Chapter 1

Georgia's Land and Climate

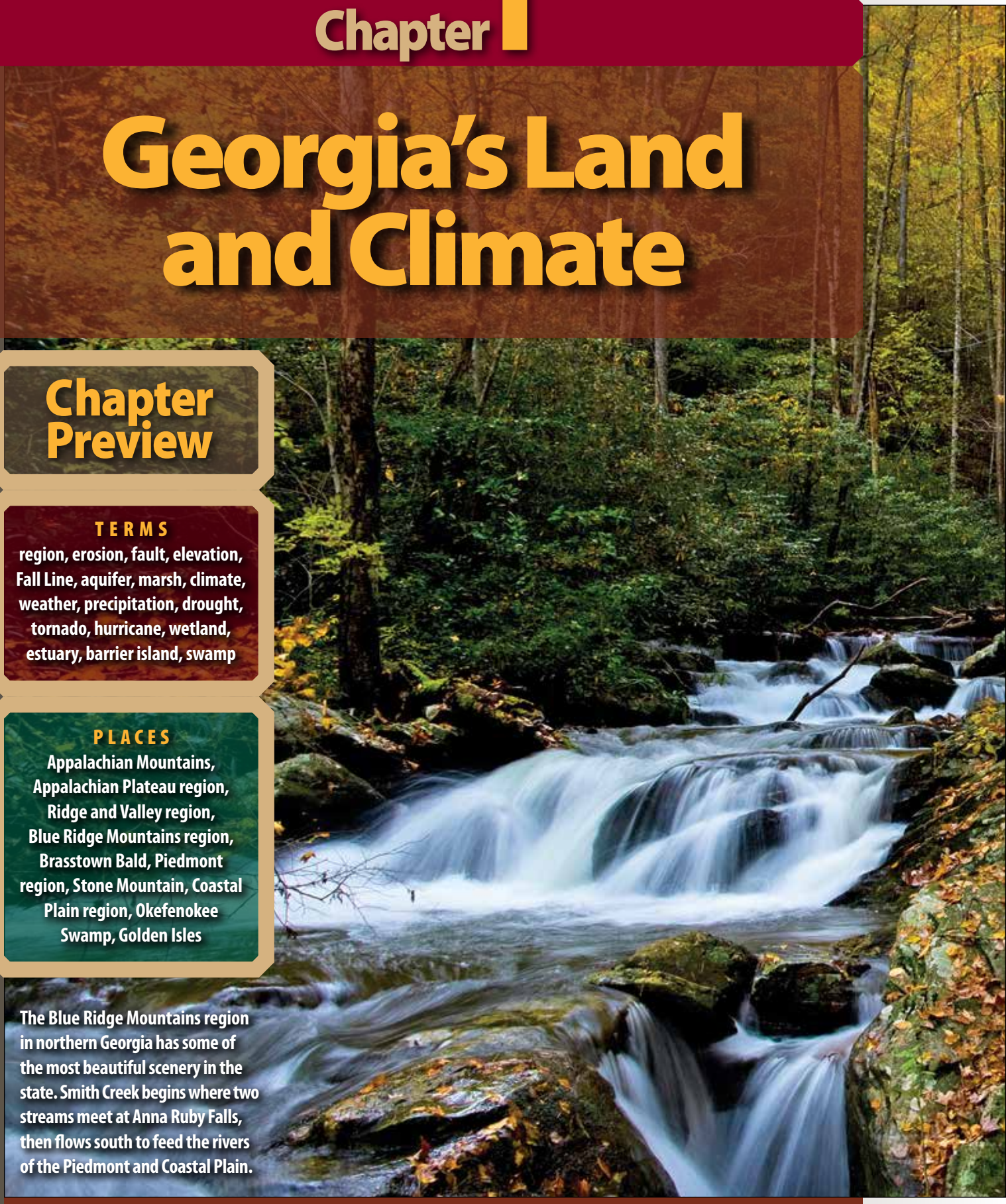
Chapter Preview

TERMS

region, erosion, fault, elevation, Fall Line, aquifer, marsh, climate, weather, precipitation, drought, tornado, hurricane, wetland, estuary, barrier island, swamp

PLACES

Appalachian Mountains, Appalachian Plateau region, Ridge and Valley region, Blue Ridge Mountains region, Brasstown Bald, Piedmont region, Stone Mountain, Coastal Plain region, Okefenokee Swamp, Golden Isles



The Blue Ridge Mountains region in northern Georgia has some of the most beautiful scenery in the state. Smith Creek begins where two streams meet at Anna Ruby Falls, then flows south to feed the rivers of the Piedmont and Coastal Plain.

With mountains and beaches, oaks and pines, deer and alligators, Georgia has a rich diversity of land, soil, and life-forms. The state is in the northern and western hemispheres of our planet on the continent of North America. North America includes not only the United States of America and Canada, but also the large island of Greenland in the Atlantic Ocean, the countries of Central America, such as Mexico, and the island countries in the Caribbean south of the United States. The North American continent is the third largest in land area, behind Asia and Africa. North America is the fourth largest in population, behind Asia, Africa, and Europe.

Georgia is in the southeastern area of the United States of America and is the largest state east of the Mississippi River. It stretches about three hundred miles from its northern boundary to its southern border. Georgia is bordered on the north by Tennessee and North Carolina, on the west by Alabama, on the south by Florida, and on the east by South Carolina and the Atlantic Ocean.

The state is divided into five geographic regions. (A **region** is an area with common characteristics such as soil, vegetation, climate, landforms, recreation, or economic opportunities.) These regions have affected the settlement, culture, and economy of the state and provided homes for many different plants and animals. This chapter explores our state's geography and examines its importance in how Georgia's history unfolded.

Focus on Reading Skills

Reading Maps

Defining the Skill

A map provides information in a graphic manner. There are many types of maps, including topographical, physical/political, historical, and satellite. Some common forms of maps found in textbooks focus on climate, weather regions, movement, transportation routes, distance, waterways, and natural resources.

To properly read a map, you should

- look at the title to determine the subject or purpose;
- determine the type of information it displays;
- look at any key or legend to determine the meaning of symbols or colors;
- look at the compass rose and scale to determine direction and distance.

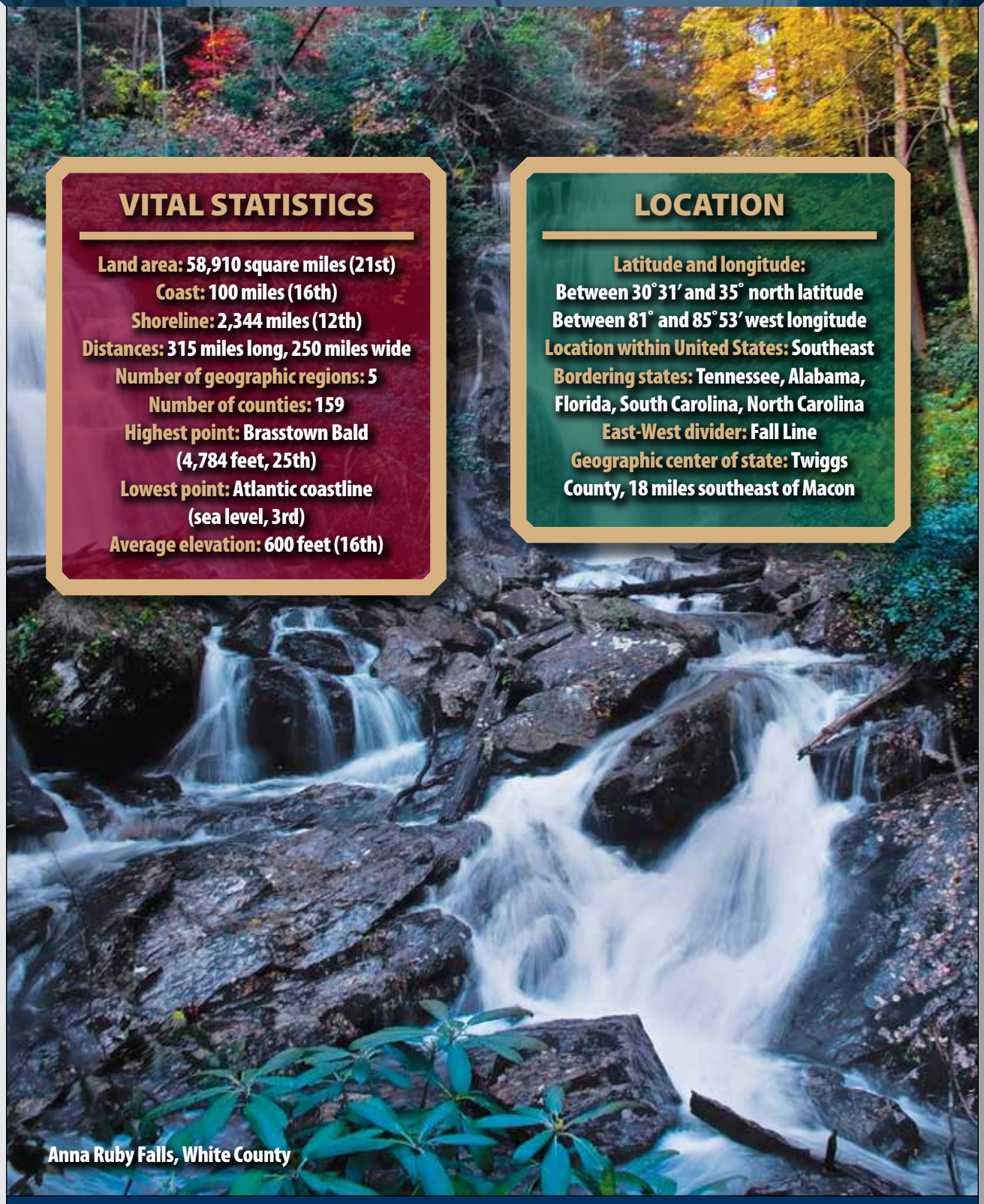
Practicing the Skill

Look at the map below. While you examine the map, answer the following questions on a separate sheet of paper.

1. What is the subject of the map?
2. What type of information is displayed on the map?
3. Is there a scale? If so, what does it tell you?
4. Is there a legend? If so, what types of information does it indicate?
5. How many towns are shown on the map? Name one.
6. What states are shown on the map?

Now, create one or more questions of your own about the map.

Signs of the Times



VITAL STATISTICS

Land area: 58,910 square miles (21st)
Coast: 100 miles (16th)
Shoreline: 2,344 miles (12th)
Distances: 315 miles long, 250 miles wide
Number of geographic regions: 5
Number of counties: 159
Highest point: Brasstown Bald (4,784 feet, 25th)
Lowest point: Atlantic coastline (sea level, 3rd)
Average elevation: 600 feet (16th)

LOCATION

Latitude and longitude: Between 30˚31′ and 35˚ north latitude Between 81˚ and 85˚53′ west longitude
Location within United States: Southeast
Bordering states: Tennessee, Alabama, Florida, South Carolina, North Carolina
East-West divider: Fall Line
Geographic center of state: Twiggs County, 18 miles southeast of Macon

Anna Ruby Falls, White County

Section 1

Georgia's Geographic Regions

As you read, look for
- the five geographic regions of Georgia,
- key physical features, including the Fall Line,
- terms: erosion, fault, elevation, Fall Line, aquifer, marsh.

Based on its landforms (the natural features of a land surface), Georgia is divided into five distinct regions: the Appalachian Plateau, the Ridge and Valley area, the Blue Ridge Mountains, the Piedmont, and the Coastal Plain. Each of these regions has soil, physical features, and climate that help determine what kinds of animals and plants can live and thrive in it. Georgia's landforms and its climate have influenced the history of each region because they are strong determiners of where and how people live and earn their living.

Appalachian Plateau Region

Running over two thousand miles from northern Georgia into Canada is the eastern mountain chain known as the Appalachians. They are very old mountains, some of the oldest in the world. They were formed when two plates of Earth crashed into each other, pushing one plate upward and forming the mountains. Because they are so old, the weather has worn them down, and they are more rounded and less jagged than the younger mountains of the western United States such as the Rockies.

Below: This panoramic view of the Appalachian Plateau, also known as the Cumberland Plateau, is from Lookout Mountain, the 80-mile-long ridge that defines the western edge of the Appalachian Plateau region.

Map 1 Georgia's Geographic Regions

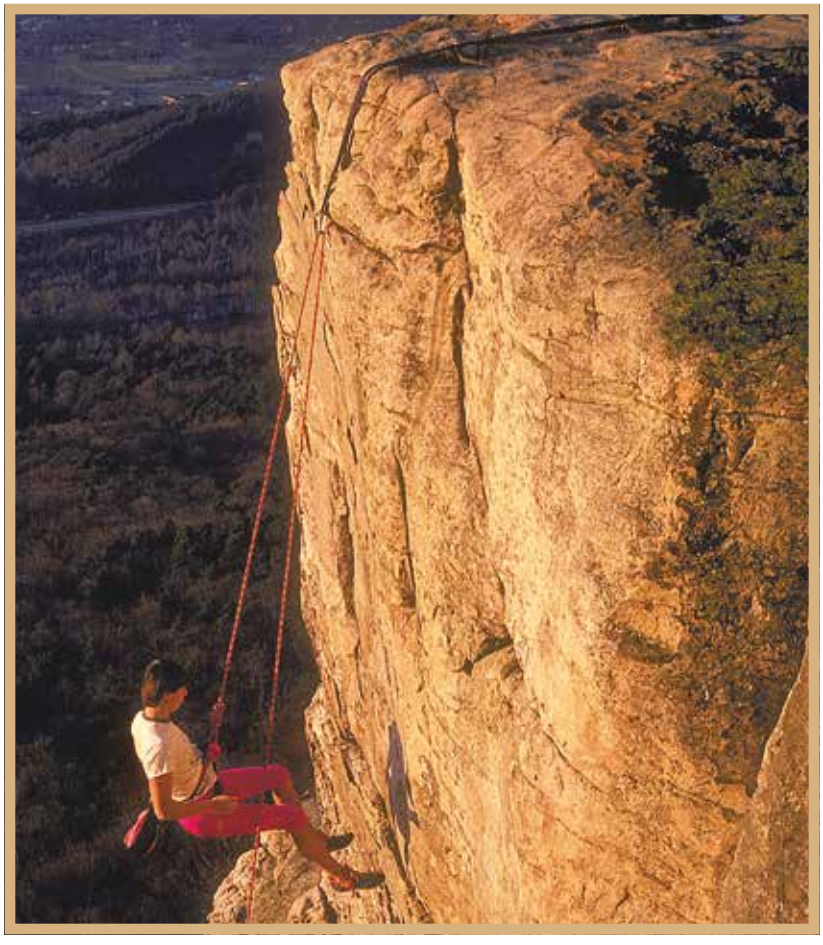
Map Skill: What is the smallest geographic region?

