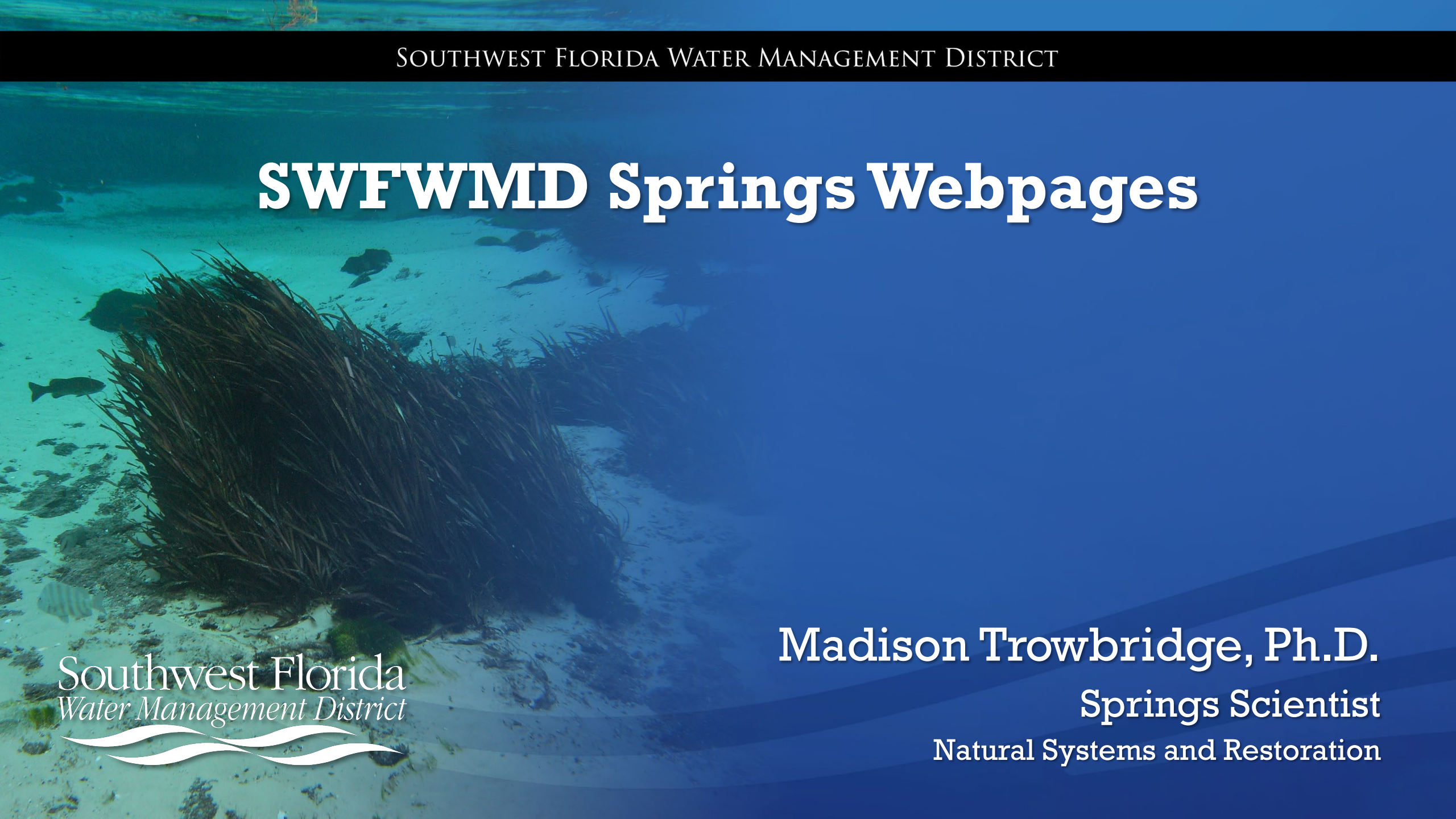
SWFWMD Springs Webpages



Southwest Florida
Water Management District

Madison Trowbridge, Ph.D.
Springs Scientist
Natural Systems and Restoration

Agenda

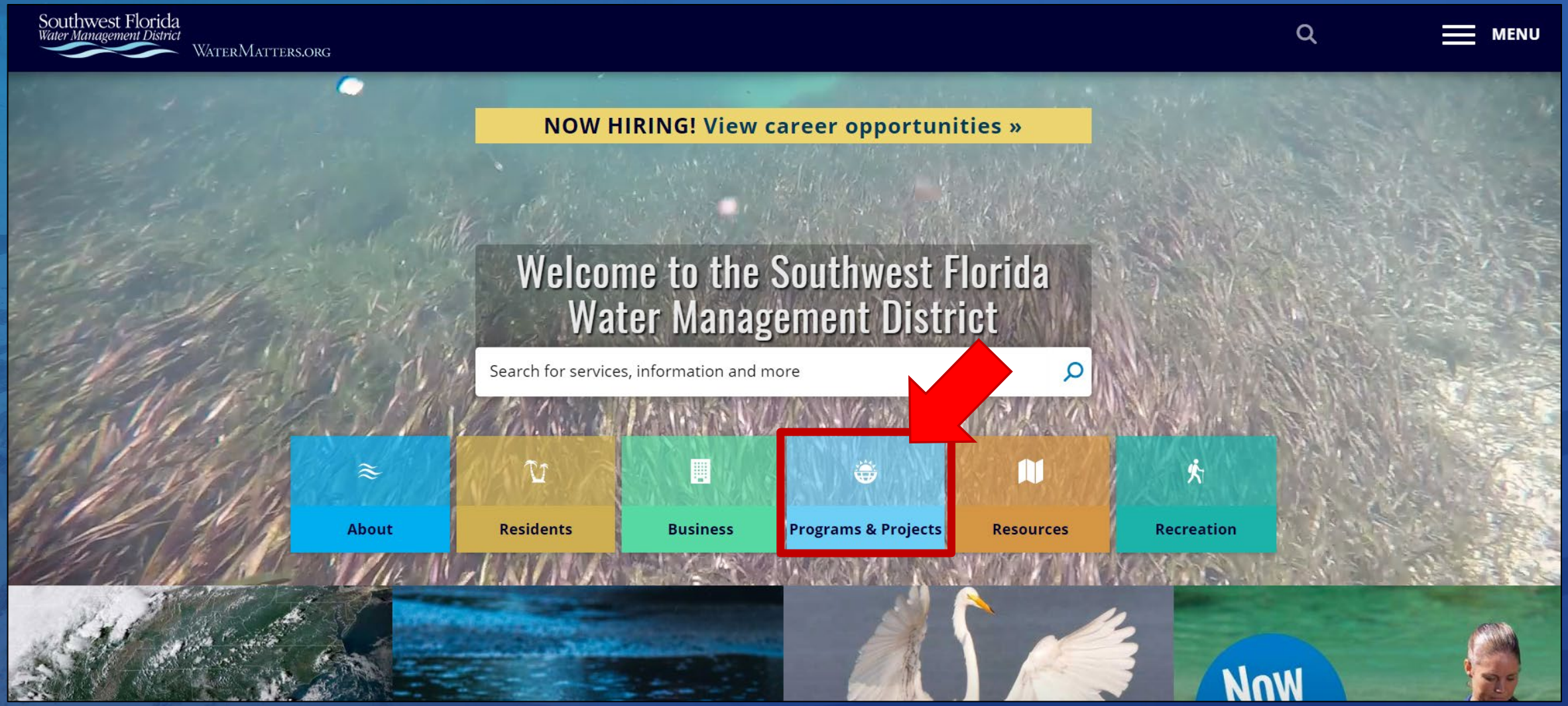
- Review updates to springs homepage content

- Review updates to system-specific content

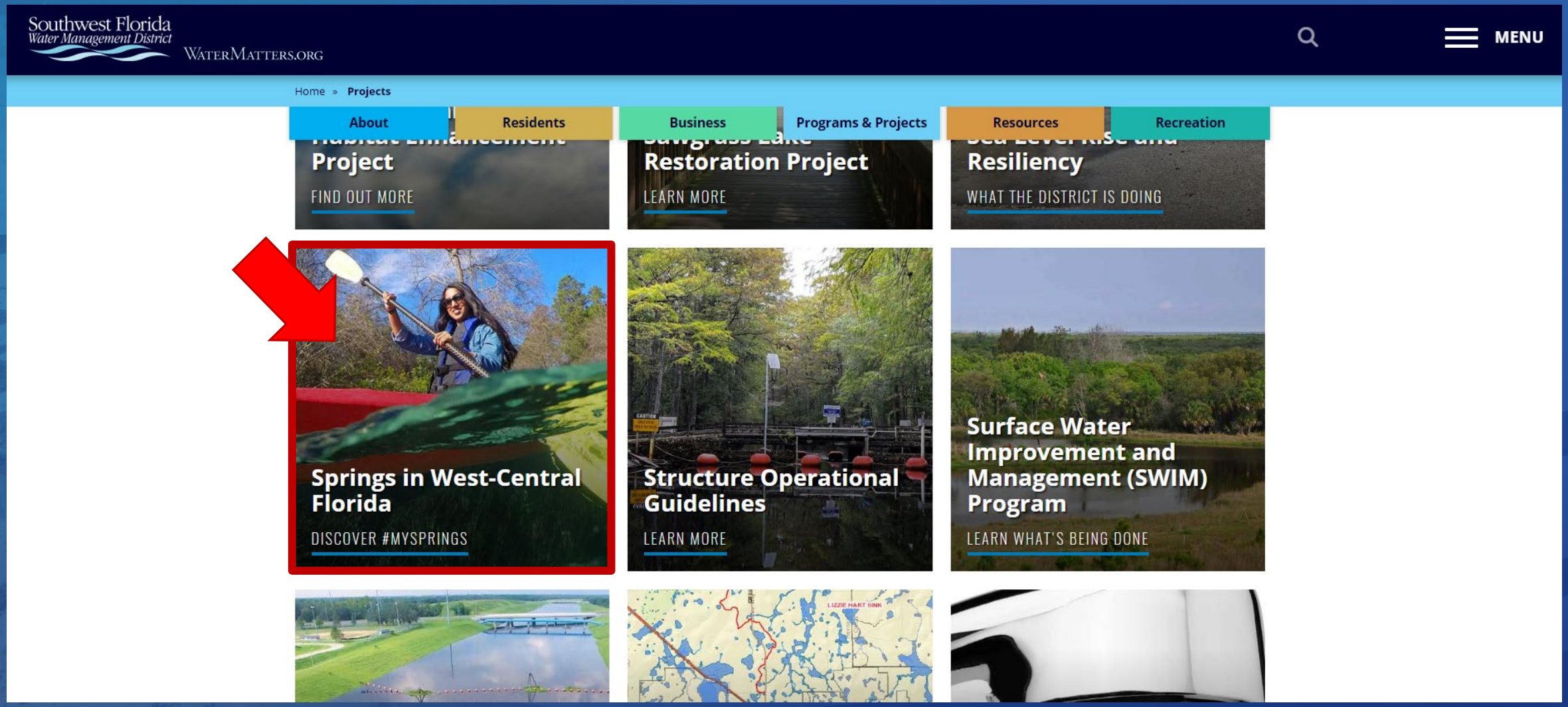
Updates & New Features

- Additional tabs included on homepage
  - Springs Committees
  - FAQs
- Graphics/videos
- Updated narratives
- Links to other resources

