

The Suwannee River is a major Florida River, meandering some 235 miles from the Okefenokee swamp in Georgia to the Gulf of Mexico. 206 of these miles are in Florida.

There are three principal tributaries. The Alapaha and Withlacoochee Rivers drain large areas of southern Georgia and join the Suwannee northwest of Live Oak. The Santa Fe River drains an area of north Florida stretching from Santa Fe Lake east of Gainesville to its junction with the Suwannee below Branford.

The downward flow. The Suwannee averages about four miles per hour as it descends from an elevation of about 120 feet above sea level at the Okefenokee.

Transitions in geology create an *Upper*, *Middle*, and *Lower* Suwannee.

The *Upper* has steep banks, swift flow, and shoals. "Big Shoals," above the town of White Springs, is a rare Florida "whitewater". Tannic acid, derived from flatwoods and swamp vegetation, darkens the Upper Suwannee water and makes it acidic.

The *Middle* Suwannee, beginning near Luraville, is wider and flows more slowly. The banks are sandy, less steep, and reveal fewer limestone ledges and outcroppings. Many springs enter the river in this section, diluting the dark tea color of the water, reducing the acidity, and making a more favorable fish habitat.

Near Fanning Springs the *Lower* river widens, the banks diminish, and the current slows. A wide floodplain and a multitude of creeks and sloughs provide excellent fish habitat. As it nears the Gulf of Mexico, the river fans out into salt marshes and, through two main passes, into the Gulf. East Pass is deep and biologically rich; West Pass is important habitat for manatees and young Gulf Sturgeon and branches into McGriff Pass, a dredged waterway created to handle the major boat traffic in and out of the Suwannee.

The estuary (where the fresh water of the river blends with the salt water of the Gulf) is shallow and is extremely important habitat for young and adult finfish and shellfish. The saltiness of the Gulf seldom works its way upriver more than 3-4 miles; but the Gulf tides do influence daily river levels up to Fanning Springs, and, at rare periods of low flow, as high as Rock Bluff.

Hydrogeology of the basin. Aside from the river valleys themselves, there is one pronounced geological feature of the Suwannee Basin: the Cody Scarp. This escarpment marks a break between the "Northern Highlands" and the "Gulf Coastal Lowlands". It snakes down from the Georgia border east of the Withlacoochee, winds along a line curving below Lake City; and then it loops up to join the southern end of the Trail Ridge in Bradford County.

The Highlands have an elevation of 100 to 230 feet above mean sea level. Thick clay formations (the Hawthorn formation) cover and "confine" the limestone housing the deep Floridan aquifer. This clay provides a relatively impermeable layer so that lakes; ponds; streams; and a secondary, near-surface aquifer are found in the Highlands. The clay vanishes along the edge of the scarp; land surface drops from 20 to 85 feet in less than a mile; and many rivers and streams disappear into the porous limestone, joining the ground water, perhaps to emerge at a spring downstream. The Alapaha and Santa Fe Rivers are distinctive in that they reappear after flowing underground in limestone caverns and conduits for several miles. The Suwannee River crosses the scarp without disappearing because, as the steep banks of the upper river show, it has already cut through the Hawthorn clay to run along the limestone aquifer.

The Gulf Coastal Lowlands range in elevation from about 100 feet to sealevel. Except for places such as Waccasassa Flats where a shallow hard pan holds water, the creeks and ponds of the

Lowlands are at the water table of the Floridan aquifer. The Suwannee River, which has cut through to sea level by the time it reaches the confluence with the Santa Fe River, runs along the exposed aquifer and receives water from springs and groundwater. Thus, surface water, groundwater, springs, and the river are all tightly interrelated in the Middle and Lower Suwannee regions.



Springs. There are 62 springs in the river floodplain. They contribute, on average, 1/4 of the flow of the Suwannee River. Spring water is clear water, with constant temperature and low acidity, which has been pushed from the aquifer through cracks, crevices, conduits and caves by the pressure of new water entering. At times of high river flow, the dark river water may push back into a spring and into connecting underground caves. A falling river will, in turn, allow the spring pressure to force out the dark water and turn the spring clear once more.

Some of the springs in the Upper river contain sulfur and enjoyed a period of fame as health resorts. The Spring House at White Springs and the wall at Suwannee Springs are historic remains of those times.

High volume springs, reliably producing at least 65 million gallons per day, are classified as First Magnitude. The nine in the Suwannee region are: Ichetucknee, Holton, Alapaha Rise, Falmouth, Troy, Fanning, Manatee, Blue on the

Withlacoochee, and the Wacissa Group in Jefferson County.

Flooding. People who choose to live in the flood plain have to be optimists; the reality is that rivers do flood. Survivors love to tell how it really was: The snakes were driven from their burrows, fire ants floated in huge balls that no person should have the misfortune of coming into contact with, docks and houses were destroyed, roads were underwater -- and it lasted so long!

Floods are essential to a functioning river system. To change a river through artificial flood control can do untold damage to the natural environment, to commercial fishing, to recreation, and to the water supply feeding agricultural, industrial, and domestic consumption. The Suwannee River Water Management District has adopted a wise strategy to deal with flooding. Rather than encourage development where it should not be by constructing dams, levees, canals, and other structures for flood control, the District maintains the natural flood control system of low floodplains and wetlands by severely limiting the amount of building in the floodplain and by acquiring floodplain acreage for preservation. In this way, high water absorption is maximized, and property destruction is minimized. Preservation of low areas maintains flood tolerant vegetation which help convert water to atmospheric vapor as well as provide important habitat.

