



Florida's Springs: A Personal Journey



**WATER INSTITUTE
SYMPOSIUM**



February 2024

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Tubing the Ichetucknee River



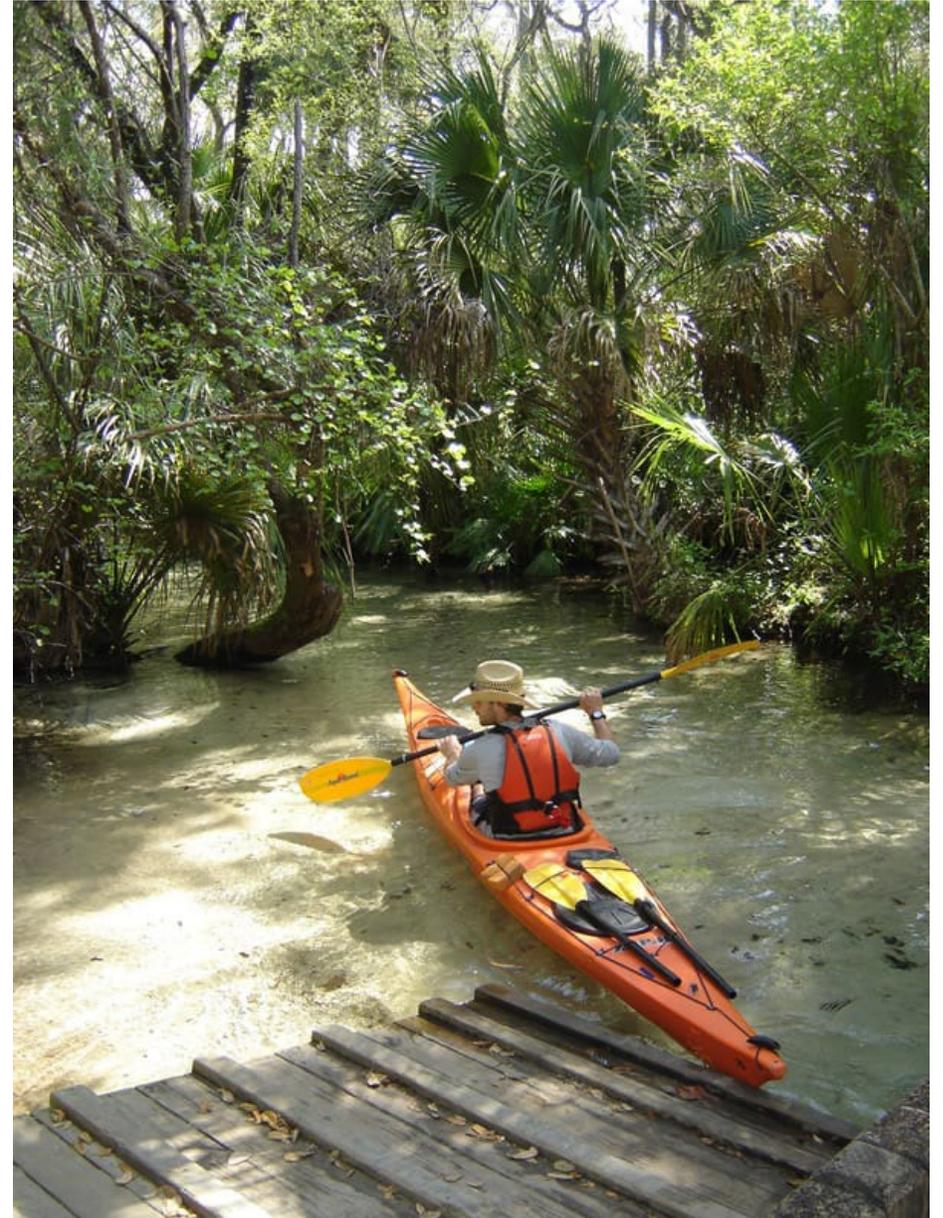
