General Soil Map of Georgia with Major Land Resource Area (MLRA) Descriptions

MLRA 128
Southern Appalachian Ridges and Valleys

MLRA 130B
Southern Blue Ridge

MLRA 136
Southern Piedmont

MLRA 137
Carolina and Georgia Sand Hills

MLRA 133A
Southern Coastal Plain

MLRA 153A
Atlantic Coast Flatwoods
Physiography

Elevation ranges from 660 feet (200 meters) near the southern end of the area to more than 2,400 feet (730 meters) in the part of the area in the western tip of Virginia. Some isolated linear mountain ridges rise to nearly 4,920 feet (1,500 meters) above sea level. This area is highly diversified. It has many parallel ridges, narrow intervening valleys, and large areas of low, irregular hills. Many ridges and valleys have a difference in elevation of 660 feet (200 meters).

Geology

The bedrock in this area consists of alternating beds of limestone, dolomite, shale, and sandstone of early Paleozoic age. Ridgetops are capped with more resistant carbonate and sandstone layers, and valleys have been eroded into the less resistant shale beds. These folded and faulted layers are at the southernmost extent of the Appalachian Mountains. The narrow river valleys are filled with unconsolidated deposits of clay, silt, sand, and gravel.

Soils

The soils in this area are mainly Udults and, to a lesser extent, Uderts. They have a udic soil moisture regime and a thermic or mesic soil temperature regime; are dominantly well drained, strongly acid, and highly leached; and have a clay-enriched subsoil. They range from shallow on sandstone and shale ridges to very deep in valleys and on large limestone formations.

Paleudults (Decatur, Dewey, Frederick, Fullerton, and Pailo series, commonly cherty) are in the many extensive areas underlain by limestone that traverse the MLRA from southwest to northeast. Hapludults (Townley and Armuchee series) are dominant in valleys underlain by acid shale. Steep, shallow or moderately deep, shaly and stony Dystrudepts (Weikert, Wallen, Montevallo, and Calvin series) are on the sides of steep ridges. Shallow, shaly Eutludepts (Bays and Dandridge series) are in areas of the shale formation extending along the eastern side of the MLRA. Eutudepts (Hamblen, Sullivan, and Pettyjon series) are on narrow bottom land.

Land Use

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

Cropland—private, 12%
Grassland—private, 21%; Federal, 1%
Forest—private, 41%; Federal, 2%
Urban development—private, 16%
Water—private, 5%
Other—private, 2%

Most of this area consists of small and medium-size farms. More than two-fifths of the area supports mixed hardwoods. Most of the forestland, except for a few wooded mountain ridges, is in small farm woodlots. Hay, pasture, and some grain for beef cattle and dairy cattle are the principal crops grown in this area. Burley tobacco is the important cash crop in the southern two-thirds of the area, excluding
Georgia. Some cotton is grown south of Chattanooga. Corn and soybeans are grown on small acreages throughout the area, mainly in narrow strips of bottom land and on the adjacent low terraces.

The major soil resource concerns are sheet and rill erosion on pasture, land slippage, streambank erosion, gullying, surface compaction caused by livestock trampling, and a reduced content of organic matter on cropland. Conservation practices on cropland generally include crop rotations, contour farming, nutrient management, grassed and forested riparian buffers, cover crops, hayland planting, diversions, and grassed waterways. Pasture management includes rotational grazing, watering systems, fencing, managed livestock access to streams, pasture planting, and nutrient management. Forest management includes properly constructed forest harvest trails, critical area planting, and water bars on trails.

### 130B—Southern Blue Ridge

#### Physiography

Elevation ranges from about 900 feet (275 meters) at the south and southwest boundaries of the area to more than 6,600 feet (2,010 meters) at the crest of the Great Smoky and Black Mountain ranges.

#### Geology

The bedrock geology in this area consists mostly of Precambrian metamorphic rock formations with a few small bodies and windows of igneous and sedimentary rocks. The degree of metamorphism varies but generally decreases westward. The higher grade metamorphic rocks include formations of gneiss, schist, and amphibolite. Low-grade metamorphic formations in the southwestern part of the MLRA include distinct and interbedded bodies of metasandstone, slate, phyllite, metasiltstone, and metaconglomerate. Surficial deposits include colluvial material on fans and aprons along the ridges and alluvial material along the major streams.

#### Soils

The dominant soil orders in this MLRA are Inceptisols and Ultisols. The soil moisture regime is udic. The soil temperature regime typically is mesic, but it is frigid at elevations above 4,200 feet (1,280 meters). Soil depth ranges from shallow to very deep. The general textural class is loamy or clayey.

