in State and national forests or are used as game refuges or as military training sites. Only a very small acreage is cropped or pastured. Corn, peanuts, tobacco, and soybeans are the major crops. The major soil resource concerns are water erosion, maintenance of the content of organic matter and productivity of the soils, surface compaction, and management of soil moisture. Conservation practices on forestland generally include forest stand improvement, forest trails and landings, prescribed burning, riparian forest buffers, forest site preparation, bedding, establishment of trees and shrubs, and management of upland wildlife habitat. The most important conservation practice on pasture is prescribed grazing. Overseeding of pastures with small grains and/or legumes during winter commonly supplements forage production. Haying also provides additional feed during the long winters. Conservation practices on cropland generally include systems of crop residue management, cover crops, crop rotations, water disposal, subsoiling or deep tillage, pest management, and nutrient management. Critically eroding areas and areas where animals congregate must be monitored regularly and treated promptly.

**151 – Gulf Coast Marsh**

Louisiana constitutes 95 percent of this MLRA including the towns of Gretna, Chalmette, Marrero and New Orleans, LA. Interstate 10 and U.S. Highway 90 cross the area. The New Orleans Naval Air Station is in this MLRA. A number of national wildlife refuges and State parks occur throughout this area.

**Physiography**

Vermilion Bay splits this area into an eastern half and a western half. The eastern half is in the Mississippi Alluvial Plain Section of the Coastal Plain Province of the Atlantic Plain. The western half is in the West Gulf Coastal Plain Section of the same province and division. The land east of Vermilion Bay, part of the Mississippi River Delta, has a ragged shoreline. The land west of Vermilion Bay has a smoother shoreline. Low, narrow sandy ridges characterize much of the area. There are many rivers, lakes, bayous, tidal channels, and manmade canals. Elevation generally ranges from sea level to about 7 feet (2 meters). It is as much as 10 feet (3 meters) on beach ridges, canal spoil banks, and natural levees and as much as 165 feet (50 meters) on salt dome islands. Some areas that are protected by levees have subsided below sea level.

**Geology**

The surface of this area is primarily Mississippi River clay, silt, and fine sand deposited over the past 2 million years. The eastern half of the area, part of the Mississippi River Delta, is underlain by a mixture of Recent alluvial material and Pleistocene-age marine sediments. The area west of Vermilion Bay is underlain by older alluvial and marine sediments. Salt domes, natural gas, and petroleum deposits are below the surface in this area.

**Soils**

The dominant soil orders in this MLRA are Entisols and Histosols. The soils in the area dominantly have a hyperthermic soil temperature regime, an aquic soil moisture regime, and smectitic mineralogy. They generally are very deep, very poorly drained, and clayey. Hydraquents (Bancker, Creole, Larose, and Scatlake series) formed in clayey sediments in coastal marshes. Haplosaprists formed in organic deposits over alluvium (Allemands, Clovelly, and Lafitte series) or entirely in organic deposits (Kenner and Timbalier series).

**Biological Resources**

This area supports freshwater and saltwater marsh vegetation consisting of grasses, sedges, rushes, and other plants. Alligatorweed, spikerush, maidencane, cutgrass, and bulltongue characterize the freshwater vegetation. Roseau, common reed, bulltongue, and marshhay cordgrass characterize the intermediate water vegetation. Marshhay cordgrass, saltgrass, and Olney bulrush characterize the brackish water vegetation. Saltgrass, marshhay cordgrass, smooth cordgrass, and black needlerush are included in the saltwater vegetation. Some of the major wildlife species in this area are whitetailed deer, alligator, nutria, raccoon, otter, muskrat, swamp rabbit, cottontail rabbit, mink, mottled duck, bobwhite quail, mourning dove, meadowlark, lark bunting, and crawfish.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 16%
Grassland – private, 6%
Forest – private, 8%
Urban development – private, 3%
Water – private, 33%
Other – private, 30%; Federal, 4%

Most of this area supports marsh vegetation and is used for wildlife habitat. The area is almost treeless. Much of the area is uninhabited. The area is in the fertile and productive estuarine complex that supports the marine life of the Gulf of Mexico. The area provides

wintering ground for millions of migratory ducks and geese and habitat for many fur-bearing animals and for alligators. A significant acreage west of Vermilion Bay is firm enough to support livestock and is grazed by cattle in winter. A small acreage of freshwater marsh is drained by pumping systems and is used for pasture or for rice. The major resource concerns are determined by land use and marsh type. Flooding is a major concern in New Orleans. The concerns in areas of native marsh include maintenance of the salinity level in the soils, ingress and egress of freshwater or saltwater, and the content of organic matter in the soils. The concerns on pasture and cropland include maintenance of the content of organic matter and control of the salinity level in the soils. Erosion caused by overland water from high rainfall or a storm surge in the Gulf is a concern in areas where the native vegetation has been altered. Conservation practices on cropland include systems of crop residue management, which help to control erosion and maintain the content of organic matter in the soils. Timely tillage and planting can help to maintain tilth and the supply of soil moisture and control salinity. The practices on pasture include prescribed grazing, brush and pest management, prescribed burning, and watering facilities. Management of upland and wetland wildlife habitat is needed.

**150A – Gulf Coast Prairies**

Louisiana constitutes 17 percent of this MLRA to include the towns of Crowley, Eunice, and Lake Charles, LA. Interstate 10 and highways 90 and 190 are in the eastern part, in Louisiana.

**Physiography**

This area is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. It is characterized by nearly level plains that have low local relief and are dissected by rivers and streams that flow toward the Gulf of Mexico. Elevation ranges from sea level to about 165 feet (0 to 50 meters) along the interior margin.

**Geology**

This area is mostly a strip of land that is about 50 to 80 miles (80 to 130 kilometers) wide and runs along the Gulf of Mexico. The sedimentary rocks at the surface are of Pleistocene age. They were laid down during the last 2 million years. The deposits are deltaic and lagoonal clays and loams derived from older rocks to the west. At the western edge of this area, mostly within Texas, the sediments are older and more weathered and contain more sands. At the eastern edge, mostly within Louisiana, a cap of mixed loess and alluvium occurs on most soils. The loess was derived from the flood plain along the Mississippi River. Some Tertiary deposits occur along the interior edge of this MLRA. The weight of the recent deposits has caused them to tilt towards the Gulf of Mexico, so successively older deposits crop out from the coastal edge to the interior edge of the area. Salt domes, natural gas, and petroleum deposits are commonly below the surface throughout this area. Recent deposits of alluvial sand fill the valleys of the Brazos and Trinity Rivers and the other large rivers in the area.

