

## Scientists from across disciplines come together for springs research



Much of the work for the CRISPS project will take place at Silver Springs, the same place H.T. Odum first conducted his pioneering ecological research in springs in the 1950s. Photo by Jenny Adler

By Hannah O. Brown

At the same site where the Father of Springs Ecology, Howard T. Odum, began his pioneering research on springs decades ago, a group of scientists from the University of Florida and the St. John's River Water Management District have begun a three-year \$3 million initiative to take a closer look at some of the same questions that Odum himself explored.

"It's the same question now," said David Kaplan, UF assistant professor in the Engineering School of Sustainable Infrastructure and the Environment. "How productive are they? What are the drivers? So we are still trying to figure it out."

The project, called Collaborative Research Initiative on Sustainability and Protection of Springs or CRISPS, is focused on the Silver Springs springshed in Marion County.

While some conditions have changed since Odum's initial research in the 1950's, such as reduced water flow and an increase in nitrate concentrations, the project aims to use interdisciplinary research to identify any and all variables that may have an effect on the health of the spring.

The project's research team is organized into two "super groups" and six work groups. Researchers from UF have been paired with researchers from the SJRWMD, the funding organization, and each team is focused on a specific area of research impacting springs conservation.

"From our perspective, it's an excellent investment and a great opportunity to have a partnership like this," said Casey Fitzgerald, director of the Springs Protection Initiative at SJRWMD.

The project is directed primarily by three questions:

1. When and where is it most feasible and cost effective to reduce nitrate loading to the spring?
2. Is nitrate reduction alone sufficient to restore the degraded spring ecosystem?
3. What are the relative influences of nitrate and non-nitrate causes of excess algae in the springs?

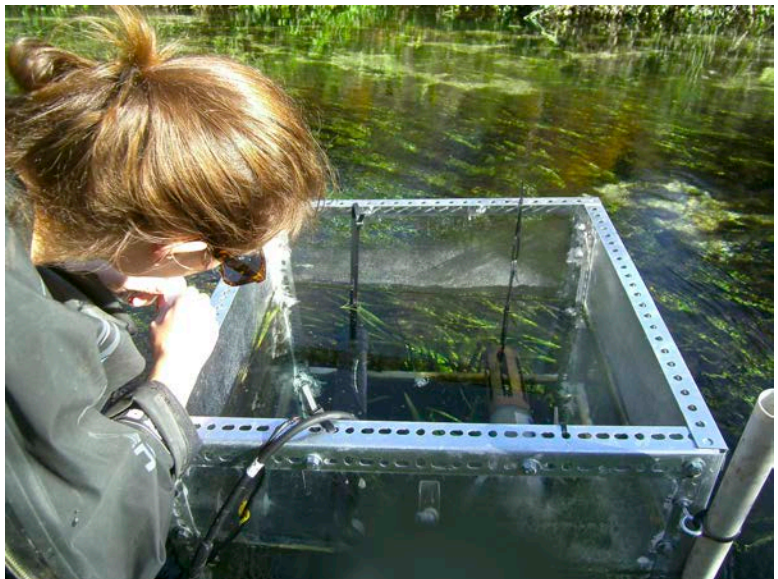
"It's a lot of disparate research in a sense," Kaplan said. "There are people looking at the scale of a springshed, which is thousands of hectares, and then people looking at the molecular scale almost, and so to synthesize that information is very hard and to do it in a way that's useful is even harder."

Dr. Pete Suscy, a researcher with SJRWMD for 22 years, works with Kaplan specifically on determining the role that the speed of water plays in the spring system.

"Our part is to focus on what velocity itself can potentially do to alter community structure in the spring, but, in particular, also to remove algae that is attached to the grasses," he said.

Velocity is just one element under consideration. Other areas of research include the effects of the food chain, what influence snails that graze on algae have, the impact of trace minerals and other topics that focus on what elements impact the health of the springshed.

UF and SJRWMD teams meet at least three times a year, with smaller



Researchers are investigating questions at many scales, from the entire springshed to the molecular level. Sensors allow scientists to collect data on dissolved oxygen, nitrates and other parameters.  
Photo by Jenny Adler

groups meeting as often as each month. With so many scientists involved, the feedback between researchers has become an intense process, pushing the team to ask new questions and consider fresh alternatives.

Fitzgerald said the abundance of scientific opinion is not a coincidence. The project was engineered to include a continuous feedback loop from the start.

“It’s very healthy to have that cross-pollination,” Fitzgerald said. “People tend to get so locked into their own areas, and really one of the keys is that we are not going to let that happen. We are going to make sure there is constant communication among the work groups and between ourselves and UF.”



Researchers are investigating a wide range of factors that may affect algal growth in the springs, including the role of grazers such as snails.  
Photo by Jenny Adler

And when the meetings are adjourned, the group makes sure not to cut the conversations short.

“When we ‘end’ the meeting, it doesn’t really end for another hour or so because people just sit there and keep talking, comparing ideas and whatnot,” Fitzgerald said. “It’s a very healthy exchange.”

CRISP researchers aim not only to identify and define the factors involved at Silver Springs, but also to create a foundation for future research in springs across Florida.

“We are confident that the restoration projects we have been funding are going to benefit the springs, but we want to be even more strategic in the future,” Fitzgerald said. “In order to do so, we need better science to answer a number

of questions so that we can better direct future investments, not only by the district but also all of the entities that are involved.”

The end goal, according to Fitzgerald, is to have a more complete picture of the various aspects impacting the springs, and then, ultimately, to come up with a plan to work toward conserving and protecting the springs as much as possible.

“So at the end of this study, we will have a much better understanding of what all of the influential factors out there are that are causing degradation of the spring systems and then how do we address those, how do we reverse those trends,” Fitzgerald said.

The project has come to the end of its first year, and Fitzgerald said everything is moving ahead according to schedule.

The researchers involved have also heralded the experience of the first year as largely positive. Kaplan said the ability for the scientists on both sides to share so much information so quickly has been inspiring.

“In one year, to have that much come out of the group, I think is pretty remarkable and says something to the determination of the scientists on both sides and also to the fact they’ve got students and a dedicated staff, and they make it happen,” Kaplan said.