In This Section

Section 2

River Basin Characteristics

This section describes the following major characteristics of the St. Marys River basin:

- *River basin description (Section 2.1): the physical features and natural processes of the basin.*
- *Population and land use (Section 2.2): the sociological features of the basin, including the types of human activities that might affect water quality and water resource use.*
- *Local governments and planning authorities (Section 2.3): identification and roles of the local authorities within the basin.*
- *Water use classifications (Section 2.4): description of water use classifications and baseline goals for management of waters within the basin as defined in the state regulatory framework.*

2.1 River Basin Description

This section describes the important geographical, geological, hydrological, and biological characteristics of the St. Marys River basin.

The physical characteristics of the St. Marys River basin include its location, physiography, soils, climate, surface water and ground water resources, and natural water quality. These physical characteristics influence the basin's biological habitats and the ways people use the basin's land and water resources.

2.1.1 River Basin Boundaries

The St. Marys River basin is located in southeast Georgia and is flanked by the Satilla River basin to the north and the Sawannee River basin to the west (Figure 2-1). The headwaters are located in Charlton County and the river flows north and east to the

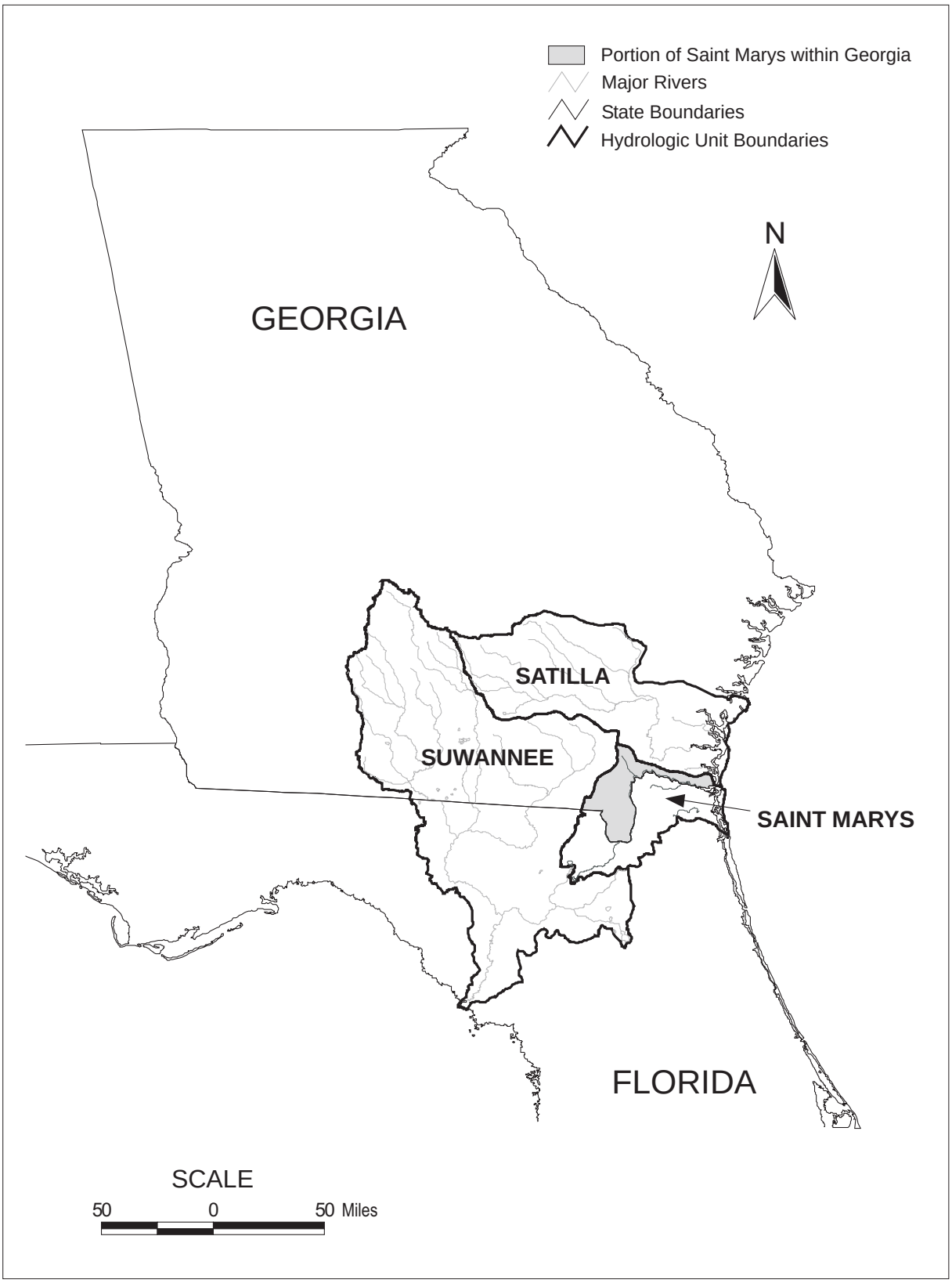

Figure 2-I. Location of the St. Marys River Basin

Atlantic Ocean. The St. Marys River watershed is located in Georgia and Florida and drains approximately 1,300 square miles, with approximately 765 square miles of drainage in Georgia.

The U.S. Geological Survey (USGS) has represented the St. Marys River basin as one subbasin, or Hydrologic Unit Code (HUC; see Table 2-1). The HUC is referred to repeatedly in this report. Figure 2-2 shows the location of this subbasin and the associated counties within the subbasin.

Table 2-I. Hydrologic Unit Code (HUC) of the St. Marys River Basin in Georgia

03070204	St. Marys River

2.I.2 Climate

The St. Marys River basin is characterized by mild winters and hot summers. Mean annual precipitation ranges from 40 to 52 inches per year. Precipitation occurs as rainfall. Average annual rainfall in the basin is about 50 inches. Fall is the driest season receiving only twenty percent of the total annual precipitation. Summer is the wettest season of the year, receiving about one-third to one-half of the total annual precipitation. The mean annual temperature is about 69 degrees Fahrenheit (Journey and Atkins, 1996; citing Peck et al., 1992; Schneider et al., 1965; and Carter and Stiles, 1983).

2.I.3 Physiography, Geology, Soils, and Hydrogeology

Physiography

The Ochlockonee, Satilla, St. Marys and Suwannee River basins lie entirely within the Coastal Plain physiographic province, which extends throughout the southeastern margin of the United States. The physiography of these river basins reflects a geologic history of repeated periods of land submergence which is typical of the Coastal Plain Province. These basins include all or portions of the Tifton Upland, the Okefenokee Basin, the Bacon Terraces and the Barrier Island Sequence districts of the Coastal Plain. The Ochlockonee River basin lies within the western third of the Tifton Upland District. The Satilla River basin lies entirely within the Bacon Terraces and Barrier Island Sequence districts. The St. Marys River basin lies entirely within the Okefenokee Basin and Barrier Island Sequence districts. The Suwannee River basin lies within the Tifton Upland and Okefenokee Basin districts.

The Tifton Upland District is characterized by a well developed, extend dendritic stream pattern where narrow, rounded interfluves occur 50 to 200 feet above relatively narrow stream valley floors. The northwestern boundary of the district is the base of the Pelham Escarpment, which rises as much as 200 feet above the Dougherty Plain to the west. The Okefenokee Basin District is typified by very low topographic relief, numerous extensive swamps, and local sand ridges. The Bacon Terraces District displays a very extended, southeast trending dendritic drainage pattern containing ling, narrow interfluves with gently rounded to flat summits that are 50 to 100 feet above narrow, marshy floodplains. The district also contains several low, moderately dissected terraces which are generally parallel to the coastline. From west to east, these are designated the Hazlehurst, Pearson, Claxton, Argyle, Waycross and Penholoway terraces. The Barrier Island Sequence District is characterized by a series of prominent marine terraces which form a step-like progression of decreasing altitudes toward the sea. The former, higher sea levels created barrier island-salt marsh environments parallel to and similar to those found on the present coast. The terraces are composed of sand ridges marking the former barrier islands, and are flanked by fresh water marshes at the former salt marsh locations.

