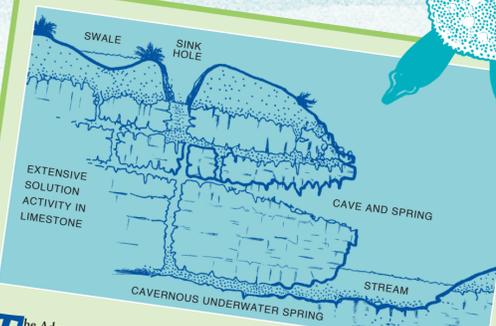


# SPRINGS OF THE SUWANNEE

## SINKHOLES

**M**ore sinkholes occur in Florida than in any other state, and many North Florida lakes once began as sinkholes. Sinkholes come in all sizes and shapes. Some look like big bowls, while others look more like shafts, or "chimneys." Some are shallow, yet others are deep enough to lead directly to the aquifer.

Sinkholes are unpredictable, and may form gradually or suddenly; but they all develop in basically the same way. As rainwater seeps into the ground, acid in the water dissolves the thick layers of underground limestone that underlie the entire state. This creates big, empty underground cavities. If the layers of sand and dirt which sit on top of the limestone fall into these cavities, the result is a sinkhole.



**T**he Advanced Stages of Karst Formations. Limestone has well developed interconnected passages that form underground drainage systems which capture much or all of prior surface drainage. Overburden has collapsed into cavities forming swales or sinkholes. Caves may form. The land surface has been lowered due to loss of sand into the limestone's voids. Ginnie Springs, Falmouth Springs and Little River Springs are just three examples of cavernous underground springs that occur in North Florida. Florida Geological Survey S.P. No. 35

## WHAT MAKES NORTH FLORIDA SPRINGS SO ENTICING

**L**ike brilliant aquamarine gems, Florida's natural springs adorn the landscape throughout the Suwannee River region, exuding a mystique that has lured man for centuries.

At once tranquil and translucent, dark and deep, these dazzling pools have enticed the curious, from ancient Indians to present-day cave divers. Revered for their "healing" properties, these mineral springs once attracted people of every race and culture suffering from arthritis, rheumatism and other chronic conditions. Some were later converted into posh health resorts by shrewd businessmen. As historic sites of early Indian villages or Spanish missions, many of these clear, natural pools today are protected and preserved for public recreation.

Cool in the summer and warm in the winter, the springs attract creatures great and small, from the tiny endangered sand grain snail to the giant, gentle manatee. Albino crayfish and shrimp, adapted only for cave existence, navigate blindly through the underwater caverns. Gulf sturgeon, a federal threatened species, use the springs as resting places during their migration up the Suwannee River to spawn.

North Florida's springs have a rich and fascinating past; their future is yet to be determined. Popularity sometimes breeds problems such as erosion and pollution. As you visit and enjoy these natural wonders, please do your part to preserve and protect them. Remember to stay on designated paths and walkways. Avoid disturbing plants and animals that live in and around the springs. Take care not to discard trash on the shore or in the water. Above all, be good stewards of what Marjorie Stoneman Douglas so aptly called "bowls of liquid light."

**L**ineaments are surface expressions of linear geologic features that can be mapped using satellite imagery or aerial photography. In Florida, lineaments are associated with the subsurface fractures in the limestone that make up the aquifer. These lineaments influence the direction of groundwater flow and spring flow. Each line in the map represents a lineament.

## WATER QUALITY

**S**prings are a "window" into the aquifer from which they flow. The water quality of a spring reflects the overall condition of the aquifer. Springs flow from the Floridan aquifer system, the source of most of the drinking water in the region.

Rock, soil and land-use characteristics in the areas that recharge the aquifer and springs can have an impact on water quality. Many kinds of water-soluble materials can enter the aquifer when rainwater recharges the aquifer. Soluble materials found naturally in groundwater include minerals such as iron, calcium, magnesium and carbonate.

Different kinds of land uses can introduce potentially harmful soluble materials such as pesticides and nitrates. Once in the aquifer, these materials can flow with the ground water over long distances, finding their way into drinking water, springs and rivers. Proper management of land use activities is essential to avoiding water contamination.