**Soils**

The dominant soil orders in this MLRA are Alfisols, Mollisols, and Vertisols. The soils have a hyperthermic soil temperature regime in the southwestern part of the area and a thermic soil temperature regime in the northeastern part. The soils in the MLRA generally have an ustic soil moisture regime and smectitic mineralogy. Drainage ranges from well drained in very gently sloping and gently sloping soils in convex areas to very poorly drained in soils in enclosed depressions. Soils that formed in early Pleistocene sediments,

generally occurring north of Interstate 10, are very deep and have a loamy surface layer and subsoil and siliceous mineralogy. Soils that formed in late Pleistocene sediments, generally occurring south of Interstate 10, are very deep and have a loamy or clayey surface layer and a clayey, very slowly permeable subsoil. Aqualfs and Udalfs (Crowley, Aris, and Vidrine series) are dominant in Louisiana. Uderts and Udalfs (League, Lake Charles, Laewest, Hockley, Katy, and Telferner series) are dominant in the eastern and central parts of the area. Usterts and Ustolls (Banquete, Cranell, Orelia, and Victoria series) are dominant in the western and southwestern parts.

**Biological Resources**

This area was originally a natural grass prairie with hardwood trees along the rivers and streams. Little bluestem, Indiangrass, switchgrass, and big bluestem are the dominant species. A few groves of live oak dot the landscape. Some of the major wildlife species in this area are white tailed deer, raccoon, opossum, rabbit, fox, coyote, squirrel, armadillo, nutria, quail, and mourning dove. Migratory waterfowl, such as ducks and geese, and neotropical migratory songbirds winter in this area. The species of fish in the area include bass, channel catfish, and bream.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 32%
Grassland – private, 39%; Federal, 1%
Forest – private, 5%
Urban development – private, 16%
Water – private, 5%
Other – private, 2%

Most of this area is in farms. Rice, soybeans, grain sorghum, cotton, corn, and hay are the chief crops. About two-fifths of the area is rangeland or pasture. The forested areas, consisting chiefly of hardwoods, border the rivers and streams that cross the MLRA. Urban development is rapidly expanding onto agricultural land throughout the area.

The major soil resource concerns are wind erosion, water erosion, maintenance of the content of organic matter and tilth of the soils, and management of soil moisture. Increasing salinity is a problem in some areas. Conservation practices on cropland generally include systems of crop residue management, which help to control erosion and maintain the content of organic matter in the soils. Timely tillage and planting can help to maintain tilth and the supply of soil moisture. Conservation practices on pasture and rangeland generally include prescribed grazing, fences, watering facilities, and nutrient and pest management.

**131C – Red River Alluvium**

Louisiana constitutes 86 percent of this MLRA to include the eastern half of the city of Shreveport and the towns of Alexandria and Bossier City, LA. Interstate 20 crosses this area and intersects Interstate 49 in Shreveport. Small areas of the Kisatchie National Forest are along the southwest edge of this MLRA.

**Physiography**

Almost all of this area is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. The southern end is in the Mississippi Alluvial Plain Section of the same province and division. This MLRA is on the alluvial plain along the lower Red River in Louisiana. The landforms in the area are level or depressional to very gently undulating alluvial plains, backswamps, oxbows, natural levees, and terraces. Landform shapes range from convex on natural levees and undulating terraces to concave in oxbows.

Landform shapes differentiate water-shedding positions from water-receiving positions, both of which have a major effect on soil formation and hydrology. Average elevations start at about 40 feet (12 meters) in the southern part of the area and gradually rise to about 270 feet (80 meters) in the northwestern part. Maximum local relief is about 10 feet (3 meters), but relief is considerably lower in most of the area.

**Geology**

Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the U.S. Alluvial deposits from flooding and lateral migration of the Red River typically lie above the bedrock. These sediments are sandy to clayey fluvial deposits of Holocene to late Pleistocene age and are many meters thick. In some areas late Pleistocene terrace deposits are within several meters of the present surfaces, but they do not crop out in this MLRA. The geologic history of the area is greatly influenced by a large logjam that formed in the Red River channel in the middle part of the area during the late 18th century and the early 19th century. At the time of its largest extent, the logjam obstructed the river and its tributary outlets for a distance of 160 miles downstream from the Arkansas State boundary. Backwater flooding, reformation of natural levees, and crevasse splays caused by this logjam played a major role in covering large parts of the area with a mantle of recent clayey to sandy material. Destruction of the logjam in the late 1800s resulted in the drainage of many large lakes that had formed.

**Soils**

The dominant soil orders in this MLRA are Vertisols, Entisols, Inceptisols, and Alfisols. The soils in the area have a thermic soil temperature regime. They dominantly have an aquic soil moisture regime, smectitic clay mineralogy, and mixed sand and silt fraction mineralogy. They are very deep and generally are poorly drained to moderately well drained and loamy or clayey. Nearly level Epiaquerts (Moreland series) and Vertic Endoaquepts (Yorktown series) dominate the Holoceneage alluvial flats and backswamps. Nearly level to gently sloping Endoaquepts (Coushatta series), Udifluvents (Severn and Roxana series), and Vertic Epiaquepts (Latanier series) dominate the Holocene-age natural levees. Nearly level to gently undulating, coarse-silty over clayey Udifluvents (Caplis series) and sandy Udifluvents (Kiomatia series) dominate the Holocene-age levee splays and point bars. Nearly level to gently undulating Hapludalfs (Gallion and Rilla series) and Argiudolls (Caspiana series) dominate the Holocene-age natural levees along the older meander scars.

**Biological Resources**

This area once consisted entirely of bottom-land hardwood deciduous forest and mixed hardwood and cypress swamps. The major tree species in the native plant communities in the areas of bottom-land hardwoods formerly were and currently are water oak, Nuttall oak, cherrybark oak, native pecan, red maple, sweetgum, eastern cottonwood, and hickory. The major tree species in the native plant communities in the swamps formerly were and currently are cypress, water tupelo, water oak, green ash, red maple, and black willow. The important native understory species are palmetto, greenbrier, wild grape, and poison ivy in the areas of bottom-land hardwoods and buttonbush, lizardtail, waterlily, water hyacinth, sedges, and rushes in the swamps. Some of the major wildlife species in this area are whitetailed deer, feral hogs, red fox, coyote, rabbit, gray squirrel, American alligator, water turtles, water snakes, frogs, otters, beavers, armadillo, crawfish, wild turkey, mourning doves, ducks, and geese. Fishing is mainly in oxbow lakes, rivers, and bayous. The species

of fish in the area include largemouth bass, smallmouth bass, catfish, drum, bluegill, gar, and yellow perch.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 37%
Grassland – private, 20%
Forest – private, 30%; Federal, 1%
Urban development – private, 5%
Water – private, 5%
Other – private, 2%

Farms and scattered tracts of forested wetlands make up nearly all of this area. The farms produce mainly cash crops. Cotton, soybeans, milo, and corn are the main crops. Sugarcane is a major crop in the southernmost part of the area. In many areas furrow irrigation is used during droughty parts of the growing season. Throughout the area, catfish are produced commercially on farm ponds that are contained by levees. Migratory waterfowl are harvested throughout the area. Hardwood timber is harvested on some forested wetlands, and most forested areas are managed for wildlife. About 22 percent of this MLRA is not protected from flooding, and flooding occurs occasionally or frequently. Levees protect nearly all of the cropland from flooding. Most of the forested wetlands are not protected from flooding. Networks of drainage canals and ditches help to remove excess surface water from the cropland. The major resource concerns are control of surface water, management of soil moisture, and maintenance of the content of organic matter and productivity of the soils. Conservation practices on cropland generally include nutrient management, crop residue management, and alternative tillage systems, especially no-till systems. In many areas land leveling or shaping optimizes the control of surface water. Other major cropland management practices are control of competing vegetation and insects through aerial or ground spraying of herbicides and insecticides and fertility management programs that make use of chemical fertilizers.