Top: Cloudland Canyon State Park in Dade County is home to one of Georgia's natural wonders, the 1,980-foot-deep Cloudland Canyon. **Above:** Lover's Leap on Lookout Mountain offers spectacular views of the Appalachian Plateau region.

In the northwest corner of the state, mostly in Dade County, is a small piece of the Appalachian Plateau, the western edge of those mountains. (Most of the plateau is in Tennessee and Alabama.) The Georgia portion is on the southern and eastern side of the over 80-mile-long Lookout Mountain. Some of the rock underlying this land is limestone, a rock made up of calcium in various forms. The **erosion**, or wearing away, of the limestone has resulted in the formation of many caves. For example, Ellison's Cave in Walker County is the twelfth deepest cave in the United States.

The region has always been somewhat isolated from the rest of Georgia. In fact, when Georgia bought the land that is now Cloudland Canyon State Park in the late 1930s, the state built the first road into the area, connecting the area through Stephens Gap to a highway on the other side.

Underneath the Appalachian Plateau is a vast coalfield. There was also a thinner layer of iron ore. As a result, for almost 150 years mining was a major occupation for the people living in this region. Before that time, the land was inhabited by the Cherokee Indians until they were forced out in the 1830s.



Something Extra!

Many people refer to this region as the "TAG corner" since it is where Tennessee, Alabama, and Georgia meet.

Left: Rock climbing on Lookout Mountain is one of a number of outdoor activities that are popular in the Appalachian Plateau region.

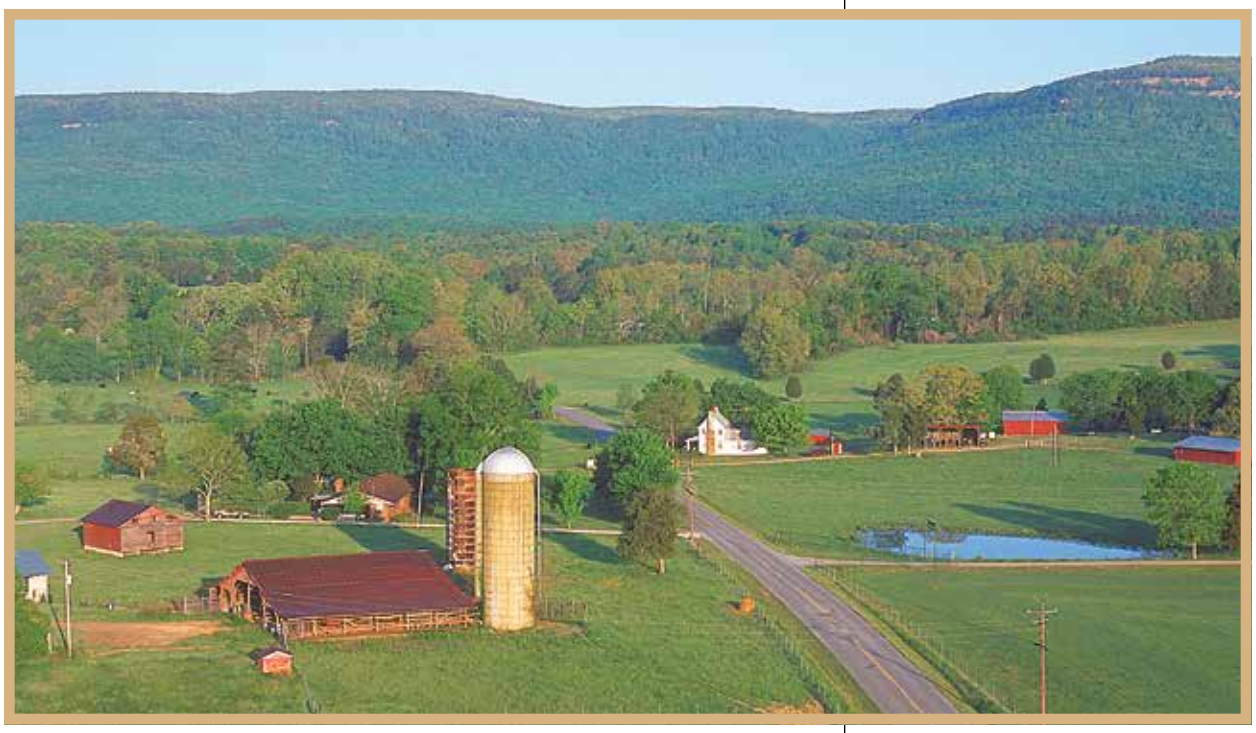
Above: The Ridge and Valley region is characterized by the long ridges and valleys running diagonally across the northwest corner of Georgia. This is Shinbone Valley. **Opposite page, below:** The fertile valleys between the ridges are good for farming.

Ridge and Valley Region

The area just east of the plateau is the Ridge and Valley region, named for its landforms. The long ridges of mountains have equally long valleys in between. These ridges and valleys parallel each other. They look like a series of parallel straight lines running on a slant. The whole formation runs diagonally across the northwest part of the state, from the southwest toward the northeast.

Harder rocks formed the ridges, while softer rocks in between eroded due to rain and wind to create the valleys. The major formations are the Chickamauga Valley, the Armuchee Ridges, and the Great Valley. The valleys, which are 700 to 800 feet above sea level, contain land that is fertile for farming. The streams and roads in this region run along the valleys. In some places, roads cut across the ridges to link the valley roads to each other.

This region is divided from the mountains in the northeastern portion of the state by the Cartersville-Great Valley fault system. (This is also sometimes called the Carter's Dam Fault.) A **fault** is a break in Earth's crust that occurs when one part of Earth's surface folds or is thrust up over the surface next to it.



Above: Brilliant fall coloring enhances the beauty of the Blue Ridge Mountains region. The Blue Ridge Mountains extend from Georgia all the way to Pennsylvania. **Below:** Blue Ridge Mountain lakes like Lake Burton are popular sites for vacation homes.

Blue Ridge Mountains Region

The portion of the Appalachian Mountains in Georgia is part of the range known as the Blue Ridge, which runs from Virginia southwest to northeastern Georgia. This region looks different from the Ridge and Valley region. The pattern of the Blue Ridge Mountains region is not the straight lines of ridge and valley. The valleys in this region have a pattern that is more like the branches of a tree. Many of the roads of the region wind around these valleys and streams, where road building is easier than it is higher on the mountains.

Throughout the mountains are rapid streams and beautiful waterfalls as water travels down the mountains and over rocks. The **elevation** (height above sea level) of the mountains ranges from about 1,600 feet to over 4,700 feet. This means the weather is usually cooler here, making Georgia's mountains an attractive summer retreat.

In this region is Georgia's highest mountain, the 4,784-foot-high Brasstown Bald. Also beginning in this region is the popular hiking trail known as the Appalachian Trail. The trail and the first tower on the top of Brasstown Bald were built as part of the recovery program known as the New Deal, which was begun in response to the Great Depression of the 1930s.

In the 1800s, Georgians found gold that could be mined in these mountains. This led to the country's first gold rush. As settlers streamed into the mountains, the Cherokee Indians who had been here for generations were forced out. Marble is also found in the mountains and eventually became an important part of the region's economy.

In the twentieth and twenty-first centuries, tourism has become an important source of income. Today, tourists come to the mountains to hike trails, raft and canoe the fast rivers and streams, observe and study the wildlife, and enjoy the beautiful colors of the changing leaves of the hardwood trees in the autumn.

Above: At 4,784 feet, Brasstown Bald is the tallest mountain in Georgia. It was known by the Cherokee as Enotah and renamed Brasstown Bald for the Cherokee village of Brasstown. The peak lies on the county line between Towns and Union counties.

Something Extra!

A U-shaped bend in a river is called an oxbow.

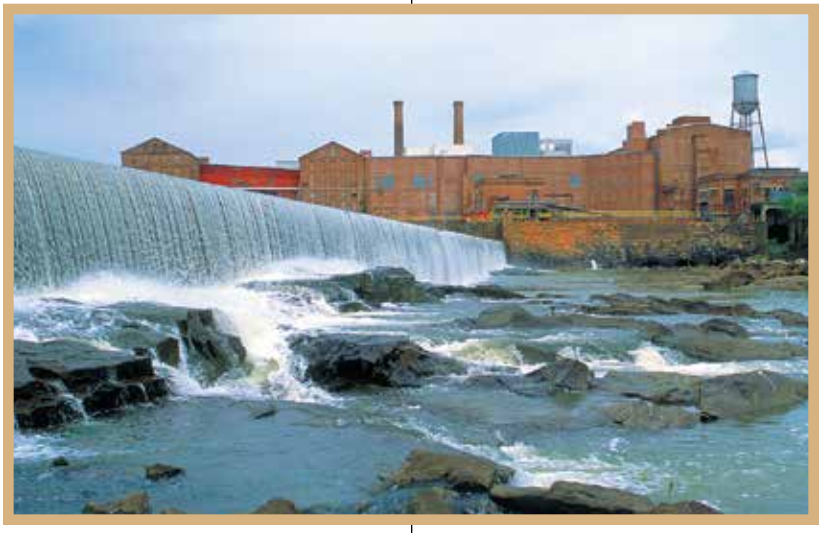
The Piedmont Region

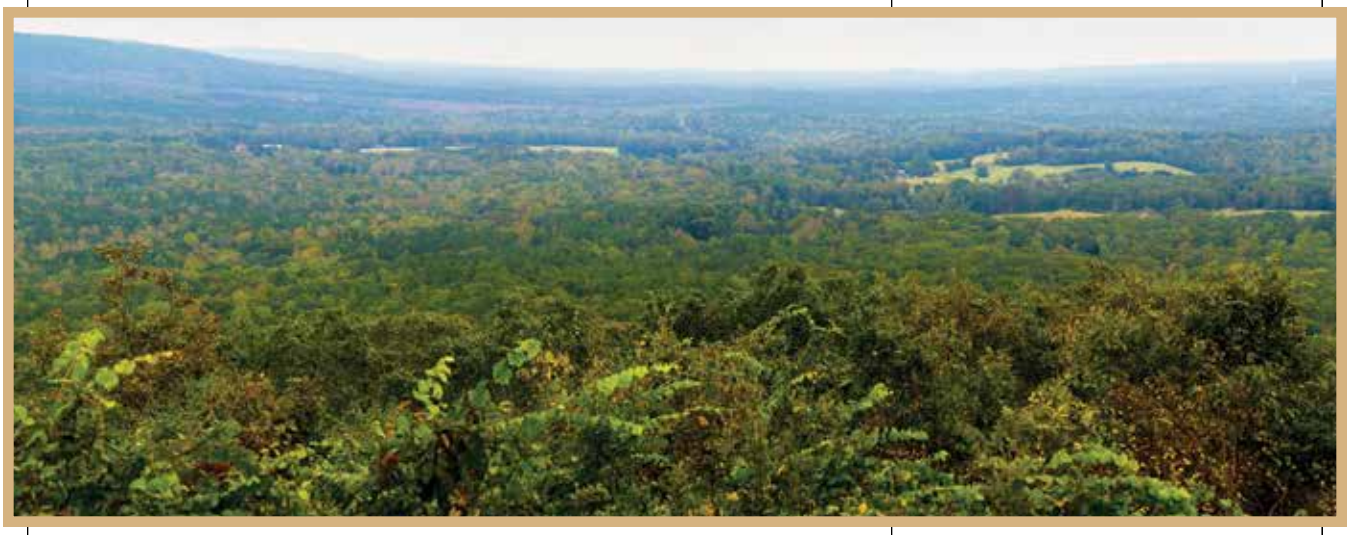
Many of Georgia's people live in the Piedmont region of the state, which lies between Georgia's mountains and its Coastal Plain. The land of the Piedmont is characterized by rolling hills. Underlying some areas of the Piedmont is granite, which can be quarried (mined) for tombstones, buildings, statues, countertops, and more. Occasionally, the granite extends above the ground, as is the case with the majestic Stone Mountain east of Atlanta. The soil in some parts of the Piedmont is clay. Iron oxide gives some of that clay a red color, for which the area is well known.

Rivers flow through all areas of the Piedmont. Most arise in the north and flow southeasterly toward the Atlantic Ocean. However, the Chattahoochee flows southwesterly, then south to the Gulf of Mexico. The Piedmont has many trees including certain types of pines as well as oak and hickory. In some places, hardwoods such as elm, maple, and sweet gum grow. Fertile topsoil in many areas made farming important in the region for over three hundred years.

At the southern edge of the Piedmont is the **Fall Line**. Here the more narrow rivers with headwaters in the north flow over the last hard rock of the Piedmont, creating waterfalls and rapids. As they flow into the softer and sandier soils of the upper Coastal Plain, the rivers

Below: The Fall Line defines the southern edge of the Piedmont region. The city of Columbus is located on the Chattahoochee River at the Fall Line.





spread out and become wider and slower. They sometimes have large curves or may flow east-west for a distance as they cut through the land. Long ago, the Fall Line marked the beginning of the Atlantic Ocean beach. As we have seen, the soil above the Fall Line has clays and sometimes granite. Below the Fall Line, the ground is more porous, often sandy.