In areas at elevations of less than 3,500 feet (1,065 meters), the soils on uplands generally are red, fine-loamy or fine Typic Hapludults (Evard, Junaluska, and Hayesville series). Humic Hapludults (Trimont and Snowbird series) are on north and east aspects. Soils that formed in colluvium in coves are Typic Dystrudepts (Tate, Greenlee, and Northcove series), Typic Hapludults (Lonon and Keener series), or Humic Hapludults (Saunook and Thunder series).

At elevations between 3,500 and 4,200 feet (1,065 and 1,280 meters), the soils on uplands generally are brown, fine-loamy or coarse-loamy Dystrudepts. Humic Dystrudepts (Plott, Porters, and Cheoah series) are common on north and east aspects, and Typic Dystrudepts (Edneyville, Chestnut, Ditney, and Stecoah series) are common on south and west aspects. Soils that formed in colluvium in coves are Humic Dystrudepts (Cullasaja, Spivey, Tuckasegee, and Santeetlah series) or Humic Hapludults (Saunook and Thunder series).
In areas at elevations above 4,200 feet (1,280 meters), the soils on uplands generally are brown, fine-loamy or coarse-loamy Humic Dystrudepts with a frigid soil temperature regime (Burton, Oconaluftee, and Breakneck series). Soils that formed in colluvium also are Humic Dystrudepts (Balsam and Chiltoskie series). Soils that formed in alluvium vary with stream gradient, energy, and entrenchment into the valley floor. In the upper reaches of watersheds where flood plains are narrow, the soils are Oxyaquic and Fluvaquentic Dystrudepts (Dellwood, Reddies, and Cullowhee series). In the lower and broader river valleys, Udipsamments (Biltmore series) and coarse-loamy Dystrudepts (Rosman series) are in areas closest to rivers and streams on flood plains. Humaquepts (Ela, Nikwasi, and Toxaway series) are in low-lying, frequently flooded or ponded areas. Ultisols are most common on the more stable stream terraces. Fine-loamy Aquic and Typic Hapludults (Dillard and Statler series) are on low terraces, and fine Typic Hapludults (Braddock and Unison series) are on high terraces.

**Land Use**

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

- **Cropland**—private, 4%
- **Grassland**—private, 10%; Federal, 3%
- **Forest**—private, 46%; Federal, 23%
- **Urban development**—private, 8%; Federal, 1%
- **Water**—private, 2%; Federal, 1%
- **Other**—private, 1%; Federal, 1%

More than two-thirds of this area is forestland used for timber production, watershed protection, recreation, and wildlife habitat. The federally owned forestland in the area is mainly U.S. Forest Service or National Park Service land. The small acreage of cropland is used for vegetables, fruit orchards, native ornamental crops, and Christmas trees as well as corn and small grain. About 10 percent of the MLRA is in pastured areas used for dairy, beef, and wool production. The largest urban area in this MLRA is Asheville, North Carolina. The MLRA is a popular area for tourism and retirement living. As a result, steady or rapid urban growth occurs in many areas.

Erosion from poorly constructed and maintained access roads is a major management concern in this area. Sediment from access roads and urban development is the main pollutant of streams in the area. Proper design and construction of access roads and stabilization of road banks can minimize the impact of timber management on water quality.

Conservation practices in agricultural areas include field borders, grassed waterways, diversions, and riparian buffers along streams. Prescribed grazing and proper forage, nutrient, and pest management practices are critical in maintaining the productivity of grazing land.

In areas where streams have been channelized, riparian areas have been removed, and livestock access is unchecked, streambank erosion is a major concern. Stabilizing streambanks and channels and restoring and maintaining riparian forest buffers can maintain or improve water quality. The condition of streambanks and channels becomes increasingly important in managing the storm-water runoff from growing urban areas.
**Physiography**

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 water falls 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 (Harper 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.
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.

136—Southern Piedmont

Physiography

This MLRA is a rolling to hilly upland with a well-defined drainage pattern. Streams have dissected the original plateau, leaving narrow to fairly broad upland ridge tops and short slopes adjacent to the major streams. The valley floors are generally narrow and make up about 10 percent or less of the land area. The associated stream terraces are minor. Elevation ranges from 330 to 1,310 feet (100 to 400 meters).

