

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 returned to the atmosphere via evapotranspiration by plants and direct evaporation. Recharge to the aquifer can carry with it the contaminants that various land uses have introduced to the natural system.

Water beneath our feet

A typical geologic cross section of the Floridan aquifer system is shown on the bottom left side of the poster. Where clays and other fine sediments restrict 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 overlies limestone, sinkholes are common and the ground water is 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 Floridan aquifer system is unconfined and is extremely vulnerable to contamination. Note the conduits and cave systems that have developed in the soluble limestone. These features transmit vast quantities of water rapidly to our springs.

Interesting interaction

In Florida, some rivers and streams flow 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.

Purpose

The "Florida's First Magnitude Springsheds" poster was created to inform governmental decision makers (e.g., county commissioners, legislators, and local and state agency personnel) and citizens of the importance of appropriate land use within springsheds. We must realize that recharge will become spring flow somewhere. Additionally, these springshed maps serve as baseline maps that can be further refined as continued research leads to a better understanding of these dynamic systems.

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 phosphorus, drainage and over-pumping are responsible for this degradation. To protect and restore these precious natural resources an understanding of springsheds is vital. With this understanding, hopefully county commissioners and citizens can make land use choices that will allow us to protect and restore springs.

Scientists define springsheds as those "areas of surface water and groundwater basins that contribute to the discharge of the spring." Simply, it is where the water comes from. The inset of north and central Florida contains the outlines of springsheds for most, not all, of our first magnitude springs.

First magnitude springs discharge more than 64.6 million gallons per day or 100 cubic feet of water per second. This is nearly 45,000 gallons per minute! It is spellbinding to observe such an enormous amount of clear groundwater gush out onto the land.

Accurate Mapping

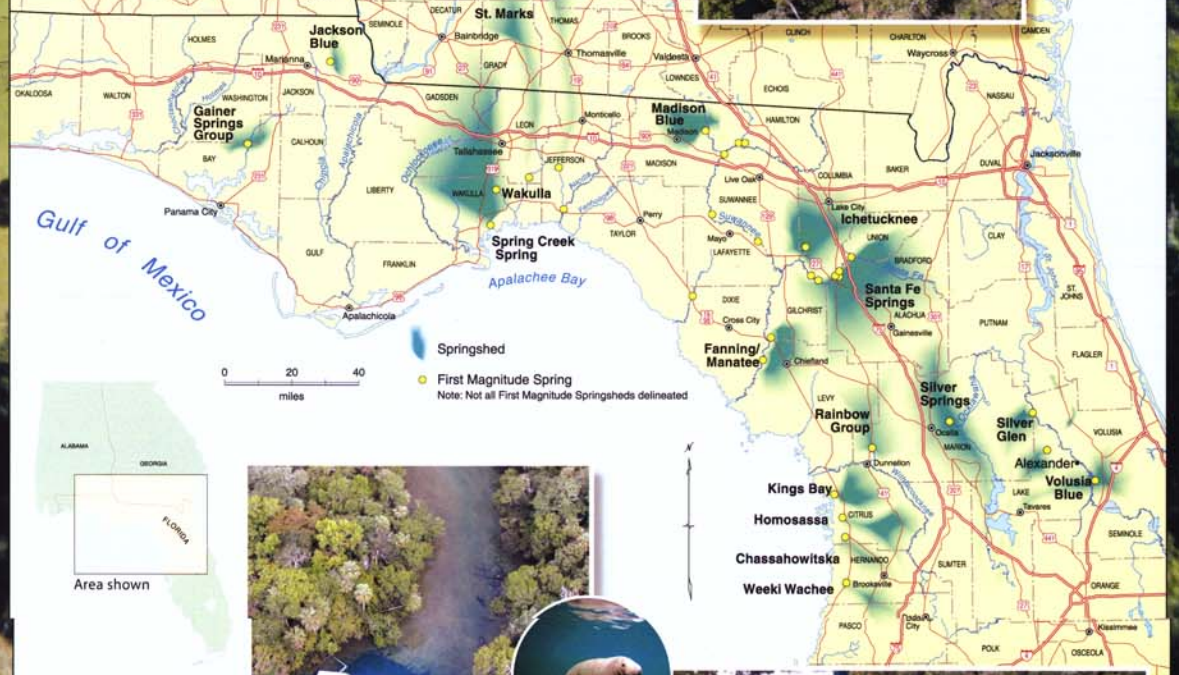
A land surface trace of the cave system leading to the spring is shown. Cave diver surveys and radiolocation techniques now allow accurate mapping of these cave systems. Some caves in which divers cannot penetrate are being linked to springs by the use of dye tracing.



Jackson Blue
Jackson County



Ichetucknee Head Spring
Columbia County



Homosassa Spring
Citrus County



Silver Springs
Marion County



The Florida Geological Survey collaborated with staff in the Northwest Florida, Suwannee River, St. Johns River and Southwest Florida Water Management Districts and the U.S. Geological Survey in the development of this poster. The springshed boundaries shown here are "preliminary" and will change as future research improves our knowledge and understanding of the hydrology of individual springs. Cave land surface trace provided by the National Speleological Society - Cave Diving Section.

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Florida Geological Survey
Poster 12

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