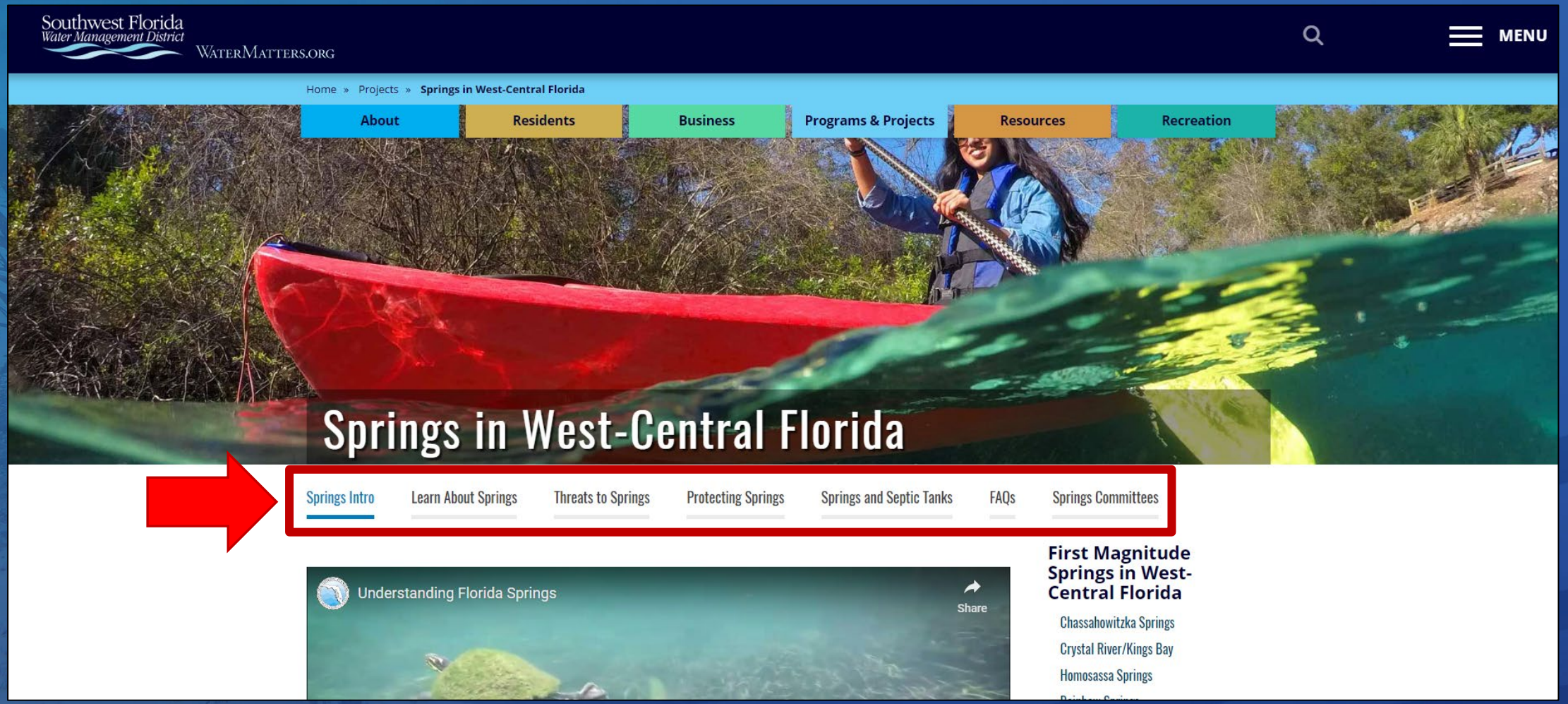
Accessing the District's Springs Webpages



Accessing the District's Springs Webpages



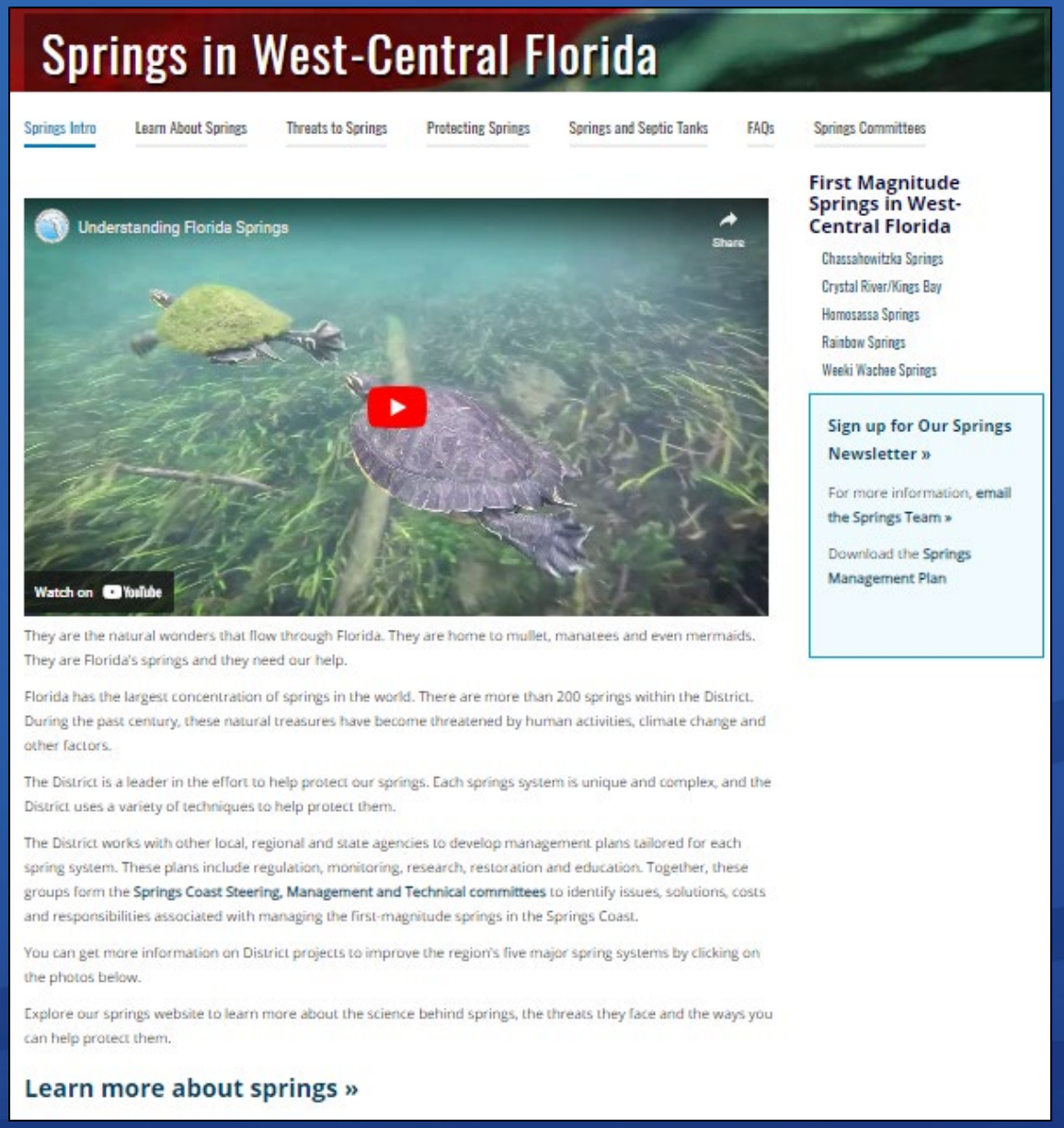
Navigating the District's Springs Webpages



WaterMatters.org/springs

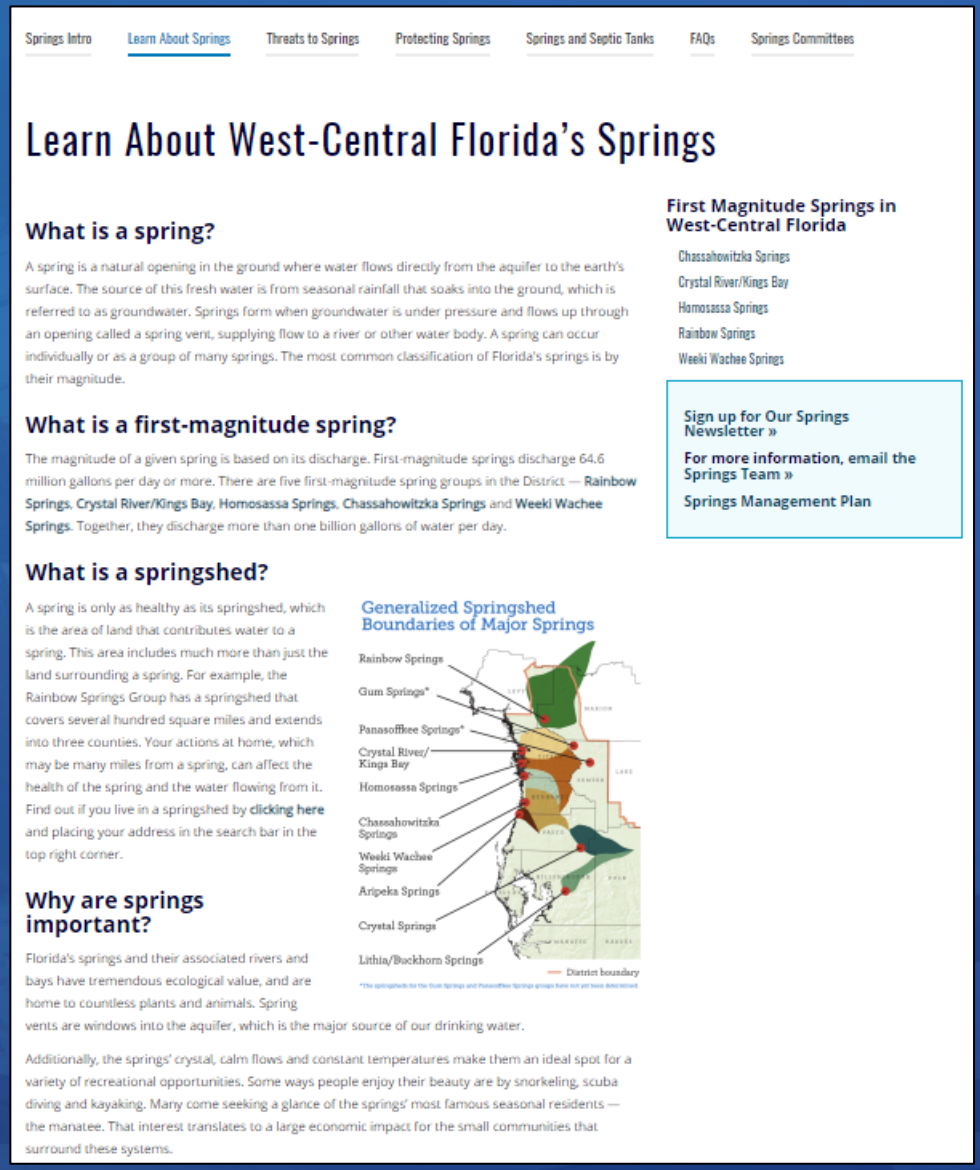
Webpage: Springs Intro

- Homepage
- Video: Understanding Florida Springs
- General overview of District springs



Webpage: Learn About Springs

- Defining springs & springsheds
- Importance of springs
- What constitutes a healthy spring



Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Learn About West-Central Florida's Springs

What is a spring?