## NORTH FLORIDA'S DISAPPEARING RIVERS

**I**n their journey to the Gulf of Mexico, most rivers in north central Florida begin in the gently sloping highlands of Georgia and North Florida. From there they wander and loop south and west before crossing over an ancient feature known as the Cody Scarp, a prehistoric shoreline that now separates the higher elevations of the Northern Highlands from the lower Gulf Coastal Lowlands. While crossing the Cody Scarp, rivers "sink" below the earth's surface, disappearing into the limestone caverns of the Floridan Aquifer before they "rise" again in the Gulf Coastal Lowlands.

The Santa Fe is one such river. It sinks below the surface in O'Leno State Park and rises back to the surface three miles southwest of the sink, just outside the Town of High Springs. The three-mile interruption in the river — created by the sinking and rising water — provides a natural bridge over which man and animal have crossed for centuries.

The Suwannee is the only river in the region that does not rise and fall in relation to the Cody Scarp, although it may have done so in the past. Through time, this ancient river has eroded a 30-foot deep channel into the limestone formation between the Okefenokee Swamp in Georgia and the Gulf of Mexico.

## ...AND THE SPRINGS THEREIN...

**O**ften crystal blue, but sometimes the color of tea, North Florida's natural springs are always a wonder. Springs occur when water pressure causes a natural flow of groundwater onto the earth's surface. As rain filters down into the Floridan aquifer system, natural acids in the rainwater slowly dissolve the aquifer's limestone. This can create large cracks, cavities and tunnels through which groundwater flows.

As rainwater enters or "recharges" the aquifer, pressure is placed on the water already there. This pressure moves water through the aquifer through cracks and tunnels, and sometimes this water flows out naturally to the surface at places called springs.

When the openings are large, spring flow may become the source of rivers such as the Ichetucknee. Other springs, such as the Manatee, Fanning, Troy, and Madison Blue contribute nearly 368 million gallons per day to the Suwannee River.

When rivers flood, the pressure created by rising floodwaters causes many springs to reverse flow. Falmouth Spring in Suwannee County is one spring which does this regularly.

Springs tell us a lot about current hydrologic trends and human impacts on our water supplies. Low spring flow may indicate drought conditions, or it may signal excessive groundwater withdrawals.

## CAVE COUNTRY

**T**he Suwannee River valley is known to divers and spelunkers around the world as "Cave Country." The region's warm climate, clear, refreshing springs and spectacular cave systems make it one of the world's premier destinations for underwater explorers. Nearly 100 miles of underwater cave systems have been mapped by volunteer divers since the first Florida cave divers explored Silver Springs in 1953.

Expansive tunnels and cavities ("rooms") in the underground limestone aquifer may be as tall as a 10-story building and hundreds of yards across. Connected by systems of long, adjoining passageways, these rooms often are large enough for scuba divers to swim through, or to drive DPVs (driver propulsion vehicles) through.

Divers enter the underwater caves through spring heads, sinkholes, and on rare occasions, through "swallow holes" or siphons. These openings are easily accessible to divers because many are located on public lands, within navigable waterways, or in privately owned commercial parks that encourage cave diving.

*\*Note: Proof of certification by a recognized training agency such as the National Association for Cave Diving or the National Speleological Society's Cave Diving Section is required for access to all cave sites.*

## KARST TOPOGRAPHY

**D**eep below the ground in Florida lies a layer of porous limestone or dolostone known as the Floridan Aquifer. This aquifer is the primary source of Florida's drinking water. It is one of the largest aquifers in the United States, extending across Florida and through parts of Georgia, Alabama and South Carolina. Above and below the aquifer are other layers of gravel, sand, clay, dolomite or limestone.

In some places, the Floridan Aquifer's limestone layers are thousands of feet thick; in others, the layers are shallow. Water is able to flow through the limestone's many interconnected holes and empty spaces. The result is a unique and complex terrain that scientists call "karst" topography — land whose shape is influenced by the dissolving of underground limestone layers.