From the Fall Line, rivers flow to the Atlantic Ocean without further obstacles. That meant goods could be easily shipped down river. Because of that, many of Georgia's important cities are located along the Fall Line. These Fall Line cities include Augusta on the Savannah River, Milledgeville on the Oconee River, Macon on the Ocmulgee River, and Columbus on the Chattahoochee River. Fur traders, farmers, craftsmen, and factory owners carried their products to the docks of these cities for shipment down the rivers to port cities, from which the products made their way to markets far away.

Top: Stone Mountain, near Atlanta, rises 825 feet above the surrounding countryside, and 1,686 feet above sea level. Above: This view of the Piedmont is from Dowdell's Knob on Pine Mountain in F. D. Roosevelt State Park. President Franklin D. Roosevelt was a frequent visitor to nearby Warm Springs. This was one of President Roosevelt's favorite picnic spots.

Above: "The Marshes of Glynn" were immortalized by Georgia's most famous poet, Sidney Lanier. **Opposite page, above:** Providence Canyon in Stewart County is one of the "Seven Natural Wonders of Georgia." The canyon is an extreme example of rapid erosion, starting in the 1800s.

Something Extra!

The largest bridge in Georgia, over the South Brunswick River, is named the Sidney Lanier Bridge.

Coastal Plain Region

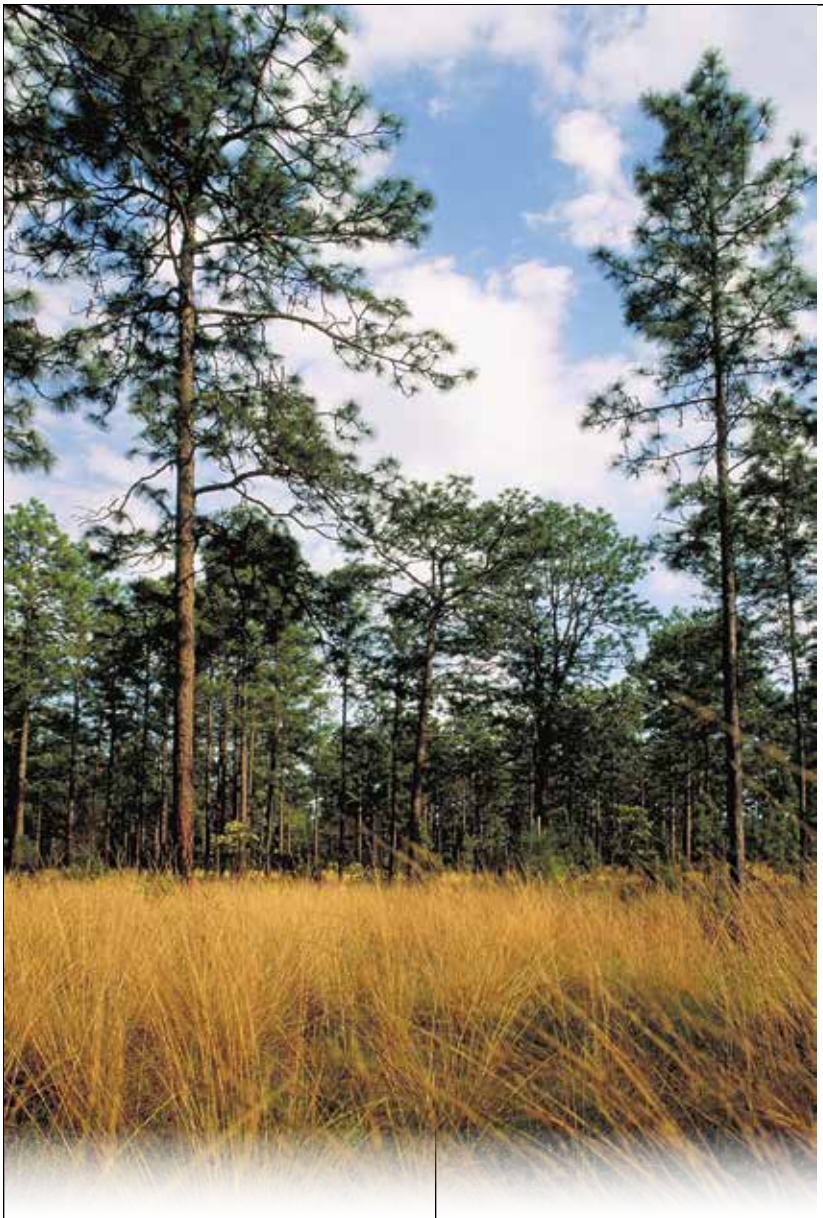
The largest geographic region of Georgia is the Coastal Plain, which is further divided into an upper and a lower area. Once under water until the Atlantic Ocean receded, the Coastal Plain region now covers the southern half of the state. The upper Coastal Plain has the Fall Line's sand hills as its northern border. The soil underneath is porous limestone, which holds rain water that is used for drinking, agriculture, and industry. This formation, known as the Floridan Aquifer, is one of the largest sources of fresh water east of the Mississippi River. (An **aquifer** is an underground natural storage tank.)

The lower Coastal Plain includes Georgia's one-hundred-mile-long coast, the islands that lie between the coast and the open Atlantic Ocean, and the large basin (depressed area) called the Okefenokee Swamp. The ports of Savannah, Brunswick, and St. Marys lie in this geographic region.

The lower Coastal Plain is flat and low with marshy areas near the coast. These **marshes** are low-lying wet areas that often have grasses growing in them. In his poem "The Marshes of Glynn," Georgia poet Sidney Lanier was inspired by the "length and the breadth and the sweep of the marshes. . ." that give Glynn County on Georgia's southeastern coast some of its beauty.

Map 2
The Floridan Aquifer

Map Skill: How many states does the Floridan Aquifer cover?



Above: The wiregrass ecosystem, consisting of tall, widely-spaced longleaf pines providing shade for the wiregrass, once covered almost the entire lower Coastal Plain. This natural habitat has been largely replaced by large commercial loblolly and slash pine tree plantations.

The flat landscape allows for straight highways through the Coastal Plain. Much of the lower Coastal Plain was once home to longleaf pine trees, with wiregrass growing on the forest floor under the shade. Wiregrass needs periodic fire to encourage its growth, and nature complies in that area with many lightning-producing storms. Gophers, turtles, and birds also like to dine on the wiregrass. Other kinds of plants do not get enough sunlight to grow, so a pine forest looks more like a park.

This wiregrass region, sometimes called the pine barrens, stretched across the entire state before the middle of the 1800s. At that time, railroads made it possible to transport big pine logs. So many trees were cut for boards that the forests no longer cover the same territory. More trees were removed as farmers cleared land for growing crops. The natural fires that were important to maintaining the grasses and trees became a danger to the fields of crops and cities nearby. Today, the forestry industry that makes lumber for building and pulp wood for papermaking relies on loblolly pine and slash pine instead of the longleaf.

These five geographic regions make Georgia an interesting state. There are many different kinds of plants and animals and many landscapes to view and study. With so many geographic regions, Georgians have had many ways of earning a living, depending on what region of the state they called home. Nature has also provided great beauty in the land from the mountains to the sea. Georgians have many opportunities for learning, for recreation, and for retreating to the natural world.

Reviewing the Section

1. Define: erosion, aquifer, marsh.
2. What are Georgia's five geographic regions?
3. What is the significance of the Fall Line?

Georgia Portraits

Dr. Eugene Odum

In the twentieth century, one of the most important people in the world in the effort to understand the relationship between the environment and society was University of Georgia Professor Eugene P. Odum. In fact, Dr. Odum is known as the "father of modern ecology." (Ecology is a branch of science that examines how living things—including humans and their society—interact with their environment.) Dr. Odum was important in the development of the idea of an ecosystem. An ecosystem is a particular area where the plants, animals, bacteria, and nonliving parts (such as minerals, chemicals, rocks, and soil) act together to form a unit. Things within an ecosystem depend on each other.

Dr. Odum spent his life working to help people understand how ecosystems worked and the effect that humans and their activities could have on those ecosystems. In 1966, he founded the Institute of Ecology at UGA and became its director. The Institute has become one of the leading places in the world to educate ecologists and to do research in ecology. He also helped establish the Savannah River Ecology Laboratory and the UGA Marine Institute on Sapelo Island. Dr. Odum wrote many books and articles about the subject, including a textbook. He was still writing books in the late 1990s, when he was in his eighties. In 2007, the Institute of Ecology at UGA was renamed the Eugene P. Odum School of Ecology in his honor.

Above: University of Georgia professor Dr. Eugene Odum was a pioneer of the concept of the ecosystem. In 1966, he founded the UGA Institute of Ecology. The sale of land left in his will went to an ecology fund and to fund a professorship in Dr. Odum's name at the University.

Dr. Odum was concerned that everyone, including young people, understand the importance of ecology. Each year, classes in the elementary, middle, and high schools in Clarke County and the surrounding counties can apply for Odum Awards for environmental projects. For example, one school received a grant to buy recycling bins for all the classrooms. The goal is to encourage students to learn about environmental issues. Dr. Odum was a truly distinguished Georgian.

Section 2

Georgia's Climate and Weather

As you read, look for

- the difference between climate and weather,
- different types of weather phenomena,
- how climate has affected our state's development,
- terms: climate, weather, precipitation, drought, tornado, hurricane.

Something Extra!

July is usually the wettest month, and October is the driest.

People sometimes confuse "climate" and "weather." **Climate** refers to the average weather and patterns of weather of a region over a long period of time. **Weather** refers to the day-to-day conditions and changes in the atmosphere. While weather varies constantly, the climate of an area remains much the same. The climate of a region influences the types of homes built, the types of industries that develop, the clothing people wear, and even what crops are grown.

Georgia's climate is *temperate*, which means it seldom has extremes of weather. Winters are cool but mild compared to more northern areas of the country. However, a dip in the jet stream can sometimes bring cold Arctic air to the state. The mountains in the north usually have snowfall a few days each year, but a snow event is very unusual in the southern half of the state. The mountains usually have a freeze by October, but by April their freezing weather is over. In the central part of the state, freezes occur from mid-November through mid-March. Spring brings mild temperatures and

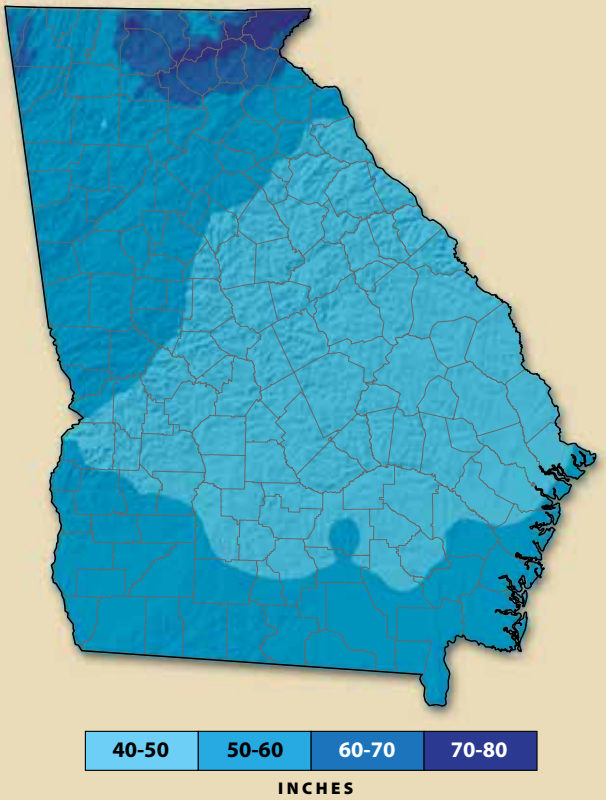
Below, from left to right: These cherry blossoms are an early sign that spring is here; heat is the primary characteristic of a Georgia summer; the leaves of many kinds of trees turn brilliant colors in the fall before falling to the ground; snow is common in the winter in north Georgia, but much less common in the southern part of the state.

a burst of green leaves and blooming flowers, including dogwoods and azaleas. Summers can be very warm and humid, although rarely as hot as the American southwest, where desert land is dominant. Leaves of gold, orange, and red bring color to autumn in many areas of the state. They are especially brilliant in the mountains.

Precipitation

Precipitation (rain, snow, sleet, or hail) is important to the state. Normal rainfall varies depending on the geographic region of the state. The northeast mountainous region averages over 60 inches. As that rain flows down from the mountains, it forms the streams and rivers that carry water to the areas south. Just south of the mountains, an average of 50-60 inches fall. In the central Piedmont region, 40-50 inches fall. Southern Georgia usually has more rainfall than central Georgia. Sometimes rainfall comes from thunderstorms that rumble through an area, bringing lightning strikes and even hail.

Georgia's rainfall allows for agriculture in much of the state, and the many rivers and streams provide drinking water, transportation, and electric power. The importance of normal rainfall becomes clear to Georgia's people when the state goes through one of its periodic droughts. (A **drought** is a prolonged period of dry weather.) With less rain, the water levels of rivers, streams, lakes, and ponds go down. The amount of groundwater also decreases. In the past, long droughts came to Georgia about every forty years, lasting for two to three years. More recently, the time between droughts has fallen to about twenty-five years. Rains in the spring and fall of 2009 began to relieve the most recent serious drought in many parts of the state.



Map 3
Average Annual Precipitation

Map Skill: What is the average annual precipitation where you live?

Something Extra!

Tornadoes can leave a path fifty yards wide or one over a mile wide. They may touch down for just a few seconds or remain on the ground for over an hour.