A spring is a natural opening in the ground where water flows directly from the aquifer to the earth's surface. The source of this fresh water is from seasonal rainfall that soaks into the ground, which is referred to as groundwater. Springs form when groundwater is under pressure and flows up through an opening called a spring vent, supplying flow to a river or other water body. A spring can occur individually or as a group of many springs. The most common classification of Florida's springs is by their magnitude.

What is a first-magnitude spring?

The magnitude of a given spring is based on its discharge. First-magnitude springs discharge 64.6 million gallons per day or more. There are five first-magnitude spring groups in the District — **Rainbow Springs**, **Crystal River/Kings Bay**, **Homosassa Springs**, **Chassahowitzka Springs** and **Weeki Wachee Springs**. Together, they discharge more than one billion gallons of water per day.

What is a springshed?

A spring is only as healthy as its springshed, which is the area of land that contributes water to a spring. This area includes much more than just the land surrounding a spring. For example, the Rainbow Springs Group has a springshed that covers several hundred square miles and extends into three counties. Your actions at home, which may be many miles from a spring, can affect the health of the spring and the water flowing from it. Find out if you live in a springshed by **clicking here** and placing your address in the search bar in the top right corner.

Generalized Springshed Boundaries of Major Springs

Why are springs important?

Florida's springs and their associated rivers and bays have tremendous ecological value, and are home to countless plants and animals. Spring vents are windows into the aquifer, which is the major source of our drinking water.

Additionally, the springs' crystal, calm flows and constant temperatures make them an ideal spot for a variety of recreational opportunities. Some ways people enjoy their beauty are by snorkeling, scuba diving and kayaking. Many come seeking a glance of the springs' most famous seasonal residents — the manatee. That interest translates to a large economic impact for the small communities that surround these systems.

First Magnitude Springs in West-Central Florida

- Chassahowitzka Springs
- Crystal River/Kings Bay
- Homosassa Springs
- Rainbow Springs
- Weeki Wachee Springs

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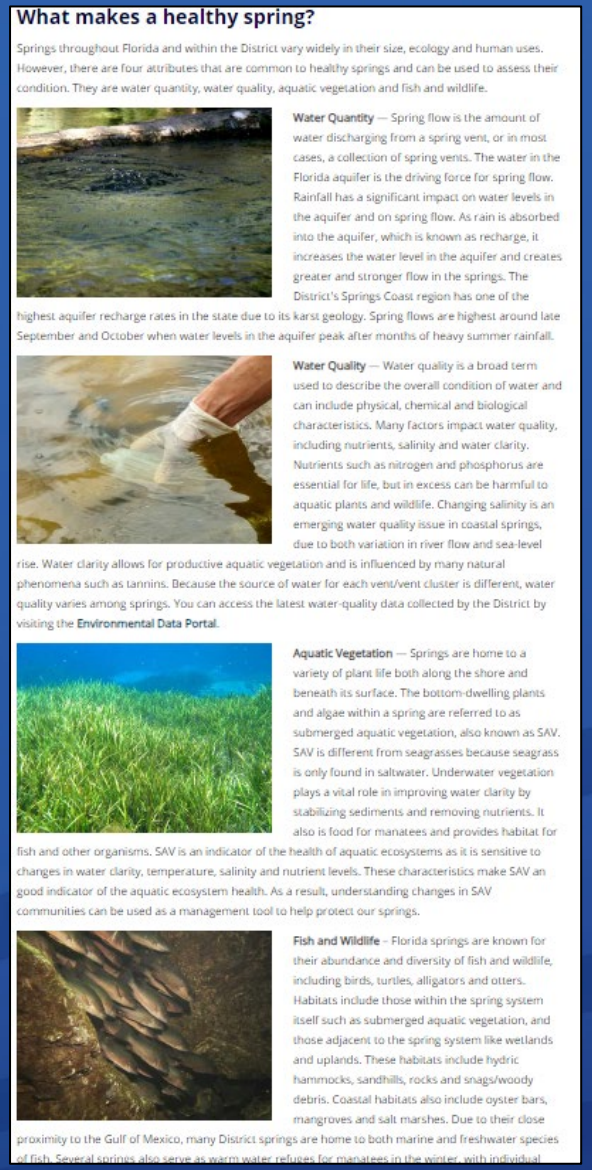
Springs Management Plan



What makes a healthy spring?

Springs throughout Florida and within the District vary widely in their size, ecology and human uses. However, there are four attributes that are common to healthy springs and can be used to assess their condition. They are water quantity, water quality, aquatic vegetation and fish and wildlife.

Water Quantity — Spring flow is the amount of water discharging from a spring vent, or in most cases, a collection of spring vents. The water in the Florida aquifer is the driving force for spring flow. Rainfall has a significant impact on water levels in the aquifer and on spring flow. As rain is absorbed into the aquifer, which is known as recharge, it increases the water level in the aquifer and creates greater and stronger flow in the springs. The District's Springs Coast region has one of the highest aquifer recharge rates in the state due to its karst geology. Spring flows are highest around late September and October when water levels in the aquifer peak after months of heavy summer rainfall.

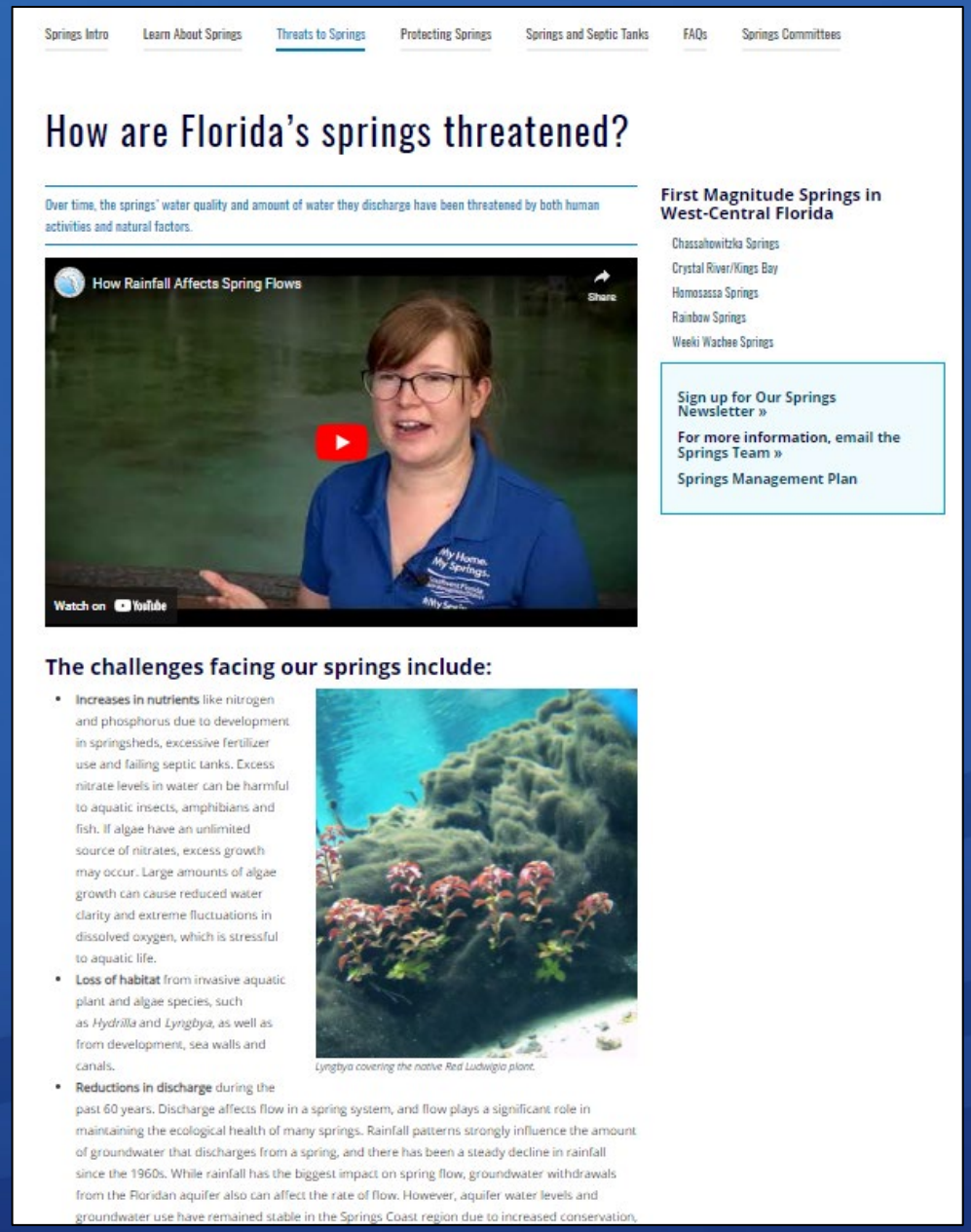
Water Quality — Water quality is a broad term used to describe the overall condition of water and can include physical, chemical and biological characteristics. Many factors impact water quality, including nutrients, salinity and water clarity. Nutrients such as nitrogen and phosphorus are essential for life, but in excess can be harmful to aquatic plants and wildlife. Changing salinity is an emerging water quality issue in coastal springs, due to both variation in river flow and sea-level rise. Water clarity allows for productive aquatic vegetation and is influenced by many natural phenomena such as tannins. Because the source of water for each vent/vent cluster is different, water quality varies among springs. You can access the latest water-quality data collected by the District by visiting the **Environmental Data Portal**.

Aquatic Vegetation — Springs are home to a variety of plant life both along the shore and beneath its surface. The bottom-dwelling plants and algae within a spring are referred to as submerged aquatic vegetation, also known as SAV. SAV is different from seagrasses because seagrass is only found in saltwater. Underwater vegetation plays a vital role in improving water clarity by stabilizing sediments and removing nutrients. It also is food for manatees and provides habitat for fish and other organisms. SAV is an indicator of the health of aquatic ecosystems as it is sensitive to changes in water clarity, temperature, salinity and nutrient levels. These characteristics make SAV an good indicator of the aquatic ecosystem health. As a result, understanding changes in SAV communities can be used as a management tool to help protect our springs.