**F**lorida has one of the largest concentrations of freshwater springs in the world (nearly 600), and almost half of those are found within the Suwannee Basin.

Sixty-five million gallons of water per day flow from each of North Florida's 21 first magnitude springs because they discharge an average of 100 cubic feet or more water per second. Springs are classified using a discharge system devised by the United States Geological Survey in 1927.

**First-magnitude springs discharge** 64 million gallons of water or more per day — or 100 cubic feet per second

**Second-magnitude springs discharge** between 6.4 and 64 million gallons of water per day — or between 10 and 100 cubic feet per second

**Third-magnitude springs discharge** between 0.64 and 6.4 million gallons of water per day — or between 1 and 10 cubic feet per second





# IN THE WATER

**E**elgrass and strap-leaf sag are among the submerged plants that form dense beds in the sandy bottoms of Florida's springs and spring-fed streams. Their tough, strap-like leaves can withstand strong currents. Dense carpets of water moss — which have no true leaves, flowers or roots — also grow on hard surfaces in areas of flow. Thriving in areas with less flow are the more highly branched water milfoil, and musk grass, an alga with a strong, garlic odor.

# Spring Towns

## The Town of Branford on the Suwannee River

**F**rom the high bluffs on the east bank of the Suwannee River, 10 miles upstream from where it joins the Santa Fe, flows a second-magnitude spring that has lured settlers from the early Timucuan Indians, pioneers and log sawyers, to modern-day farmers and cave divers from throughout the world.

First known as Rowlands Bluff, this dynamic spring town welcomed steamboats, ferries and cargo boats. After pioneer railroad tycoon Henry Plant brought the railroad to this port, residents changed its name in 1886 to "New Branford" in honor of Plant's hometown in Connecticut.

The town's 700 residents share the Branford Greenway recreational trail with strollers, rollerbladers and bicyclists. The five-mile paved trail begins at the downtown springs and ends at Little River Springs Recreation Area.

Restaurants nearby and in town feature gulf seafood and local "farm town" favorites. Accommodations include motels and vacation ranches. For more information, contact the Suwannee County Chamber of Commerce at (386) 362-3071.

## Troy Springs on the Suwannee River

**S**till visible at the bottom of the Troy spring run in the Suwannee River is the hull of the steamer ship Madison, a floating "general store" that long ago carried merchandise for settlers all up and down the river. The steambot was sunk in the run's crystal clear waters at the outbreak of the Civil War with the intent of reclaiming her after the war. Unfortunately, the valuable steamer was scavenged beyond repair for much needed equipment during the war.

A hamlet known as Old Troy was located near the springs and served as the Lafayette County seat during the early territorial period. In 1866, a mob of union deserters burned the town and the spring settlement was abandoned.

Today, Troy Springs is owned by the Florida Park Service and is a popular "swimming hole" for river boaters. For more information, call Ichetucknee Springs State Park at (386) 497-4690.

# THE SPRINGS OF THE SUWANNEE



MAP #	SPRING NAME	FEE	RECREATION AVAILABLE
1	White Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
2	Suwannee Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
3	Holton Creek Rise		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
4	Falmouth Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
5	Madison Blue	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
6	Anderson Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
7	Charles Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
8	Lafayette Blue	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
9	Peacock Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
10	Convict Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
11	Royal Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
12	Troy Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
13	Ruth Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
14	Little River Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
15	Branford Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
16	Ichetucknee Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
17	Poe Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
18	Gilchrist Blue	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
19	Ginnie Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
20	Guarato Springs		[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
21	Hart Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
22	Otter Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
23	Fanning Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]
24	Manatee Springs	■	[Icons: Fishing, Hiking, Camping, Canoeing, Picnic, Rentals, Concession, Boat Ramp, Restrooms, Dining, Snorkeling, Swimming]

# TREES

**C**ypress, maple, planer elm, buttonbush and swamp privet grow in the swamps fringing the springs or spring runs. Other trees found on spring banks near the water are the river birch and willow. The live oak, overcup oak, blue beech, and hickories grow higher up on the banks. Occasional seasonal flooding doesn't bother these trees. Native wild azaleas bloom on the high banks of the Suwannee and Santa Fe during spring. In the fall, swamp black gum trees turn color, adding splashes of bright red to the swamps.