Tornadoes

Although Georgia has a mild climate, it is also subject to two extreme forms of weather—tornadoes and hurricanes. When warm air meets cool air, a rotation can begin, leading to a tornado. According to the National Weather Service, the state has about six days a year in which tornadoes occur. **Tornadoes** are rotating funnel-shaped columns of air that reach down to the ground from storm clouds. About 70 percent of tornadoes have winds less than 110 miles an hour, but the most deaths are caused by tornadoes whose winds reach over 200 miles an hour. The Fujita Scale is used to estimate the power of a tornado based on the damage it caused.

About twenty tornadoes hit Georgia in a year, the largest number in the southwest and west-central areas of the state. In Georgia and in the southeastern United States, tornadoes are most likely to occur in the spring months of March through May, with April having the strongest and the highest number of tornadoes. However, tornadoes can occur any time of the year. Late afternoon and early evening bring the most tornadoes, but they can happen at any time of the day. Tornadoes are often accompanied by dangerous lightning and sometimes hail—those pieces of ice that can be anywhere from the size of peas to the size of baseballs.

Below: An EF5 tornado is the most dangerous, with winds in excess of 200 mph. Georgia ranked fifth in the nation with 51 tornadoes in 2009.

Figure 1 Enhanced Fujita Scale for Tornadoes

Category	Wind Speeds (mph)	Potential Damage
EF0	65–85	Minor damage
EF1	86–110	Moderate damage
EF2	111–135	Considerable damage
EF3	136–165	Severe damage
EF4	166–200	Devastating damage
EF5	Over 200	Incredible damage

Georgia's deadliest tornado occurred in April 1939 in Gainesville in Hall County. It happened at 8:15 a.m. as children went to school and adults went to work. Two tornadoes actually met and merged into one. Directly hitting the downtown, the tornado cost the town 203 of its citizens. Tornadoes still kill Georgians, but the use of the Doppler radar that we see on television has helped save lives. With early warning, people can seek shelter in interior rooms or underground until a tornado passes.

Hurricanes

Georgia is also hit occasionally by tropical storms and hurricanes. Tropical storms can turn into hurricanes if their wind speed increases. These types of storms consist of a large area of wind rotating around a calm center (called an "eye"). Large rotating storms are known as cyclones. In the Pacific, these storms are called typhoons; those in the Atlantic are known as **hurricanes**. Hurricanes also have heavy rains and storm surge, water that is pushed toward the coast by the strong winds.

Hurricanes that affect Georgia begin in the tropical area of the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico. Storms are named when their winds reach tropical storm strength. A tropical storm has winds of 39-73 miles an hour; a hurricane must have winds of at least 74 miles an hour.

The Saffir-Simpson Hurricane Scale classifies hurricanes according to the damage and flooding they may cause upon landfall. The severity of hurricanes is measured on a scale of

Below: Hurricane Katrina was a massive Category 3 hurricane that struck the Gulf Coast on August 29, 2005. Katrina is estimated to have caused over $100 billion in damage and to have killed over 1,800 people.

Figure 2 Saffir-Simpson Hurricane Scale

Category	1	2	3	4	5
Sustained Winds (mph)	74–95	96–110	111–130	131–155	Over 155
Storm Surge (in Feet)	4–4.9	5.0-7.9	8.0-11.9	12.0-18.0	Over 18.0
Expected Damage	Minimal	Moderate	Extensive	Extreme	Catastrophic

Something Extra!

A flash flood can develop quickly, sometimes in just a few minutes and without any visible signs of rain.

1-5. Major hurricanes are considered to be Category 3 or above with winds of at least 111 miles an hour. Hurricane Katrina, which struck the Gulf Coast in 2005 and devastated the city of New Orleans, began as a Category 4 storm, but was a Category 3 storm, with wind gusts up to 125 miles an hour, at the time it made landfall.

As of 2010, coastal Georgia had not had a major hurricane come ashore along its coast in over a century. In the early twentieth century, however, four minor hurricanes did hit Savannah. Georgia's neighbors, North and South Carolina and Florida, have not been so lucky. Hurricanes that make landfall and cut a path across the land gradually lose wind speed, but that can take several days. Georgia has watched and worried that hurricanes might come directly to the state, and it has designated evacuation routes for coastal areas that citizens can access at Georgia911.org.

Above: A supercell is a powerful thunderstorm that can produce strong winds, torrential rainfall, and flash flooding. It has a rotating updraft that can generate tornadoes.

Other Weather Events

Hurricanes that hit nearby states can bring serious weather events to Georgia. Hurricanes in the Atlantic Ocean can cause high tides or even storm surge. Both can wash away part of a beach. Hurricanes can also cause tornadoes to form, although those tornadoes do not usually produce lightning or hail. The danger of tornadoes can go on for days as a hurricane, or its remnants, makes its way across the land.

Flooding is also a major problem with the rains from hurricanes; even minor hurricanes and tropical storms can bring heavy rains. For example, Tropical Storm Alberto hit Florida in 1994. It moved up into west Georgia and eventually dumped heavy rains that caused flooding all the way from the mountains in the north to the Coastal Plain in the south.

Other geographic events that affect some areas of the country are not major threats to our state. For example, Georgia is fortunate that it is not

subject to volcanoes or major earthquakes. There are mild rumbles from time to time, and Georgians occasionally feel the effects of earthquakes whose epicenters are at a distance from the state. In 1886, a serious earthquake in Charleston, South Carolina, caused damage in Georgia. In general, however, Georgians can enjoy the state's diverse and beautiful geography and climate with fewer major destructive events than many areas of the world.

Development and Climate

Georgia's climate has affected its development. The temperate climate has helped determine the types of trees and plants that grow in the state and the types of animals that live here. For example, in Georgia's early history, the large deer population made trade in their skins a business for early settlers. With its winters milder and shorter than more northern states, crops that require longer growing seasons have been possible. Georgia also receives enough rain for growing crops. That has meant that, for much of its history, Georgia has been an agricultural state with crops such as tobacco, cotton, and, in the coastal areas, rice. Even when Georgia began to develop industry in the 1800s, it was related to the crops that Georgia's climate supported.

The heat and humidity of Georgia's summer made life more difficult for the early Europeans who came here, because they were not used to such high temperatures. But the other aspects of the climate attracted them. By the late 1800s, wealthy people from the North began to vacation in Georgia, not in the summer, but during the mild winters. Here they could escape the heavy freezes and snows of the North. With the invention of air conditioning, Georgia became an easier place to live any time of year. The population has continued to grow, with many new businesses moving to the state. Americans have migrated to the state from other regions of the United States, and immigrants have come to Georgia from other countries.

Top: The abundance of deer in Georgia was the basis for the colonial fur trade. **Above:** Georgia's climate is ideal for growing cotton, which produced great wealth in the 19th century.

Reviewing the Section

1. Define: precipitation, drought, tornado, hurricane.
2. How are climate and weather different?
3. Why is Georgia's climate said to be "temperate"?

Section 3

Georgia's Physical Features

As you read, look for

- major rivers of Georgia,
- the barrier islands and their uses,
- the Okefenokee Swamp and similar wetlands,
- terms: wetland, estuary, barrier island, swamp.

Georgia's diverse environment has many physical features. In nondrought years, Georgia gets ample rainfall, and all that water runs into the state's waterways. Georgia's many rivers and streams provide water for drinking, for recreation, for irrigation, and for industry. Some of the state's waterways flow southwest across Georgia

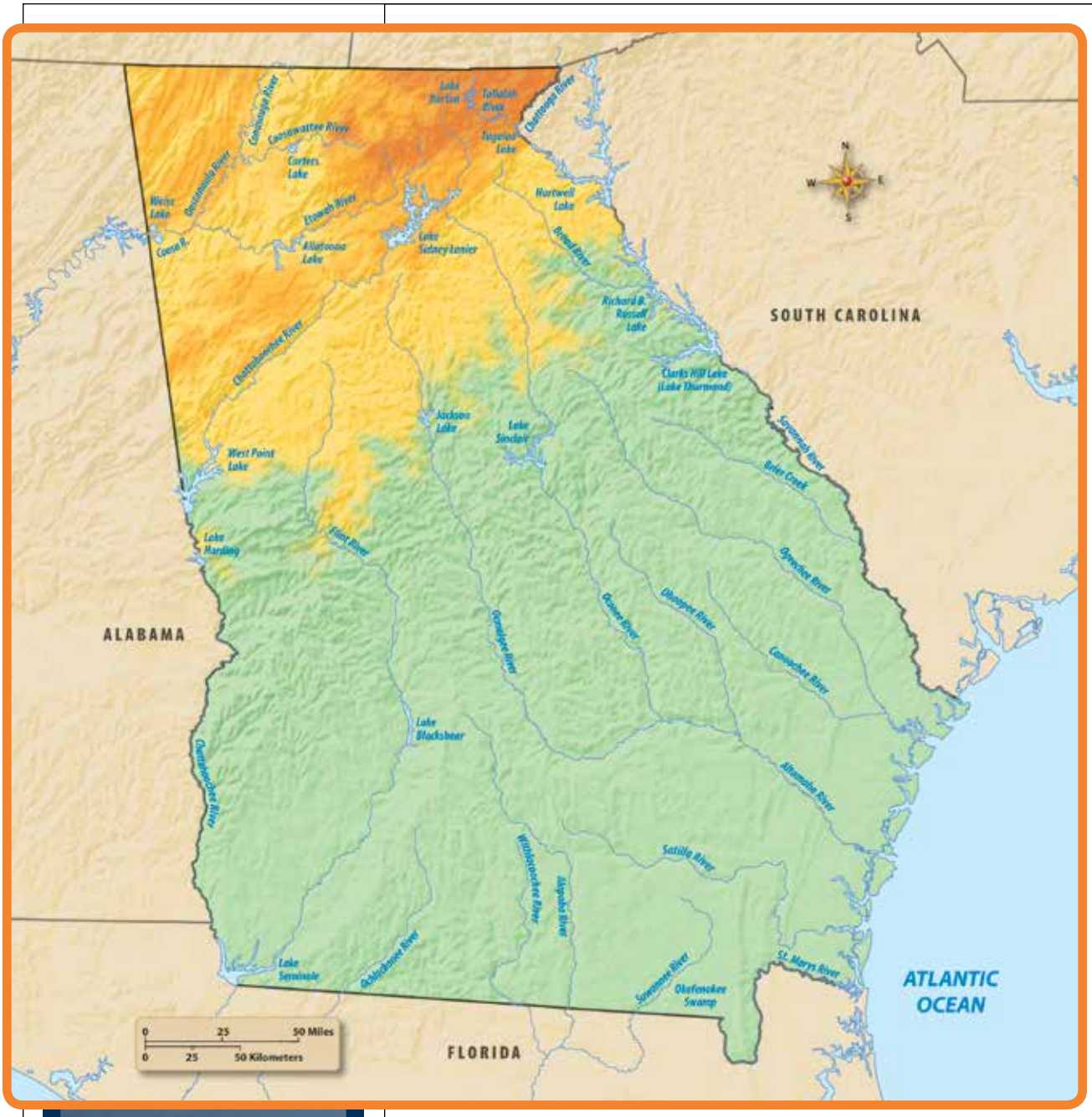
and empty into the Gulf of Mexico; most flow southeast to empty into the waters of the Atlantic Ocean.

The state's sea islands, sometimes called the Golden Isles, protect the coastline of the mainland and have been used for many purposes throughout Georgia history. Georgia also has many swamps. One of the most interesting areas in the state is the large Okefenokee Swamp in southeastern Georgia. In this section, we will learn about the important features of Georgia's land.

Rivers

Georgia's wide system of rivers is crucial to the state. The rivers provide habitat for thousands of species of plants and animals. Before the invention of railroads, they were the water highways for humans and the goods they traded. Now they not only provide drinking water for many areas of the state, but they also generate hydroelectric power at the many dams and cool the reactors at facilities that provide nuclear power. Rivers are also the source of much pleasure for Georgians who love to hike along their banks, canoe and

Above: Beautiful water lilies are a common sight in the Okefenokee Swamp. **Below:** Georgia's rivers are among our most important natural resources, providing drinking water, hydroelectric power, transportation, habitat for wildlife, and opportunities for recreation, like a leisurely canoe trip on the Chattahoochee River.



Map 4 Georgia's Rivers

Map Skill: What rivers form part of Georgia's borders?

kayak, swim and ski. Georgians also simply enjoy the rivers' beauty—from the waterfalls of the northern headwaters to the marshes of the southern estuaries. Both the rivers and the wildlife they support are threatened in modern times by overuse and pollution. Citizens must make caring for these natural treasures an important part of the future.

Etowah and Coosa Rivers

With headwaters in the mountains above Dahlonega, the Etowah River flows south and west toward Alabama. A dam built across the river in 1955 created Lake Allatoona. Further down the Etowah was the home of the early Indians who built the now famous Etowah Mounds. In Rome, the Etowah

River meets the Oostanaula River to form the Coosa River. The Coosa River flows west until it reaches the Alabama border about thirty miles from its beginning. In that state, it changes names twice again before it empties into the Gulf of Mexico at Mobile.

The Etowah-Coosa river system is home to many species of fish, snails, mussels, and darters. The Georgia Department of Natural Resources and some nonprofit environmental groups are working hard to protect this diversity of water life and restore species that are in danger.

Chattahoochee River

The flat, grassy marshes of Glynn County were not the only area in Georgia to inspire poet Sidney Lanier. One of his most famous poems extols both the beauty of the Chattahoochee River in the northeast and its uses in the southern plain. His 1877 poem, written as though the river itself is speaking, says: "Out of hills of Habersham, down the valleys of Hall, I hurry amain to reach the plain, run the rapids, and leap the fall . . . I am fain for to water the plain . . . the dry fields burn and the mills are to turn . . . ."