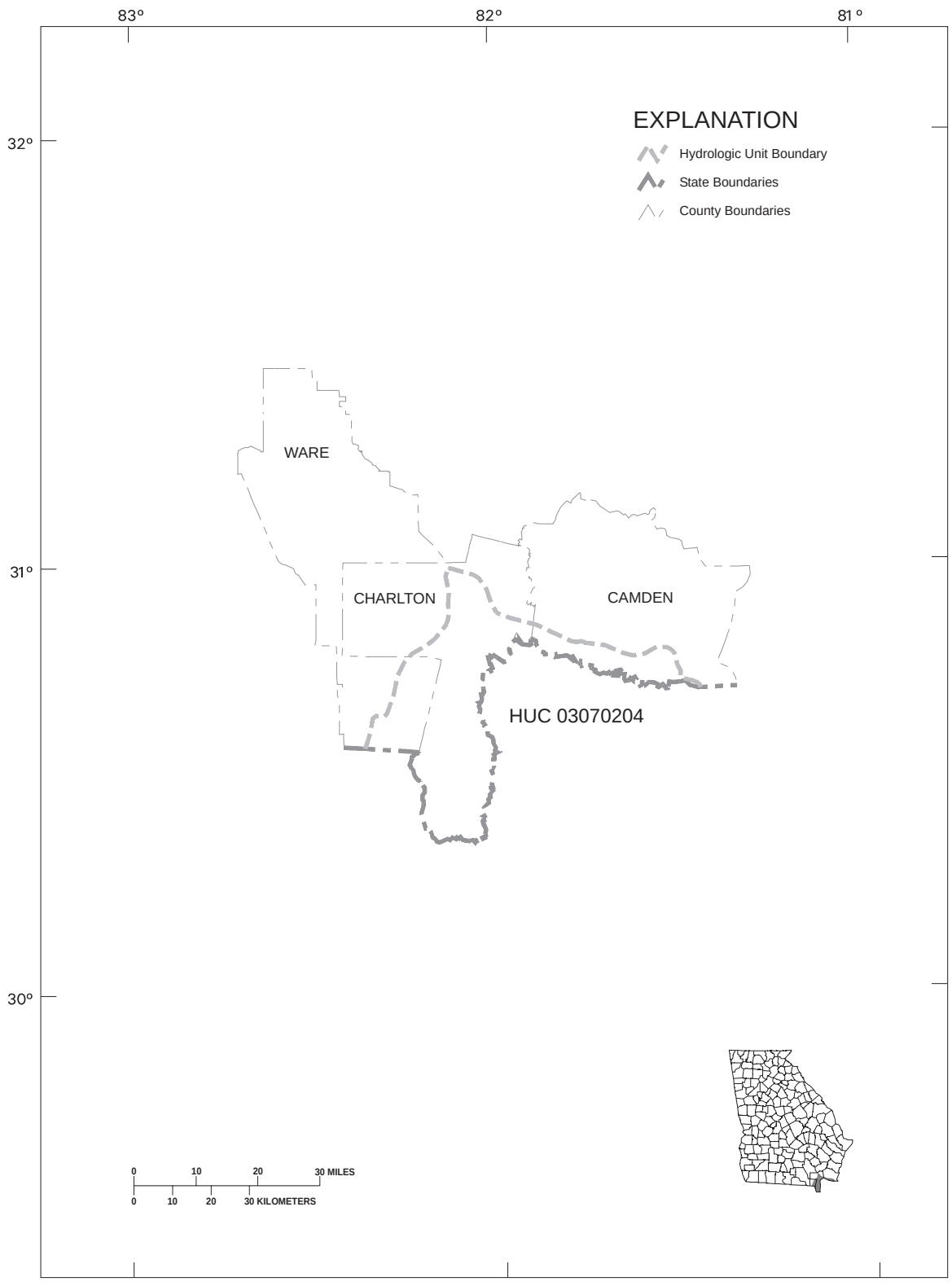

Figure 2-2. Hydrologic Units and Counties of the St. Marys River Basin

They have undergone slight to moderate dissection which is generally more advanced at the western edge of the district. Trail Ridge is the most prominent of these terraces with a maximum elevation of approximately 160 feet. It marks the western boundary of the Barrier Island Sequence District where it joins the Bacon Terraces and Okefenokee Basin districts. Other, less prominent terraces in the district, from west to east, are the Wicomico, Penholoway, Talbot, Pamlico, Princess Anne, and Silver Bluff-Holocene terraces.

The streams in these basins are typical of the Coastal Plain. They generally lack the riffles and shoals that are common to streams in the Piedmont Province to the north, and exhibit more extensive floodplain development and greater sinuosity.

Carolina Bays are elliptical or "spoon-shaped" wetland depressions aligned roughly north-northwest and are logically well developed throughout the area east of the Suwannee River basin. Lime sinks and lake-filled sinks are well developed in areas underlain by limestone in the shallow subsurface, notably in the Lake Park area south and west of Valdosta, Lowndes County.

Geology

Weathered, poorly consolidated sediments underlie all of these river basins, and are dominantly composed of sands, clays, and gravels which range from Miocene to Holocene in age. These sediments include the Miccosukee Formation (Pliocene age), Altamaha Formation and various formations of the Hawthorne Group (all Miocene age), as well as barrier island and marsh/lagoon facies of the numerous shoreline complexes (Pleistocene to Holocene age). Local occurrences of calcareous sediments include the Suwannee Limestone (Oligocene age) and Duplin Marl (Pliocene age). Other rock types in the area include dolomite, chert, peat, phosphate and fuller's earth, as well as Quaternary alluvium in the flood plains along the major stream valleys. Most of these sediments were deposited in either terrestrial or shallow marine environments.

Sediments in the area are locally mined for construction sand and fill material. In addition, the Meigs Member of the Coosawhatchie Formation (Hawthorne Group) is the source of the economically important fuller's earth clay deposits being mined in the Ochlockonee River Basin. In the past, crushed stone was produced from some of the limestone deposits, and a few of the larger Carolina Bays were mined for peat.

Soils

The Saint Mary's River Basin is within the Atlantic Coast Flatwoods Major Land Resource Area (MLRA) (Figure 2-3). The soils within the river basin vary considerably, particularly from west to east across the area. The soils in this area can be combined into four major groups for discussion.

The first group of soils occur within the Okefenokee Swamp. This area is dominated by organic soils that are saturated and covered with water most of the time. These soils are extremely acid. They are normally underlain by sandy or loamy material at various depths. Scattered within the area of organic soils are islands of sandy mineral soils, most of which are Spodosols. Spodosols are sandy soils that have a layer where a complex of organic matter and aluminum has accumulated. These sandy soils are mostly poorly drained, with a water table at or near the surface during wet seasons, but they are higher in elevation and drier than the surrounding organic soils.