Fish and Wildlife – Florida springs are known for their abundance and diversity of fish and wildlife, including birds, turtles, alligators and otters. Habitats include those within the spring system itself such as submerged aquatic vegetation, and those adjacent to the spring system like wetlands and uplands. These habitats include hydric hammocks, sandhills, rocks and snags/woody debris. Coastal habitats also include oyster bars, mangroves and salt marshes. Due to their close proximity to the Gulf of Mexico, many District springs are home to both marine and freshwater species of fish. Several springs also serve as warm water refuges for manatees in the winter, with individual

Webpage: Threats to Springs

- Challenges springs face
- Video: How Rainfall Affects Spring Flow



Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

How are Florida's springs threatened?

Over time, the springs' water quality and amount of water they discharge have been threatened by both human activities and natural factors.

How Rainfall Affects Spring Flows

Share

Watch on YouTube

First Magnitude Springs in West-Central Florida

Chassahowitzka Springs
Crystal River/Kings Bay
Homosassa Springs
Rainbow Springs
Weeki Wachee Springs

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Springs Management Plan

The challenges facing our springs include:

- **Increases in nutrients** like nitrogen and phosphorus due to development in springsheds, excessive fertilizer use and failing septic tanks. Excess nitrate levels in water can be harmful to aquatic insects, amphibians and fish. If algae have an unlimited source of nitrates, excess growth may occur. Large amounts of algae growth can cause reduced water clarity and extreme fluctuations in dissolved oxygen, which is stressful to aquatic life.
- **Loss of habitat** from invasive aquatic plant and algae species, such as *Hydrilla* and *Lyngbya*, as well as from development, sea walls and canals.
- **Reductions in discharge** during the past 60 years. Discharge affects flow in a spring system, and flow plays a significant role in maintaining the ecological health of many springs. Rainfall patterns strongly influence the amount of groundwater that discharges from a spring, and there has been a steady decline in rainfall since the 1960s. While rainfall has the biggest impact on spring flow, groundwater withdrawals from the Floridan aquifer also can affect the rate of flow. However, aquifer water levels and groundwater use have remained stable in the Springs Coast region due to increased conservation.

Lyngbya covering the native Red Ludwigia plant.

Webpage: Protecting Springs

- From home
- While visiting a spring
- How the District helps protect springs

Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Protecting Florida's Springs

The District uses a variety of tools to protect our springs but it takes a community effort by all of us.

There is no single solution to protecting Florida springs. The District uses a variety of tools to help protect them. But it takes the work of all of us to protect these resources. There are various ways you can help when visiting a spring and even at home.

How to responsibly enjoy a spring:

- Stay in the vessel when possible.
- If you have to leave the vessel, tie off in shallow waters.
- Avoid docking on riverbanks.
- Don't trample vegetation or kick up silt.
- Avoid climbing on banks.
- Don't climb trees or use rope swings.
- Don't throw out litter or leave anything behind.
- Trim boat motors to prevent propeller scarring.

These are good tips to remember no matter what spring or river system you visit. But also remember each system may have its own rules and regulations to follow.

How to protect springs at home:

- Use fertilizer sparingly. Too much fertilizer applied to landscapes can seep into the aquifer or run off into nearby waterways. Use these **Florida-Friendly Fertilizing tips** to reduce impacts when fertilizing, or hire a Green Industries Best Management Practices **certified professional** to maintain your lawn.

- Have septic tanks inspected every two to three years. Septic tanks that are not properly maintained can pollute the groundwater that ultimately emerges from springs.
- Never dump anything down a storm drain and always dispose of grass clippings, litter, motor oil and pet waste properly to avoid these items entering stormwater ponds, which help prevent flooding and filter out pollutants before they reach water bodies.
- Plant a buffer zone between the lawn and shoreline and avoid cutting your lawn too short, which reduces its ability to capture and filter water before it enters a stormwater pond or water body.
- Always dispose of hazardous household chemicals such as industrial cleaners, solvents, automotive fluids and paints at an approved landfill. Never discard of these items or other debris into a sinkhole, which are often directly connected to the aquifer. As a result, hazardous contaminants can seep into the aquifer, our drinking water and springs.

First Magnitude Springs in West-Central Florida

Chassahowitzka Springs
Crystal River/Kings Bay
Homosassa Springs
Rainbow Springs
Weeki Wachee Springs

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For more information, email the Springs Team »

Springs Management Plan

How the District helps protect springs:

Since each spring system is unqiue and complex, the District uses a variety of techniques to address each system's challenges:

- **Data collection and monitoring:** Springs protection starts with data collection and monitoring. The District collects and monitors various types of data including rainfall, water clarity and salinity. The data goes through an extensive quality control process and is published to our **Environmental Data Portal**.
- **Analysis and planning:** Once you have sufficient data, you can analyze it and look for trends. This information is used to develop District management plans. These plans guide the focus for management actions using an adaptive management strategy.
- **Stormwater and restoration projects:** The District funds and implements stormwater improvement and natural system restoration projects. These projects help reduce nutrients from entering water systems, benefit water quality and/or improve habitat.
- **Conservation and reuse efforts:** The District prioritizes water conservation and reclaimed water projects.

Even as population has increased in the District's northern region, groundwater use has declined. This is due to conservation efforts and implementing reclaimed water projects, which offset the demand on groundwater withdrawals.

- **Land acquisition:** The region's lands and waters are forever linked by Florida's natural water cycles. Therefore, the District acquires and manages conservation lands around lakes, rivers, springs, wetlands and estuaries to help protect them.
- **State laws and regulation:** Florida statutes require state water management districts to establish minimum flows and levels, which are the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area. Also under state law, the District is responsible for issuing various types of permits that ultimately protect water resources.
- **Outreach and education:** Through various communication tactics like social media, speaking engagements and educational programs, the District informs residents about important water issues and engages them to protect our water resources through conservation and responsible best practices.

Webpage: Springs and Septic Tanks

- Overview of nutrient leaching
- Video: How Septic Systems Impact Springs
- Homeowner tips

Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Springs and Septic Tanks

Septic tanks contribute up to 40% of the current nitrogen pollution in the District's five first-magnitude springs. If you have a septic system, it's important to have the system inspected regularly and maintained as necessary.

How do septic tanks impact springs?

Wastewater from traditional or damaged septic tanks can leach into the ground, causing nitrates to enter the aquifer. When this happens, the nitrates eventually reach the spring, which results in excessive algae growth and contributes to the poor water quality. Watch this animation to learn more.

To help reduce the impact of septic tanks in the Springs Coast region, the District launched a Septic to Sewer initiative to provide matching funds for conversion projects that also receive funding from the Florida Department of Environmental Protection. District funding helps reduce the financial burden on the local communities and residents.

How can you help springs?

As a homeowner, there are several steps you can take to prevent your home's septic system from impacting nearby springs. Here's a few easy ways to help protect your springs:

- Use water efficiently such as fixing leaky toilets and spreading out laundry loads.
- Plant only grass over and near your septic system to avoid damage from tree roots.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drain field or damage the pipes, tank or other septic system components.
- Have your system routinely inspected and maintained as necessary.
- Don't dispose of household hazardous wastes in sinks or toilets.

Your Frequently Asked Questions »

First Magnitude Springs in West-Central Florida

Chassahowitzka Springs
Crystal River/Kings Bay
Homosassa Springs
Rainbow Springs
Weeki Wachee Springs

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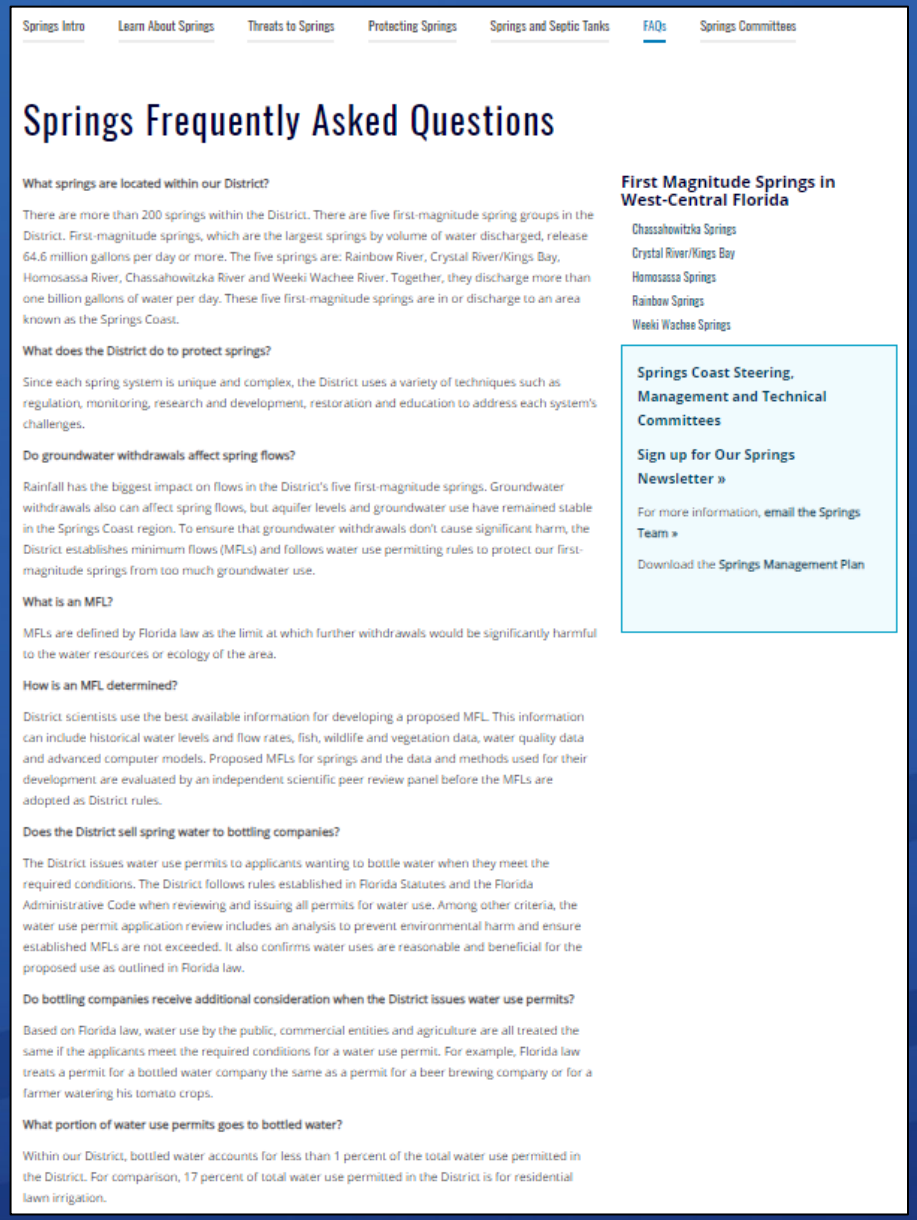
For more information, email the Springs Team »

Springs Management Plan

Webpage: Frequently Asked Questions

- Question & Answer for common topics, including:
  - Minimum Flows & Levels
  - Bottled water
  - Water quality
  - Recreation
  - Protecting springs



Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Springs Frequently Asked Questions

What springs are located within our District?