**133A – Southern Coastal Plain**

Louisiana constitutes a mere 1% of this MLRA near the town of Bogalusa, LA in the extreme eastern part of the state.

**Physiography**

This area extends from Virginia to Louisiana and Mississippi, but it is almost entirely within three sections of the Coastal Plain Province of the Atlantic Plain. The northern part is in the Embayed Section, the middle part is in the Sea Island Section, and the southern part is in the East Gulf Coastal Plain Section. This MLRA is strongly dissected into nearly level and gently undulating valleys and gently sloping to steep uplands. Stream valleys generally are narrow in their upper reaches but become broad and have widely meandering stream channels as they approach the coast. Elevation ranges from 80 to 655 feet (25 to 200 meters), increasing gradually from the lower Coastal Plain northward. Local relief is mainly 10 to 20 feet (3 to 6 meters), but it is 80 to 165 feet (25 to 50 meters) in some of the more deeply dissected areas.

**Geology**

This MLRA is bordered on the west and north by the “fall line.” This line of waterfalls marks the western and northern extent of the unconsolidated Coastal Plain sediments. It is an erosional scarp formed when this area was the Atlantic Ocean shore in Mesozoic time. The MLRA is underlain by eroded igneous and metamorphic bedrock. Rivers and streams

draining the Appalachians deposited a thick wedge of silt, sand, and gravel east and south of the fall line as delta deposits in the Atlantic Ocean. These Jurassic and Cretaceous river sediments were eventually exposed as the Coastal Plain uplifted and the sea level changed. When the sea level rose again, the Coastal Plain was submerged and covered by a thin layer of Cretaceous sands in the eastern half of the area. In the western part of the area, the water was deeper and limestone, dolomite, and calcareous sands were deposited. As the Coastal Plain continued to uplift and the sea level dropped again, Quaternary material consisting of unconsolidated clay, silt, sand, and gravel was deposited over the Tertiary sand and carbonates. Subsequent changes in the sea level created terraces in these younger deposits along many of the streams and rivers draining this area. Much of the MLRA has a "benched" appearance because of the cycles of erosion and deposition that occurred as the area was exposed and submerged numerous times in its geologic history.

**Soils**

The dominant soil orders in this MLRA are Ultisols, Entisols, and Inceptisols. The soils in the area dominantly have a thermic soil temperature regime, a udic or aquic soil moisture regime, and siliceous or kaolinitic mineralogy. They generally are very deep, somewhat excessively drained to poorly drained, and loamy. Hapludults formed in marine sediments (Luverne and Sweatman series) and mixed marine sediments and alluvium (Smithdale series) on hills and ridges. Kandiudults formed in marine sediments (Dothan, Fuquay, Norfolk, and Orangeburg series) and mixed marine and fluvial sediments (Troup series) on hills and ridges. Fragiudults (Ora and Savannah series) and Paleudults (Ruston series) formed in mixed marine and fluvial sediments on uplands and stream terraces. Fluvaquents (Bibb series) and Endoaquepts (Mantachie series) formed in alluvium on flood plains. Quartzipsamments (Lakeland series) formed in sandy eolian or marine material on uplands. Paleaquults (Rains series) formed in marine and fluvial sediments on terraces.

**Biological Resources**

This area supports mixed oak-pine vegetation. Loblolly pine, longleaf pine, slash pine, shortleaf pine, sweetgum, yellow-poplar, red oak, and white oak are the major overstory species. Dogwood, gallberry, and farkleberry are the major understory species. Common sweetleaf, American holly, greenbrier, southern bayberry, little bluestem, Elliott bluestem, threeawn, grassleaf goldaster, native lespedezas, and low panicums are other understory species. Some of the major wildlife species in this area are whitetailed deer, turkey, rabbit, squirrel, bobwhite quail, and mourning dove. The species of fish in the area include bass, bluegill, and channel catfish.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 17%
Grassland – private, 8%
Forest – private, 61%; Federal, 3%
Urban development – private, 6%
Water – private, 3%
Other – private, 2%

Timber production, cash-grain crops, and forage production are important in this MLRA. Soybeans, cotton, corn, and wheat are the major crops grown throughout the area. Pastures are grazed mainly by beef cattle, but some dairy cattle and hogs are raised in the area. The major resource concerns are water erosion, maintenance of the content of organic matter and productivity of the soils, control of surface water, artificial drainage, and

management of surface compaction and soil moisture. Conservation practices on cropland generally include systems of crop residue management, cover crops, crop rotations, water disposal, subsoiling or deep tillage, pest management, and nutrient management. The most important conservation practice in pastured areas is prescribed grazing. Pastures commonly are overseeded with small grains and/or legumes to supplement forage production during winter. Haying also helps to provide supplemental feed during the long winters. Critically eroding areas and areas where animals congregate should be monitored and treated.

**131A – Southern Mississippi River Alluvium**

Louisiana constitutes 32 percent of this MLRA including the towns of Lake Providence, Morgan City, and Houma, Louisiana. The cities of Baton Rouge and New Orleans, Louisiana, are just outside this area. Parts of Interstates 10 and 20 cross this MLRA.

**Physiography**

This area makes up most of the Mississippi Alluvial Plain Section of the Coastal Plain Province of the Atlantic Plain. It is on the alluvial plain along the lower Mississippi River, south of its confluence with the Ohio River. The landforms in the area are level or depressional to very gently undulating alluvial plains, backswamps, oxbows, natural levees, and terraces. The parts of the MLRA south of Baton Rouge, Louisiana, are on a deltaic plain. Landform shapes range from convex on natural levees and undulating terraces to concave in oxbows. These shapes differentiate water-shedding positions from water receiving positions, both of which have a major role in soil formation and hydrology. Average elevations start at sea level in the southern part of the area and gradually rise to about 330 feet (100 meters) in the northwestern part. Maximum local relief is about 15 feet (5 meters), but relief is considerably lower in most of the area.