The second major group of soils is dominated by nearly level, poorly drained soils on broad flats, and by very poorly drained soils in depressions and along drainageways. This area is characterized by an abundance of Spodosols. Most of the soils in this area are sandy, although a loamy subsoil is sometimes found at depth of around 3 feet. Water

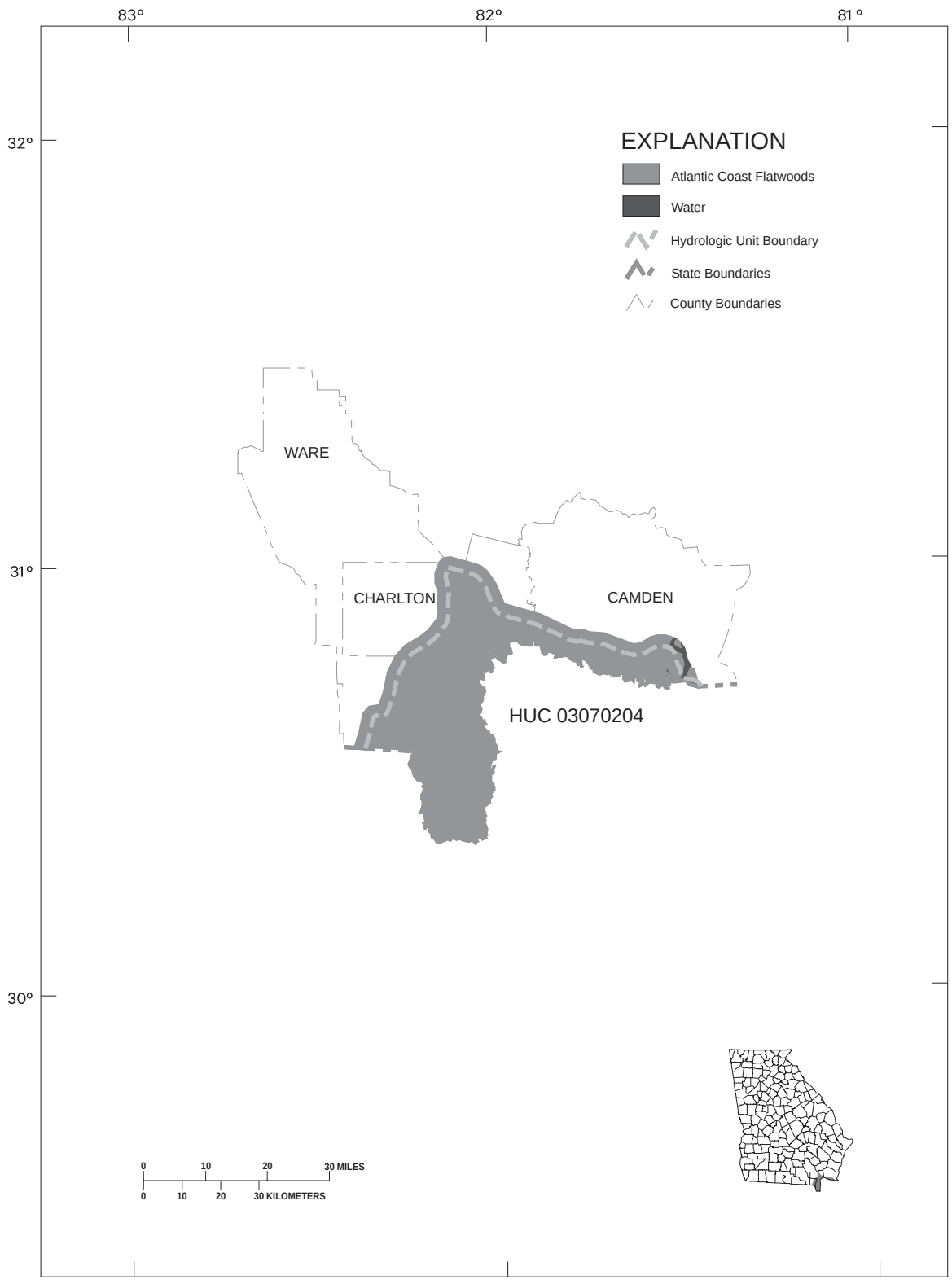

Figure 2-3. Major Land Resource Areas in the St. Marys River Basin

tables are commonly at or near the surface during wet seasons, and soils in depressions are often ponded. There are areas that are higher in elevation and have a deeper water table, particularly along Trail Ridge. Many of these soils are also Spodosols.

The third group of soils are nearly level, poorly drained and very poorly drained, clayey soils on low marine terraces and in depressions. These soils are different from most soils in the Atlantic Coast Flatwoods because of their high clay content. They are often ponded or flooded. Brookman, Bladen, and Pooler are common soils in this area.

The fourth group of soils occur in tidal marshes. These soils are continuously saturated with water. They are clayey or silty, and are high in sulpher and salt content. Bohicket and Capers are common soils in this area. Islands and other areas of higher elevation in this area are dominated by sandy Spodosols as outlined in group two above.

Hydrogeology

Coastal Plain sediments underlie the entire region and groundwater is produced from several aquifers. Sources of ground water include, in order of importance, the unconfined Surficial aquifer, the Upper and Lower Brunswick aquifers and the Upper and Lower Floridan aquifers. The Surficial aquifer is up to 230 feet thick and consists of interlayered, Miocene and younger, sand, clay and limestone. It is underlain by the Upper and Lower Brunswick aquifers both of which are composed of 150 and 70 feet, respectively, of poorly sorted sand. The Upper and Lower Floridan aquifers consist of Eocene to Oligocene carbonate rocks (largely limestone and dolostone) 700 to 2,500 feet in thickness. In each of the aquifers, except for the Surficial aquifer, the groundwater is under confined (aquifer) conditions. Most of these aquifers consistently have excellent water quality; however, the Lower Floridan aquifer is saline and generally does not meet drinking water standards. Stream networks within each HUC are shown in Figure 2-4.

2.1.4 Surface Water Resources

The St. Marys River Basin is a 765 square-mile landmass in southeast Georgia, the smallest of the area's four basins. An additional 535 square-mile portion of the basin lies in Florida. The basin is one of three basins in the area whose hydrologic boundaries continue into Florida.

The upstream boundary of the St Marys Basin is the Okefenokee Swamp. From this point the Georgia portion of the basin extends eastwards and northward to include parts of Ware, Charlton and Camden counties.

Surface water resources in the basin are limited by its small size. The main stem of the St Marys River is the principal surface water resource , with an annual average flow at its mouth of about 1400 cfs. The North Prong St Marys River and Spanish Creek, with tributary areas of 540 square miles and 109 square miles, respectively, are the only significant tributaries.

2.1.5 Ground Water Resources

Groundwater resources in the St Marys River basin are supplied by the Floridan aquifer system, one of the most productive ground water reservoirs in the United States. The system supplies about 50 percent of the ground water used in the state. It is used as a major water source throughout most of South Georgia. A more detailed description of the Floridan aquifer system is provided below.