There are more than 200 springs within the District. There are five first-magnitude spring groups in the District. First-magnitude springs, which are the largest springs by volume of water discharged, release 64.6 million gallons per day or more. The five springs are: Rainbow River, Crystal River/Kings Bay, Homosassa River, Chassahowitzka River and Weeki Wachee River. Together, they discharge more than one billion gallons of water per day. These five first-magnitude springs are in or discharge to an area known as the Springs Coast.

What does the District do to protect springs?

Since each spring system is unique and complex, the District uses a variety of techniques such as regulation, monitoring, research and development, restoration and education to address each system's challenges.

Do groundwater withdrawals affect spring flows?

Rainfall has the biggest impact on flows in the District's five first-magnitude springs. Groundwater withdrawals also can affect spring flows, but aquifer levels and groundwater use have remained stable in the Springs Coast region. To ensure that groundwater withdrawals don't cause significant harm, the District establishes minimum flows (MFLs) and follows water use permitting rules to protect our first-magnitude springs from too much groundwater use.

What is an MFL?

MFLs are defined by Florida law as the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area.

How is an MFL determined?

District scientists use the best available information for developing a proposed MFL. This information can include historical water levels and flow rates, fish, wildlife and vegetation data, water quality data and advanced computer models. Proposed MFLs for springs and the data and methods used for their development are evaluated by an independent scientific peer review panel before the MFLs are adopted as District rules.

Does the District sell spring water to bottling companies?

The District issues water use permits to applicants wanting to bottle water when they meet the required conditions. The District follows rules established in Florida Statutes and the Florida Administrative Code when reviewing and issuing all permits for water use. Among other criteria, the water use permit application review includes an analysis to prevent environmental harm and ensure established MFLs are not exceeded. It also confirms water uses are reasonable and beneficial for the proposed use as outlined in Florida law.

Do bottling companies receive additional consideration when the District issues water use permits?

Based on Florida law, water use by the public, commercial entities and agriculture are all treated the same if the applicants meet the required conditions for a water use permit. For example, Florida law treats a permit for a bottled water company the same as a permit for a beer brewing company or for a farmer watering his tomato crops.

What portion of water use permits goes to bottled water?

Within our District, bottled water accounts for less than 1 percent of the total water use permitted in the District. For comparison, 17 percent of total water use permitted in the District is for residential lawn irrigation.

First Magnitude Springs in West-Central Florida

Chassahowitzka Springs
Crystal River/Kings Bay
Homosassa Springs
Rainbow Springs
Weeki Wachee Springs

Springs Coast Steering, Management and Technical Committees

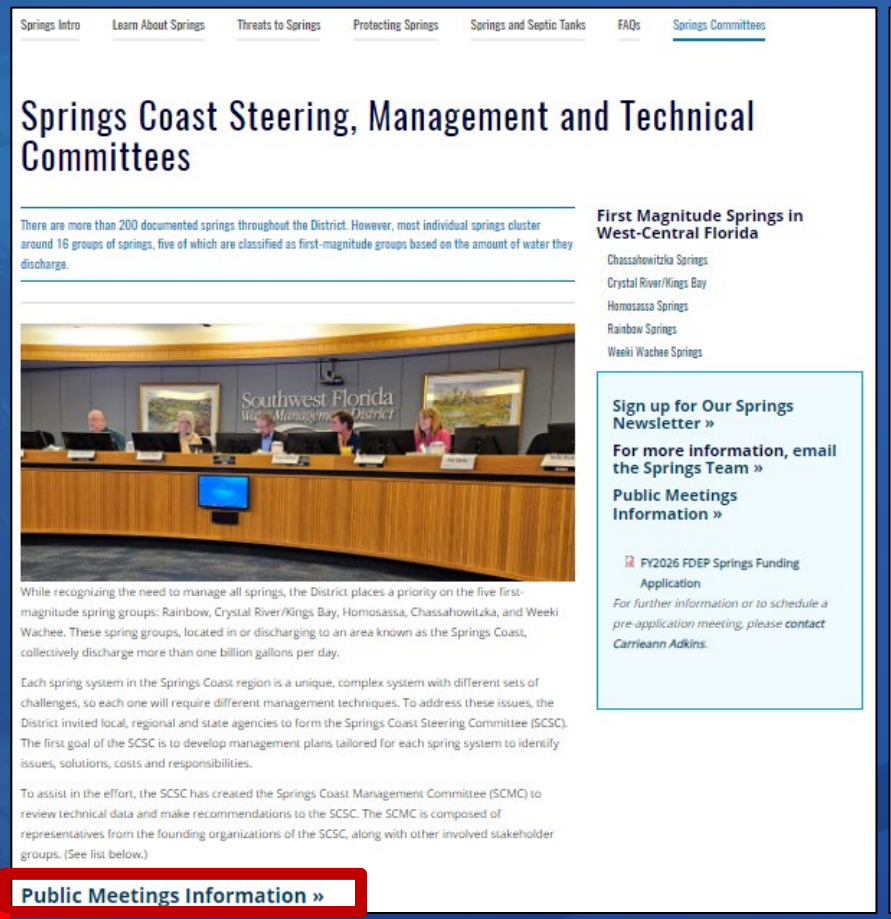
Sign up for Our Springs Newsletter »

For more information, email the Springs Team »

Download the Springs Management Plan

Webpage: Springs Committees

- Mission
- Public meetings link
- Committee members
- FDEP Springs Funding Applications (sidebar)



Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Springs Coast Steering, Management and Technical Committees

There are more than 200 documented springs throughout the District. However, most individual springs cluster around 16 groups of springs, five of which are classified as first-magnitude groups based on the amount of water they discharge.

While recognizing the need to manage all springs, the District places a priority on the five first-magnitude spring groups: Rainbow, Crystal River/Kings Bay, Homosassa, Chassahowitzka, and Weeki Wachee. These spring groups, located in or discharging to an area known as the Springs Coast, collectively discharge more than one billion gallons per day.

Each spring system in the Springs Coast region is a unique, complex system with different sets of challenges, so each one will require different management techniques. To address these issues, the District invited local, regional and state agencies to form the Springs Coast Steering Committee (SCSC). The first goal of the SCSC is to develop management plans tailored for each spring system to identify issues, solutions, costs and responsibilities.

To assist in the effort, the SCSC has created the Springs Coast Management Committee (SCMC) to review technical data and make recommendations to the SCSC. The SCMC is composed of representatives from the founding organizations of the SCSC, along with other involved stakeholder groups. (See list below.)

Public Meetings Information »

First Magnitude Springs in West-Central Florida

- Chassahowitzka Springs
- Crystal River/Kings Bay
- Homosassa Springs
- Rainbow Springs
- Weeki Wachee Springs

Sign up for Our Springs Newsletter »

For more information, email the Springs Team »

Public Meetings Information »

FY2026 FDEP Springs Funding Application

For further information or to schedule a pre-application meeting, please contact Carrieann Adkins.

Springs Coast Steering Committee Members

Agency	Representative	Title
City of Crystal River	Robert Holmes	City Council Member
Citrus County	Rebecca Bays	County Commissioner
Hernando County	Beth Narverud	County Commissioner
Marion County	Kathy Bryant	County Commissioner
Pasco County	Seth Weightman	County Commissioner
FDEP	Ken Weaver	Deputy Director, Division of Environmental Assessment and Restoration
FFWCC	Gregory Workman	Northeast Regional Director
FDACS	Yesenia Escribano	Environmental Administrator, Office of Agricultural Water Policy
SWFWMD	Kelly Rice	Governing Board Member, Chair

Springs Coast Management Committee Members

Agency	Representative
City of Crystal River	Troy Slattery
Citrus County	Ken Cheek
Hernando County	Alys Brockway
Marion County	Jody Kirkman
Pasco County	Jason Mickel
FDEP	Moira Homann
FFWCC	Michelle Sempsrott
FDACS	Vanessa Bauzo
SWFWMD	Jennette Seachrist, Chair
FGUA	William Fontaine
Agriculture	Curt Williams
Public Supply	Suzy Folsom
Environmental	Charles Lee
Regional Planning Council	Alana Todd
Industry	Ilia Balcom
Academia	Dr. Patricia Spellman
State Parks	Rick Owen

Webpage: Springs Committees

- Public meeting information
  - Meeting link
  - Meeting materials

Springs Coast Public Meetings

Information on upcoming and recent public meetings on the District's Springs Coast Steering and Management Committees will be consolidated on this page.

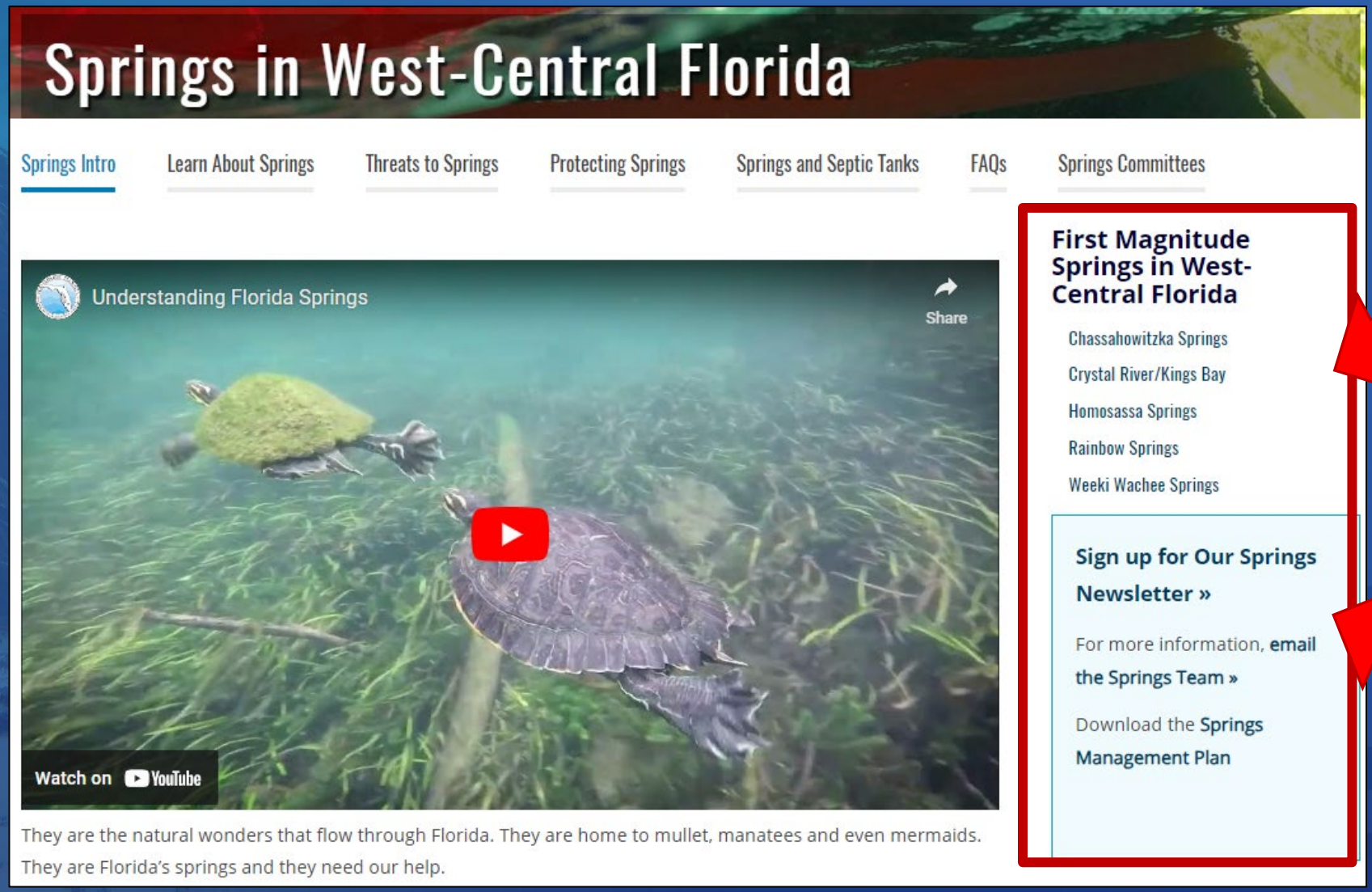
Springs Coast Steering Committee Meeting Info