Above: The Etowah River provided food and transport to the Indians who built the Etowah Mounds. Below: The Chattahoochee River flows from the Blue Ridge Mountains through Atlanta, and forms much of the western border of Georgia as it flows south.

Something Extra!

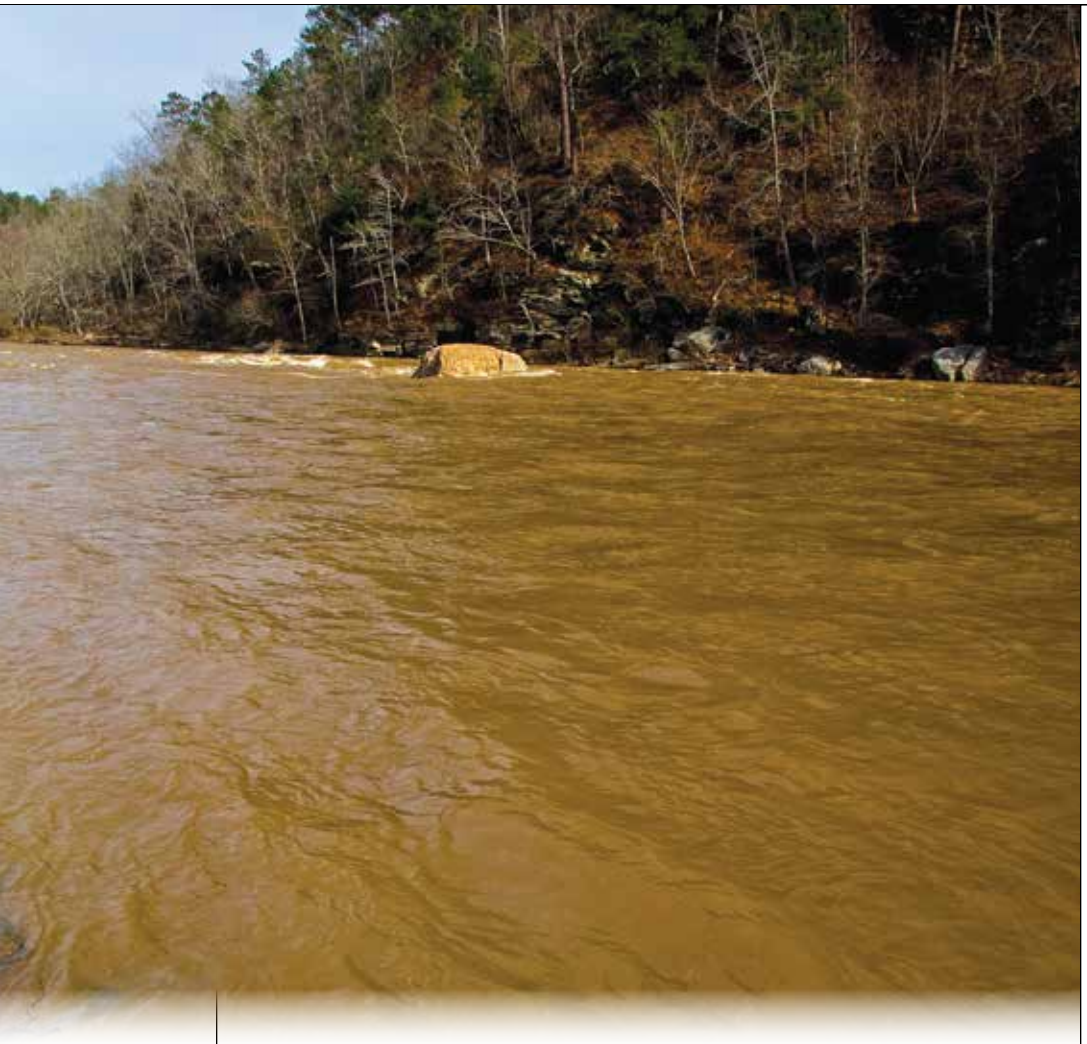
On the Flint River, the important Joseph W. Jones Ecological Research Center near Newton is dedicated to research on the environment of the area.

The Chattahoochee River begins in the Blue Ridge Mountains and flows southwest through Atlanta and then over the Fall Line at Columbus. From there until it crosses into Florida and down to the Gulf of Mexico, it forms Georgia's western boundary with Alabama.

In Florida, the Chattahoochee River takes a different name—the Apalachicola. The Chattahoochee River is a very important source of water for Georgia, Alabama, and Florida. How that water is used has been a source of tension and conflict among the three states.

Flint River

The Flint River does not begin in the mountains as most rivers do. It begins south of Atlanta near the Hartsfield-Jackson International Airport. Its headwaters (source) come from the groundwater, and it becomes larger with each tributary (streams and creeks that flow into a larger river). The Flint River flows for over two hundred miles before reaching the first dam, which created Lake Blackshear. The dams at both Lake Blackshear and Lake Chehaw provide hydroelectric power. The Flint River runs through Albany toward the southwest corner of Georgia, where it meets the Chattahoochee River at Lake Seminole.



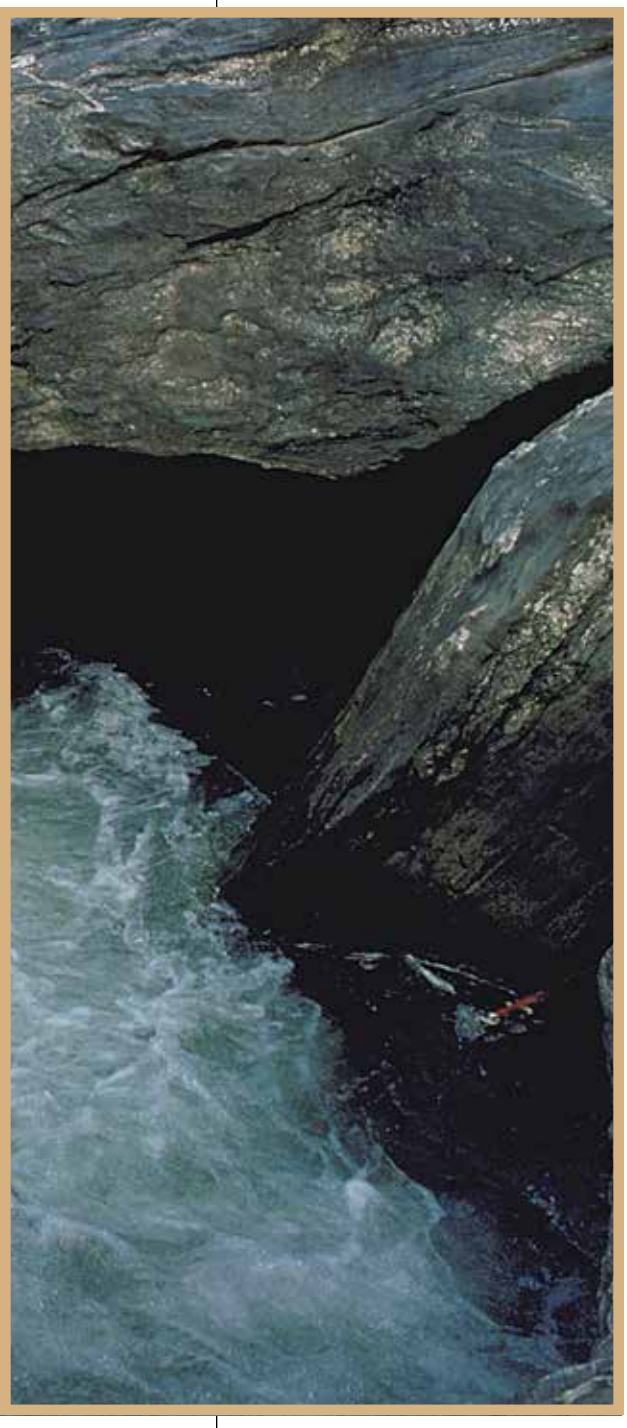
Top: The Flint River originates from groundwater near Atlanta, unlike many Georgia rivers that start as mountain streams. **Above:** Every year, Bainbridge hosts the Flint River Sucker Fish Festival. **Below:** In the 1920s, the Flint River was dammed to form Lake Blackshear, seen here at Georgia Veterans State Park.

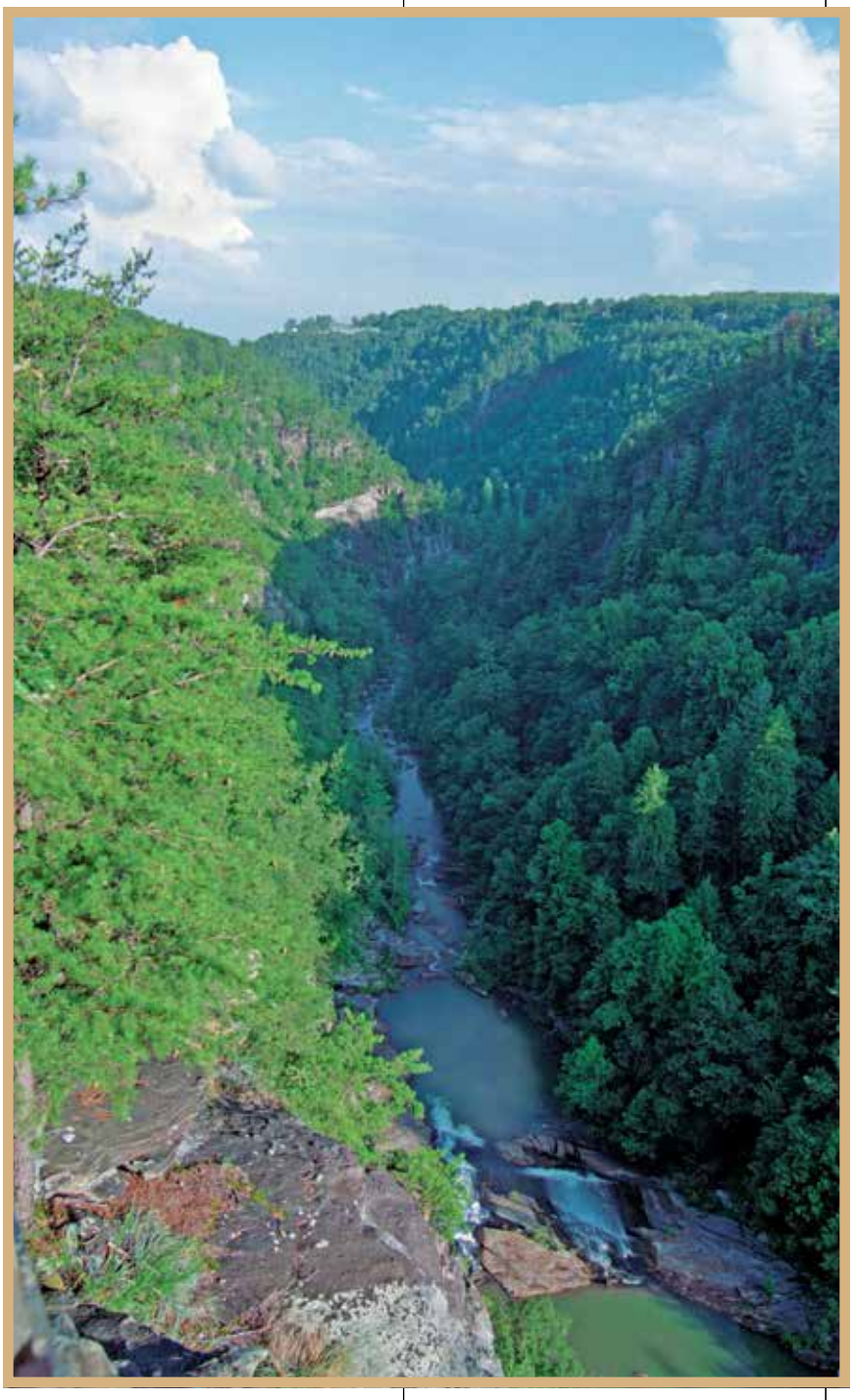
Above: The Chattooga River in the northeast corner of Georgia is one of the state's most challenging rivers for whitewater rafting and canoeing.

Chattooga River

The Chattahoochee River is only one of the rivers that forms a border with another state. Also arising in the Blue Ridge Mountains is the Chattooga River, which is the northeastern boundary between Georgia and South Carolina. With its designation as a "National Wild and Scenic River," the Chattooga is managed by the National Park Service.

After flowing for about fifty miles, the river ends at Tugaloo Lake, formed by the confluence (meeting) of the Chattooga and Tallulah Rivers.





The Tallulah River begins in North Carolina and flows south into Georgia. Over time, it has carved the 1,000-foot-deep canyon called Tallulah Gorge with its six awe-inspiring waterfalls. In the late 1800s, the town of Tallulah Falls was a major resort with the railroad bringing in tourists from all over the country.

When the Chattooga and Tallulah rivers flow out of the lake, they form the Tugaloo River. At Hartwell Lake in Hart County, the river joins with the Seneca River of South Carolina to become the Savannah River.

Above: The Tallulah River has carved Tallulah Gorge to depths of as much as 1,000 feet. The gorge is regarded as one of the "Seven Natural Wonders of Georgia" and has been protected as a state park since 1993.

Savannah River

The Savannah River forms the eastern boundary separating Georgia and South Carolina. Unlike the Chattahoochee and Flint rivers, the Savannah River flows to the southeast and empties into the Atlantic Ocean about thirteen miles after it passes the city of Savannah. Because of its position near the mouth of the river, Savannah is one of the busiest ports in the United States. Huge ships come into the port from all over the world.