**Geology**

Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the U.S. Alluvial deposits from flooding and lateral migration of the Mississippi River typically lie above the bedrock. These sediments are sandy to clayey fluvial deposits of Quaternary age and are many meters thick. The Yazoo, Tensas, and Atchafalaya Basins and the modern deltaic plain are in areas of Holocene deposits. The St. Francis Basin, in the northwestern part of the MLRA, and some surfaces surrounded by the Yazoo Basin, in the central part of the MLRA, are in areas of Wisconsin Stage deposits of Pleistocene age. Some small areas in the western part of the MLRA are covered by a thin mantle of pre-Wisconsin, Quaternary-age loess deposits.

**Soils**

The dominant soil orders in this MLRA are Alfisols, Vertisols, Inceptisols, and Entisols. The soil temperature regime is thermic in most of the MLRA. It is hyperthermic, however, south of Baton Rouge, Louisiana. The soils in the MLRA dominantly have an aquic soil moisture regime, smectitic clay mineralogy, and mixed sand and silt fraction mineralogy. The soils are very deep, dominantly poorly drained and somewhat poorly drained, and dominantly loamy or clayey. Nearly level Epiaquerts (Sharkey series), Vertic Epiaquepts (Tunica series), and Vertic Endoaquepts (Dowling series) dominate the alluvial flats and backswamps of Holocene to late Pleistocene age. Nearly level to gently sloping Endoaquepts (Commerce series), Udifluvents (Robinsonville series), and Fluvaquents (Convent series) dominate the natural levees of Holocene age. Nearly level to gently undulating, sandy Udifluvents (Bruno series) and Udipsamments (Crevasse series)

dominate the levee splays and point bars of Holocene age. Nearly level to gently undulating Endoaqualfs (Dundee series), Hapludalfs (Dubbs series), and

Epiaqualfs (Tensas series) dominate the terraces of Pleistocene age.

**Biological Resources**

This area once consisted entirely of bottom-land hardwood deciduous forests and mixed hardwood and cypress swamps. The major tree species in the native plant communities in the areas of bottom-land hardwoods formerly were and currently are water oak, Nuttall oak, cherrybark oak, native pecan, red maple, sweetgum, eastern cottonwood, and hickory. The major tree species in the native plant communities in the swamps formerly were and currently are cypress, water tupelo, water oak, green ash, red maple, and black willow. The important native understory species are palmetto, greenbrier, wild grape, and poison ivy in the areas of bottom-land hardwoods and buttonbush, lizardtail, waterlily, water hyacinth, sedges, and rushes in the swamps. Some of the major wildlife species in this area are whitetailed deer, feral hogs, red fox, coyote, rabbit, gray squirrel, American alligator, water turtles, water snakes, frogs, otters, beavers, armadillo, crawfish, wild turkey, mourning doves, ducks, and geese. Fishing is mainly in oxbow lakes, rivers, and bayous. The species of fish in the area include largemouth bass, smallmouth bass, catfish, drum, bluegill, gar, and yellow perch. Crawdads are a commercial species in the southern end of this MLRA.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 70%
Grassland – private, 2%
Forest – private, 15%; Federal, 3%
Urban development – private, 3%
Water – private, 6%
Other – private, 1%

Most of this area is in farms, which produce mainly cash crops. Cotton, soybeans, milo, and corn are the main crops, and sugarcane is a major crop in the southernmost part of the area. Furrow irrigation is used in many areas during droughty parts of the growing season. Rice is grown in some land-leveled, flood irrigated areas. Catfish and crawfish are produced commercially on farm ponds that are contained by levees. The catfish are produced throughout the MLRA, and the crawfish are produced in the southern part of the area. Migratory waterfowl are harvested throughout the area. Hardwood timber is harvested on most forested wetlands, and most of the forested areas are managed for wildlife. About 29 percent of this MLRA is not protected from flooding, and flooding occurs occasionally or frequently in these unprotected areas. Levees protect nearly all of the cropland, urban land, and grassland from flooding. Most areas of forested wetlands are not protected from flooding. Networks of drainage canals and ditches help to remove excess surface water from the cropland. The major resource concerns are control of surface water, management of soil moisture, and maintenance of the content of organic matter and productivity of the soils. Conservation practices on cropland generally include nutrient management, crop residue management, and alternative tillage systems, especially no-till systems that reduce the cost of tillage. In many areas land leveling or shaping optimizes the control of surface water. Other major cropland management practices are control of competing vegetation and insects through aerial or ground spraying and fertility management programs that make use of chemical fertilizers.

**131D – Southern Mississippi River Terraces**

Louisiana constitutes 12 percent of this MLRA, including the town of Bastrop, LA.

**Physiography**

This MLRA is in the Mississippi Alluvial Plain Section of the Coastal Plain Province of the Atlantic Plain. It consists dominantly of Pleistocene-age, level to gently sloping terraces along the Mississippi River. Slopes generally range from level to gently sloping but are steep along terrace escarpments. Channel scars are evident in some areas. Elevation is generally 50 to 250 feet (15 to 75 meters) on the terraces.

**Geology**

Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the U.S. Alluvial deposits from flooding and lateral migration of the rivers crossing this area typically lie above the bedrock. These sediments form Pleistocene-age alluvial terraces. Silty alluvium underlies most of the area. Clayey sediments are in old channel scars. The Pleistocene terraces are part of the Prairie Terrace complex. A minor portion of the area is in the Deweyville and Montgomery terrace formation. These terraces have a base of red alluvium capped by one to several meters of brownish alluvium.

**Soils**

The dominant soils in this MLRA are Alfisols. They have a thermic soil temperature regime, an ustic or aquic soil moisture regime, and mixed mineralogy. They are very deep and formed dominantly in silty alluvium. They generally are moderately well drained to poorly drained. Gently sloping Hapludalfs (Goodwill series) are on natural levees and low terraces. Gently sloping to level Hapludalfs (Immanuel and Stuttgart series) and Fraglossudalfs (Grenada series) are on broad interfluves and along terrace escarpments. Level Endoaqualfs (Idee series), Albaqualfs (Dewitt series), Glossaqualfs (Ethel series), Epiaqualfs (Lagrue), and Fragiaqualfs (Henry series) are on low terraces and natural levees. Nearly level and level Endoaqualfs (Tichnor and Forestdale series) are on low terraces, natural levees, and flood plains. Nearly level Dystrudepts (Oaklimeter series) are along drainageways and on flood plains.