Ichetucknee Springs & River

Poe Springs



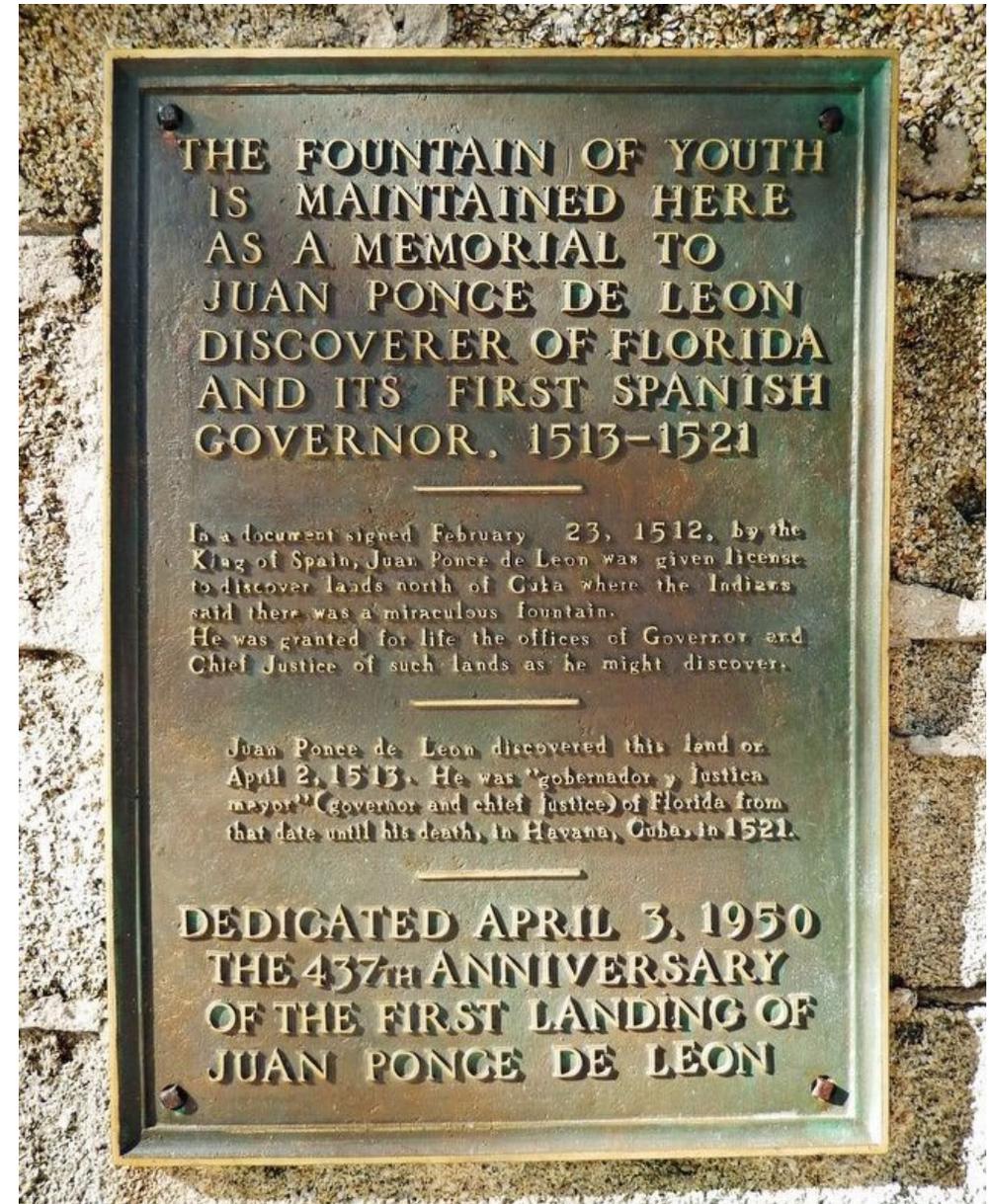


Juniper Springs
and run

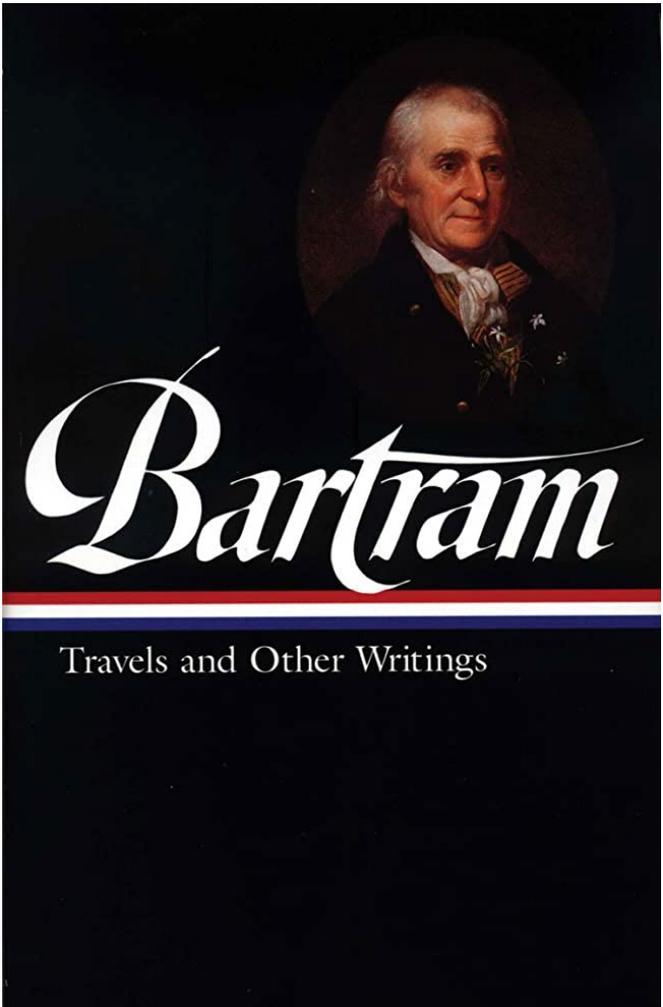
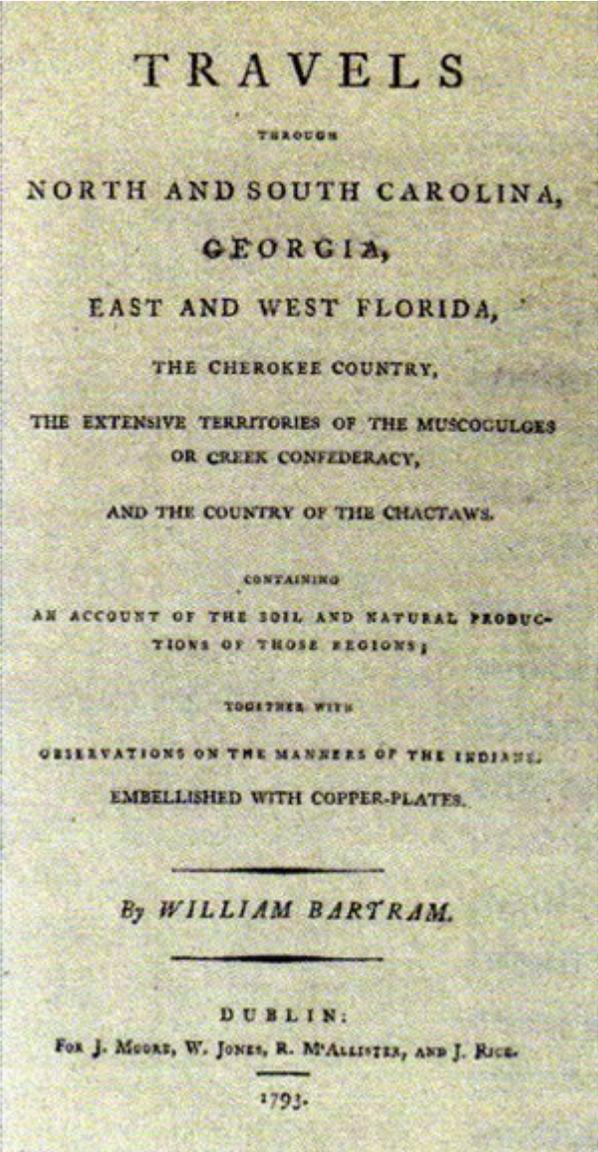
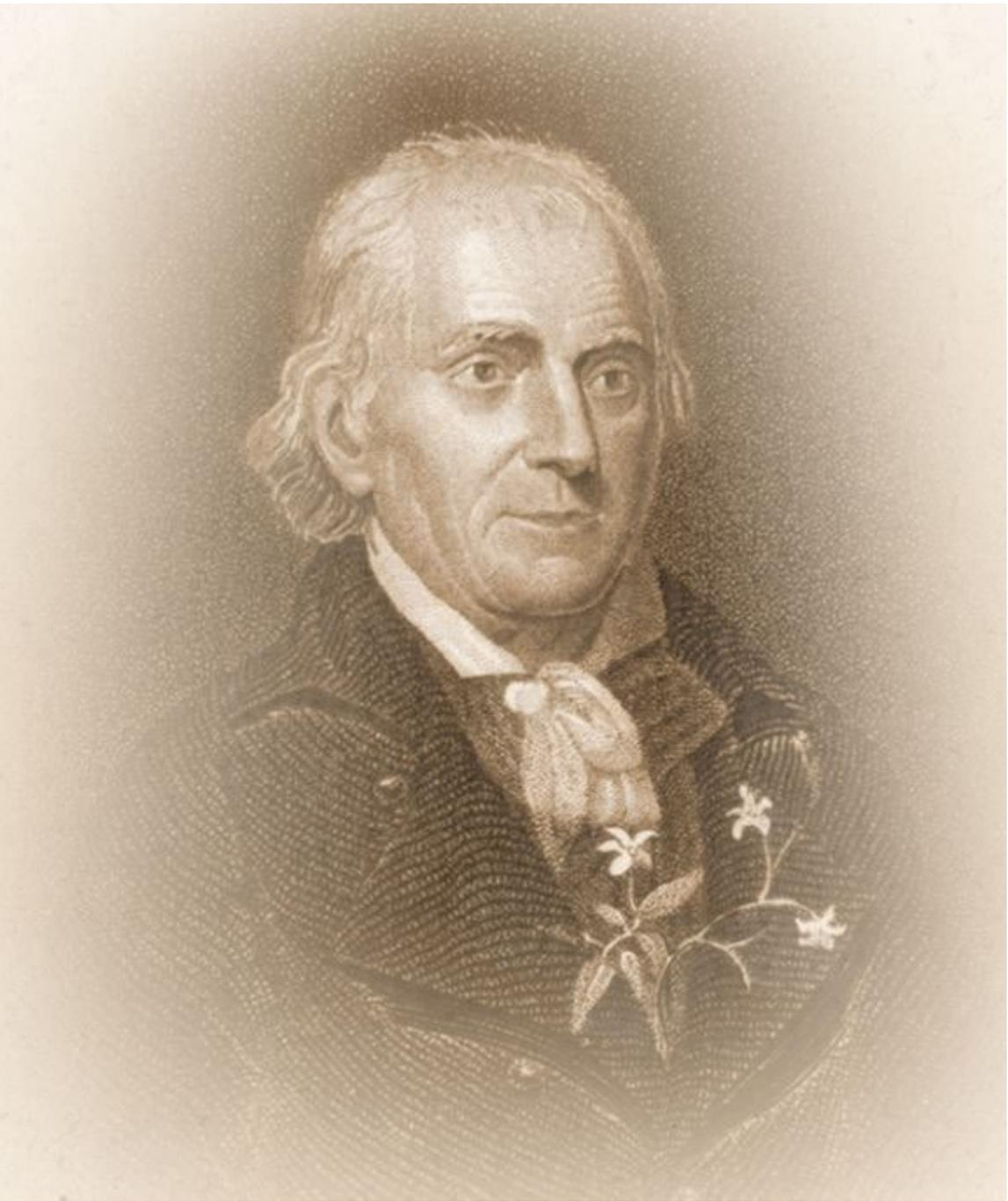