Floridan Aquifer

The Floridan aquifer underlies the rest of the southern portion of the basin. The aquifer is overlain by approximately 25-125 feet of sandy clay residuum derived from

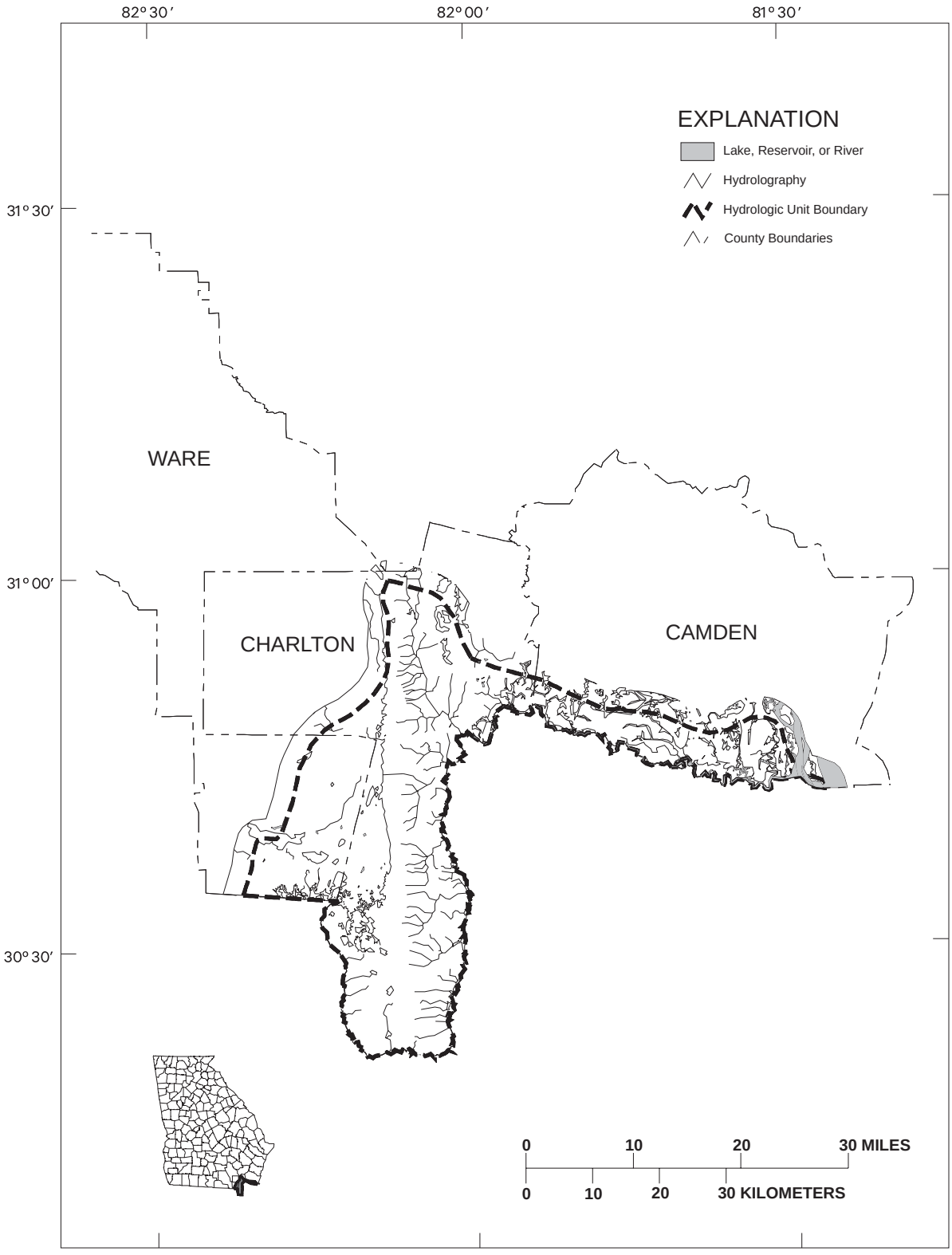

Figure 2-4. Hydrography, St. Marys River Basin, HUC 03070204

chemical weathering of the underlying rock. The total thickness of the Floridan aquifer in the basin ranges from a few feet in the north to more than 400 feet in the extreme southern portion of the basin. Clastic grains of sand and shale are major components of the Floridan aquifer near its northernmost extent, where it is dominantly limestone in the Ochlockonee basin. Throughout most of the basin, the aquifer can be divided into three thick limestone formations: the Tampa Limestone, the Suwannee Limestone and the Ocala Limestone. The Tampa Limestone consists of whitish gray limestone that has a shale bed at its base. This shale acts as a confining layer to the underlying Suwannee and Ocala limestones (Miller, 1986). Below the Tampa, the Suwannee limestone is a massive chalky unit that is easily dissolved and weathered. For this reason, the many solution cavities in the Tampa provide abundant water to the underlying Ocala Limestone. The Ocala Limestone is the principal unit of the Floridan aquifer, and contains an upper friable, porous unit and a lower fine-grained unit (Miller, 1986). This lower unit contains most of the groundwater in the Floridan aquifer (Torak and others, 1993). The Ocala is underlain by the clay-rich Lisbon Formation, which acts as a slower confining bed to the water-bearing limestones above. Well yields in the Floridan aquifer can range from about 40 GPM in the north to more than 10,000 GPM in the thickest, southern most portion of the Floridan aquifer. The Floridan serves as the main aquifer from Decatur and Burke counties to the coast.

Recharge occurs through the sandy soil in the outcrop area. In the northern portion of the basin this unit is seen as one single aquifer and can be called either the Cretaceous Aquifer or the Dublin-Midville Aquifer. As you move to the south, an intervening clay layer becomes apparent, and divides the aquifer into two distinct units. Below is the Midville Aquifer of definite Cretaceous age. Overlying the confining shale unit is the Dublin Aquifer, which is of Cretaceous-Early Tertiary age.

2.I.6 Biological Resources

Fish Fauna

The fish fauna of the St. Marys River basin includes 52 species representing 17 families. Fifteen of the 34 species in the sunfish family Centrarchidae are present in the St. Marys River, making this family the largest group of fish species found in the river basin. Other families with large numbers of species are the minnow and catfish families, with six species from each family being found in the St. Marys basin. Fish populations in the St. Marys basin are limited in productivity by acidic waters, low alkalinity, and extreme variation in flow.

Fisheries

The St. Marys River is a blackwater stream that originates in the Okefenokee Swamp and north-eastern Florida. The St. Marys River flows in a easterly direction for 143 miles, forming the border between southeast Georgia and northeast Florida, before emptying into the Atlantic Ocean near St. Marys, Georgia. The river is well known for its near natural conditions and many landmarks. The St. Marys River and its tributaries provide good fishing opportunities for largemouth bass, redbreast sunfish, bluegill, warmouth, crappie, and several catfish species.

The blackbanded sunfish and the banded topminnow are two fish species found in the basin that are currently listed by the state as rare species. The Atlantic and shortnose sturgeon are both known anecdotally from the St. Marys River, including recorded landings of Atlantic sturgeon as recently as 1992. However, no Atlantic or shortnose sturgeon were collected in over 100 hours of sampling effort from 23 May - 8 September, 1994 (unpublished data, CRD).

2.2 Population and Land Use

2.2.I Population

As of 1995, about 9,000 people lived in the St Marys watershed (DRI/McGraw-Hill, 1996). Population distribution in the basin at the time of the 1990 census by census blocks is shown in Figure 2-5. Population centers in the St Marys watershed include the development surrounding Kingsland and Folkston.

Between 1995 and 2050, the population in the St Marys River basin is estimated to increase by 0.9 percent per year (DRI/McGraw-Hill, 1996).

The river basin will mirror state trends in terms of its elderly population with the 65 and older age group showing the largest gains in share through 2050, at which time 19 percent of the population will be in this age group. Large youth and elderly populations will mean a decline in the working age population, down 19 percent in 2050 from 35 percent today.

2.2.2 Land Cover and Use

Land use/land cover classification (Figures 2-6 and 2-7) was determined for the St. Marys River Basin based on high-altitude aerial photography for 1972-76 (U.S. Geological Survey, 1972-78). Subsequently in 1991 land cover data were developed based on interpretation of Landsat TM satellite image data obtained during 1988-90, leaf-off conditions. These two coverages differ significantly. Aerial photography allows identification of both land cover and land uses. Satellite imagery, however, detects primarily land cover, and not land use, such that a forest and a wooded subdivision may, for instance, appear similar. Satellite interpretation also tends to be less accurate than aerial photography.