Geology

Precambrian and Paleozoic metamorphic and igneous rocks underlie almost all of this MLRA. The dominant metamorphic rock types include biotite gneiss, schist, slate, quartzite, phyllite, and amphibolite. The dominant igneous rock types are granite and metamorphosed granite. Some gabbro and other mafic igneous rocks also occur, and diabase dikes are not uncommon. The Carolina Slate terrane occurs just east of an imaginary centerline in this MLRA. It consists of metamorphic rocks with some metavolcanics and metasediments. Scattered graben basins, which are bounded by faults where the ground between the faults has dropped down, occur from South Carolina to south of Charlottesville and Richmond, Virginia. These basins have Triassic and Jurassic siltstone, shale, sandstone, and mudstone. River valleys have recent alluvium and few terraces.
Soils

The dominant soil orders in this MLRA are Ultisols, Inceptisols, and Alfisols. The soils in the area dominantly have a thermic soil temperature regime, a udic soil moisture regime, and kaolinitic or mixed mineralogy. They are shallow to very deep, generally well drained, and loamy or clayey. Hapludalfs (Enon and Wilkes series), Hapludults (Badin, Nason, and Tatum series), and Kanhapludults (Appling, Cecil, Georgeville, Herndon, Madison, Pacolet, and Wedowee series) formed in residuum on hills and ridges. Dystrudepts (Chewacla series) formed in alluvium on flood plains. Udults in the Rhodic subgroup (Davidson, Hiwassee, and Lloyd series) formed in old alluvium on stream terraces or in residuum derived from mafic rocks.

Land Use

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

- Cropland—private, 9%
- Grassland—private, 11%
- Forest—private, 58%; Federal, 2%
- Urban development—private, 15%
- Water—private, 3%
- Other—private, 2%

Most of this area is in small farms, but a sizable acreage is controlled by forest products companies. Although most of the land was once cultivated, much has reverted to mixed stands of pine and hardwoods. Most of the open areas are used as pasture, but some crops, such as soybeans, corn, cotton, and wheat and other small grains, are grown in these areas. Tobacco is grown to a lesser extent. Dairy cattle and poultry are important locally. Rural land adjacent to the major cities is being converted to residential development and associated urban development. This land use conversion is occurring rapidly in the corridor called the Piedmont Crescent, which extends from Atlanta, Georgia, to Raleigh, North Carolina.

The major soil resource concerns are water erosion and the increasing conversion of prime farmland and farmland of statewide importance to urban uses. Conservation practices on cropland generally include conservation tillage, crop residue management, field borders, vegetative wind barriers, and nutrient and pest management.

137—Carolina and Georgia Sand Hills

Physiography

This area is in a transitional zone between the true Piedmont and the Coastal Plain. This MLRA is a dissected, rolling to hilly upland. Many of the more dissected areas have stabilized dunes, resulting in very irregular slopes. Elevation ranges from 165 to 660 feet (50 to 200 meters), increasing gradually from south to north. Local relief is mainly 10 to 20 feet (3 to 6 meters), but a
few hills are 80 to 165 feet (25 to 50 meters) above the adjacent areas.

**Geology**

The Sand Hills area is just below the “fall line,” which marks the boundary between the older crystalline rocks in the Piedmont and the younger, unconsolidated sediments of the Coastal Plain. Deep Cretaceous sands deposited in this ancient shoreline area were reworked during periods of submergence of the Coastal Plain in Pleistocene time. Several areas have deposits of kaolin and high-silica sands that are mined. Stabilized sand dunes are common in the area. Deposits of siltstone, shale, and marl generally lie beneath the coastal plain side of this area, and the crystalline rocks of the Piedmont lie beneath the sands on the inland side.

**Soils**

The dominant soil orders in this MLRA are Ultisols and Entisols. The soils dominantly have a thermic soil temperature regime, a udic soil moisture regime, and kaolinitic or siliceous mineralogy. They generally are very deep, well drained to excessively drained, and loamy or sandy. Hapludults (Blaney series) and Kanhapludults (Ailey, Pelion, and Vaucluse series) formed in marine sediments on flats, hills, and ridges. Kandiudults formed in marine sediments (Fuquay series) and mixed marine and alluvial sediments (Troup series) on uplands. Paleudults formed in marine sediments (Candor series) and mixed marine and eolian deposits (Blanton series) on uplands and stream terraces. Quartzipsamments (Lakeland series) formed in mixed marine and eolian deposits on uplands.