Juan Ponce de Leon and the mythology of the Fountain of Youth



William Bartram 1739-1823

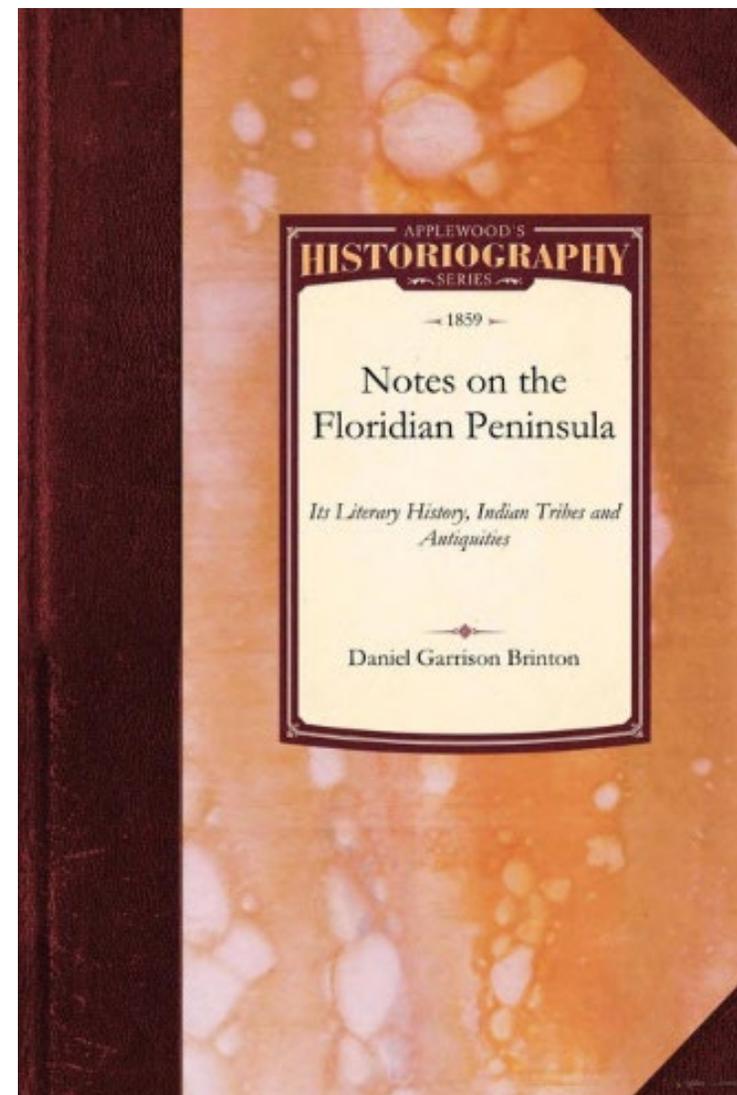




Volusia Blue Spring



Daniel Brinton 1837-1899



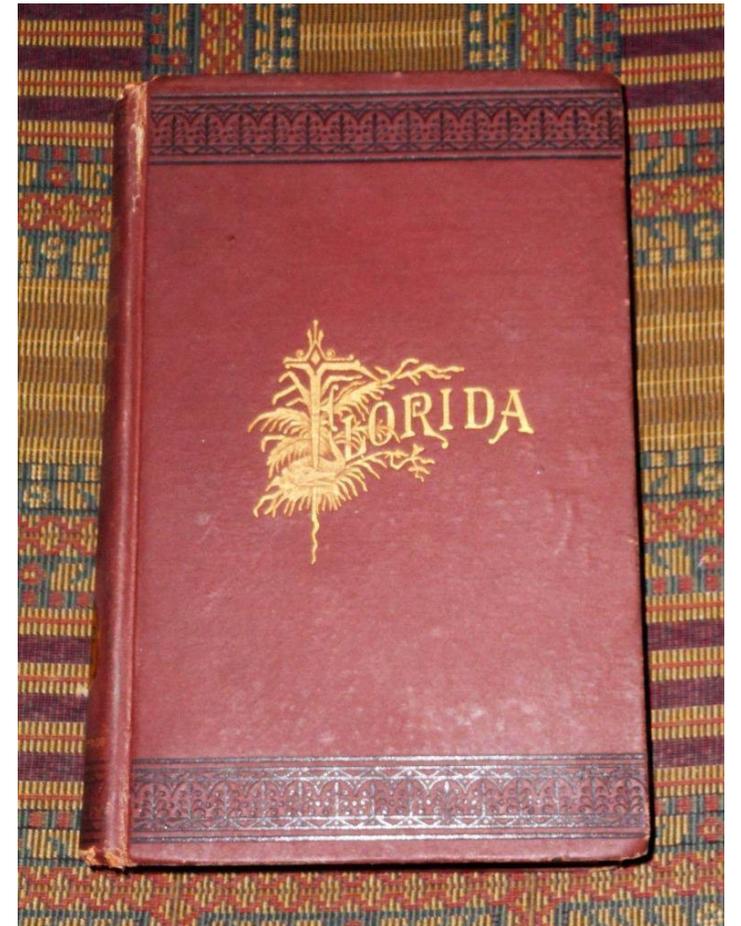
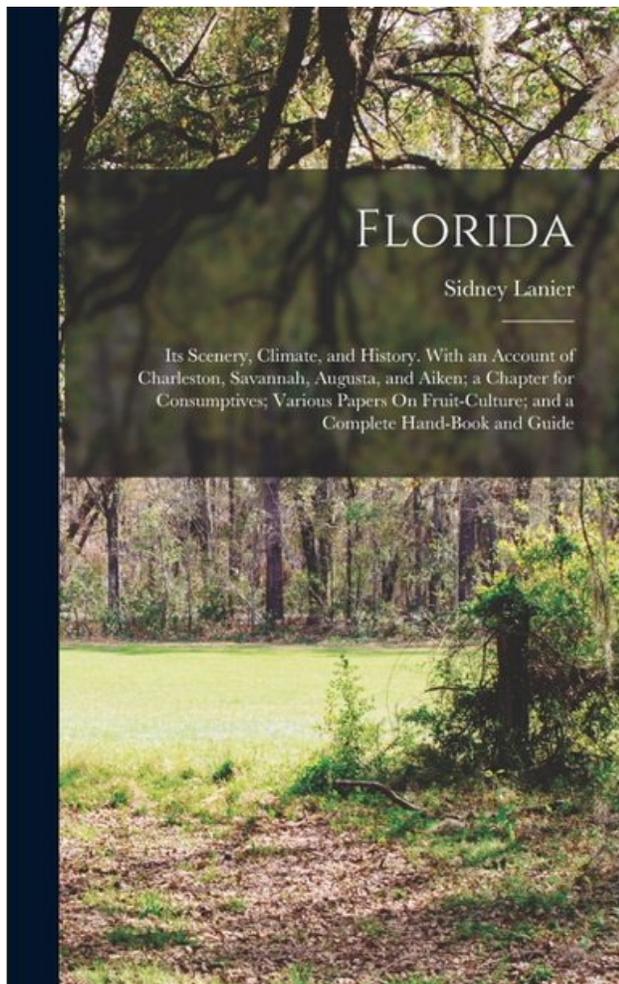


Wakulla Springs

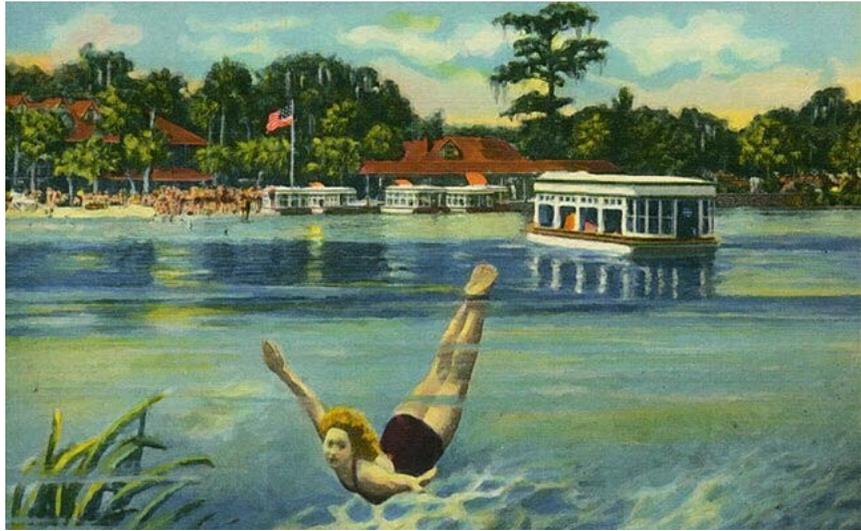


Manatee Springs





Sidney Lanier 1842-1881



Silver Springs



HOWARD T. ODUM



1924, Chapel Hill, North Carolina

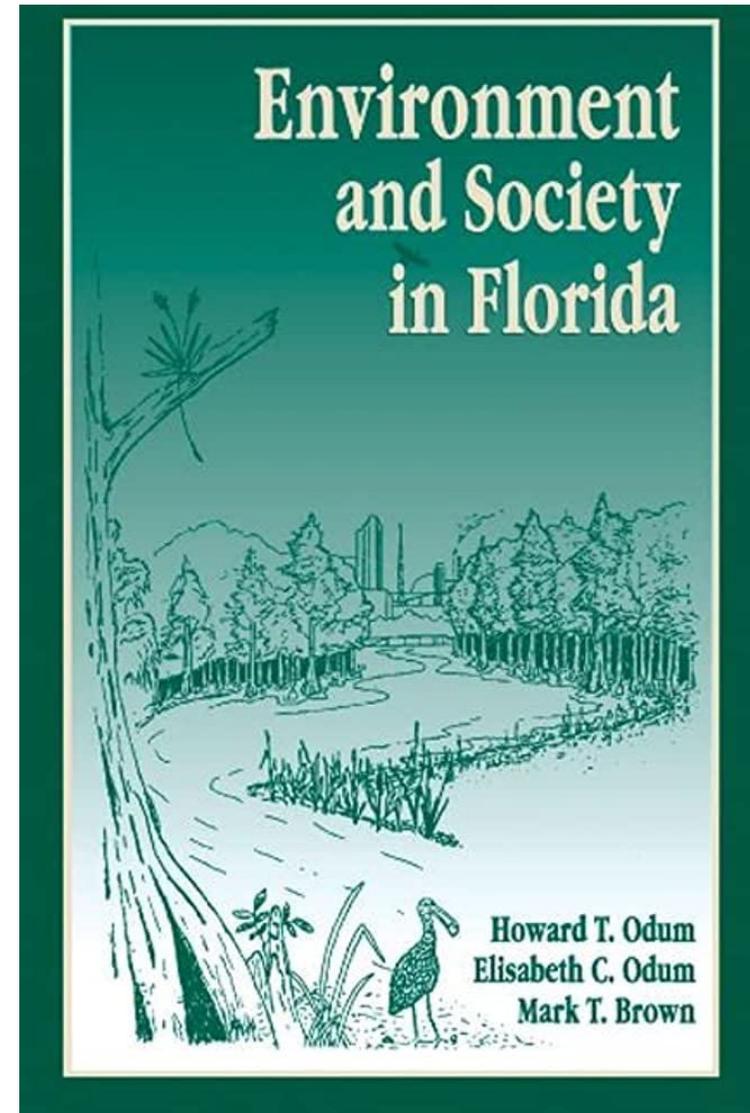
2002, Gainesville, Florida

“As sometimes attributed to past cultures, people may again find glory in being an agent of the earth”

Odum was a scientist, teacher, an agent of the earth, and an Integral permaculturist

“If the bewildering complexity of human knowledge developed in the 20th century is to be retained and well used, unifying concepts are needed to consolidate the understanding of systems of many kinds and to simplify the teaching of general principles”