Significant Suwannee River floods have occurred in 1948, 1973, 1984, and 1986. Flood waters have reached 17 feet above normal at Fanning Springs; at White Springs 40 feet above normal has been observed. Markers indicating historical flood levels are placed as reminders at various parks such as Stephen Foster and Hart Springs. Flooding often comes in late winter/early spring when cold fronts can bring heavy rain to the Suwannee Basin and the

vegetation is still relatively dormant, not utilizing the water as it does at the height of the growing season. Heavy rains can also come to the basin during hurricanes, dropping tremendous quantities of water so quickly as to overwhelm the natural containment features.



Water Quality. The Suwannee is one of the few major rivers in America that have suffered little destruction from damming, channeling, re-direction, or the introduction of overwhelming quantities of contaminants. However, over the years, some deterioration has occurred. In 1960 a dam was built below the Okefenokee to hold water in the swamp for fire protection. Swamp vegetation has been altered as a result and the dam is not performing as designed, so it might soon be removed or redesigned.

From the earliest settlement by European-Americans, the watershed has been affected. Extensive logging and the turpentine industry altered drainage. Phosphate mining above and below White Springs has added pollutants. A package paper plant in Georgia discharges to the Withlacoochee. The City of White Springs sewage treatment plant effluent flows to the river, but plans are in the works to eliminate that. A poultry processing plant near Live Oak has fed effluent to the river for years. Large dairy and poultry farms have contributed nitrates to the

groundwater as have intensively fertilized row crops and improved pastures. The nitrates leach into the groundwater and ultimately flow to the springs and river, artificially stimulating plant growth and diminishing oxygen. Equally significant, human waste, deposited in cesspits and septic tanks, sends pollutants into the groundwater, and then to the river. The shellfish beds in the estuary have been contaminated -- shutting down an important industry in the local economy.

So, although researchers still report overall good water quality in the Suwannee, there are causes for concern. The concern has led to stringent restrictions on septic tanks in the floodplain, the construction of a sewage system for the town of Suwannee, sewage system proposals for the cities of White Springs and Fanning Springs, a public program to install improved animal waste management facilities at dairies and poultry operations, and testing for precise fertilizer needs for various crops. No one can deny that more people, more industry, more animals, more fertilizer, and more power boating will adversely affect the quality of the Suwannee. Active measures must be taken to deal with the destructive by-products of continued growth.

Water Quantity. The abundance of water in the Suwannee Basin has created envy in other parts of the state. But, in the Basin itself, more people, more wells, larger wells, and ever more intensive agriculture result in constantly increasing withdrawals. There is a finite amount of water readily available, and lowered water tables affect wells and natural systems alike. As an example, two of the historically most significant springs, at Suwannee River State Park and at White Springs, virtually dry up part of the year. With continued increases in water consumption, the flow of springs could be permanently reduced. This has happened elsewhere in Florida: The flow at

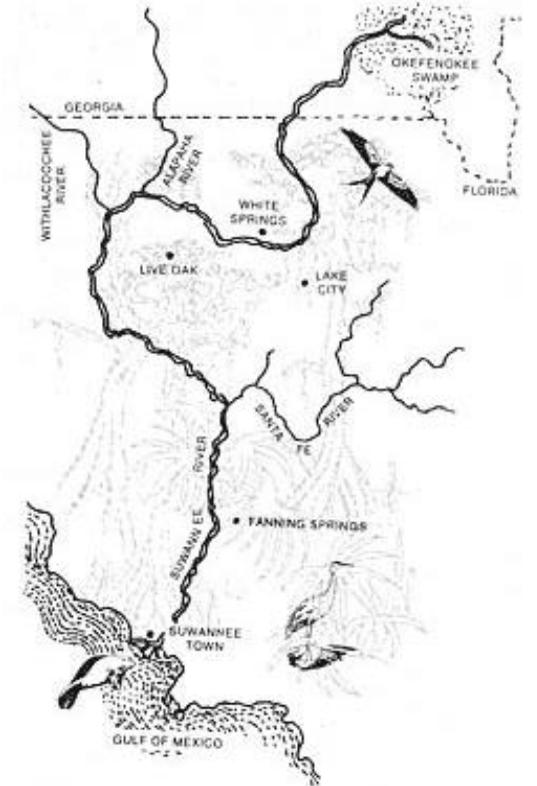
Homosassa Springs has diminished an estimated 50%. Kissengen Springs, near Bartow in Polk County, was a vacation resort noted for its first magnitude mineral spring until it went dry around 1950 when wells were drilled nearby to supply phosphate mining.

A major cause for concern is the envious look northward from the water-exhausted Tampa Bay area. In recent years, the cities there have reached out into adjoining counties to locate well-fields, with some devastating effects on lakes, wells, and cypress wetlands. Since the 1960's the Suwannee River has been on the list of possible new sources. We, of Save Our Suwannee, believe the facts are that the estuary requires that fresh water and that a reduced flow will affect the natural systems and water wells from the top of the Suwannee to the Gulf.



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