The 1988-90 land cover interpretation showed 41 percent of the basin in forest cover, 41 percent in wetlands, 2 percent in urban land cover, and 2 percent in agriculture (Figure 2-7). Statistics for 15 landcover classes in the Georgia portion of the St. Marys River basin for the 1988-90 coverage are presented in Table 2-2 (GA DNR, 1996).

Table 2-2. Land Cover Statistics for the St. Marys Basin

Class Name	%	Acres
Open Water	1.5	6,132.3
Clear Cut/Young Pine	8.1	33,497.8
Pasture	0.7	2,922.0
Cultivated/Exposed Earth	1.6	6,826.5
Low Density Urban	1.0	3,973.4
High Density Urban	0.9	3,754.8
Emergent Wetland	4.2	17,488.6
Scrub/Shrub Wetland	11.6	48,173.8
Forested Wetland	23.9	99,450.4
Coniferous Forest	25.8	107,390.7
Mixed Forest	13.0	53,847.8
Hardwood Forest	2.5	10,210.3
Salt Marsh	0.5	2,171.7
Brackish Marsh	1.0	4,338.9
Tidal Flats/Beaches	0.1	255.3
Total	*100.0*	*415,636.2*

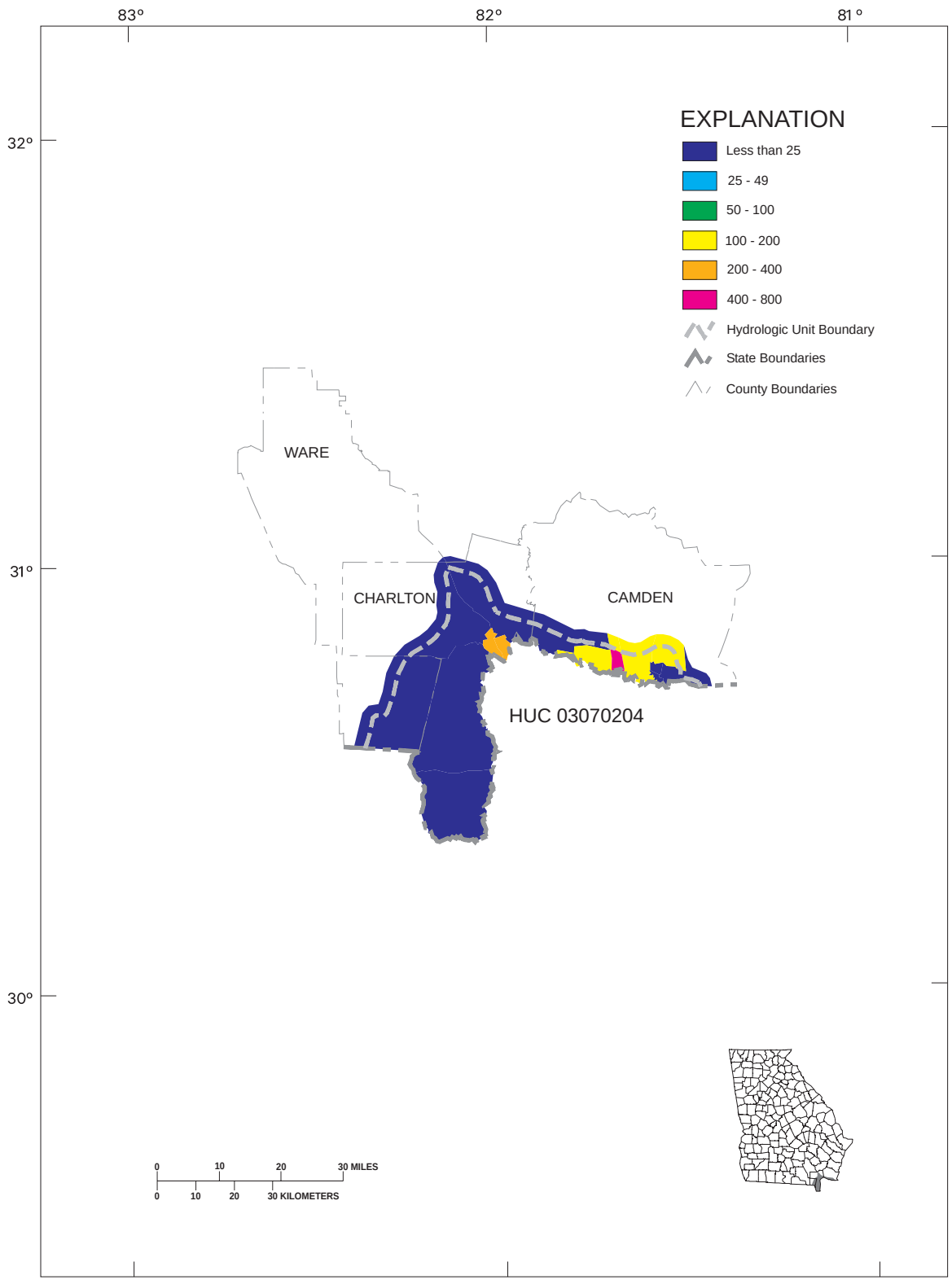

Figure 2-5. Population Density in the St. Marys River Basin, 1990 (persons per square mile)