Howard (HT) Odum 1924-2002





1894



2023



Kissengen Spring

Palma Ceia Spring

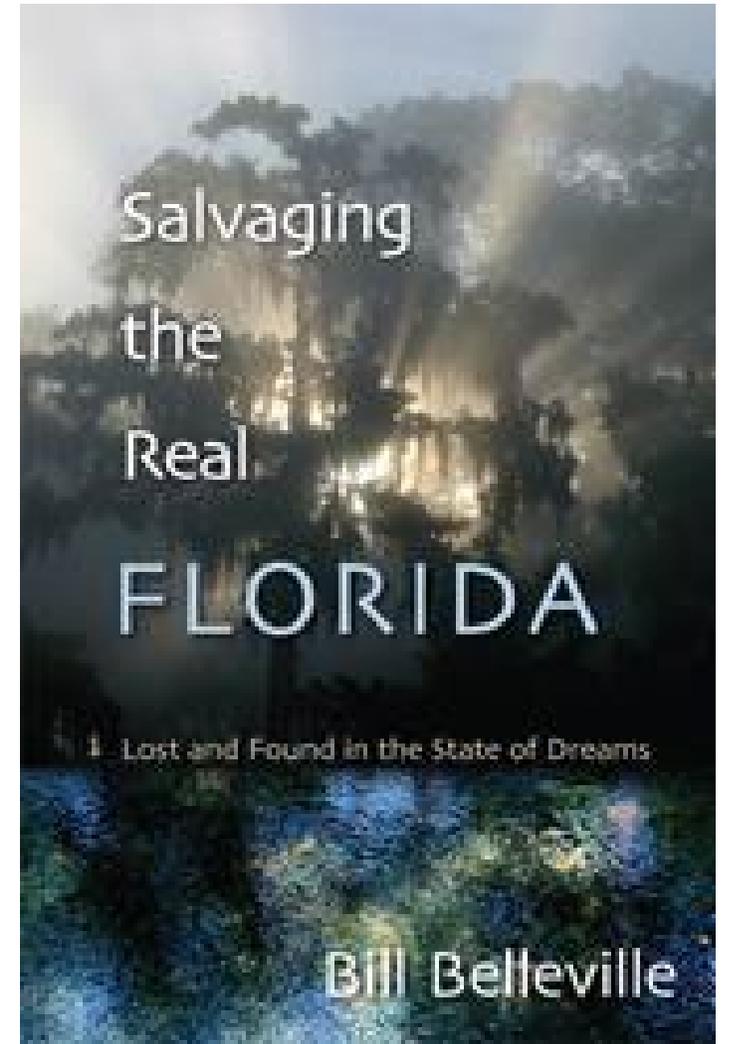


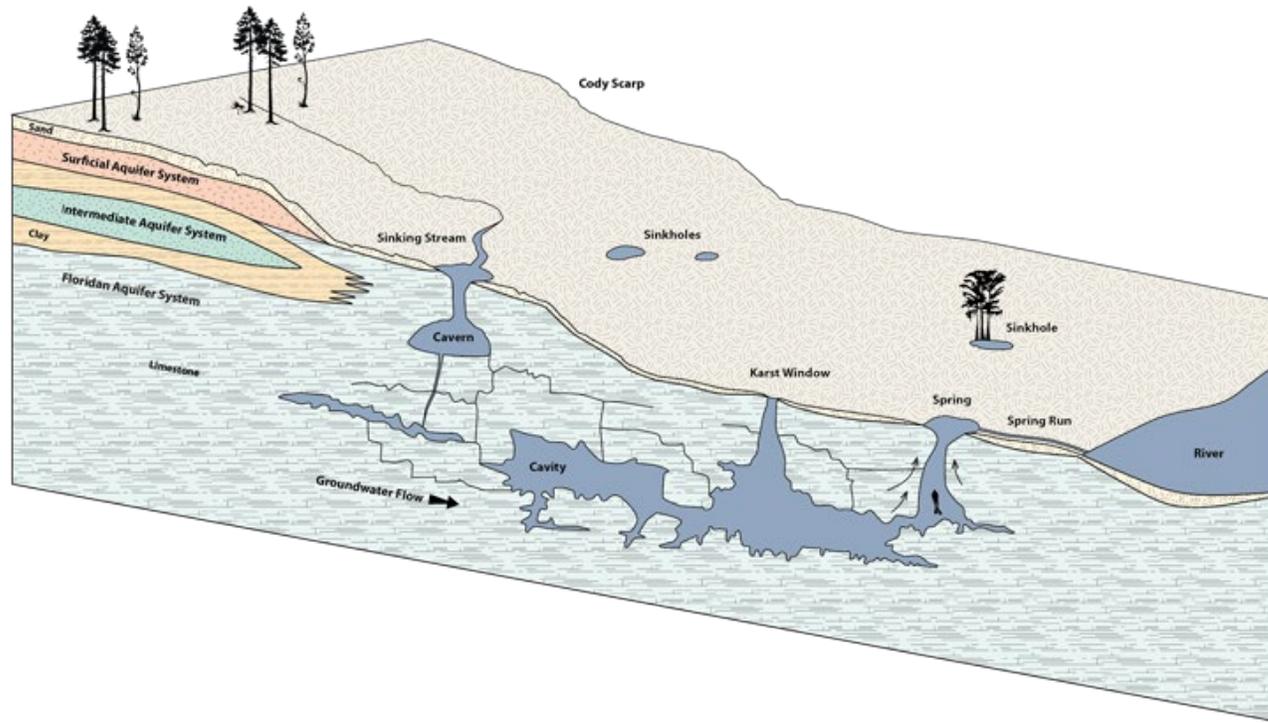
Tampa used to be dotted by springs. Many have dried up or been paved over. Palma Ceia Spring has a small presence today in Fred Ball Park.



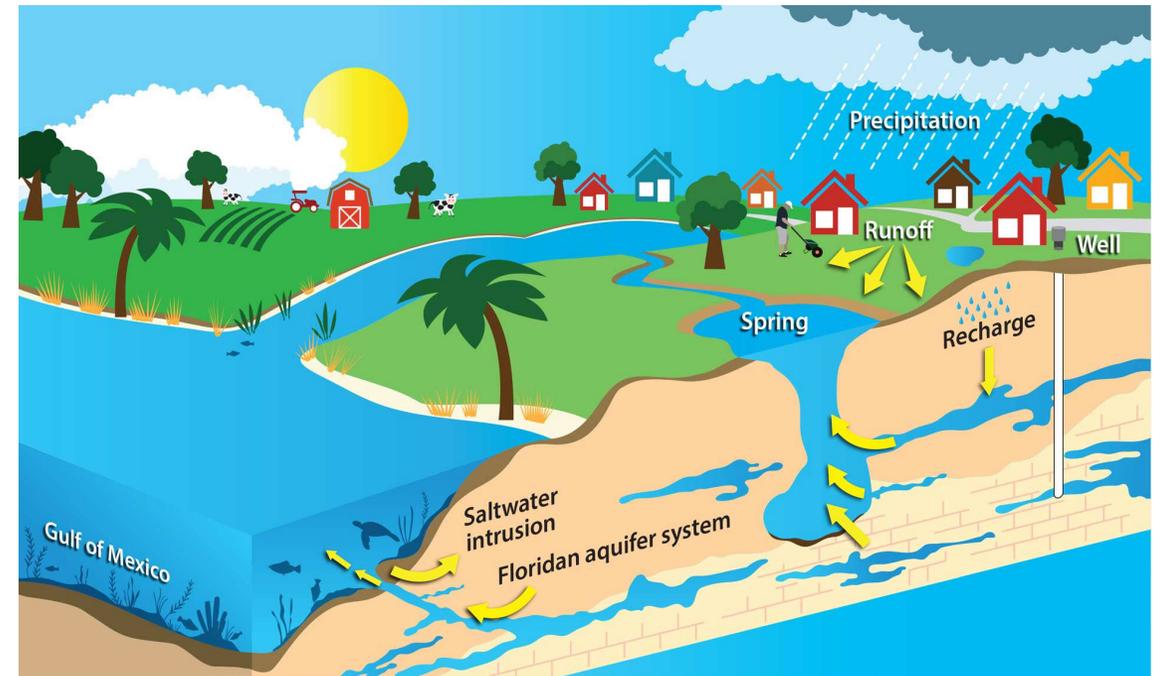
Bill Belleville 1945- 2020

“The Florida I have inside me is the Florida Bartram wrote about,” Belleville once said. “It’s mysterious and enchanting.”





What is a spring?



Florida's First Magnitude SPRINGSHEDS

Recharge from above
On the horizon you see a cloud formation and rainfall. Rainwater is the source of the water that recharges Florida's aquifers. Most of the rainwater, however, is absorbed into the atmosphere via evaporation or plants and does not evaporate. Recharge to the aquifer can vary with the contaminants that various land uses have introduced to the natural system.

Water beneath our feet
A typical package cross section of the Florida aquifer system is shown on the bottom left side of the poster. Where clay and other fine sediments collect the downward percolation of water as shown in cross section, the aquifer is said to be confined. Where a highly permeable, thin layer of sand or fine limestone, sandstones are covered and the ground water within a few feet of land surface. This setting is referred to as unconfined and here water percolates rapidly and directly into the aquifer. Most of our springs occur where the Florida aquifer system is unconfined and is extremely vulnerable to contamination. Both the conduits and cave systems that have developed in the unconfined aquifer. These features seasonal and boundaries of water quality to our springs.

What are Springsheds?
The ecology of many of Florida's springs and their spring runs are changing rapidly due to declining groundwater quality and quantity. Excess nutrients, primarily nitrate and phosphate, are changing natural resources and responsible for undesirable "toxic" and restore these spring natural resources an understanding of springsheds is vital. With this understanding, locally county commissioners and citizens can make land use choices that will allow us to protect and restore springs.

Accurate Mapping
A land surface trace of the cave system leading to the spring is shown. Cave diver surveys and radiocarbon techniques have allowed accurate mapping of these cave systems. Some caves as which divers cannot penetrate and being tracked by springs by the use of dye tracing.

Purpose
The Florida's First Magnitude Springshed project was created as a governmental decision makers (e.g. county commissioners, topographic and local land use planning personnel) and citizens of the importance of appropriate land use planning. We must realize that recharge will become water that contaminates. Additionally these springshed maps are an effective way that can be further refined as continued research leads to better understanding of these dynamic systems.

Interesting Interaction
In Florida's spring runs and streams that directly into the aquifer and become part of the groundwater flow system. Thus, surface waters can contribute to the flow of springs even when water enters the ground far from the spring.

Scientist's define springsheds as those "areas of surface water and groundwater that contribute to the discharge of the spring," length of 1 to 10 miles in length. The head of each and central Florida contains the highest of springsheds for most, not all of our first magnitude springs.

First magnitude springs discharge more than 100 million gallons per day or 100 cubic feet of water per second. This is nearly 45,000 gallons per second. It is surprising to observe such an enormous amount of low groundwater push out onto the land.