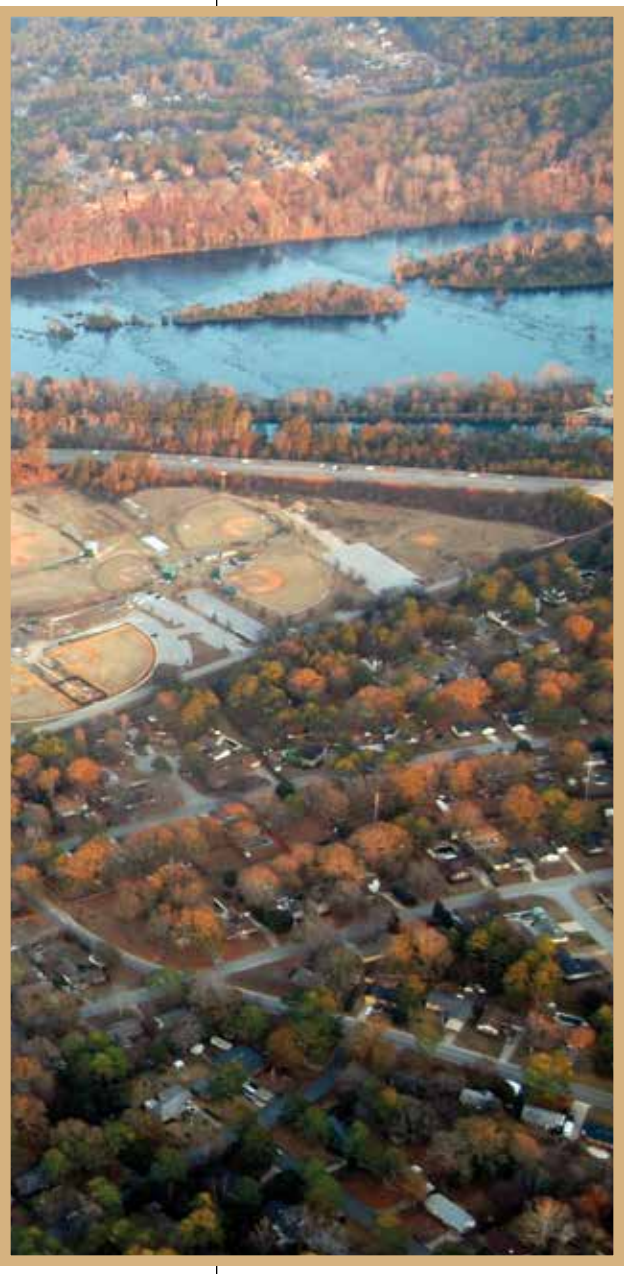
The Savannah River crosses the Fall Line at Augusta. Along its path to the sea, it is joined by several important waterways including Kiokee Creek, Brier Creek, and Ebenezer Creek. Downstream from Augusta is the Southeastern Natural Sciences Academy, which includes the beautiful Phinizy Swamp, a wetlands that is home to many species of wildlife. (**Wetlands** are low-lying

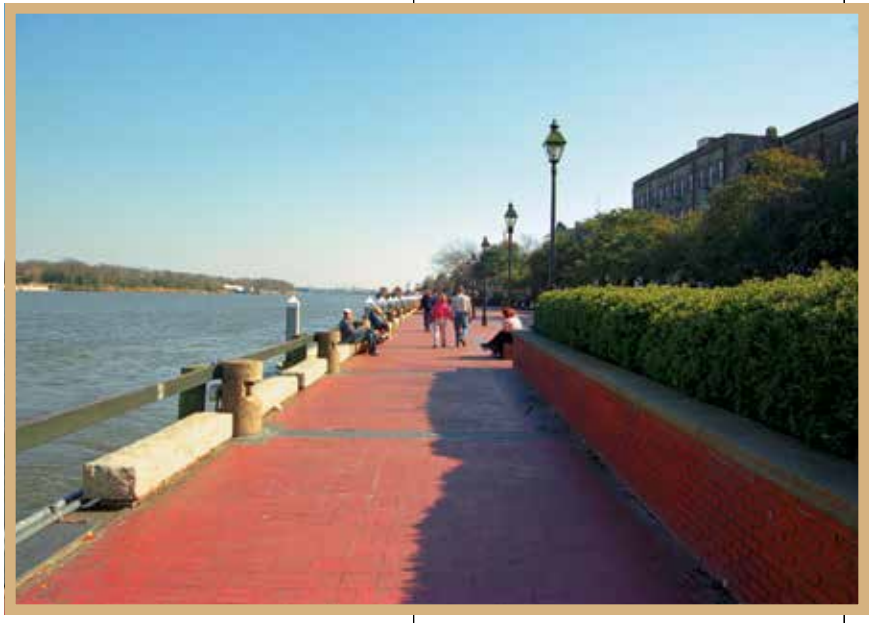
Below: The 350-mile-long Savannah River, seen here as it passes Augusta, forms most of the border between Georgia and South Carolina. It is probably the most important river to the history and economy of Georgia. The narrow band of water running parallel to the river is the Augusta Canal.

areas where water lies close to the surface.) The lower Savannah River also includes swamps. Near the city of Savannah, the river's **estuary** (the wide part of the river where its current meets the tidal ebbs and flows) creates three branches. The shallow Back River and Middle River feed into the Savannah National Wildlife Refuge. The Front River flows past Savannah's Riverwalk with its restaurants and shopping.

The Savannah River is dammed in three places, forming Hartwell Lake in Hart County, Russell Lake in Elbert County, and Lake Thurmond (also known as Clarks Hill Lake) in Columbia County. The river is important to both Georgia and South Carolina, not only for drinking water for the large cities of Savannah and Augusta, but also for two nuclear facilities, the Savannah River Site in Aiken County, South Carolina, and Plant Vogtle in Burke County, Georgia.

Below: The port of Savannah on the Savannah River is the largest and busiest in Georgia. This container ship has just passed under the Eugene Talmadge Memorial Bridge. Bottom: The Savannah waterfront was the location of the founding of the colony of Georgia in 1733.





Something Extra!

The Ogeechee River is the longest river in Georgia to keep its name throughout its route.

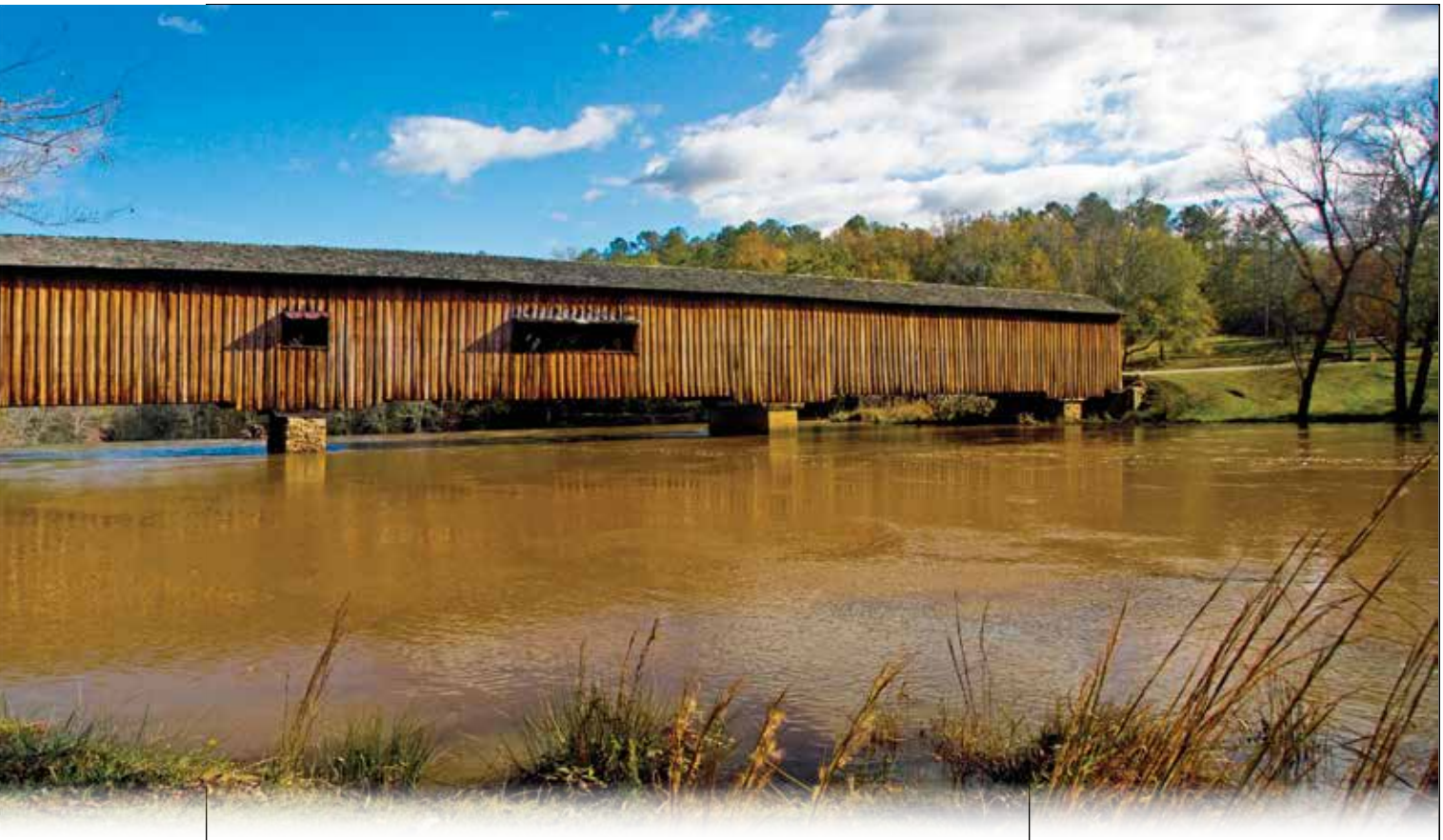
Top: The bridge across the South Fork Broad River at Watson Mill Covered Bridge State Park is the longest, at 229 feet, of the 20 remaining covered bridges in Georgia. Once, there were more than 200. Above: The Ogeechee River winds through cypress swamps on its way south to the Atlantic Ocean.

Ogeechee River

One of the most natural rivers in Georgia is the Ogeechee, which begins with a North and South Fork in the Piedmont, and flows all the way to Ossabaw Sound south of Savannah. The Ogeechee's clear waters become darker as the river takes on decaying materials along its route. Before it reaches Savannah, the Ogeechee River is joined by the Canoochee River. Because of its undeveloped state, the Ogeechee is a favorite of canoeists and wildlife lovers. Visitors to the river, however, have to be on watch for dead trees in the water as well as cottonmouth snakes and alligators.

Oconee River

The next major river to the west is the Oconee, which begins in the northeast mountains of Hall County. The North and Middle Oconee Rivers join near Athens to form the Oconee. The Apalachee River joins the Oconee River at Lake Oconee, a manmade lake created by a Georgia Power Company dam

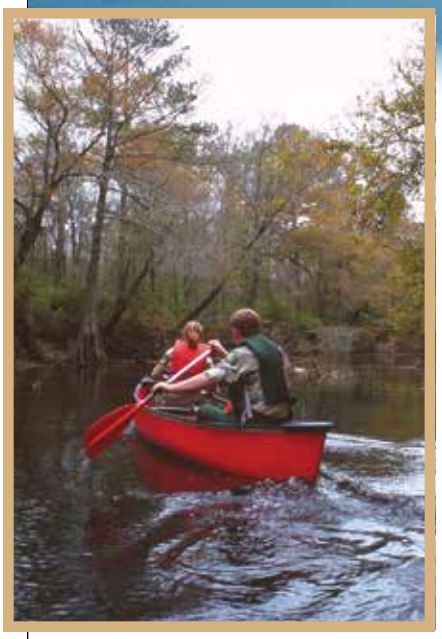


completed in 1980. An earlier dam on the Oconee had created Lake Sinclair further downstream. The Oconee River meets the Fall Line at Milledgeville, the capital of Georgia from the early 1800s until the seat of government moved to Atlanta after the Civil War. Dublin is another city on the river's route.

Ocmulgee River

South of Atlanta, three rivers—the Yellow, the Alcovy, and the South—come together behind the Lloyd Shoals Dam. The dam, built in 1910 in Butts County, formed Lake Jackson. The river that flows out of Lake Jackson is the Ocmulgee River. The river crosses the Fall Line at Macon and enters the Coastal Plain. A smaller tributary, called the Little Ocmulgee River, goes through McRae and joins the Ocmulgee south of Lumber City. The Ocmulgee and the Oconee Rivers merge to become the Altamaha River a few miles further downstream. In this area was the wiregrass region of longleaf pines. In the nineteenth century, the lumber industry was an important part of the area's economy.

Above: The Ocmulgee River starts at Lake Jackson and flows south for 255 miles, joining the Oconee River to form the Altamaha. On its way, it crosses the Fall Line at Macon and passes the Ocmulgee Mounds, the site of a major Mississippian Indian village.



Top: The Altamaha is a broad, slow-moving river by the time it reaches the coast of Georgia near Brunswick. **Above:** The Satilla, like the Altamaha, is a "blackwater" river. It enters the Atlantic Ocean between Jekyll and Little Cumberland islands.

Altamaha River

The Altamaha River runs southeast across the Coastal Plain to its destination at the Atlantic Ocean near the town of Darien. Along the way, it is joined by the Ohoopee River, which begins in the Coastal Plain.

The Altamaha River, rich with soil and plant life, is one of Georgia's "blackwater" rivers, called that because of its dark coloring. Eighteenth-century traveler William Bartram, who studied the natural environment of Georgia, called the Altamaha a "large majestic river." It is the single largest river drainage basin in the southeastern part of the country. Along its banks, Bartram and his father John discovered a new species of plant they named Franklinia or Franklin tree in honor of fellow Pennsylvanian Benjamin Franklin, one of the founding fathers of the United States.

The estuary of the river is the area of marshes described in Sidney Lanier's poem quoted earlier in this chapter. The river and its banks are home to a rich diversity of fish, birds, snakes, and frogs, as well as mammals like beaver, fox, and wild pigs.