**Biological Resources**

This area supports hardwoods and pines. The Grand Prairie area, in Arkansas, originally supported tall prairie grasses interlaced with hardwood timber. Cherrybark and Shumard oak are widely distributed. Yellow-poplar, white ash, cottonwood, and black walnut are important species on the flood plains. Loblolly pine and shortleaf pine are on a wide variety of sites, mainly the eroded soils on uplands and ridges. Other hardwood species that commonly grow in this area are white oak, basswood, sweetgum, water oak, American elm, blackgum, sycamore, sassafras, southern red oak, chinkapin oak, American beech, and hickory. Some of the major wildlife species in this area are whitetailed deer, coyote, bobcat, beaver, raccoon, skunk, armadillo, mink, cottontail, turkey, mourning dove, ducks, and geese. The species of fish in the area include channel catfish, largemouth black bass, crappie, and bluegill.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 42%
Grassland – private, 4%
Forest – private, 46%; Federal, 1%

Urban development – private, 3%
Water – private, 3%
Other – private, 1%

Scattered tracts of forests and farms make up nearly all of this area. Rice, soybeans, and wheat are the main crops. In most areas furrow or flood irrigation is used throughout the growing season. Hardwood timber is harvested on some forested wetlands, and most forested areas are managed for wildlife. Bait fish are produced commercially in ponds that are contained by levees. Migratory waterfowl are harvested throughout the area. The major soil resource concerns are management of soil moisture, erosion control, and maintenance of the content of organic matter and productivity of the soils. Depletion of ground water through excessive pumping is a major concern in the Grand Prairie area. Conservation practices on cropland generally include nutrient management, crop residue management, and alternative tillage systems, especially no-till systems that reduce the need for tillage. In many areas land leveling or shaping optimizes the control of surface water. Other major cropland management practices are control of competing vegetation and insects through aerial or ground spraying of herbicides and insecticides and fertility management programs that make use of chemical fertilizers.

**134 – Southern Mississippi Valley Loess**

Louisiana constitutes 15 percent of soils in this MLRA to include Baton Rouge, Opelousas, Lafayette, and New Iberia, Louisiana. Interstates 49 and 10 cross the area.

**Physiography**

This area is in the Coastal Plain Province of the Atlantic Plain. Most of the part of the area east of the Mississippi River is in the East Gulf Coastal Plain Section of the province. Parts of the western edge of the area, the part of the area in Arkansas, and the isolated part in northern Louisiana are in the Mississippi Alluvial Plain Section. The farthest southwest part in Louisiana is in the West Gulf Coastal Plain Section. The sharply dissected plains in this MLRA have a loess mantle that is thick at the valley wall and thins rapidly as distance from the valley wall increases. Valley sides are hilly to steep, especially in the western part of the area. The intervening ridges generally are narrow and rolling, but some of the interfluves between the upper reaches of the valleys are broad and flat. Stream valleys are narrow in the upper reaches but broaden rapidly downstream and have wide, flat flood plains and meandering stream channels. Elevation ranges from 80 to 600 feet (25 to 185 meters). Local relief is mainly 10 to 20 feet (3 to 6 meters), but it can be 80 to 165 feet (25 to 50 meters).

**Geology**

This area is mantled with loess, which varies in thickness. The area is underlain by unconsolidated sand, silt, and clay, mainly of marine origin. Crowley's Ridge is underlain by Pliocene sand and gravel. The seas extended up the present-day valley of the Mississippi River in Tertiary time, when these sediments were deposited by rivers draining the surrounding uplands. Throughout Quaternary and Recent time, the valley floor received fine grained sediments each time the Mississippi River flooded. After these sediments dried, winds picked them up and deposited them as loess in the higher areas on each side of the valley. There are five known periods of loess deposition in the area. The surface deposit is the Peoria Loess, which is of Late Wisconsin age (about 10,000 years ago). Pre-Peorian Loess, which is of Middle Wisconsin age (about 20,000 to 40,000 years ago), occurs in some areas. This loess is thinner than the Peorian Loess and is generally redder or darker. Loveland-Sicily Island Loess, which is of pre-Wisconsin age (85,000 to 130,000 years

ago), is at the surface in some areas in the southern part of this MLRA. It has a well developed reddish paleosol (buried soil). Two other loess deposits have been described on Crowley's Ridge. They have been identified as Marianna Loess and Crowley's Ridge Loess. These deposits are not exposed at the surface. They have well developed paleosols.

**Soils**

The dominant soil orders in this MLRA are Alfisols, Entisols, Inceptisols, and Ultisols. The soils in the area are very deep or deep, are medium textured, and have a thermic soil temperature regime, a udic soil moisture regime, and mixed mineralogy. Well drained, nearly level to very steep Hapludalfs (Memphis series) are on uplands. Nearly level to steep, well drained Hapludalfs (Memphis, Coteau, and Feliciana series), moderately well drained and somewhat poorly drained Fraglossudalfs (Olivier, Grenada, and Calloway series), moderately well drained Fragiudalfs (Loring series), and well drained Eutrudepts (Natchez series) formed in thick deposits of loess. Nearly level to gently sloping, somewhat poorly drained Epiaqualfs (Patoutville series), moderately well drained Fragiudults (Gigger, Toula, and Tangi series), well drained to somewhat poorly drained Hapludalfs (Colyell and Dexter series), and well drained Paleudults (Lytle series) formed in deposits of loess 2 to 4 feet (1 meter) thick. Nearly level and very gently sloping, somewhat poorly drained and poorly drained Glossaqualfs (Calhoun, Encrow, and Frost series), somewhat poorly drained Glossudalfs (Egypt series), somewhat poorly drained Hapludalfs (Satsuma series), and somewhat poorly drained Argiaquolls (Jeanerette series) formed in a thin mantle of loess over loamy alluvium or mixed loess and loamy alluvium. Deep, gently sloping, well drained Eutrudepts (Weyanoke series), somewhat poorly drained Fragiudults (Bude series), and somewhat poorly drained Fraglossudalfs (Fluker series) formed in silty material or in a mantle of loess and the underlying late Pleistocene loamy terrace material. In the eastern part of the area, where the loess mantle thins, well drained Paleudalfs (Lexington series), moderately well drained Fragiudalfs (Dulac and Providence series), well drained Hapludults (Brandon and Silerton series), and well drained Paleudults (Smithdale series), all of which are gently sloping to steep, are on ridgetops and side slopes. Well drained Dystrudepts (Ariel series), moderately well drained Udifluvents (Collins series), moderately well drained Dystrudepts (Oaklimeter series), and somewhat poorly drained Fluvaquents (Gillsburg series) are on flood plains.

**Biological Resources**

This area supports hardwood-pine vegetation. Cherrybark oak, Shumard oak, white oak, post oak, southern red oak, and southern magnolia are widely distributed. Loblolly pine and shortleaf pine are the dominant pines. Yellow-poplar, white ash, swamp chestnut, cottonwood, sweetgum, and black walnut are important species on the flood plains. Loblolly pine and shortleaf pine are on a wide variety of sites, mainly the eroded soils on uplands and ridges. Other hardwood species that commonly grow in this area are white oak, basswood, sweetgum, water oak, American elm, blackgum, sycamore, sassafras, southern red oak, chinkapin oak, American beech, and hickory. Beech-magnolia-holly forests are dominant on narrow ridges and in steep ravines in the Tunica Hills of Louisiana. Some of the major wildlife species in this area are whitetailed deer, red fox, gray fox, raccoon, opossum, skunk, muskrat, cottontail, gray squirrel, fox squirrel, bobwhite quail, and mourning dove. The species of fish in the area include largemouth bass, bluegill, and bullhead.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 36%