USGS

Jackson Blue
Jackson County

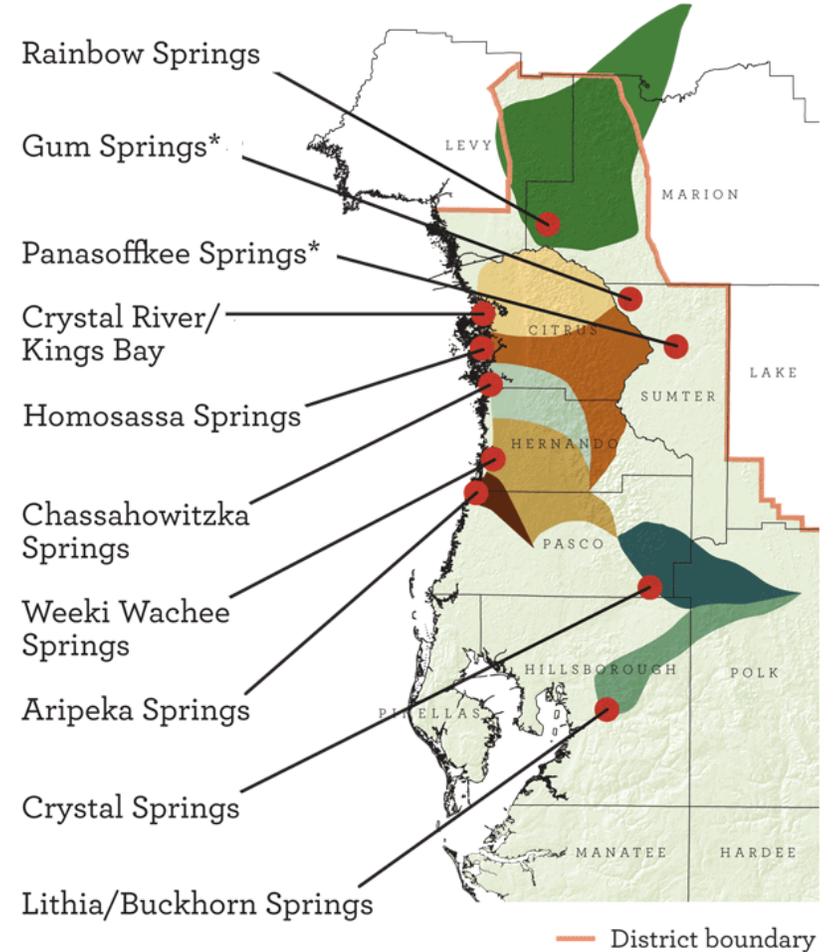
Lichenshake Head Spring
Collier County

Homosassa Spring
Citrus County

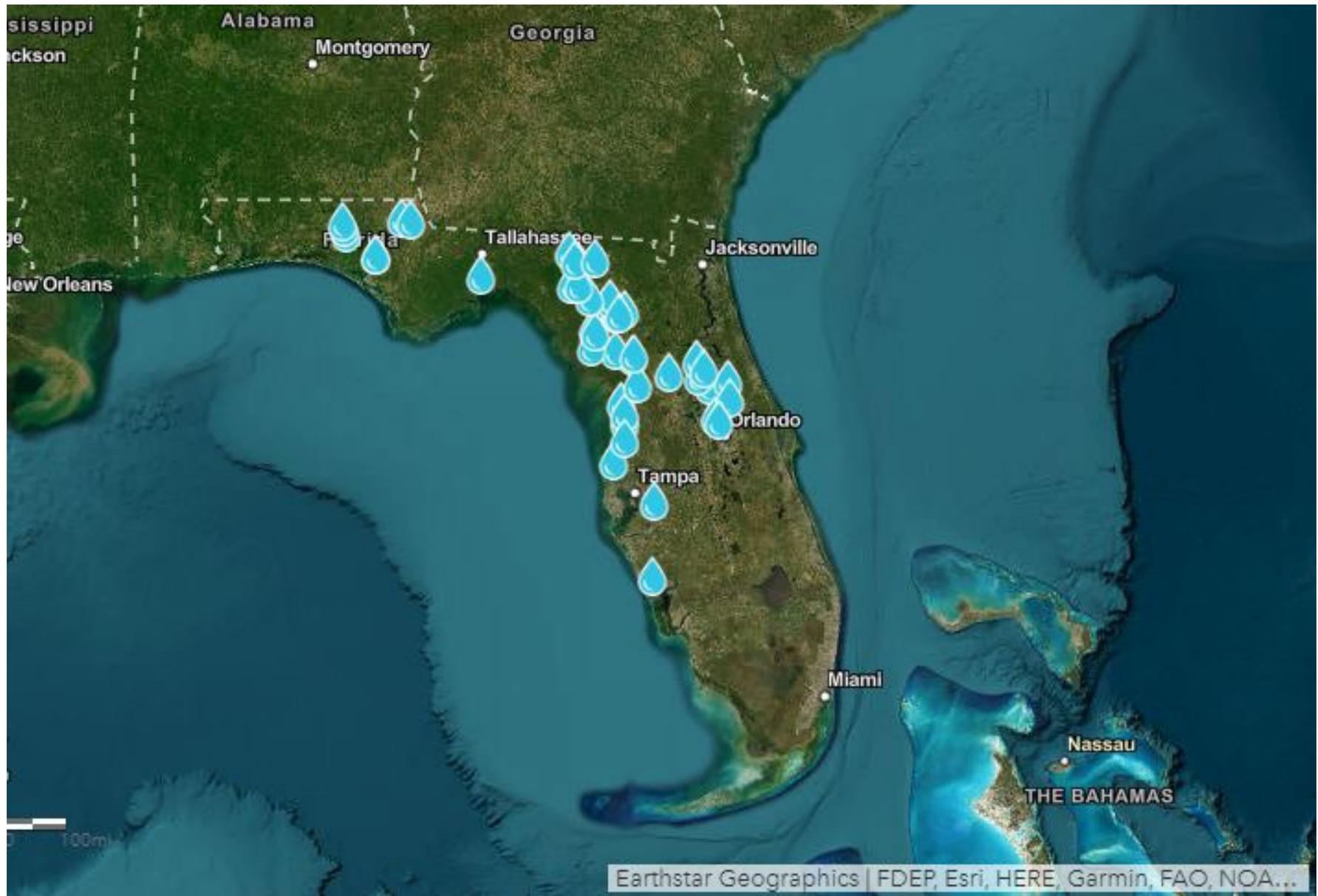
Silver Springs
Marion County

What is a springshed?

Generalized Springshed Boundaries of Major Springs



*The springsheds for the Gum Springs and Panasoffkee Springs groups have not yet been determined.



Freshwater Stewardship

We're working to achieve healthy and sustainable waters across the Sunshine State.



Support water recycling: Encourage "potable reuse" to reduce the 830 million gallons per day of precious water that are currently wasted.

Reduce impacts of development: Inspire low-impact development, including use of nature and green stormwater infrastructure, use of best management practices for water, and irrigation-free landscaping.



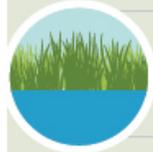
Encourage transition from septic to sewer: Reduce discharges from septic tanks into our groundwater.

Guide integrated water planning for cities, using nature based solutions: Influence stormwater solutions, public water supply, comprehensive municipal water planning.



Partner with farmers: Share best management practices for fertilizer and water use to increase crop yields and benefit water conservation. Implement the 4Rs: Right fertilizer, right rate, right time, right place.

Implement wetland conservation: Reinvigorate natural systems and water flow.



Safeguard the Everglades and Lake Okeechobee: Support efforts that protect the liquid heart of the state—which needs healthy waters in just the right amounts—to benefit this iconic natural system.

Strengthen the health of springs: Financially support impactful projects.



Advocate for federal and state legislation: Support funding of water initiatives.

Keep freshwater habitats healthy: Protect our watersheds, estuaries, rivers, lakes, and wetlands.



Threats to Springs

The springs in our region are unique, complex systems that have been changing for nearly a century and it will take time to restore them.



The challenges facing these springs are:

- Increases in nutrients like nitrogen and phosphorus due to development, excessive fertilizer use, wastewater treatment plant discharges and failing septic tanks
- Habitat loss from invasive aquatic plant and algae species as well as from development, sea walls and canals
- Reductions in discharge due to a steady decline in rainfall since the 1960s
- Increases in salinity due to spring flow declines and sea-level rise

The 3 Ps

Pumping
Pollution
People

flow reductions

nitrate pollution

excessive recreation



**Of the 30 Outstanding Florida Springs,
24 are considered impaired by nitrate pollution.**

Chassahowitzka Springs Group
Crystal River
DeLeon Spring
Devil's Ear Spring
Falmouth Spring
Fanning Springs
Gemini Springs
Homasassa Spring Group
Hornsby Spring
Ichetucknee Spring Group
Jackson Blue Spring
Lafayette Blue Spring
Madison Blue Spring
Manatee Spring
Peacock Springs
Rainbow Spring Group

Rock Springs
Silver Springs
Troy Spring
Volusia Blue Spring
Wacissa Spring Group
Wakulla Spring
Weeki Wachee Springs Group
Wekiwa Spring

*Alexander Spring
*Columbia Spring
*Gainer Spring Group
*Poe Spring
*Silver Glen Springs
*Treehouse Spring

The 6 springs that are meeting water quality standards are starred. Recent data from the Florida Springs Institute suggests that Poe Spring now exceeds required water quality levels for nitrates

Nitrogen-Reducing Systems for Areas Affected by the Florida Springs and Aquifer Protection Act (updated May 2021)

The "Florida Springs and Aquifer Protection Act", passed during the 2016 legislative session, directed the Department of Environmental Protection (DEP) to develop restoration plans, known as Basin Management Action Plans (BMAPs). Under these plans, new septic systems on lots of less than one acre and located in some sensitive springs areas (Priority Focus Areas, or PFAs) are required to be nitrogen-reducing. New conventional systems are no longer permitted in these areas except when a sewer will be available within five years. For more information about DEP's BMAPs, go to [Protecting Florida Springs](#).

Which new septic system permits are affected?

New septic system construction permits issued after the date BMAPs become effective on lots less than one acre and located in a PFA require nitrogen-reduction. For information on what is considered a "new" system, please see [Memorandum DCEH 19-004](#).

Wachee Sample (T2211920)

Analytical Results

Lab ID: T2211920001
Sample ID: Weeki Wachee Water Sample

Date Collected
Date Received

Parameter	Results	Units
WET CHEMISTRY (SM 4500NO3-F)		
Nitrate (as N)	0.8	mg/L

Testing conducted by Advanced Environmental Laboratories in Tampa in 2021 found the level of nitrates in Weeki Wachee Spring came back more than twice the level of DEP standards.



Problems with Overpumping

- "Florida Springs Institute estimates that spring flows have decreased by 30% to 40% statewide."
- 33% of the loss of flow at Ginnie Springs is from bottling
- "When the bottled water plant's operation is ramped up to pump the full permitted amount, this one water use will reduce spring flow by nearly 4%"
- "Overpumping has also made our aquifers susceptible to saltwater intrusion, increased the potential for sinkholes and damaged our wetlands." - Haskell, 2015, Tampa Bay Times

0 CALORIES PER BOTTLE

16.9 FL. OZ.
500 mL

Good Food, Good Life



Nestlé®

Good to talk
nestlesplash.com
☎ 1-844-577-5274

CONTAINS NO...
Nutrition Fa...
Calories 0. Total %...
Not a significant...
vitamin C...

INGREDIENTS:
POTASSIUM...
SUCRALOSE...

WARNING:
CHOKING...

NUTRITIONAL COMPASS®





Ginnie Springs

**We can't let Nestlé
drain this...**

for these.