Wednesday, July 24, 2024 - 02:00	Springs Coast Steering Committee	Agenda FY2026 Draft Springs Application Item 7 Presentation Item 8 Presentation Items 5 and 6 Presentation
Wednesday, March 6, 2024 - 02:00	Springs Coast Steering Committee	Agenda FDEP Spring Funding FY2025 Final Evaluations Springs Projects Spreadsheet Item 4 - FY2025 FDEP Springs Funding Final Evaluations Item 5 - Springs Protection Zones Item 6 - Crystal River Bull Shark Survey Project Minutes
Wednesday, January 24, 2024 - 02:00	Springs Coast Steering Committee	Agenda FDEP Springs Funding FY2025 Preliminary Evaluations Item 4 - FY2025 FDEP Springs Funding Preliminary Evaluations Item 5a - Hernando County Utilities Department Item 6 - As Above So Below: Benefits of the FARMS Program on the FL Aquifer Minutes
Wednesday, January 10, 2024 - 01:30	Springs Coast Management Committee and Springs Coast Steering Committee Member Tour	Agenda Minutes

Springs Coast Management Committee Meeting Info

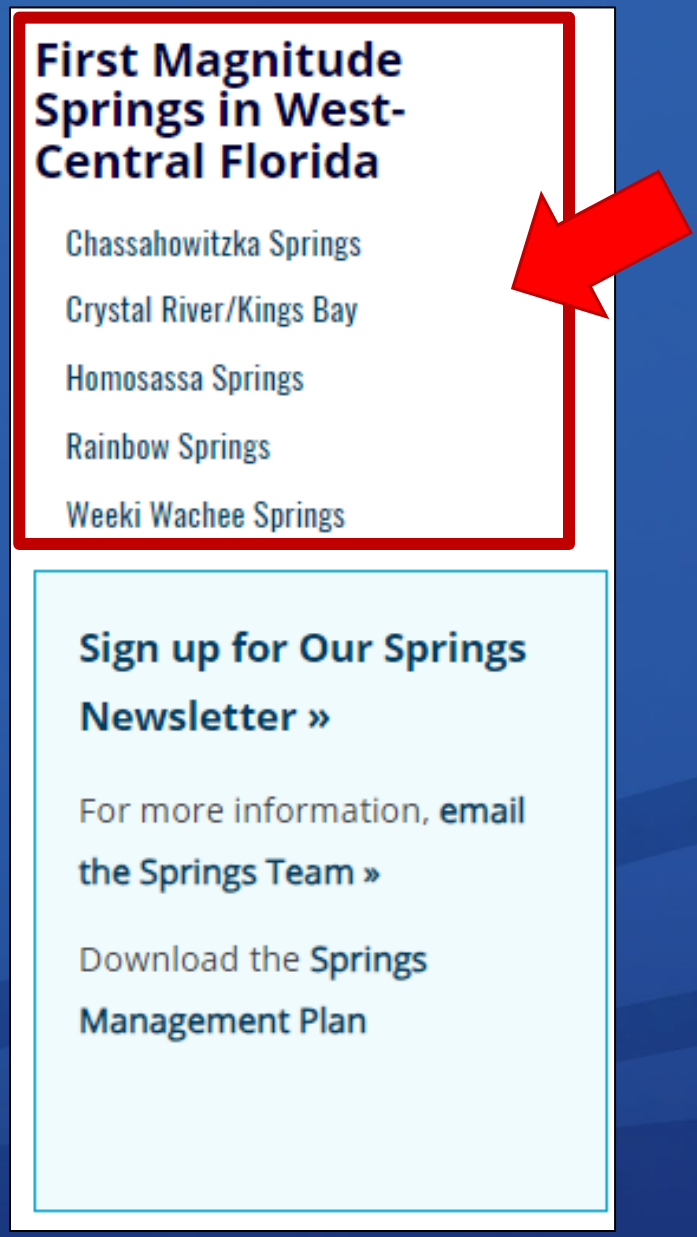
Wednesday, July 10, 2024 - 01:30	Springs Coast Management Committee	Agenda FY2026 Springs Funding Application Items 5 and 6 - FY2026 FDEP Springs Funding Process and SCMC Meeting Dates Item 7 - Basin Management Action Plans (BMAP) Updates Item 8 - Overview of SWFWMD's Available Monitoring Data and Maps
Wednesday, May 22, 2024 - 01:30	Springs Coast Management Committee	Agenda Item 4 - FY2025 FDEP Springs Funding Update and Lessons Learned Item 6 - Youth Education in Springs: Springs Coast Environmental Education Center Addition/Deletion to Agenda Minutes
Wednesday, February 21, 2024 - 01:30	Springs Coast Management Committee	Agenda FY2025 FDEP Springs Funding Final Evaluations Springs Projects Spreadsheet Item 4 - FY2025 FDEP Springs Funding Final Evaluations Item 5 - Springs Protection Zones Item 6 - Kings Bay Bull Shark Survey Minutes
Wednesday, January 10, 2024 - 01:30	Springs Coast Management Committee and Springs Coast Steering Committee Member Tour	Agenda Minutes

Sidebar Conversations: Additional Features



Webpages: First-Magnitude Springs

- Customized for each spring
- Includes:
  - System description, challenges, & unique features
  - Photos, videos, & a map
  - Links to projects & SWIM Plans
  - Data & current readings



Springs Intro | Learn About Springs | Threats to Springs | Protecting Springs | Springs and Septic Tanks | FAQs | Springs Committees

Chassahowitzka Springs, Citrus County

Current Readings

As of Aug. 22, 2024, 9:32 am

74.8° F	7.41	3300 uS/cm	1.73 ppth	3.33 mg/l
Water Temp.	pH	Specific Conductance	Salinity	Dissolved Oxygen

Made up of a dozen springs, Chassahowitzka Springs is the headwaters of one of the most ecologically healthy rivers in west-central Florida.

First Magnitude Springs in West-Central Florida

- Chassahowitzka Springs
- Crystal River/Kings Bay
- Homosassa Springs
- Rainbow Springs
- Weeki Wachee Springs

Chassahowitzka River SWIM Plan - 2024

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Contact Info

For more information, email the Springs Team »

Current readings

Virtual visit

SWIM Plan

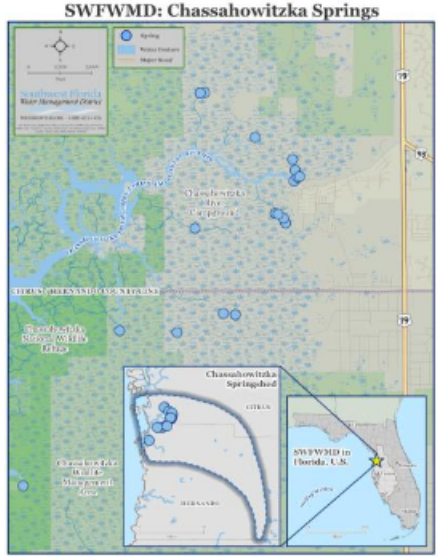
Map with springs & springshed

Challenges identified in SWIM Plans

About the Springs

The Chassahowitzka River is a **first-magnitude spring system** that originates in southwest Citrus County. The river is known for being short and shallow, flowing 5.6 miles from the headsprings to the Gulf of Mexico. Mid-channel depths range from 2 to 9 feet depending on tides and location.

SWFWMD: Chassahowitzka Springs



Click to view map larger.

Many springs make up the Chassahowitzka River system. The Chassahowitzka Main Spring is at the head of a large pool near the public boat ramp. Upstream of the main spring is Seven Sisters Springs, named for the seven circular vents within the limestone. There are many smaller springs, such as Crab Spring, Baird Spring (also known as "the Crack"), Potters Creek Spring and Salt Creek Spring, forming spring runs connecting to the river.

The Chassahowitzka springshed, which contributes groundwater to the Chassahowitzka spring system, is approximately 190 square miles and covers a significant land area in northern Hernando County and southern Citrus County. Rainfall in this region directly affects the amount of water discharged from the springs by impacting the water level in the aquifer, which provides the driving force for spring flow. Due to its proximity to the Gulf of Mexico, tidal stage also impacts the amount of flow from springs in the Chassahowitzka River system. Visit the District's **Environmental Data Portal** to view spring flow data for the Chassahowitzka River.

Challenges

The primary issues facing this system include nitrate enrichment, changing salinity, potential decreases in historical flows, and decreases in desirable aquatic vegetation. Nitrate concentrations are higher compared to historical concentrations for many of the springs in the Chassahowitzka River system. These elevated concentrations can have adverse effects on the ecosystem. Long-term spring flow is largely affected by rainfall patterns and to a lesser extent by groundwater withdrawals. The Chassahowitzka River system has an adopted Minimum Flows and Levels (MFL). Changes in vegetation are likely due to salinity changes and manatee grazing. Increased recreational activities have had negative environmental impacts on the river by damaging vegetation, which increases erosion and negtively impacts water quality.