Grassland – private, 13%
Forest – private, 38%; Federal, 2%
Urban development – private, 7%
Water – private, 2%
Other – private, 2%

Most of this area is in farms. A small acreage is federally owned. About one-third of the area is cropland, but the proportion varies greatly from county to county, depending on the soils and the topography. This is largely a cash-crop area. Cotton, corn, rice, soybeans, and wheat are the major crops. Strawberries are important in Louisiana. Feed grains and forage are grown on dairy farms. Less than 15 percent of the area is pasture or hayland. About two-fifths is forest of mixed pine and hardwoods. Lumber is the major forest product, and some pulpwood is harvested. The present trend is toward the conversion of pasture and forest to cropland. Some areas are used for urban development, which is expanding near the metropolitan areas. The major soil resource concerns are water erosion, maintenance of the content of organic matter and productivity of the soils, and management of soil moisture. Water erosion is a hazard in sloping areas that are bare because of tree harvesting. Conservation practices on forestland generally include systems of tree residue management and reforestation. Conservation practices on cropland generally include crop residue management, which increases the content of organic matter in the soils, and applications of lime in areas of low pH. Many of the soils remain wet or have a high water table for some or most of the year. Measures that improve drainage should be applied, or the crops adapted to the wet conditions should be selected for planting.

**133B – Western Coastal Plain**

Louisiana constitutes 31 percent of this MLRA and includes Minden, Ruston, West Monroe and Shreveport, Louisiana. The area includes parts of Interstates 20 and 49.

**Physiography**

This area is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. It consists of level to steep uplands that are intricately dissected by streams. Broad flood plains and terraces are along some streams. Elevation ranges from 80 to 650 feet (25 to 200 meters), increasing gradually from southeast to northwest. Local relief is generally less than 30 feet (9 meters).

**Geology**

Tertiary and Cretaceous marine sediments underlie most of this area. Tertiary units include the Wilcox and Midway Groups, the Claiborne Group, the Jackson Group, the Catahoula Formation, and the Willis Formation. They consist of interbedded sandstone, siltstone, and shale and unconsolidated sands, silts, and clays. The Reklaw and Weches Formations in the Claiborne Group form the Redland area in east Texas. The Cretaceous marine sediments of the Fleming and Oakville Formations are of minor extent in the area. They consist of calcareous clays and marls. Sand, silt, and clay alluvium is under the flood plains and terraces along the major drainages.

**Soils**

The dominant soil orders in this MLRA are Alfisols and Ultisols. The soils in the area dominantly have a thermic soil temperature regime, a udic or aquic soil moisture regime, and siliceous, mixed, or smectitic mineralogy. They generally are very deep, well drained to poorly drained, and loamy or clayey. Hapludults formed in residuum (Cuthbert and Kirvin series) and marine sediments (Sacul series) on hills and ridges. Paleudults formed in marine sediments (Bowie and Malbis series) and mixed marine sediments and alluvium

(Ruston series) on uplands. Endoaquults (Amy series) formed in old alluvium on stream terraces. Fragiudults (Savannah series) formed in mixed marine sediments and alluvium on uplands and stream terraces. Hapludalfs (Eastwood and Woodtell series) formed in marine sediments on hills and ridges. Glossaqualfs formed in alluvium on flood plains and stream terraces (Guyton series) and in old alluvium on stream terraces (Wrightsville series).

**Biological Resources**

This area supports pine-hardwood vegetation. The dominant trees are loblolly pine, shortleaf pine, sweetgum, southern red oak, white oak, flowering dogwood, and post oak. American beautyberry, greenbrier, hawthorns, and berry vines are included in the woody understory. Little bluestem and pinhole bluestem are the dominant herbaceous species. Other major grasses include beaked panicum, longleaf uniola, spike uniola, and yellow Indiangrass. The plant community has many species of low-growing panicums and paspalums and perennial forbs. The major wildlife species in this area include white-tailed deer, coyote, beaver, raccoon, skunk, opossum, muskrat, mink, cottontail, squirrel, weasel, armadillo, and mourning dove.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 2%
Grassland – private, 18%
Forest – private, 65%; Federal, 4%
Urban development – private, 6%
Water – private, 3%; Federal, 1%
Other – private, 1%

The forested areas in this MLRA are used for the production of lumber and pulpwood. The cleared land is used mostly for pasture and hay. Where the water supply is adequate, such crops as corn, grain sorghum, oats, soybeans, peanuts, rice, and vegetables are grown. The major resource concerns are water erosion, wetland restoration, and water supplies for livestock. Conservation practices on cropland generally include buffer strips, which help to control erosion and runoff. They also include the proper use and timing of irrigation.

**152B – Western Gulf Coast Flatwoods**

Louisiana constitutes 41 percent of this MLRA and includes Singer, Sulfur, and Oberlin, Louisiana, are in this MLRA. Interstate 10 is just south of this area. The Sam Houston Jones State Park is in the part in Louisiana.

**Physiography**

This area is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. The area is nearly level to gently sloping and has low local relief. Elevation ranges from 80 to 330 feet (25 to 100 meters).

**Geology**

The entire area is underlain by unconsolidated clay, silt, sand, and gravel deposited by ancient rivers in late Tertiary and Quaternary time. Recent silt, sand, and gravel deposits fill the valleys along most of the major rivers in the area.

**Soils**

The dominant soil orders in this MLRA are Alfisols and Ultisols. The soils in the area dominantly have a thermic soil temperature regime, an aquic or udic soil moisture regime, and siliceous or smectitic mineralogy. They generally are very deep, moderately well drained to very poorly drained, and loamy or clayey. Glossaqualfs formed in loamy and

clayey sediments on stream terraces (Caddo and Evadale series), in loamy marine sediments on uplands (Waller series), and in alluvium on flood plains and stream terraces (Guyton series). Glossudalfs (Messer series) formed in loamy marine sediments on mounds and ridges. Vermaqualfs (Sorter series) formed in old alluvium on uplands. Hapluderts (Kaman series) formed in alluvium on flood plains. Paleudults (Kirbyville and Malbis series) formed in loamy marine sediments on uplands.

**Biological Resources**

This area supports pine-hardwood forest vegetation characterized by longleaf pine. Sweetgum, blackgum, post oak, blackjack oak, and southern red oak are the principal hardwood species. Hawthorns, myrtle, and shining sumac make up the woody understory. Mid and tall grasses are dominant in open areas. Little bluestem, pinhole bluestem, big bluestem, switchgrass, and Indiangrass are the principal grasses. Longleaf uniola, Virginia wildrye, Florida paspalum, beaked panicum, and several low-growing panicums and paspalums are the principal grasses in shady areas. Lespedezas, tickclover, wildbeans, and several composites are the principal forbs in the area. Some of the major wildlife species in this area are whitetailed deer, coyote, fox, nutria, raccoon, skunk, cottontail, gray squirrel, fox squirrel, mink, armadillo, wood rat, white-footed mouse, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, hispid pocket mouse, marsh rice rat, turkey, quail, and mourning dove. Other major species include cottonmouth moccasin, broad-banded water snake, coral snake, hognose snake, canebrake rattlesnake, pigmy rattlesnake, copperhead, Louisiana milk snake, speckled kingsnake, rough green snake, buttermilk snake, five-lined skink, broad-headed skink, green anole, smooth softshell turtle, three-toed box turtle, red-eared turtle, Mississippi mud turtle, marbled salamander, smallmouth salamander, Fowler's toad, East Texas toad, spring peeper, eastern tree toad, northern cricket frog, northern leopard frog, and bullfrog. The species of fish in the area include spotted bass, largemouth bass, crappie, catfish, bullhead, carp, and bluegill.