Take Action ▶

WATER
FOR LIFE **NOT PROFIT**
NO TO NESTLE
www.oursantaferiver.org

“Spring water is a rapidly renewable resource when managed correctly. Nestlé Waters North America is committed to the highest level of sustainable spring water management at all of the springs we manage... We have worked to be a good neighbor in Florida for decades. Our commitment goes beyond just caring about the water. We value our relationships with Florida residents and community leaders, and always strive to create shared value within the communities where we operate.”

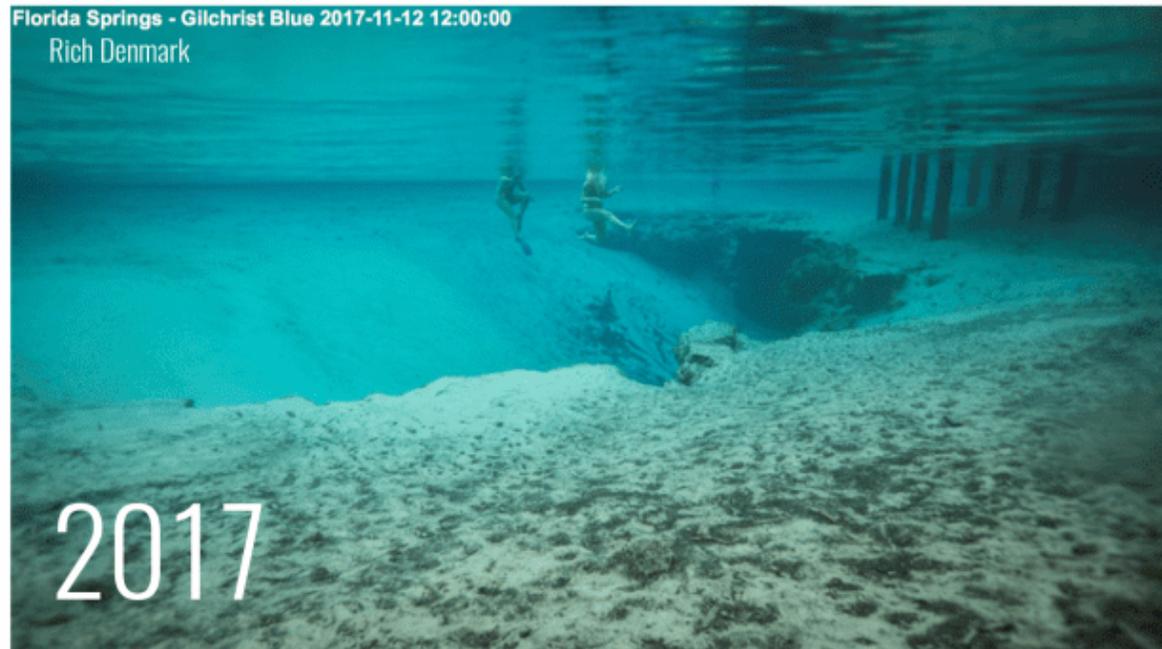
– Nestle Waters North America





Blue Spring, FL

Then and Now





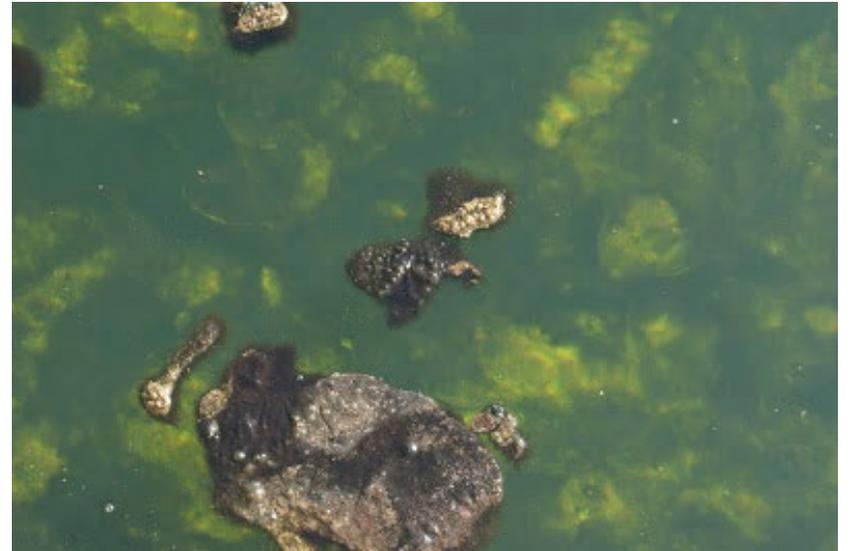
*Ichetucknee Springs, Florida
Same View: 1995 vs 2012*



Photos Credit: John Moran / Springs Eternal Project



Sulphur Springs



White Springs



White Sulphur Springs, 1919



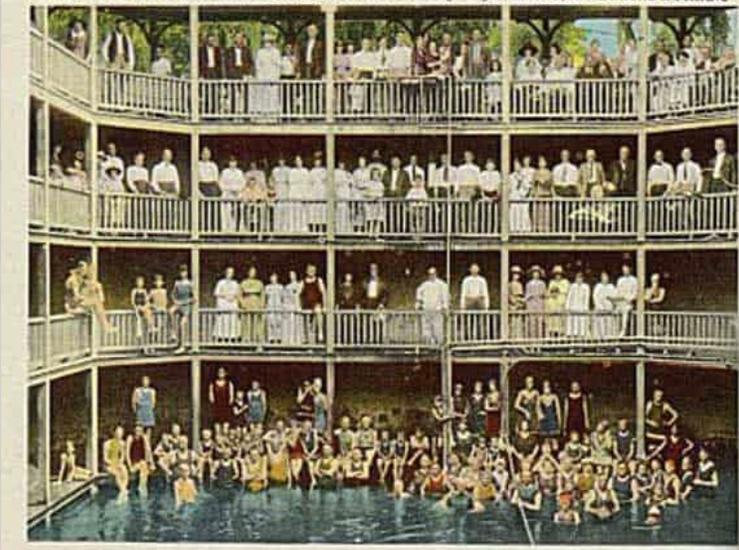
White Sulphur Springs, 2012

THEN & NOW

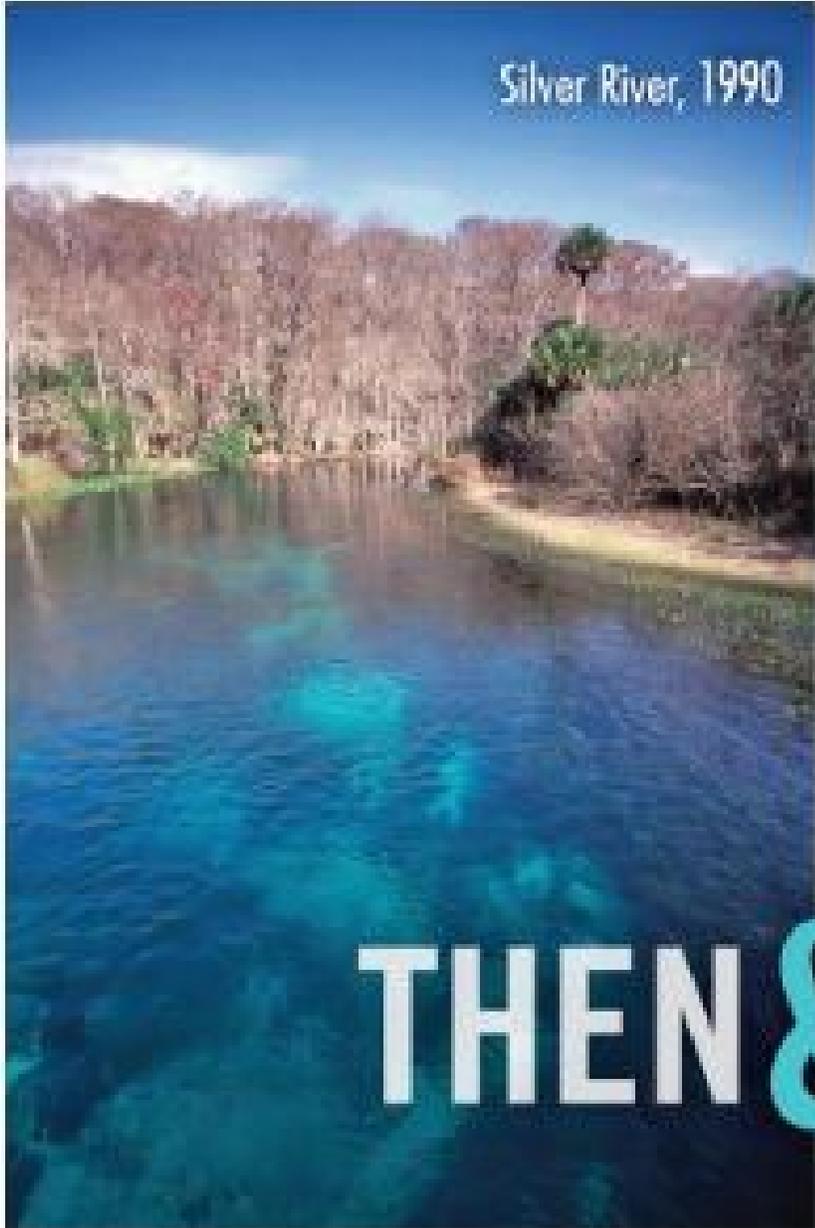


Interior of Bath House, White Springs, Florida. The Spring Flows 32,400 Gallons a Minute