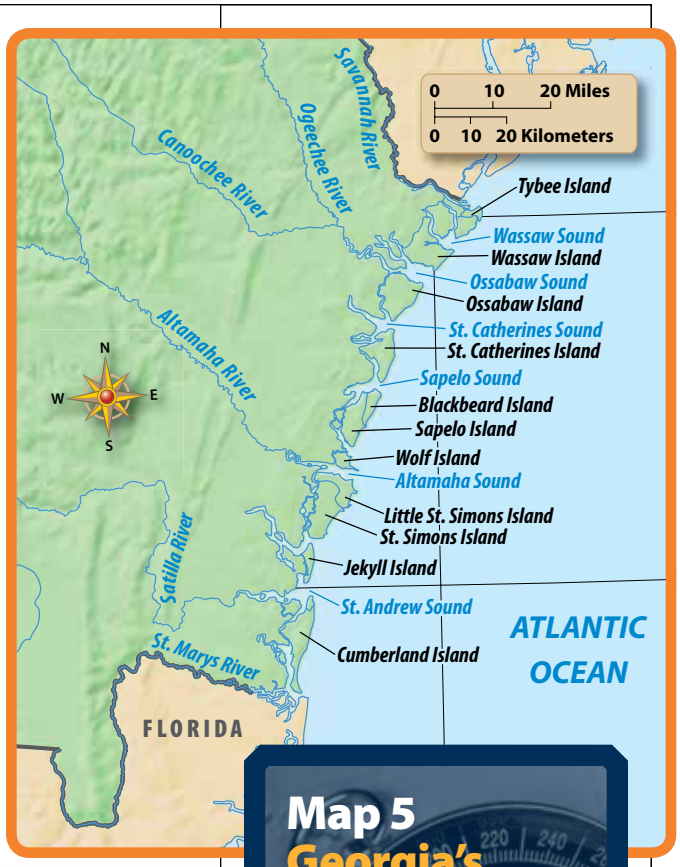
Two other rivers flow into the Atlantic Ocean south of the Altamaha River. The Satilla River, another blackwater river, begins near Fitzgerald, passes through Waycross, and flows into the Atlantic Ocean between the towns of Brunswick and St. Marys. The St. Marys River forms part of Georgia's boundary with Florida. The St. Marys River has a big bend, or "dog leg," caused by a large sand ridge. Behind the ridge, water pooled to form the Okefenokee Swamp.

Islands

The southern portion of Georgia's eastern border is the coast of the northern Atlantic Ocean. This body of salt water separates the United States from the continents of Europe and Africa. The current of the Gulf Stream system keeps these waters warm.

Four to six miles off Georgia's mainland are the Golden Isles, a series of islands that face the Atlantic on the east. On the islands' western side are the natural marshy waters that separate them from the mainland. In Georgia's early history, small vessels could use these waters to go up and down the coast without having to venture into the ocean. In the late 1930s, the federal government created the Intracoastal Waterway by deepening the channel and keeping it dredged (cleaned out) so larger boats could use the waterway.

These islands are constantly changing land formations, blown by the winds and molded by the waves and water currents of the mighty Atlantic Ocean. From the mouth of the Savannah River at the northern end of the coast going south toward Florida are Tybee and Little Tybee, Wassaw, Ossabaw, St. Catherines,



Map 5
Georgia's Golden Isles

Map Skill: Which island appears to be the largest?

The beaches of the barrier islands, like this one on St. Simons Island, are on the eastern side, facing the Atlantic Ocean.

Blackbeard, Sapelo, Wolf, Little St. Simons, Sea, St. Simons, Jekyll, Little Cumberland, and Cumberland islands.

Over time, these islands have been home to Native Americans; Spanish missions; rice, indigo, sea island cotton, and sugar plantations; winter getaways for wealthy northerners; and modern resorts. The mainland is directly connected to four—Jekyll, Sea, St. Simons, and Tybee—by bridges and causeways (dry passageways over wet areas). The others must be reached by boat. Some were formed only a few thousand years so, others are up to forty thousand years old. The state of Georgia owns three islands: Little Tybee, Ossabaw, and Sapelo (except for the over 400-acre African American community on Sapelo known as Hog Hammond). The U.S. National Park Service runs Cumberland. Blackbeard, Wassaw, and Wolf islands are national wildlife refuges.

These **barrier islands** are so called because they protect the mainland from strong winds and waves. They all have several common characteristics. The eastern sides that face the Atlantic Ocean have sandy beaches. Near the water, the sand is fine quartz densely packed into a hard surface. Beyond the beach are sand dunes held in place partially by plants such as sea oats. The farther inland one travels, the softer the dunes become. These eastern beaches are constantly eroding, as the waves and sometimes storms move the sand. Sea walls of stone have been placed to try to slow the erosion.

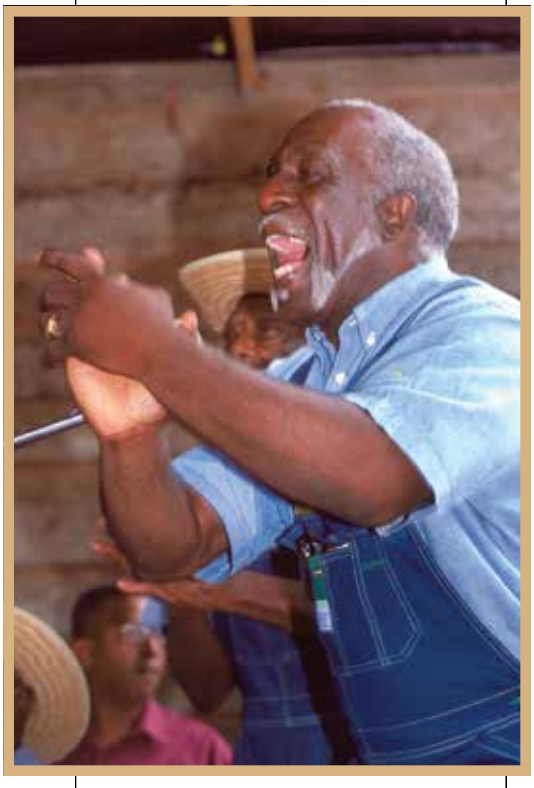
Beyond the dunes are grasses and shrubs. Beyond those are the interior forests with trees such as magnolias and live oaks with hanging Spanish moss. On the sides of the islands facing the mainland are saltwater marshes. Here people can catch fish, shrimp, and crab.

The islands are home to many animals. Ducks and wading birds are common, as are alligators and snakes, turtles and frogs. Smaller animals like rabbits and squirrels are numerous.

Many of the islands have interesting stories. Blackbeard Island got its name from the eighteenth-century pirate Edward Teach, whose nickname was "Blackbeard." No buried treasure has ever been found on the island in spite of rumors that such a treasure existed. In 1914, Blackbeard Island became a wildlife preserve by order of President Woodrow Wilson, who grew up in Georgia in the mid-1800s.

The largest of the islands is Cumberland. Catherine Greene, the widow of Revolutionary War hero Nathanael Greene, built a house on the island in 1786, which she called Dungeness. That house burned down. In the 1880s, on the foundation of that house, Thomas Carnegie (younger brother of Andrew Carnegie) built a mansion named for the earlier Dungeness. His wife Lucy inherited his estate and built three houses for her children that are still standing: Plum Orchard, Greyfield, and Stafford. Unfortunately, the second Dungeness burned in the 1950s, but the ruins are still there for visitors to explore. Another historic site is an African American church built in the 1930s.

Endangered loggerhead sea turtles build their nests on the barrier island beaches to lay their eggs. Jekyll Island is the home of the Georgia Sea Turtle Center. When the Europeans first settled the area, the Spanish called Jekyll Island the "Island of Whales" because they could watch right whales swimming off shore. Today, there may be fewer than 350 of these animals in the world. In the late 1800s, Jekyll Island became home to many of the country's wealthiest men. Banker J. P. Morgan, newspaper owner Joseph Pulitzer, department store founder Marshall Field, and others were members of the Jekyll Island Club.



In the early twentieth century, Sapelo Island became home to Howard Coffin, a leader in the automobile industry and later in aviation. Coffin and his wife bought the island and built a mansion on the ruins of sugar planter Thomas Spalding's plantation home. There the Coffins entertained the country's leaders, including Presidents Coolidge and Hoover. Realizing the attraction of the climate and beauty of the barrier islands, Coffin purchased large tracts of land on St. Simons Island, and he bought Sea Island. On these, he helped develop the tourist industry. Sea Island became home to his upscale resort, the Cloister.

Although Georgians probably think of these islands more as places of recreation, resorts, and ecological research, they still serve the environmental purpose of protecting Georgia's mainland from the direct currents and winds of the Atlantic Ocean. Their beaches, forests, and marshes are important wildlife habitats, and their beauty still inspires us.

Opposite page, above: Sea oats anchor the dunes on Cumberland Island National Seashore. Opposite page, below: The Tybee Island lighthouse is 154 feet tall. Top: Endangered loggerhead sea turtles nest on the island beaches. Above: Sapelo Island Cultural Day celebrates the traditions of the Hog Hammond community.

Above: While most swamps are in the Coastal Plain, the Alcovy River swamps are an example of Piedmont swamps. **Below:** The Okefenokee Swamp is the largest in the United States. More than half the swamp is protected as the Okefenokee National Wildlife Refuge.

Swamps

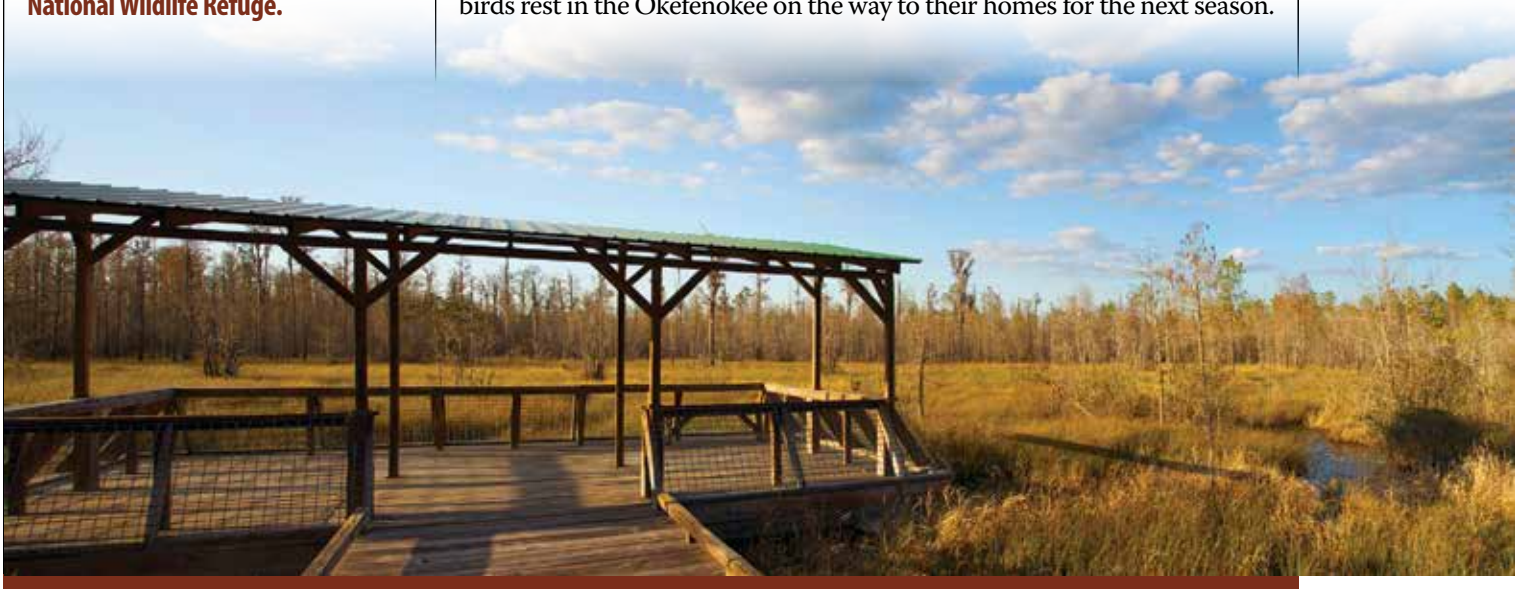
Georgia is home to over 450 **swamps**. These land formations are low, sometimes spongy land, usually covered with water. They are very important wildlife habitats. In fact, swamps are one of the reasons Georgia has so many different species of plants and animals. While most swamps are in the Coastal Plain, Georgia does have Piedmont river swamps above the Fall Line. The Alcovy River near Atlanta has more swamps than other rivers in the Piedmont.

Located in the southeast portion of the state (with a small part in northern Florida), the Okefenokee is Georgia's largest and best-known swamp. In fact, it is the largest swamp in the country, with almost seven hundred square miles (402,000 acres). The swamp formed thousands of years ago after the ocean receded to its present boundary. A sand bar separated the land from the ocean and the low-lying land, or basin, filled up with fresh water. The leaves and dead plants that fell into the water created peat, a mass of decaying plant material that absorbs water. Trees grow on floating islands of peat. A person can walk on peat, but it is spongy and shakes. That is why the Native Americans called the Okefenokee the "land of the trembling earth."

Not all areas of the Okefenokee are peat. Prairie areas of the swamp have no trees but are covered with grasses. The swamp also has dozens of lakes. The water of the swamp comes from rain, about fifty inches in a normal year. The swamp can be on the path of tropical storms from the Gulf of Mexico and from the Atlantic Ocean. Sometimes these storms include dangerous lightning that can spark swamp fires.

Most of the water that leaves the swamp from the western end goes into the Suwannee River and then to the Gulf of Mexico. The water that flows from the eastern part of the swamp goes into the St. Marys River, which empties into the Atlantic Ocean.