**Land Use**

Following are the various kinds of land use in this MLRA:

Cropland – private, 1%
Grassland – private, 12%; Federal, 1%
Forest – private, 74%; Federal, 3%
Urban development – private, 7%
Water – private, 1%
Other – private, 1%

The forestland in this area consists principally of pine and pine-hardwood forests. Much of the forested acreage is owned by large corporations, and lumber and pulpwood are the chief forest products. Cleared areas are used mostly for pasture. The major pasture grasses are bahiagrass and coastal bermudagrass. Only a few small areas are used for crops. Many small subdivisions are being developed throughout the area, especially in the vicinity of Houston and Beaumont, Texas. The major soil resource concerns are water erosion, maintenance of the content of organic matter and productivity of the soils, and soil moisture management. When areas are bare after a tree harvest, water erosion is a hazard on sloping land. Conservation practices on forestland generally include forest stand improvement, forest trails and landings, prescribed burning, riparian forest buffers, forest site preparation, bedding, establishment of trees and shrubs, and management of upland wildlife habitat. The soils in this area are low in content of organic matter and productivity. Measures that increase the content of organic matter are needed. Applications of lime in

areas of low pH help to maintain or improve productivity. Many of the soils remain wet or have a high water table for some or most of the time during the year. Measures that improve drainage or adapt the land use to the wet conditions are needed.

**Soils of Louisiana**

In 2008, 315 soil series were being used in Louisiana (Soil Survey Staff, 2008c)(Table 1). Among these series, 54 benchmark soil series were mapped in the state (Soil Survey Staff, 2008c) (Table 1). Benchmark soils occupy large extents, hold key positions in soil classification, and are important in determining the properties and interpretations of soils in a large area (Soil Survey Staff, 1993). Alfisols, Entisols, Inceptisols, Histosols, Mollisols, Ultisols, and Vertisols are found in the state (Table 1).

The state soil of Louisiana is the Ruston series (Fine-loamy, siliceous, semiactive, thermic Typic Paleudult). The Ruston soil contains both albic and argillic horizons with an ochric epipedon (Soil Survey Staff, 2008c). It occupies 733,714 acres (296, 924 ha) in the state and widely supports woodland vegetation consisting of hardwoods and southern pine (Soil Survey Staff, 2008d).

***Taxonomic classification scheme of common soil series in Louisiana. Benchmark soil series are in bold***

**Table 1**

| | **Order: Entisols** | | |
|---|---|---|---|
| Suborder | Great Group | Subgroup | Series |
| Aquents | Fluvaquents | Aeric | **Falaya**, Vacherie |
| | | Thapto-Histic | Westwego |
| | | Typic | Bibb, Cypress, Gueydan, Placedo |
| | | Vertic | Sostien |
| | Hydraquents | Typic | Arat, Balize, **Barbary**, Creole, Gentilly, **Larose**, |
| | | Sodic | Bancker, Scatlake |
| | Psammaquents | Typic | Osier |
| Fluvents | Udifluvents | Aquic | Cocodrie |
| | | Oxyaquic | Caplis |
| | | Typic | Bruno, Morganfield, Nugent, Ochlockonee, Robinsonville, Roxana, Severn |
| Psamments | Quartzipsamments | Aquic | Lotus |
| | | Typic | Bigbee, Alaga |
| | Udipsamments | Aquic | Felicity, Iuka |
| | | Typic | Cheniere, Crevasse, Peveto |

| | **Order: Alfisols** | | |
|---|---|---|---|
| Suborder | Great Group | Subgroup | Series |
| Aqualfs | Albaqualfs | Aeric | Mamou, Springfield, Tenot |
| | | Typic | **Crowley**, Zachary |
| | | Vertic | Anacoco |
| | Endoaqualfs | Aeric | Dupuy, Galvez |
| | | Mollic | Loreauville |
| | | Typic | Amagon, **Dundee**, **Forestdale**, Ged |
| | Epiaqualfs | Aeric | Acadia, Acy, Essen, Frozard, Groom, **Hebert**, Patoutville, Solier |
| | | Typic | Rigolette |
| | | Vertic | Baldwin, Kaplan, Midland, Tensas |
| | Glossaqualfs | Aeric | Bursley |

| | | | |
|---|---|---|---|
| | | Oxyaquic | Acadiana |
| | | Typic | Basile, Besner, **Caddo**, **Calhoun**, **Fountain**, Frost, Gilbert, **Guyton**, Kinder, Leton, Merryville, Mowata, Waller, **Wrightsville** |
| | Natraqualfs | Glossaquic | Lafe |
| | | Glossic | Bonn, Brimstone, Deerford, **Foley**, Verdun |
| | Vermaqualfs | Typic | Gessner |
| Udalfs | Fragiudalfs | Aquic | Bude |
| | | Oxyaquic | **Loring**, **Providence** |
| | | Typic | Gigger, Libuse |
| | Fraglossudalfs | Aquic | **Calloway**, Fluker, Necessity, Olivier |
| | | Oxyaquic | **Grenada**, Pineisland |
| | Glossudalfs | Aquic | Egypt, Fred, Vidrine |
| | | Fragic | Duralde |
| | | Haplic | Elysian, Messer |
| | | Oxyaquic | Kleinpeter |
| | Hapludalfs | Albaquic | Cadeville, Corrigan |
| | | Aquic | Goldman |
| | | Glossaquic | Colyell, Coteau, Frizzell, Glenwild, Satsuma, Vick |
| | | Oxyaquic | Glenwild, Rexor |
| | | Typic | Gallion, Kisatchie, **Memphis**, **Rilla**, Sterlington |
| | | Ultic | Dexter, Dossman, Feliciana, Kenefick, Lexington, Liddieville, Meth, Sugartown |
| | | Vertic | **Eastwood**, Herty, Iota, Mckamie, Natchitoches, Oula, Rayburn, **Woodtell** |
| | Paleudalfs | Aeric | Falkner |
| | | Aquic | Duson, Muskogee, Tippah |
| | | Arenic | Larue, **Wolfpen** |
| | | Glossaquic | Abita, Glenmora, Keithville, **Kolin**, Metcalf |
| | | Glossic | **Bernaldo**, Evangeline |
| | | Lamellic | Flo |
| | | Psammetic | Bienville |
| | | Rhodic | Nacogdoches |
| | | Typic | Attoyac, Bistineau, Darbonne |
| | | Vertic | Boswell, Forbing, Gore |