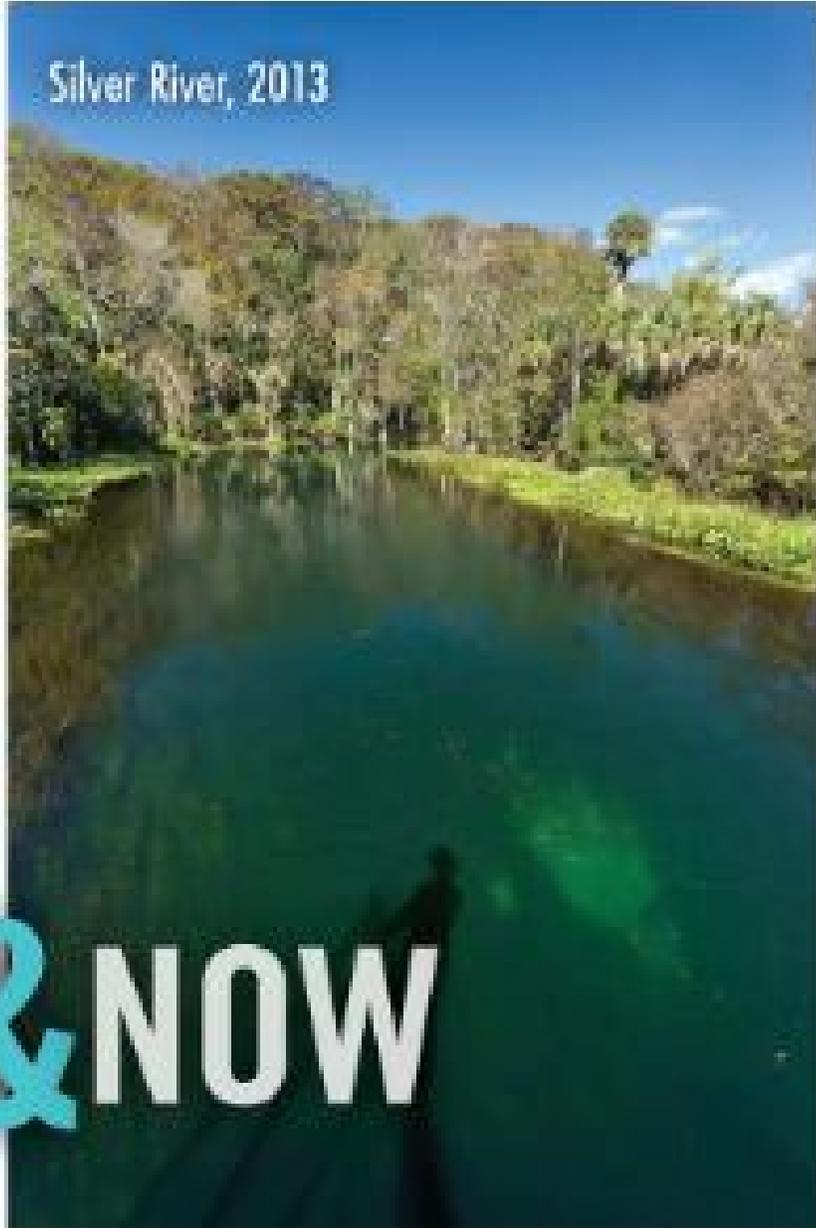
Springhouse today and a scene from its heyday, in the early part of the 20th century.



Silver River, 1990



Silver River, 2013

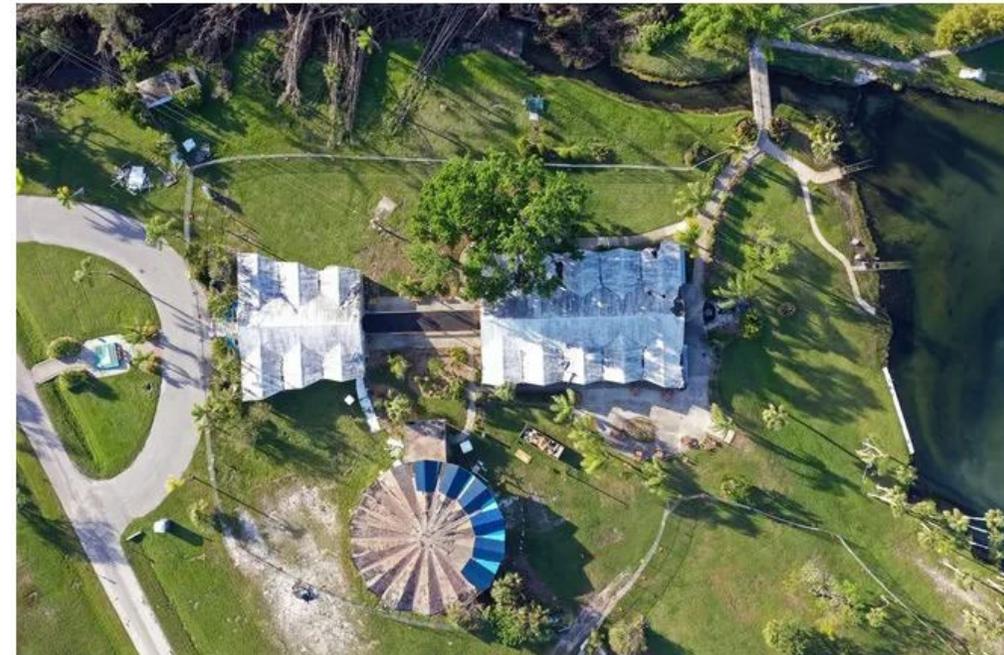


THEN & NOW

Warm Mineral Springs



Visitors enjoy Warm Mineral Springs in North Port on July 31, 2021. [STEPHANIE HAYES | Times]



Warm Mineral Springs Park's Spa Buildings and Cyclorama (below) (depicting Ponce de Leon's purported discovery of the Fountain of Youth) were constructed near the spring in 1959 to accommodate a Florida Quadricentennial celebration that ran from Dec. 14, 1959 to March 15, 1960. The buildings are condemned, but there are plans to restore them. THOMAS BENDER/HERALD-TRIBUNE

Kayaktivism on the Santa Fe Activating for the environment



#wordsmatter

kayaktivism

A FEW STEPS YOU CAN TAKE TO #SAVEOURSPRINGS

1.

Reduce Your Water Use

☞ Be mindful of your water use & water footprint, from your diet to your hygiene routine. Expand to explore steps you can take!



2.

Grow Native & Cut the Chemicals

☞ Harsh chemical fertilizers, pesticides, herbicides are polluting springs, lakes, rivers, and coastal waters. Click to learn a few steps you can take to keep your lawn beautiful while protecting our water.



3.

Septic System Inspections & The 3Ps

☞ Sewage spills and leaky septic systems are causing pollution in our surface and groundwaters. Human waste has very high levels of nutrients as well as pharmaceutical and hormonal contaminants such as antibiotics, hormones, and opiates.



4.

Get Involved with Organizations Fighting for Change

☞ Non-profit organizations who are working to protect our natural resources have the expertise necessary to lead and spearhead effective group efforts. If you don't know where to start or want to put your time and money where it counts, volunteer with a non-profit whose focus is on protecting Florida's springs. The following organizations are fighting for the protection of Florida's springs and rivers.

5.

Talk With Your Representatives

☞ Leverage your power as a voter and talk with your representatives about why protecting springs is important to you and your community. Click for a few tips on getting in touch with them and navigating the conversation.



6.

Stay Informed & Share Your Knowledge!

☞ The most powerful tool in your toolbox is your voice! Educate yourself, then educate others to increase your impact.



7.

VOTE!

☞ Leverage your power as a voter to ensure the protection of our natural resources. Many of the challenges that face our springs and aquifer can be met through regulatory intervention. Expand to learn how you can educate yourself before heading to the polls.





Credit: 10 Tampa Bay

Merrillee Malwitz-Jipson with Our Santa Fe River and Bob Knight with the Florida Springs Institute paddles along the Santa Fe River next to Rum Island Spring.



Spring Fling Cleanup!

Join Stand Up 4 Springs and Current Problems as we paddle down the Santa Fe River and help pick up trash along the way. The event is completely FREE with kayaks, canoes, paddles and supplies all provided!

**Sunday, March 26th
10 AM - 12:30 PM**

RSVP HERE!



How to celebrate Earth Day on April 22:



Attend Stand Up 4 Springs' Spring Fling to celebrate the Florida springs and help promote its protection



Plant a tree or another plant to help clean the air by providing oxygen to both people and animals

Drink from a reusable water bottle to minimize waste from plastic bottles and the harm caused from the overpumping of water systems by water bottling companies





Ginnie Springs turtle. © Ralph Pace

With YOUR help, we can protect and restore Florida's waters that sustain us all.

From Florida's sunny beaches to its cobalt springs and world-renowned Everglades, water is the essential element. It sustains our lives from the faucet that fills our glass to the food on our table. It is our economy's raw material, from agriculture to tourism. Water nourishes all life on earth, including Florida's amazing array of plants and wildlife.

Virtually surrounded by water, and with Florida's high rainfall rates, it's easy to take water for granted. Our beaches look healthy and inviting. Florida's Everglades and natural springs never cease to amaze. But our waters are in trouble. At risk are the quality and quantity of our waters, threatening not only Florida's treasured natural places, but also our quality of life.

But with YOUR support, The Nature Conservancy can advance a suite of strategies to protect Florida's water in ways where people and nature can both thrive.



Blue Head Ranch in Highlands County, Florida.
© Carlton Ward Jr.