## Suwannee Springs on the Suwannee River

**L**ocated on the Suwannee River 6 1/2 miles north of Live Oak, Suwannee Springs has been a part of the region's colorful history for centuries drawing Native Americans, pioneers, Seminole War soldiers and steamboat captains to the sulphurous waters that flow from this second-magnitude spring.

Today, the remains of the spring pool make the springs a popular swimming hole for locals and visitors alike.

A railroad extension line built during the Civil War from Live Oak to Dupont, Georgia, later carried hundreds of wealthy invalids to the hotels and cottages surrounding an elaborately constructed spring pool and facilities before the turn of the century.

Suwannee Springs are owned by the Suwannee River Water Management District and are located near the Spirit of the Suwannee River Music Park and Campground, which features nationally known concerts including the Blues Festival, Suwannee (Country Music) Jam, Cajun Nights and more. For more information, call (386) 364-1683.

# ANIMALS

**I**f you're quiet — and lucky — you may see a variety of wild animals. But remember: these are not pets, and if they feel threatened or cornered, they will bite or otherwise defend themselves. Deer, bobcat, raccoons and other animals come to springs for a cool drink. While canoeing, you may encounter beavers and their dams, or be followed by a curious river otter. If you are very lucky, you may see an endangered West Indian manatee.

# TURTLES

**F**reshwater turtles including the chicken turtle and sliders love to browse on lush plants that grow in springs and spring-fed rivers. The Suwannee cooter is a large sliders with a black shell and yellow stripes on its black head. It is found in Florida and in only a few other large southeastern rivers.

Poking around near the bottom or bank are small, brown mud turtles or "stinkjims," which may have a musky odor when removed from the water. You may recognize the alligator snapping turtle (largest freshwater turtle in North America) by its long, alligator-like tail and three rows of ridges along the back of its shell.

# AROUND THE SPRINGS

**S**pring banks can be very colorful, depending on the season. Spring and early summer bring bright yellow bur-marigolds. Appearing in late summer and fall are the bright red cardinal flower, buttonbush (with white 'pom-pom' flowers), and wild rice — a large grass that grows in a broad marsh fringing the Ichetucknee River. Springtime brings the spider lily, and breathtaking white flowers of the zephyr lily to floodplain swamps. Royal fern, Virginia chain fern, and shield fern flourish along the cool, shady spring banks and fringing swamps.

To learn more about North Florida springs, please visit: Suwannee River Water Management District: www.mysuwanneeriver.com FL Department of Environmental Protection: www.dep.state.fl.us/springs/



# FISH

**F**ish-watching is easy and fun in the clear water of springs. Look for striped mullet, Atlantic needlefish, hogchoker and gar. The Suwannee bass, found only in the Suwannee and Ochlockonee rivers, prefers stretches of river with a lot of spring inflow. Good-eatin' fish you might spot include largemouth bass, redear sunfish, black crappie and bluegill sunfish.

## The Town of High Springs on the Santa Fe River

**H**igh Springs has neither a high altitude nor natural springs to which its name may be traced. It was, however, once a boisterous phosphate mining town and important railroad hub where steam engines "refueled" by pumping water through wooden pipes from a large rainfall catch basin on the town's highest hill to the rail yard.

Steam engines don't roll through town anymore, but tobacco and peanuts remain important local crops for the town's estimated 3,500 residents. 'Outfitters' now provide outdoor adventures to canoeists, kayakers, cave divers, hikers, bicyclists and equestrians. Outside of town, you'll find the Santa Fe River and the Ichetucknee River, renowned for its summer tubing and canoeing opportunities. Hundreds of nearby springs and downtown historic walking tours are also popular.

First settled in 1846 at Crockett Springs 3 miles east of the present town, this frontier town of miners and small farmers used the railroad to develop the area as one of Florida's major agricultural centers by 1892, when it was incorporated as the Town of High Springs.