**Order: Ultisols**

| Suborder | Great Group | Subgroup | Series |
|---|---|---|---|
| Aquults | Albaquults | Typic | Leaf |
| | Endoaquults | Aeric | Haggerty, Zenoria |
| | | Typic | Myatt |
| | Paleaquults | Typic | **Smithton** |
| Udults | Fragiudults | Glossaquic | **Pheba** |
| | | Glossic | Prentiss |
| | | Typic | Ora, **Savannah**, Shatta, Tangi, Toula |
| | Hapludults | Aquic | Mollicy, **Sacul** |
| | | Typic | Bassfield, Bearhead, Cahaba, Darley, **Kirvin**, Latonia, **Mahan**, Olla, Smithdale, Sweatman |
| | Kandiudults | Arenic | Lucy |
| | Rhodudults | Typic | Ruple |
| | Paleudults | Aquic | Angie, Bodcau, Gurdon, Harleston, **Sawyer** |
| | | Arenic | Boykin, **Briley**, Letney, Trep |
| | | Fragiaquic | Stough |

| | | | |
|---|---|---|---|
| | | Lamellic | **Betis** |
| | | Oxyaquic | Brule, **Kirbyville** |
| | | Plinthaquic | Beauregard, Saucier |
| | | Plinthic | **Bowie**, Doucette, Malbis, Pinetucky |
| | | Typic | Blevins, Dubach, Lytle, Mclaurin, Niwana, **Ruston**, Sailes, Warnock |

**Order: Inceptisols**

| Suborder | Great Group | Subgroup | Series |
|---|---|---|---|
| Aquepts | Epiaquepts | Fluvaquentic | **Cancienne**, Newellton |
| | | Typic | Una |
| | | Vertic | **Portland**, **Tunica**, Urbo, Yorktown |
| | Endoaquepts | Aeric | Hackberry |
| | | Fluvaquentic | Mhoon, Rosebloom, Waverly |
| | | Fluventic | Arkabutla, Carville, **Commerce**, Convent, **Mantachie** |
| | | Typic | Mermentau |
| | | Vertic | **Dowling**, **Fausse**, Harahan, Rita |
| Udepts | Dystrudepts | Fluvaquentic | Sardis |
| | | Fluventic | Cascilla, Jena, **Ouachita** |
| | Eutrudepts | Dystric | Weyanoke |
| | | Fluventic | Coushatta, Norwood |
| | | Oxyaquic | Bruin |
| | | Rendollic | Keiffer, **Sumter** |
| | | Typic | Natchez |

**Order: Histosols**

| Suborder | Great Group | Subgroup | Series |
|---|---|---|---|
| Saprists | Haplosaprists | Fluvaquentic | Kenner |
| | | Terric | **Allemands**, Bellpass, Carlin, **Clovelly**, Delcomb |
| | | Typic | Lafitte, Maurepas, Timbalier |

**Order: Mollisols**

| Suborder | Great Group | Subgroup | Series |
|---|---|---|---|
| Aquolls | Argiaquolls | Typic | Andry, Jeanerette |
| Udolls | Argiudolls | Aquertic | Sonnier |
| | | Aquic | Armistead |
| | | Oxyaquic | Morey |
| | | Typic | Caspiana, Mer rouge |

**Order: Vertisols**

| Suborder | Great Group | Subgroup | Series |
|---|---|---|---|
| Uderts | Dystruderts | Aquic | Bayoudan, Bellwood, **Vaiden** |
| | Hapluderts | Aquic | Buxin, Hornbeck, Lebeau |
| | | Chromic | Morse |
| | | Watsonia | Leptic |
| | | Oxyaquic | **Latanier**, **Moreland** |
| Aquerts | Dystraquerts | Chromic | **Alligator**, Ashford, Litro, Mayhew, Oktibbeha |
| | Epiaquerts | Aeric | Bossier |
| | | Chromic | Gramercy, **Perry**, **Schriever**, **Sharkey** |
| | | Typic | Iberia, Judice |

## 3. CONCLUSIONS

Louisiana displays a wide variety of soils and natural resources throughout the state. Dynamic geology, climate and cultural practices have added to the diversity of natural resources found in the state. While initial soil sampling in Louisiana is complete, the Soil Survey Staff continue to produce updates to established soil survey data in an effort to keep soils information current in the face of changing land use, soil series, and concepts in soil pedology.

## REFERENCES

Amacher, M.C., W.J. Day, B.A. Schumacher, P.M. Walthall, and B.J. Miller. 1989. A Guide to the Classification of Soils of Louisiana. Bull. 803. La. Agric. Exp. Stn., Baton Rouge.

ATLAS. 2008. The Louisiana Statewide GIS [Online]. Available at http://atlas.lsu.edu/ (Verified 20 Feb. 2008).

Louisiana Geological Survey. 2008. Generalized Geologic Map of Louisiana [Online]. Available at www.lgs.lsu.edu (Verified 20 Feb. 2008).

Lytle, S.A. 1968. The morphological characteristics and relief relationships of representative soils in Louisiana. La. Agric. Exp. Stn., Baton Rouge.

Lytle, S.A. and M.B. Sturgis. 1962. General soil areas and associated soil series groups of Louisiana. Agronomy Department, La. Agric. Exp. Stn., Baton Rouge.

Soil Survey Staff. 1993. Soil survey manual. USDA-NRCS. Agricultural Handbook No. 18. U.S. Gov. Print. Office. Washington, DC.

Soil Survey Staff. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. USDA-NRCS. Agriculture Handbook No. 296. U.S. Gov. Print. Office. Washington, DC.

Soil Survey Staff. 2008a. Louisiana climate data: temperature and precipitation [Online]. Available at http://datagateway.nrcs.usda.gov/ (Verified 20 Feb. 2008).

Soil Survey Staff. 2008b. Major land resource areas of Louisiana [Online]. Available at http://datagateway.nrcs.usda.gov/ (Verified 20 Feb. 2008).

Soil Survey Staff. 2008c. Official soil series descriptions [Online]. Available at http://soils.usda.gov/technical/classification/osd/index.html (Verified 21 Feb. 2008).

Soil Survey Staff. 2008d. Ruston- Louisiana state soil [Online]. Available at http://soils.usda.gov/gallery/state_soils (Verified 28 Feb. 2008).

US Census Bureau. 2000. State and County Quick Facts: Louisiana [Online]. Available at http://quickfacts.census.gov/qfd/states/22000.html (Verified 19 Feb. 2008).

US Geological Survey. 2008. Elevations and Distances in the United States [Online]. Available at http://erg.usgs.gov/isb/pubs/booklets/elvadist/elvadist.html#Highest (Verified 20 Feb. 2008).