The Challenge

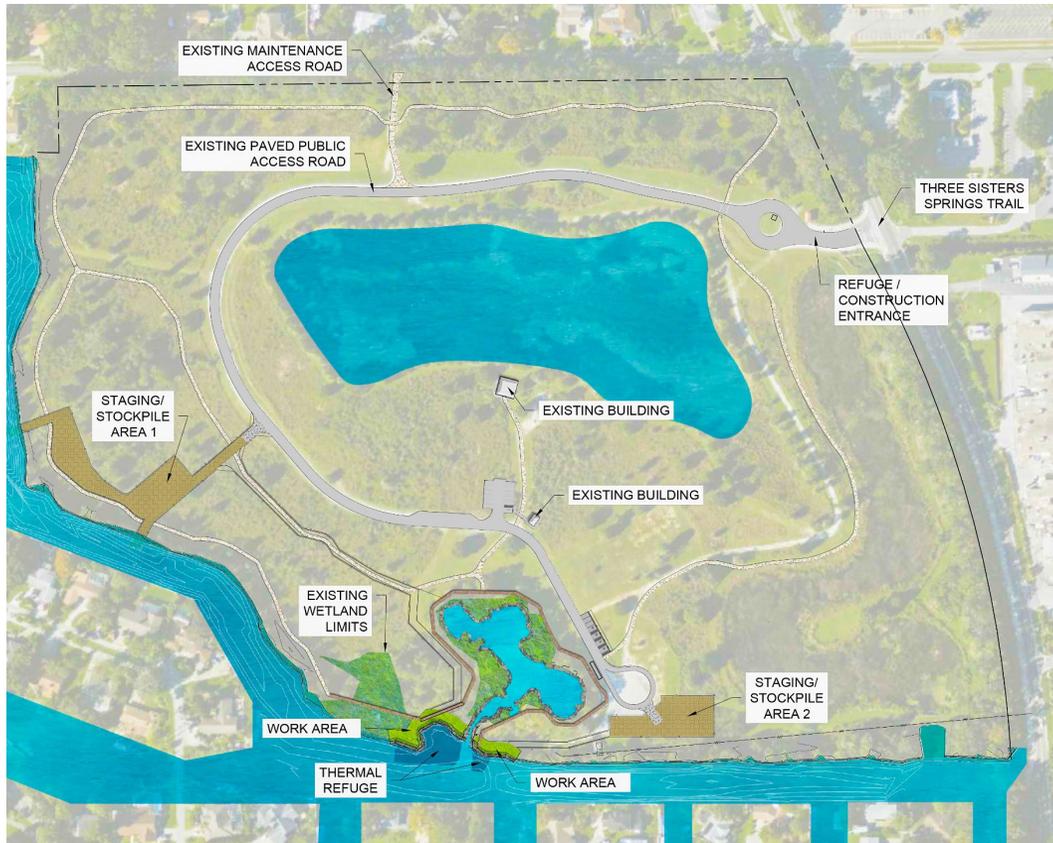
Given Florida's growth rates, the state's fresh water demands are expected to increase by 20 percent over the next 20 years. By 2035, Floridians — homeowners, farmers, everyone — will be using 1.4 billion gallons of fresh water every day. We know that traditional sources won't be enough to meet this demand.

As water is increasingly drawn from underground aquifers and surface sources, Florida's natural systems are at risk. Our treasured springs, rivers and estuaries often lack sufficient water to keep them healthy and sustainable.

Just as challenging, poor water quality threatens more than half of Florida's freshwater bodies, including our rivers, lakes and springs. Among the many complex sources of pollution is runoff from roads and parking lots, as well as ranches and other agricultural enterprises.

Three Sisters Springs Canal Stabilization Project

SWFWMD is now conducting a shoreline restoration extending from the mouth of the spring run to around the area of Idiot's Delight Spring. These improvements will benefit the Crystal River/Kings Bay spring system by restoring habitat, including critical manatee habitat and reducing erosion along the shoreline of the Three Sisters property.



Upcoming Public Meeting

An in-person public meeting to discuss the project is scheduled for:

Wednesday, April 5 at 5:30 p.m.

Crystal River National Wildlife Refuge

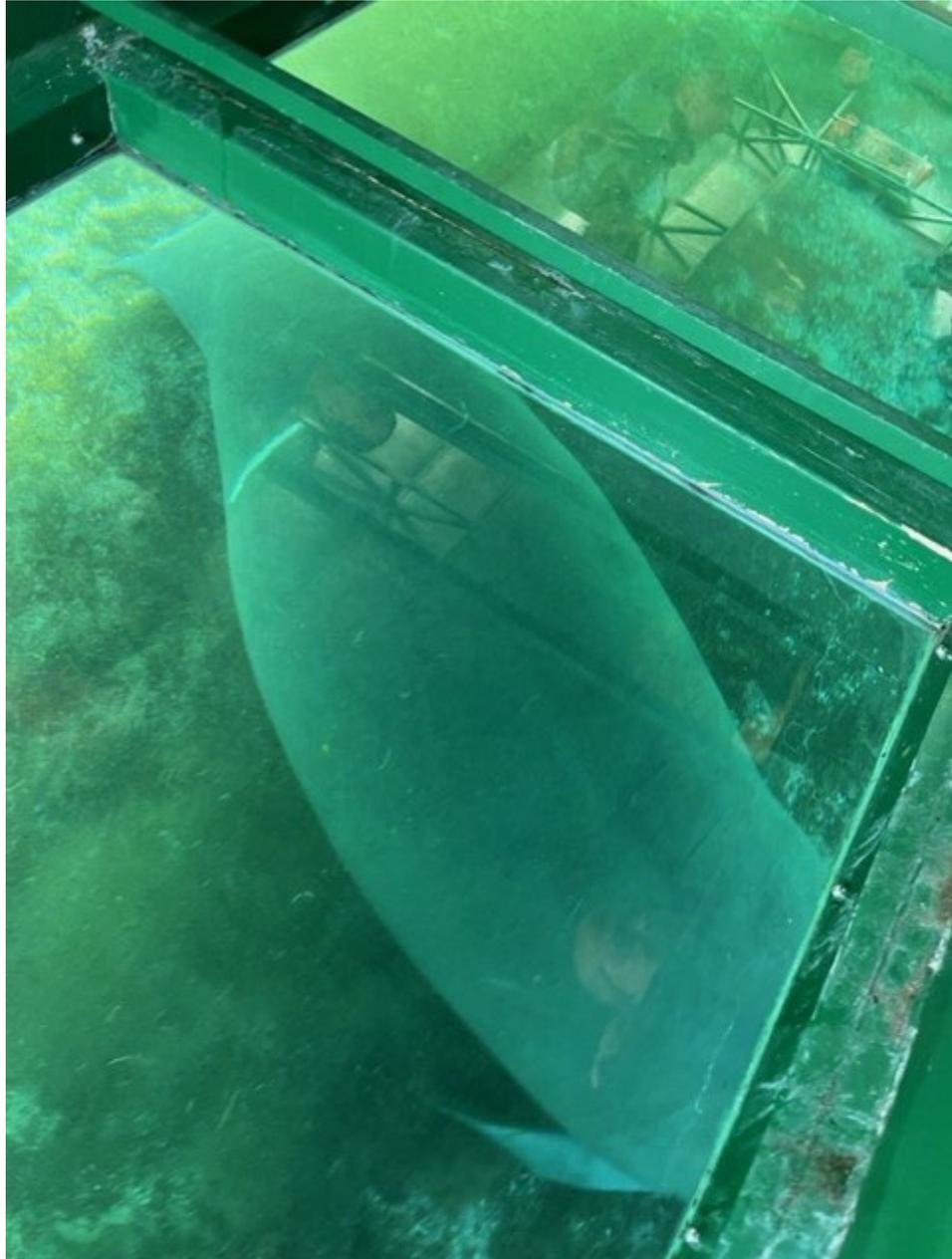
Complex Headquarters

1502 SE Kings Bay Dr

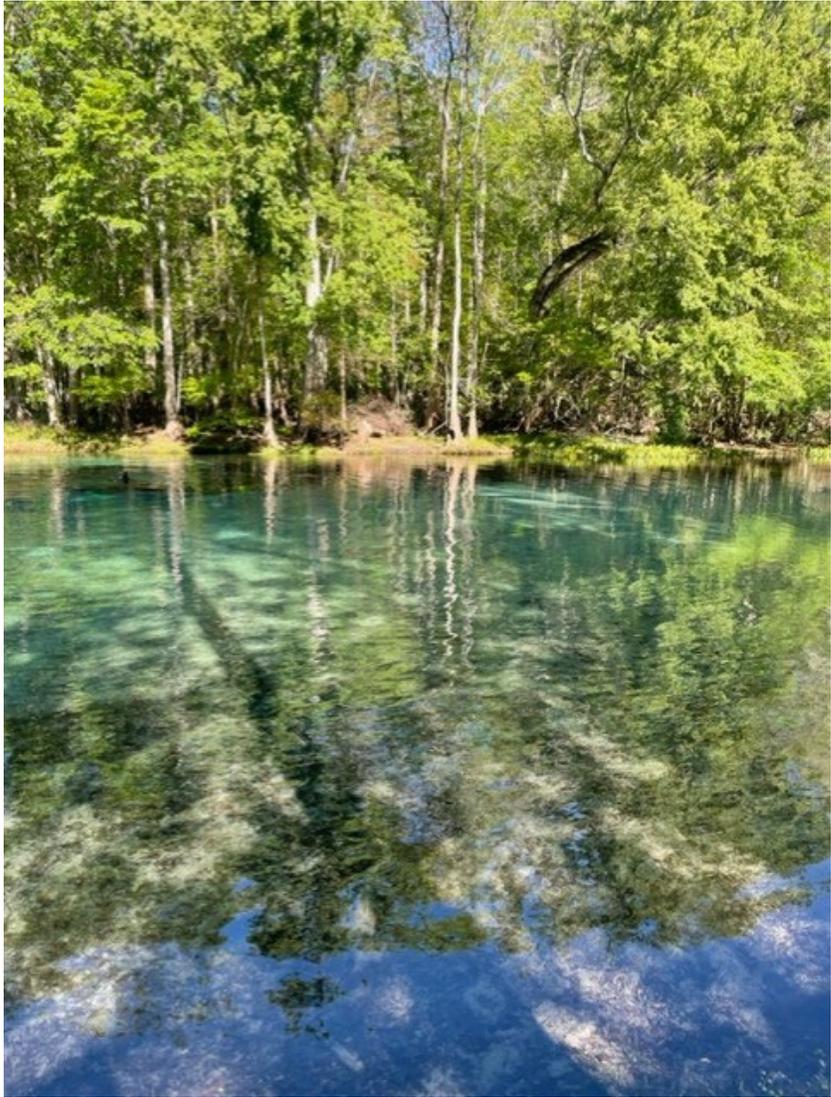
Crystal River, FL 34429

District staff will begin the meeting with an overview presentation of the project and attendees will have an opportunity to ask questions or give a comment.





Manatee at Silver Springs through the bottom of
a glass-bottom boat
Fall 2022



Gilchrist Blue Springs
Spring 2023





"Man, the dope's that there's
still hope" -
Bruce Springsteen

"Don't mourn- organize"-
Mother Jones