Visitors to the Okefenokee are greeted by a chorus of animal sounds including croaking frogs and singing birds. Paddling through the canoe trails or walking along boardwalks over the shallow waters, visitors can see alligators, snakes, lizards, and frogs. In summer and fall, migrating birds rest in the Okefenokee on the way to their homes for the next season.



Wading birds, including storks and cranes, feed there. In the winter, ducks make their homes in the wetlands. Otters and beavers live and play in the water. On drier ground, the gray fox, deer, and black bear roam. Turtles can be seen enjoying the sun.

The Okefenokee Swamp is also home to many different kinds of plants. Pine and cypress trees fill its forests. In the early twentieth century, however, logging activities carried off many of the trees. Grasses and sedges cover the prairies, while water lilies float in the wetter zones. Insect-eating plants are some of the more interesting swamp species.

Above: Sunbathing alligators are a common site in the Okefenokee Swamp. The name alligator is derived from *el largarto*, which means "the lizard" in Spanish.

The importance of this geographic treasure has been recognized by our national government. In the 1920s and 1930s, Franklin Delano Roosevelt visited Georgia for health treatments. At Warm Springs in western Georgia, Roosevelt built a home where he could come to soak in the healing waters bubbling up from underground. Shortly after building his home, Roosevelt became president of the United States. His connection to Georgia and its people led him, in the mid-1930s, to designate 80 percent of the swamp a national wildlife refuge. In the mid-1970s, over 350,000 acres of the swamp received the additional protection of becoming a national wilderness area.

Few states are so fortunate to have the geographic diversity of Georgia. Rich in resources of water, minerals, soils, plants, and animals, Georgia has been able to provide its human inhabitants with life and livelihood for thousands of years. Its moderate climate and natural beauty have made it an appealing place to live and visit for generations of humans, from the Paleo Indians to modern Georgians. Each generation has the duty to care for the land and use its resources wisely, so the state will remain a geographic treasure for thousands of years to come.

Something Extra!

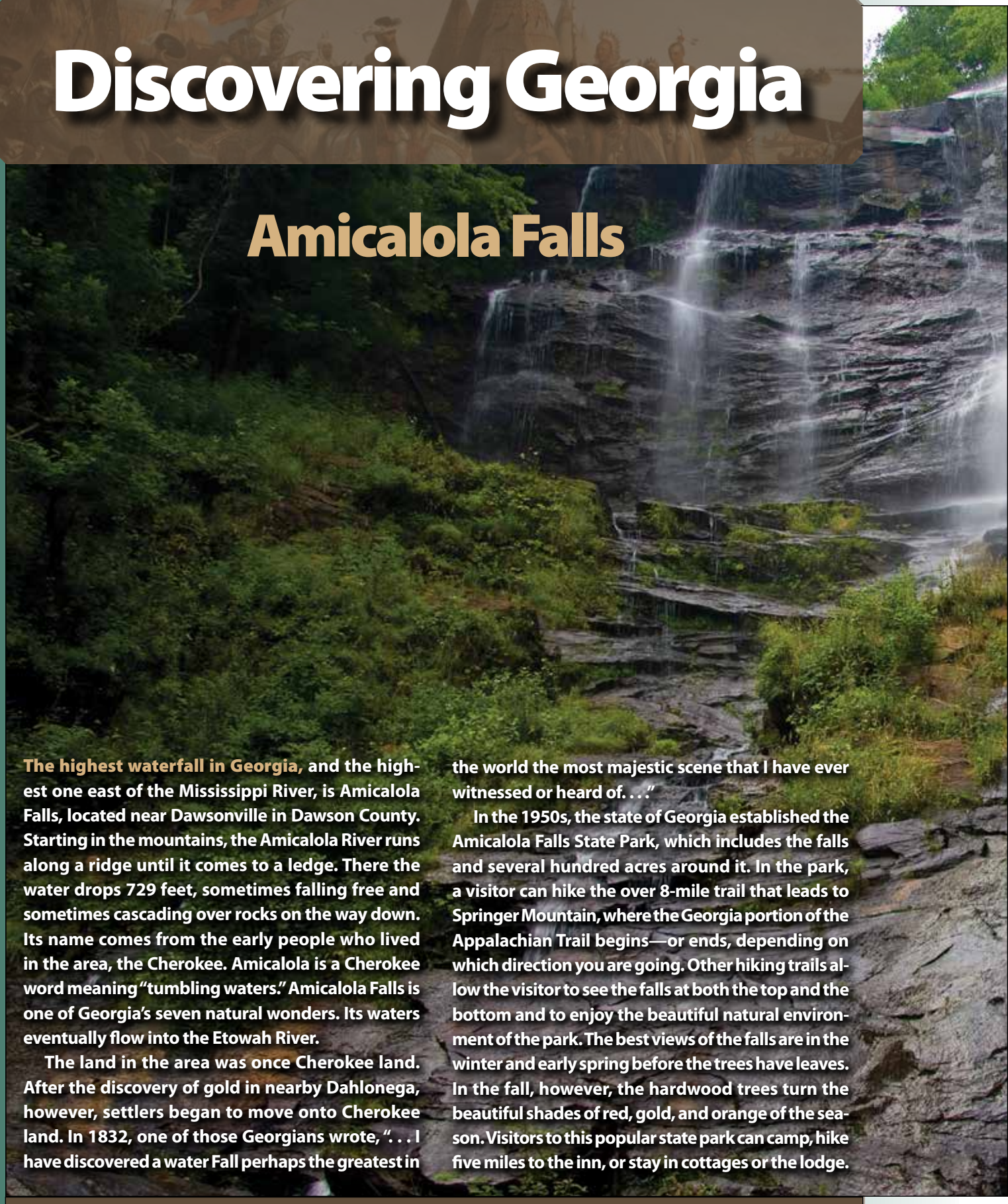
The Okefenokee Swamp is considered to be one of Georgia's "Seven Natural Wonders."

Reviewing the Section

1. **Define: wetland, estuary, swamp.**
2. **Which Georgia rivers flow into the Gulf of Mexico? Which flow into the Atlantic Ocean?**
3. **Why did the Native Americans called the Okefenokee the "land of the trembling earth"?**

Discovering Georgia

Amicalola Falls



The highest waterfall in Georgia, and the highest one east of the Mississippi River, is Amicalola Falls, located near Dawsonville in Dawson County. Starting in the mountains, the Amicalola River runs along a ridge until it comes to a ledge. There the water drops 729 feet, sometimes falling free and sometimes cascading over rocks on the way down. Its name comes from the early people who lived in the area, the Cherokee. Amicalola is a Cherokee word meaning "tumbling waters." Amicalola Falls is one of Georgia's seven natural wonders. Its waters eventually flow into the Etowah River.

The land in the area was once Cherokee land. After the discovery of gold in nearby Dahlonega, however, settlers began to move onto Cherokee land. In 1832, one of those Georgians wrote, ". . . I have discovered a water Fall perhaps the greatest in the world the most majestic scene that I have ever witnessed or heard of. . . ."

In the 1950s, the state of Georgia established the Amicalola Falls State Park, which includes the falls and several hundred acres around it. In the park, a visitor can hike the over 8-mile trail that leads to Springer Mountain, where the Georgia portion of the Appalachian Trail begins—or ends, depending on which direction you are going. Other hiking trails allow the visitor to see the falls at both the top and the bottom and to enjoy the beautiful natural environment of the park. The best views of the falls are in the winter and early spring before the trees have leaves. In the fall, however, the hardwood trees turn the beautiful shades of red, gold, and orange of the season. Visitors to this popular state park can camp, hike five miles to the inn, or stay in cottages or the lodge.

Chapter Review

Chapter Summary

Section 1 Geographic Regions

- Georgia is divided into five geographic regions: the Appalachian Plateau, the Ridge and Valley area, the Blue Ridge Mountains, the Piedmont, and the Coastal Plain.
- The Appalachian Mountains, one of the oldest mountain chains in the world, run through northern Georgia.
- The Appalachian Plateau region is in the extreme northwest corner of the state and is somewhat isolated from the rest of Georgia.
- The Ridge and Valley region is characterized by long, parallel ridges and valleys.
- The Blue Ridge Mountains region also has ridges and valleys, which are popular with tourists and outdoors lovers. The highest point in the state, Brasstown Bald, is in this region.
- The Piedmont region has rolling hills, and some of its soil is distinctive for its red color. Agriculture and forestry have been important to the region's economy.
- The Fall Line separates the hard rock of the Piedmont from the softer, sandier soil of the Coastal Plain.
- The Coastal Plain region is the largest region in the state and is divided into an upper Coastal Plain and lower Coastal Plain. The upper Coastal Plain contains many of the state's aquifers. The lower Coastal Plain includes the coastline and the barrier islands.

Section 2 Climate and Weather

- Climate refers to the average weather of a region over a long period of time. Weather refers to the day-to-day conditions and changes in the atmosphere.
- Georgia has a temperate climate.
- Georgia goes through periodic droughts.
- Tornadoes are rotating funnel-shaped columns of air that reach down to the ground from storm clouds. While tornadoes can occur any time of the year, Georgia sees most of its tornadoes March through May.
- Georgia is also affected by occasional hurricanes—tropical storms with very strong winds, heavy rains, and sometimes storm surge.

Section 3 Physical Features

- Major rivers include the Chattahoochee, Flint, Chattooga, Savannah, Ogeechee, Oconee, Ocmulgee, and Altamaha.
- Georgia's Golden Isles are a series of fourteen barrier islands, which protect the mainland from strong winds and waves.
- The Okefenokee Swamp is located in southeast Georgia and is the largest swamp in the country.

Understanding the Facts

1. List the five geographic regions and identify one way that each one is unique.
2. List the types of extreme weather that are likely to occur in Georgia.
3. What are the barrier islands and what purpose do they serve?
4. Use a map to identify the rivers that form portions of Georgia's state boundary.

Developing Critical Thinking

Imagine you are living in Georgia in the late 1700s. Explain ways that an extended drought period might affect you. Now imagine an extended drought today. How would the effects be the same or different?

Writing Across the Curriculum

Your local Chamber of Commerce has asked your class to prepare a set of advertisements declaring your geographic region the best place to live in Georgia. Brainstorm the reasons that you like your area and write an advertisement of 150-200 words.

Extending Reading Skills

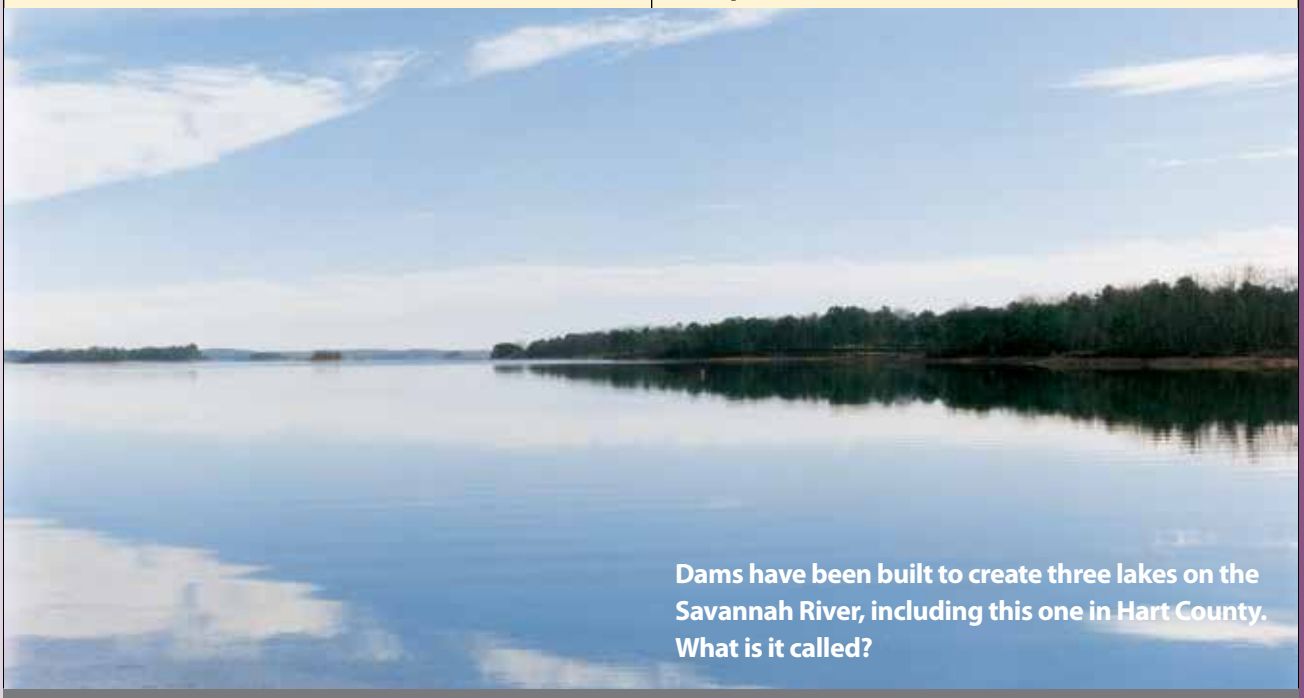
Look at Map 4 on page 28. What is the subject of the map? Which of the rivers do not flow into the Atlantic Ocean?

Exploring Technology

1. Use a search engine to find as many specialized maps of Georgia as you can (for example, a mineral map that shows where various deposits are located).
2. Research the dates when Georgia has experienced hurricanes. Using this list, construct a bar chart of hurricane frequency and calculate the average number of years between hurricanes.

Practicing Your Skills

Research the weather patterns in your hometown or community over a period of one year. (This information is available from the University of Georgia.) With partners, build graphs that show averages such as rainfall, high and low temperatures, wettest and driest months, and so on. Compare the charts as a class.



Dams have been built to create three lakes on the Savannah River, including this one in Hart County. What is it called?