Geographic info

Notable springs

Springshed

Unique features

Unique Features

The Chassahowitzka River and its associated springs are heavily influenced by its proximity to the Gulf of Mexico. Not only does tide impact the amount of flow, but many of the smaller springs are considered salt springs, which discharge brackish groundwater. Since each spring may have a different localized water source, even springs in close proximity may vary from fresh to brackish under similar conditions.

The river transitions from a fresh, clear water spring to a tannin-colored, brackish river. Closer to the mouth of the river near the mangrove islands and oyster bars, water clarity improves as the river transitions to a marine environment.

The ecology of the river also transitions with changes in the river. Salinity impacts the types and locations of submerged aquatic vegetation (SAV) throughout the system. Changing salinity, particularly due to sea level rise and from frequent storm events such as hurricanes, is an emerging issue in the Chassahowitzka River.

The river is home to both freshwater and saltwater species of animals due to the influence of the Gulf of Mexico. For example, freshwater fish are more commonly found during the summer months and saltwater fish are more common in the winter. Visitors can spot river otters, manatees, alligators, blue crabs, stingrays and even bull sharks swimming in the river. Various birds, raccoons, snakes, squirrels, white-tailed deer and bobcats occasionally may be observed along the banks.

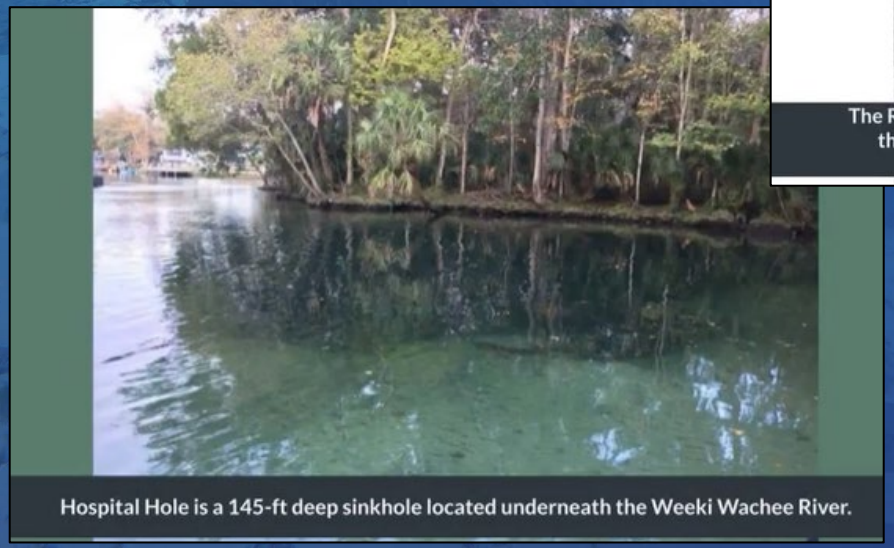
Recent (& historic) photos

Southwest Florida Water Management District

The Chassahowitzka River is a shallow spring-fed river in Citrus County. The name means "pumpkin hanging place" and is attributed to the Seminole Indian name for a variety of pumpkin once found in this region.

The springs in Kings Bay, including Three Sisters Springs, provide critical warm water habitat for manatees during winter months.

The Rainbow River and its immediate surroundings were mined for phosphate in the early part of the twentieth century. The river is still impacted from the mining activities today.



Hospital Hole is a 145-ft deep sinkhole located underneath the Weeki Wachee River.

The Ellie Schiller Homosassa Springs Wildlife State Park features an underwater observation platform, known as the fish bowl, that allows visitors to "walk underwater" above the spring vent.

Annual Environmental Assessment Report

SWIM Plan

Other resources

Data Collection

Water quality is routinely monitored in the Chassahowitzka River, with some para[illegible] hourly. The data is available through the District's **Environmental Data Portal**. [illegible] collected including nitrate levels, water clarity, spring flow and salinity. Submerged [illegible]quatic vegetation is currently mapped twice a year within the river at specified locations. A summary of the current data for the Chassahowitzka River in relation to the parameters collected by the District can be viewed in this report:

Environmental Assessment of the Chassahowitzka River

Springs Management

The District has designated the Chassahowitzka River system as a Surface Water Improvement and Management (SWIM) priority water body. Additionally, this system is designated as an Outstanding Florida Spring and an Outstanding Florida Water by the state. These designations provide additional protections and require management plans to ensure the river's conservation and restoration for future generations. The District has invited local, regional and state agencies to form the **Springs Coast Committees**, who assist in the development of the District's management plans tailored for each spring system, called SWIM plans. The Chassahowitzka River SWIM Plan can be viewed here:

Chassahowitzka River SWIM Plan - 2024

Project Highlights

- Protecting the Chassahowitzka River
- Chassahowitzka Springs Restoration Project (completed)
- Canal Navigation Basin Dredging (completed)
- Chassahowitzka Submerged Aquatic Vegetation Mapping (ongoing)

Recreation

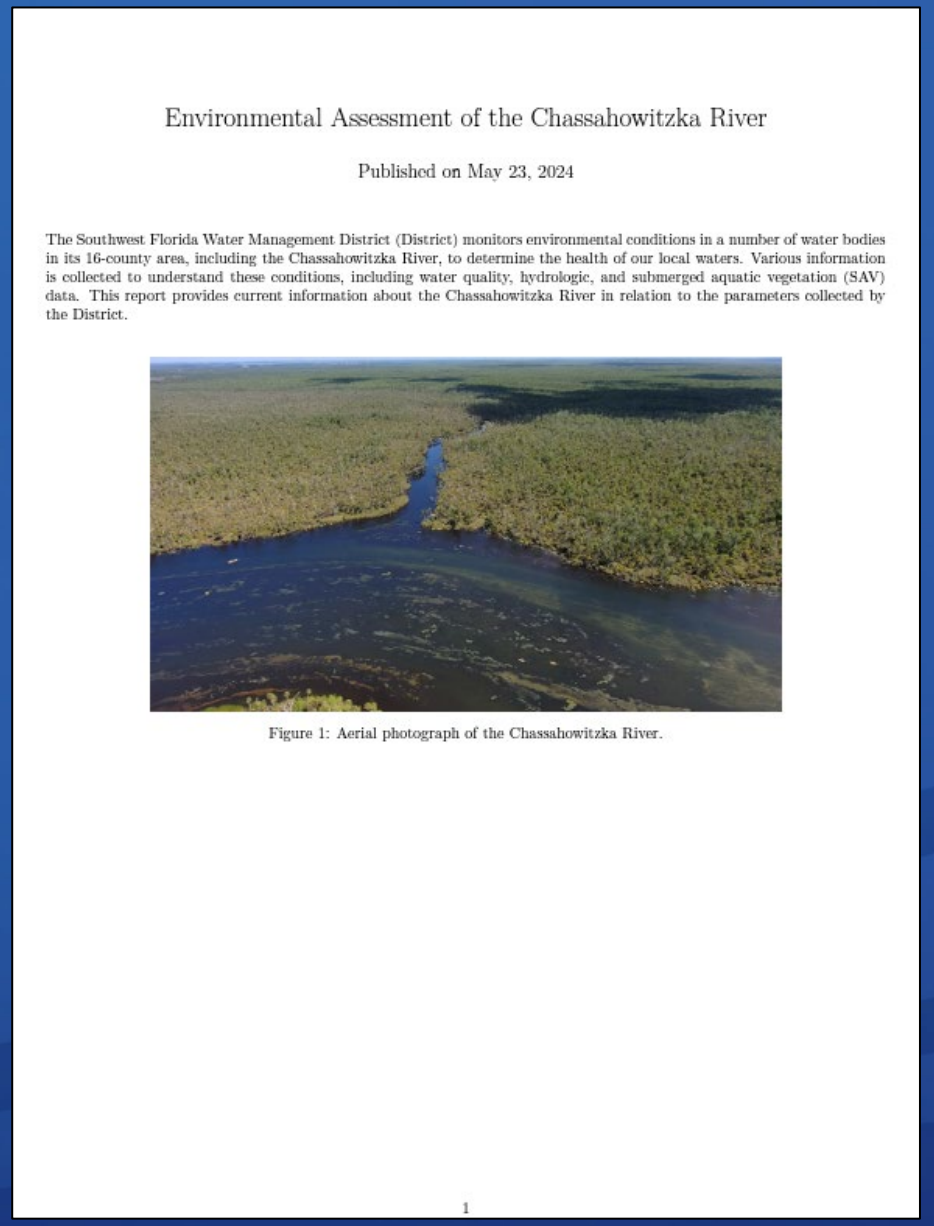
- Chassahowitzka River and Coastal Swamps
- Chassahowitzka National Wildlife Refuge

Link to District's Environmental Data Portal

Featured projects

Environmental Assessment Reports

- Updated annually
- Follow quantifiable objectives
- Includes:
  - Data collection information
  - Rainfall & flow data
  - Water quality data
  - Submerged aquatic vegetation (SAV) data



Environmental Assessment of the Chassahowitzka River

Published on May 23, 2024

The Southwest Florida Water Management District (District) monitors environmental conditions in a number of water bodies in its 16-county area, including the Chassahowitzka River, to determine the health of our local waters. Various information is collected to understand these conditions, including water quality, hydrologic, and submerged aquatic vegetation (SAV) data. This report provides current information about the Chassahowitzka River in relation to the parameters collected by the District.

Figure 1: Aerial photograph of the Chassahowitzka River.

1

Sampling Locations

The maps below (Fig 2) indicate the sampling locations for some of the environmental conditions collected within the Chassahowitzka River. The surface water sampling location numbers indicate approximate distance from headspring.

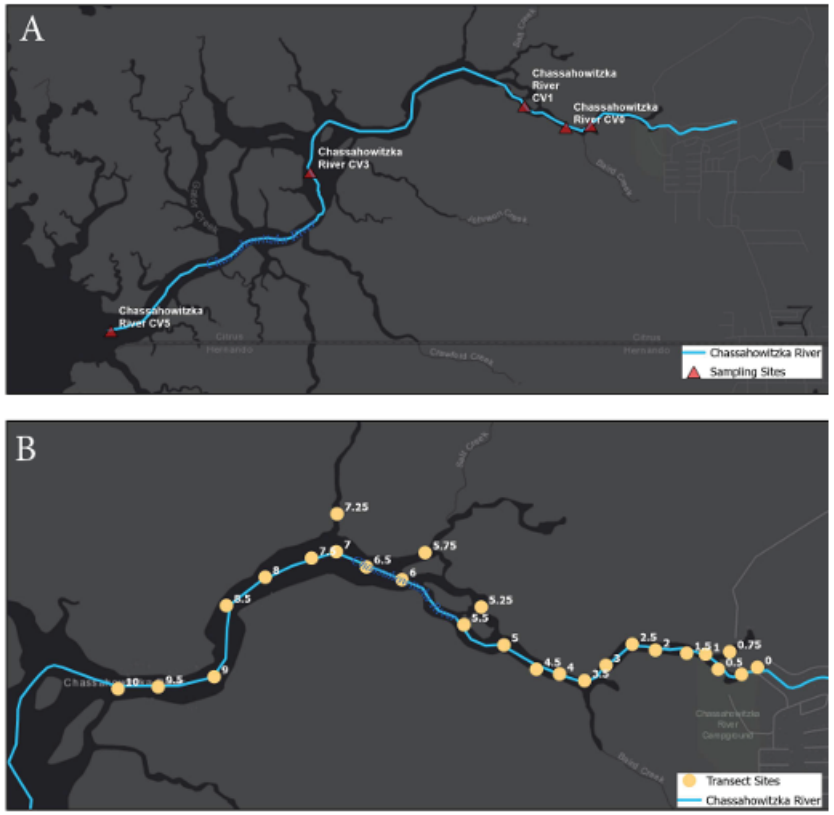


Figure 2: Sampling locations for (A) surface water sites and (B) submerged aquatic vegetation in the Chassahowitzka River.