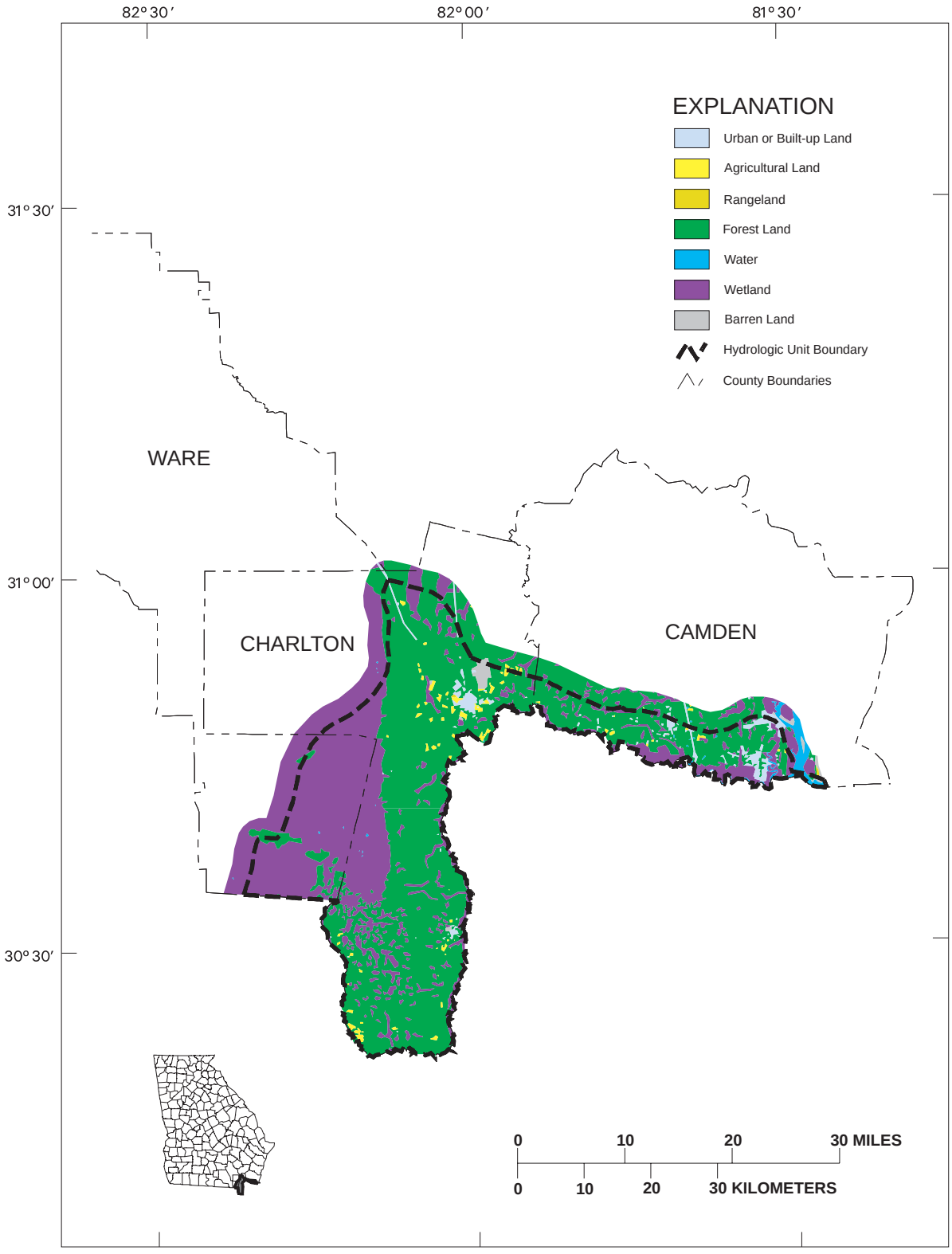

Figure 2-6. Land Use, St. Marys River Basin, HUC 03070204, USGS 1972-76 Classification Updated with 1990 Urban Areas

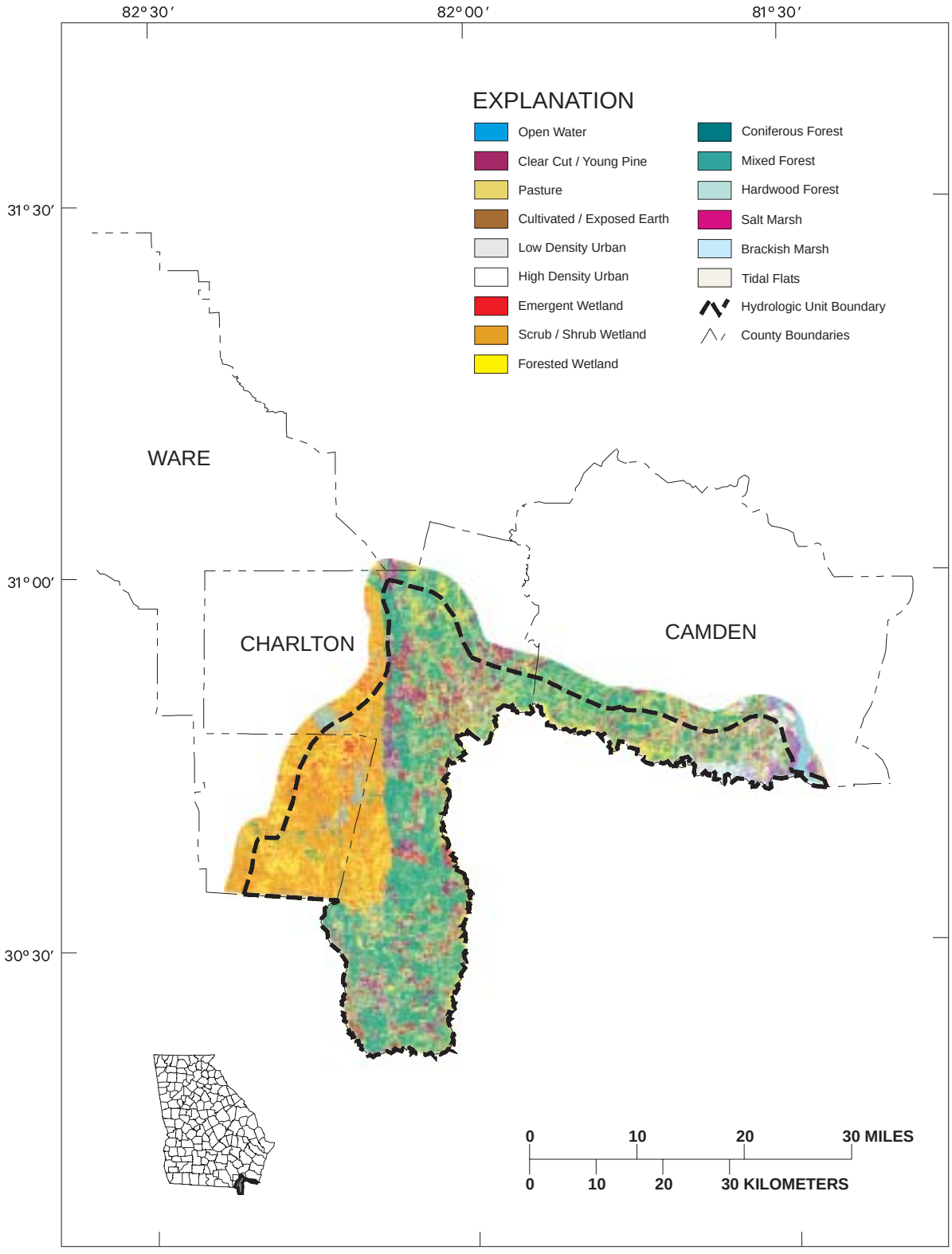

Figure 2-7. Land Cover 1990, St. Marys River Basin, HUC 03070204

Forestry

Forestry is a major part of the economy within the basin. Markets for forest products afford landowners excellent investment opportunities to manage and sell their timber, pine straw, naval stores, etc., products. Statewide, the forest industry output for 1997 grew to approximately $19.5 billion dollars. The value added by this production, which includes wages, profits, interest, rent, depreciation and taxes paid into the economy reached a record high $9.3 billion dollars. Georgians are benefited directly by 177,000 job opportunities created by the manufacture of paper, lumber, furniture and various other wood products as well as benefiting the consumers of these products. Other benefits of the forest include hunting, fishing, aesthetics, wildlife watching, hiking, camping and other recreational opportunities as well as providing important environmental benefits such as clean air and water and wildlife habitat.

According to the US Forest Service's Forest Statistics for Georgia, 1997 report (Thompson, 1997), there is approximately 919,800 acres of commercial forest land in the entire counties within the basin. Approximately 62 percent of the total land area in the basin is commercial forest. Private landowners account for 38 percent of the commercial forest ownership while the forest industry companies account for 55 percent. Governmental entities account for about 7 percent of the commercial forest land. An additional 319,600 acres are classified as reserved timberland but are withdrawn from timber utilization through statute or administrative regulation. Figure 2-8 depicts silvicultural land use in the St. Marys basin. Forestry acreage in the St. Marys River basin is summarized in Table 2-3.

Table 2-3. Forestry Acreage in the St. Marys River Basin

County	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Camden	267,600	138,600	29,700	9,000	86,000
Charlton	307,100	202,000	41,200	7,300	38,400
Ware	345,100	228,700	32,400	0	66,400
Total	*919,800*	*569,300*	*103,300*	*16,300*	*190,800*

There are 40,300 acres considered as non-stocked.

For the period from 1982 to 1997, for the entire counties within the basin, the area classified as commercial forest land decreased approximately 4 percent. The area classified as pine type decreased approximately 14 percent. The area classified as oak-pine type increased approximately 63 percent. The area classified as upland hardwood decreased approximately 58 percent. The area classified as bottomland hardwood did not change and remains at 190,800 acres.

Agriculture

Agriculture in the St. Marys River Basin is relatively limited. In fact, agriculture accounts for only 2.4 percent of the land use in the basin.