Town restaurants provide local 'farm town' favorites and unique cafes and tea rooms serve vegetarian cuisine and gourmet fare. Overnight accommodations include bed and breakfasts, renovated motels, and camping for tent campers and RVs. For more information, contact the High Springs Chamber of Commerce at (386) 454-3120.

## The Town of Fanning Springs on the Suwannee River

**F**ort Fanning was built by U.S. troops in 1836 during the Seminole War, on the high bluffs of the Suwannee River's east bank near two second-magnitude springs. Named for Col. Alexander C.W. Fanning, who served under Gen. Andrew Jackson, the strategically located fort later was used during the Civil War by Confederate troops who successfully sank a 90-foot Union gunboat with cannon fire near the mouth of the springs. Remains of the boat can still be seen by divers.

both Little and Big Fanning Springs, located within the Fanning Springs State Recreation Area. The springs also serve as a trailhead for the Nature Coast Greenway, spanning more than 30 miles from the Suwannee River to Cross City.

Historic restaurants in the area feature great gulf seafood and local 'southern style' favorites. Accommodations include motels, houseboats and camping for tent campers and RVs. For more information, contact the Greater Chiefland Area Chamber of Commerce at (352) 493-1849, or the Suwannee River Chamber of Commerce at (352) 542-7349.

The town that grew around the springs was incorporated in 1965 and is one of three Florida communities that lie within two counties (Levy and Gilchrist). Its 2,000 residents enjoy

## Ichetucknee Springs on the Santa Fe River

**T**he Ichetucknee River and springs are located near the town of Fort White in Columbia County. This magnificent springs system that once attracted Native Americans, as well as Spanish and European settlers, is one of the most popular tubing destinations in the world.

The Spanish explorer Hernando de Soto led an expedition through the area around 1539. In 1675, the Spanish built a mission on the banks of the river, and in the 1800s a grist mill was in operation. The springs also were a place of refreshment for dusty and thirsty travelers on the Bellamy Road, the first public

road to connect Pensacola and St. Augustine, completed in 1826. Named for a Native-American word meaning "beaver pond," the Ichetucknee is considered the crown jewel of Florida springs. In 1972, the head spring was declared a National Natural Landmark by the U.S. Department of the Interior. Soon after, the State of Florida acquired the springs as a state park.

Ichetucknee Springs State Park is open year-round. Tubes, snorkeling and diving gear can be rented from private vendors outside the park. A new education center is located at the park's south entrance. For more information contact the park at (386) 497-4690.

## The Town of White Springs on the Suwannee River

**T**he "white" springs on the upper Suwannee River are caused by sulphur deposits in the underground aquifer that sometimes make the spring's water appear "milky." For centuries, the springs have attracted Paleoindians, settlers and well-to-do tourists — all believing in the legendary "healing" properties of the mineral waters of this second-magnitude spring.

Outdoor enthusiasts are invited to enjoy cycling, hiking and horseback trails on some 5,000 acres of public lands surrounding the town, or challenge the "Big Shoal" rapids of the Suwannee River. Tours of the historic antebellum structures are popular, along with the nationally recognized folklife events at the Stephen Foster Folk Culture Center State Park.

A pioneer settlement developed near the springs which later became known to plantation and pioneer families as the "Rebel's Refuge" during the Civil War. In 1885, the town was incorporated with a thriving economy dependent on two things: the timber industry, and the mineral springs that prospered as an elite vacation destination.

Although fires destroyed most of the elaborate hotels in 1911, outdoor recreational opportunities still abound.

# BIRDS

**T**he great egret, great blue heron, tri-color heron, snowy egret and other wading birds can be seen at or near springs. Limpkins forage along the banks for their favorite meal of apple snails. In the water, double-crested cormorant and anhinga hunt for fish, and common moorhen or American coot forage for small invertebrates and aquatic plants along the marshy shorelines.

In nearby swamps, you may hear the fussing of a red-shouldered hawk or the booming call of the barred owl. You may also flush one or more wood ducks as you canoe quietly down river.