Water quality and hydrologic data

The District's Data Collection Bureau is responsible for the collection and management of water resource data. Water quality and hydrologic data is available through the District's Environmental Data Portal.

At each of these locations (Fig 2A), surface water samples and measurements are collected and include parameters such as total nitrogen, dissolved oxygen, water clarity, salinity, specific conductance, and temperature. Water clarity is recorded from horizontal secchi measurements.

In addition to the surface water sites, nitrate data is collected from the spring vent and reported to the Springs Coast Committees. This location is referenced in the Environmental Data Portal as station number 21022.

Rainfall data is derived from the monthly rainfall total throughout the Chassahowitzka Springshed.

Figure 3: Water quality data collection at one of the sampling stations in the Chassahowitzka River.

Submerged aquatic vegetation (SAV) data

Twenty-five sampling locations (Fig 2B), which are referred to as transects, are used to evaluate SAV in the river and are currently mapped during the winter and summer of each year. SAV data may be requested by emailing the Springs Team at SpringsTeam@WaterMatters.org.

Figure 4: *Vallisneria americana*, also known as eelgrass, is one of the SAV species found in the Chassahowitzka River.

Water Quality and Hydrologic Data

Rainfall and spring flow

The amount of rainfall a region receives directly affects the amount of water that flows from a spring. As rain falls to the ground, it is absorbed and percolates downward into the limestone bedrock. The limestone holds the water like a sponge, and the water becomes part of the Floridan Aquifer. This natural replenishment of the aquifer through rainfall is referred to as recharge, and is demonstrated in Figure 5.

Figure 5: Hydrologic cycle showing how recharge occurs.

Due to the complexity of the aquifer system, travel time can take days to years before the water reaches the spring vent. However, patterns between rainfall and spring flow (Figure 6) can still be seen.

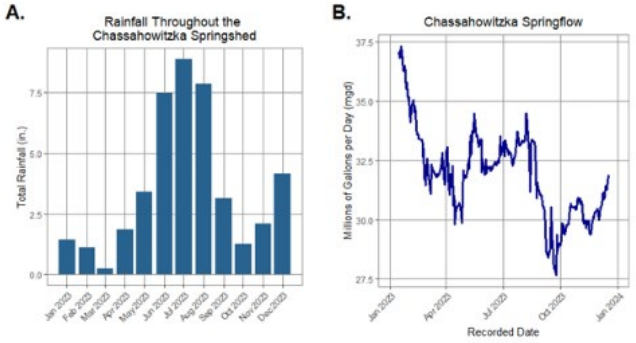
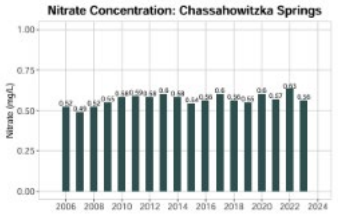


Figure 6: (A) Rainfall in the Chassahowitzka River Springshed influences the (B) amount of springflow.

Nutrients and other water quality parameters

Development within the Chassahowitzka springshed has contributed to increased nutrients within the spring. These nutrients are from a variety of sources, including fertilizer use and septic tanks. Excess of nutrients can cause an ecological imbalance in the river. The Florida Department of Environmental Protection (FDEP) has adopted a Basin Management Action Plan (BMAP) to implement the total maximum daily load (TMDL) for the protection and restoration of this system. The below graphs show the nitrate concentration at the spring vent and the total nitrogen concentration within the river, which are reported to the Springs Coast Committees.

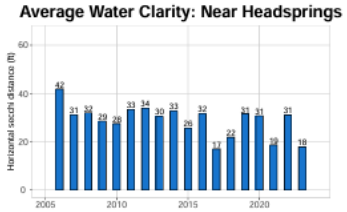


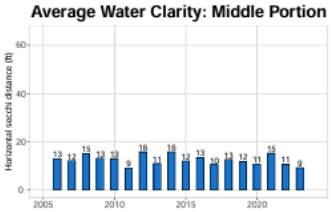
Excess nutrients in the water can cause reduced water clarity. However, water clarity is also impacted by many other natural factors such as tides, wind, and tannins. Tannins are compounds derived from plant organic matter that give water a brown pigment, which is how tea gets its color. Tannins from surrounding wetlands can enter spring-fed rivers and cause a change in the river's color.

Water clarity is measured using horizontal secchi measurements. A secchi disk is a black and white circular disk used by scientists to measure the distance until the disk is no longer visible. This method is often used by lowering the disk from a boat, but water clarity in springs often exceeds river depth. Horizontal secchi measurements are therefore conducted, where a diver swims until the disk is no longer visible. An example of this process is shown in Figure 7.

Figure 7: A secchi disk is used to measure water clarity.

Water clarity decreases with downstream distance, which is a common phenomenon in many riverine systems. The below graphs show water clarity in the headsprings and middle portions of the Chassahowitzka River, which are reported to the Springs Coast Committees.





Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) is mapped in the winter and summer of each year at specified locations called transects (see Fig 2B). Quadrats, which are square frames made of PVC pipe as seen in Figure 8, are used to measure coverage of species present. At each of these transects, one 0.25 m^2 quadrat is randomly tossed in the middle of the river and two are randomly tossed to each side approximately one-third and two-thirds the distance to the shoreline. The average of these five quadrats is used to capture the percent coverage at each transect to capture the variation between each riverbank.

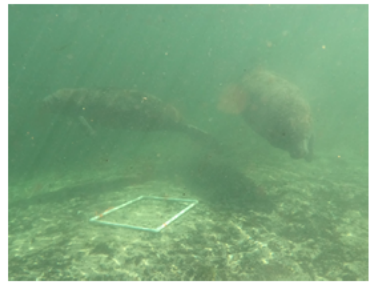


Figure 8: Manatees inspect quadrat during data collection in the Chassahowitzka River.

Seasonal variation can be seen in the Chassahowitzka River between the summer and winter SAV data collection efforts. This variability is attributed to differing ecological conditions such as growth patterns of SAV species, seasonal changes in spring flow, and manatee grazing.

Salinity impacts the type and abundance of SAV species with freshwater species appearing closer to the headsprings. As a result, ecological zones are present within the river (see Figure 9), which are characterized by their salinities. The tidal freshwater habitat functions like a spring-fed river. The elevated salinities within the transition and estuarine zones cause fewer freshwater SAV species to grow.

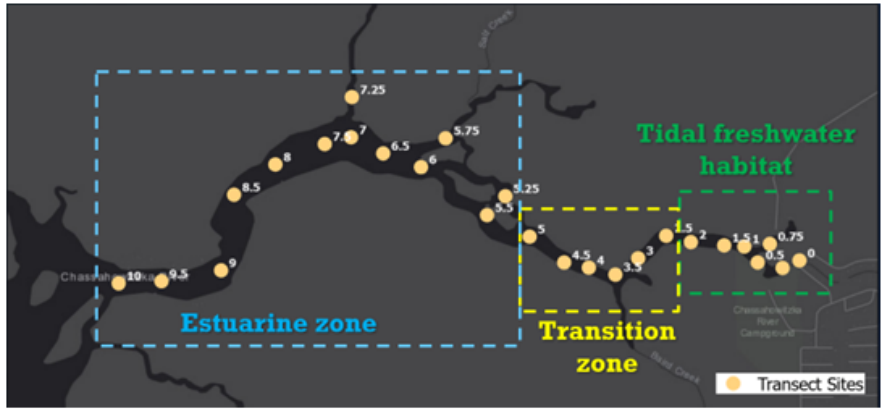
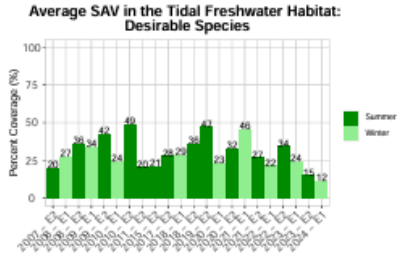
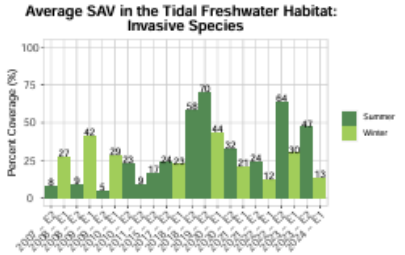
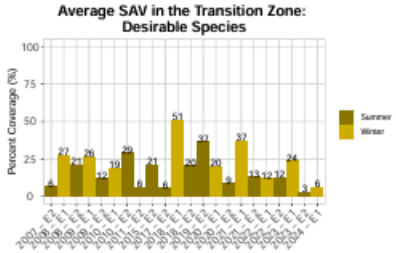


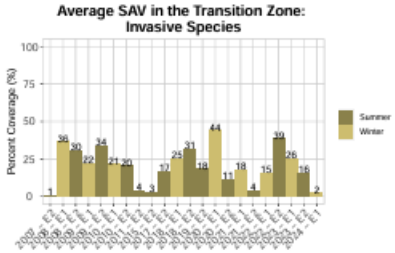
Figure 9: The submerged aquatic vegetation (SAV) in the Chassahowitzka River can be classified into the tidal freshwater habitat, transition zone, and estuarine zone.

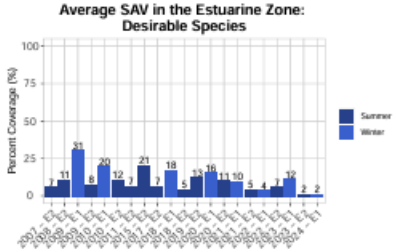
The below graphs show the average desirable and invasive SAV species in the different zones present in the Chassahowitzka River.

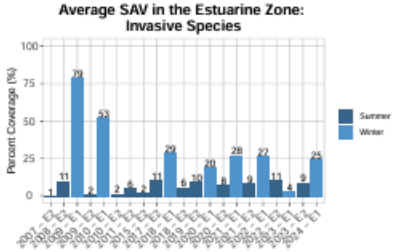












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WaterMatters.org/springs

Southwest Florida
Water Management District

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