In 1997, there were some 10,606 acres devoted to agricultural production (Figure 2-9). Corn is the primary commodity grown in the Basin with Hay production coming in a distant second. Orchard and vegetable production are limited to non-existent in the Basin.

Georgia's irrigation permit database shows 11 irrigation permits have been issued for the purpose of agricultural irrigation in the St. Marys River Basin. There are only an estimated 765 acres of cropland under irrigation in the area.

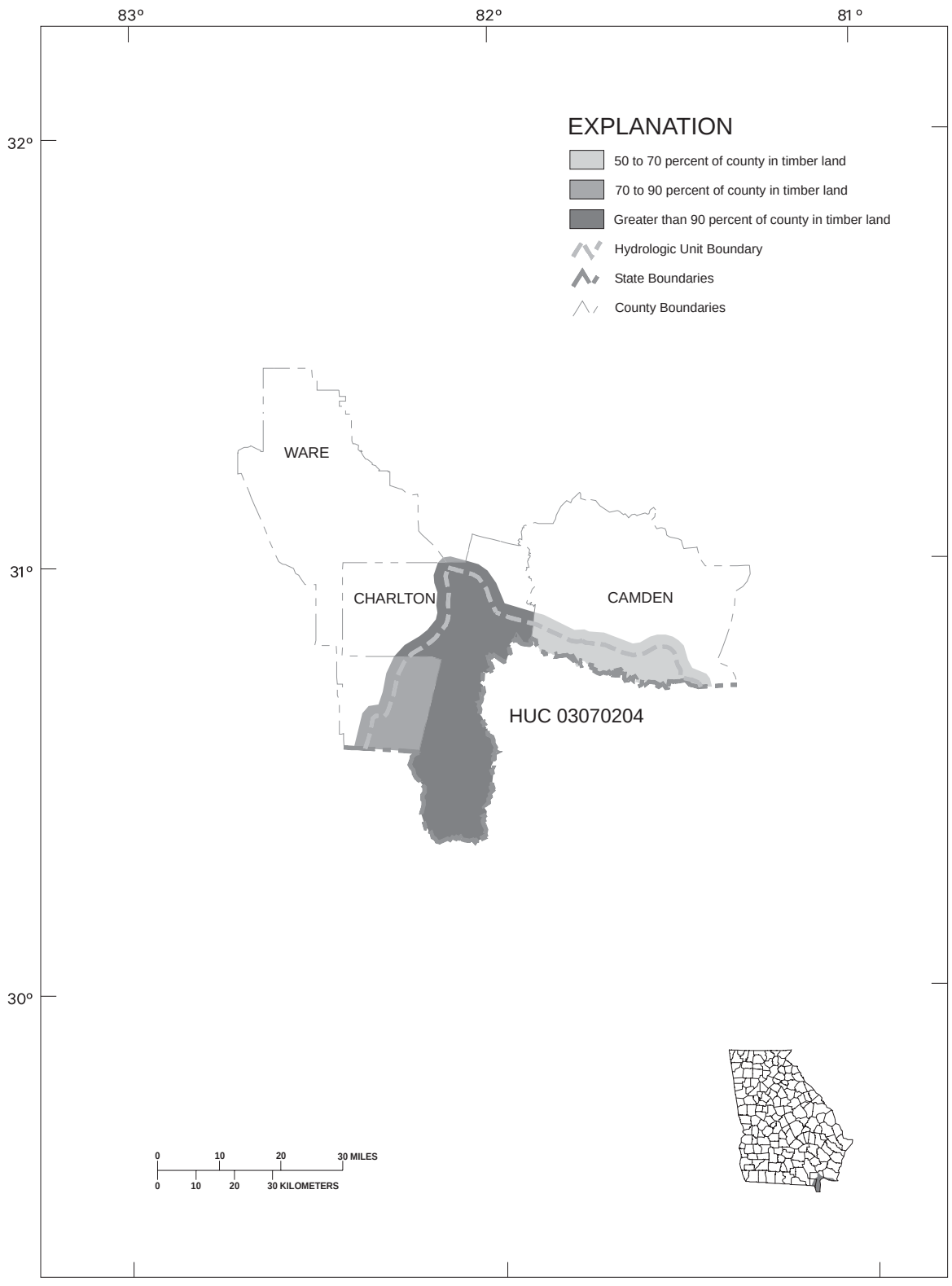

Figure 2-8. Silvicultural Land in the St. Marys River Basin

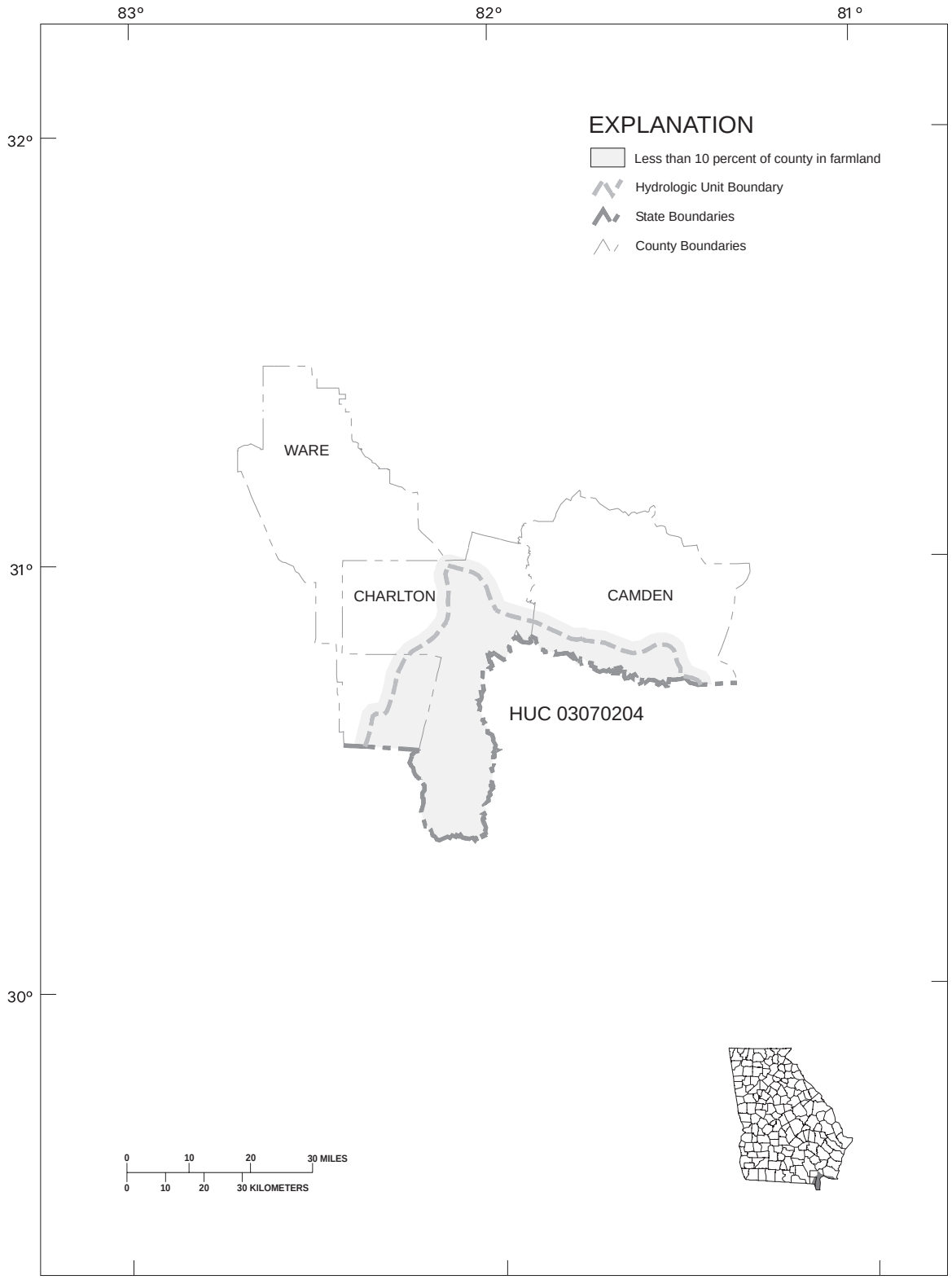

Figure 2-9. Agricultural Land in the St. Marys River Basin

The St. Marys River Basin also has a limited animal industry as well. Table 2-4 shows number of animals by sector within the animal agricultural industry in the Basin. Poultry operations represent the largest sector of this industry.