**Land Use**

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

- Cropland—private, 12%
- Grassland—private, 4%
- Forest—private, 58%; Federal, 10%
- Urban development—private, 13%
- Water—private, 1%
- Other—private, 2%

Most of this area is in farms, most of which are part-time or subsistence farms. About one-tenth of the area is federally owned and used for military posts and training areas. The forested areas support pine and scrub oaks. Pulpwood and some lumber are the principal forest products. The cropland in the area is used mainly for corn or cotton. A substantial acreage in the area is used for urban development.

The major resource concerns are controlling water erosion and enhancing the available water capacity of the soils. Conservation practices on cropland generally include systems of crop residue management, diversions, and grassed waterways. Field borders provide cover for bobwhite quail and cottontail. Conversion to a permanent cover of vegetation has been a continuing recommendation for the soils that are low in natural productivity.
153A—Atlantic Coast Flatwoods

**Physiography**

This area is a relatively flat coastal plain crossed by many broad, shallow valleys that have widely meandering stream channels. Some short, steep slopes border the stream valleys. Elevation ranges from 25 to 165 feet (8 to 50 meters). Local relief is mainly less than 35 feet (10 meters).

**Geology**

Mostly unconsolidated Coastal Plain sediments occur at the surface throughout this area. These sediments are primarily Tertiary to Quaternary in age. They are a mixture of river-laid sediments in old riverbeds and on terraces, flood plains, and deltas. These young sediments are made up of combinations of clay, silt, sand, and gravel. From central North Carolina to Florida, Cretaceous marine, near-shore shale, sandstone, and limestone deposits occur beneath the surface. Swamps were common in this area prior to agricultural development. The present-day river valleys are extensive and are flat near the coast. The water table typically is close to the surface in these river valleys. Soils having restricted drainage are common throughout the area.

**Soils**

The dominant soil orders in this MLRA are Spodosols and Ultisols. The soils in the area dominantly have a thermic soil temperature regime, an aquic or udic soil moisture regime, and siliceous or kaolinitic mineralogy. They generally are very deep, well drained to very poorly drained, and loamy or clayey. Paleaquults formed in marine sediments on flats and in depressions on the coastal plain (Coxville, Lynchburg, Pantego, and Pelham series) and on marine terraces (Rains series). Paleudults (Goldsboro series) and Kandiudults (Norfolk series) formed in marine sediments on uplands. Albaquults (Leaf series) formed in mixed alluvium and marine sediments on flats and terraces. Aiquods (Leon and Mascotte series) formed in marine sediments on flats and terraces and in depressions. Haplosapristes (Croatan series) formed in organic deposits over mixed marine and fluvial deposits on the coastal plain.

**Land Use**

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

- Cropland—private, 15%
- Grassland—private, 2%
- Forest—private, 61%; Federal, 6%
- Urban development—private, 8%
- Water—private, 4%
- Other—private, 4%
Most of this area is in farms, but some is in national forests or is used for game refuges or related purposes. Some of the forests are farm woodlots, but most are large holdings. Pulpwood is the main wood product. Lumber and naval stores are other wood products. The acreage of cropland is somewhat higher in the northern part of the area than in the southern part and is considerably lower in Florida. Vegetable crops, fruits, melons, sweet potatoes, and Irish potatoes are important crops. Large acreages are used for corn, soybeans, wheat, and tobacco. Some peanuts are grown on the sandy soils in Virginia, North Carolina, and Georgia. Poultry farming is an important enterprise in the northern part of the area and in some parts of Florida. Swine operations are of major importance in North Carolina and Virginia.

The major soil resource concerns are wind erosion and a low soil conditioning index resulting from surface compaction and a low content of organic matter in cultivated areas. Many areas of poorly drained and very poorly drained soils on uplands have been restored to wetland conditions. Wetland restoration improves water quality and provides wildlife habitat.

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. Conservation practices on cropland generally include crop residue management, establishment of field borders, vegetative wind barriers, and nutrient and pest management.
MLRA 128
Southern Appalachian
Ridges and Valleys

Legend

s1609  Shack-Minvale-Fullerton-Bodine Association
MLRA 130B
Southern Blue Ridge

Legend
- s1620 Tusquitee-Porters-Edneyville-Ashe Association
MLRA 136
Southern Piedmont

Legend

s1623 Pacolet-Madison-Cecil Association
MLRA 137
Carolina and Georgia
Sand Hills

Legend

s1636  Vaucluse-Lakeland Association
MLRA 153A
Atlantic Coast Flatwoods

Legend
s1661 Pelham-Leefield-Irvington Association