Table 2-4. Agricultural Operations in the St. Marys River Basin (data supplied by NRCS)

Element	St. Marys Basin Total
Acres	10533
Dairy Cattle (Head 1997)	0
All Cattle and Calves (Head 1997)	842
Hogs and Pigs (Head 1996)	280
Boilers (thousands, 1997)	263424
Layers (thousands, 1997)	36400
Irrigated Acres (1995)	170
Total Agriculture Acres (1989-1997)	10606

Collectively, across all animal operations, there are an estimated 3,380 Animal Units (AUs) in the Basin. AUs are defined here as 1000 lb. Animal Equivalents. The AUs in the St. Marys River Basin generate some 42,730 tons per year of animal waste. Producers handle animal waste through various management activities that utilize nutrients, and other soil amendment benefits, for commodity production.

Although a limited industry in the St. Marys River Basin's, agriculture still contributed $137 million to the local economy in 1997. Agriculture is not considered to be a significant threat to water quantity and water quality in the Basin. However, the Georgia Soil and Water Conservation Commission (GSWCC)—with technical assistance from the Natural Resources Conservation Service (NRCS)—assess agricultural impacts on water quantity and water quality. Historical, present, and future agricultural water demand is assessed in Section 3; while agricultural non-point source pollution is assessed in Section 4.

2.3 Local Governments and Planning Authorities

Many aspects of basin management and water quality protection depend on decisions regarding zoning, land use, and land management practices. These are particularly important for the control of nonpoint pollution—pollution that arises in storm water runoff from agriculture, urban or residential development, and other land uses. The authority and responsibility for planning and control of these factors lies with local governments, making local governments and jurisdictions important partners in basin management.

The Department of Community Affairs (DCA) is the state's principal department with responsibilities for implementing the coordinated planning process established by the Georgia Planning Act. Its responsibilities include promulgation of minimum standards for preparation and implementation of plans by local governments, review of local and regional plans, certification of qualified local governments, development of a state plan, and provision of technical assistance to local governments. Activities under the Planning Act are coordinated with the Environmental Protection Division (EPD), Regional Development Centers (RDCs), and local governments.

2.3.1 Counties and Municipalities

Local governments in Georgia consist of counties and incorporated municipalities. As entities with constitutional responsibility for land management, local governments have a significant role in the management and protection of water quality. The role of local governments includes enacting and enforcing zoning, storm water and development ordinances; undertaking water supply and wastewater treatment planning; and participating in programs to protect wellheads and significant ground water recharge areas. Many local governments are also responsible for operation of water supply and wastewater treatment facilities.

The St. Marys River basin includes part of 3 Georgia counties (Table 2-5 and Figure 2-2). Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-6 lists the municipalities in the St. Marys River basin.

Table 2-5. Georgia Counties in the St. Marys River Basin

Counties Entirely Within the St. Marys River Basin	Counties Partially Within the St. Marys River Basin	Counties With Less Than 20% Area Within the Basin
None	Charlton, Camden	Ware

Table 2-6. Georgia Municipalities in the St. Marys River Basin

HUC 03070204		
Folkston	Kingsland	St. George
Homeland	Moniac	St. Marys

2.3.2 Regional Development Centers

Regional Development Centers (RDCs) are agencies of local governments, with memberships consisting of all the cities and counties within each RDC's territorial area. There are currently 17 RDCs in Georgia. RDCs facilitate coordinated and comprehensive planning at local and regional levels, assist their member governments with conformity to minimum standards and procedures, and can have a key role in promoting and supporting management of urban runoff, including watershed management initiatives. RDCs also serve as liaisons with state and federal agencies for local governments in each region.

Funding sources include members' dues and funds available through DCA. Table 2-7 summarizes the RDCs and the associated counties within the St. Marys River basin.

Table 2-7. Regional Development Centers in the St. Marys River Basin

Regional Development Center	Member Counties with Land Area in the St. Marys Basin
Southeast Georgia	Charlton
Coastal Georgia	Camden

2.4 Water Use Classifications

2.4.1 Georgia's Water Use Classification System

The Board of Natural Resources was authorized through the Rules and Regulations for Water Quality Control promulgated under the Georgia Water Quality Control Act of 1964, as amended, to establish water use classifications and water quality standards for the surface waters of the State.

The water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. Georgia was the second state in the nation to have its water use classifications and standards for intrastate waters approved by the federal government in 1967. For each water use classification, water quality standards or criteria were developed which established a framework to be used by the Water Quality Control Board and later the Environmental Protection Division in making water use regulatory decisions.

The water use classification system was applied to interstate waters in 1972 by the EPD. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-8 provides a summary of water use classifications and criteria for each use.

Congress made changes in the CWA in 1987 that required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, the Board of Natural Resources adopted 31 numeric standards for protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a summary of toxic substance standards that apply to all waters in Georgia. Water quality standards are discussed in more detail in Section 5.2.1.

Table 2-8. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[2]		pH	Temperature (other than trout streams)[2]	
Use Classification[1]	30-Day Geometric Mean[3] (no/100 ml)	Maximum (no./100ml)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise above Ambient (°F)	Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing[4]	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

[1] Improvements in water quality since the water use classifications and standards were originally adopted in 1972 provided the opportunity for Georgia to upgrade all stream classifications and eliminate separate use designations for "Agriculture", "Industrial", "Navigation", and "Urban Stream" in 1993.
[2] Standards for Trout Streams for dissolved oxygen are an average of 6.0 mg/l and a minimum of 5.0 mg/l. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2 °F is allowed in Secondary Trout Streams.
[3] Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: the geometric mean of 2 and 18 is the square root of 36.
[4] Standards are same as fishing with the exception of dissolved oxygen which is site specific.

In the latter 1960s through the mid-1970s there were many water quality problems in Georgia. Many stream segments were classified for the uses of navigation, industrial, or urban stream. Major improvements in wastewater treatment over the years have allowed the stream segments to be raised to the uses of fishing or coastal fishing which include more stringent water quality standards. The final two segments in Georgia were upgraded as a part of the triennial review of standards completed in 1989. All of Georgia's waters

are currently classified as either fishing, recreation, drinking water, wild river, scenic river, or coastal fishing.

2.4.2 Water Use Classifications for the St. Marys River Basin

Waters in the St. Marys River basin are classified as fishing, recreation, drinking water, or wild and scenic. Most of the waters are classified as fishing. Those waters explicitly classified in Georgia regulations are shown in Table 2-9; all waters not explicitly classified are classified as fishing.

Table 2-9. St. Marys River Basin Waters Classified in Georgia Regulations[1]

Waterbody	Segment Description	Use Classification
Littoral waters	All littoral waters on the ocean side of Cumberland Island	Recreation

[1] Rules and Regulations for Water Quality Control, Chapter 391-3-6(13). Waters within the St. Marys River basin not explicitly classified and listed above are classified as Fishing.

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