Florida LAKEWATCH

Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program

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LAKEWATCH REGIONAL MEETINGS ARE BACK!

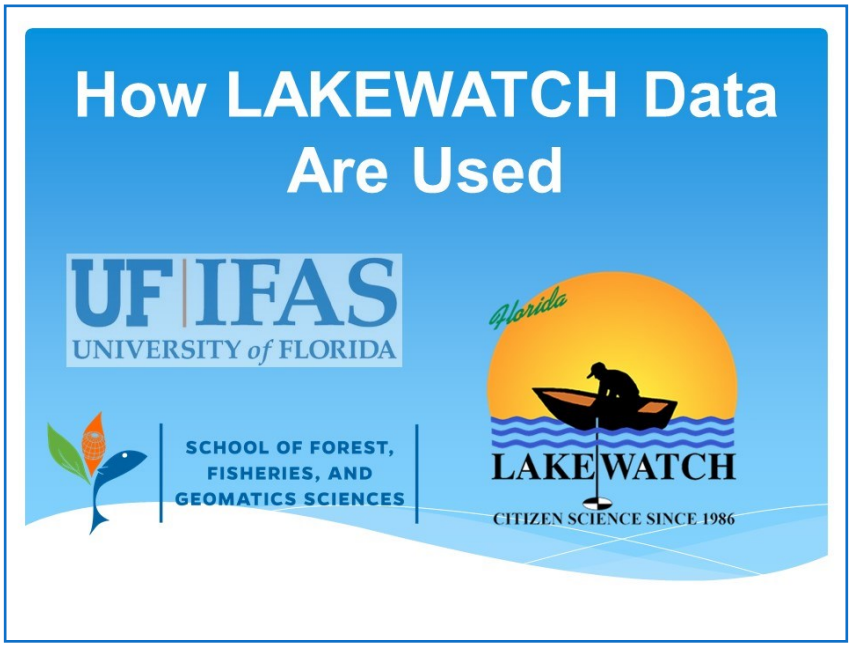
COVID-19 caused world-wide disruptions to everyone's lives. Florida LAKEWATCH was not an exception as sampling was postponed for a few months, our laboratory was shut down, staff were working from home and our annual face-to-face Regional Meetings were stopped. The last in-person Regional Meeting in 2020 was held March 10 in Sarasota County.

Since that time life has slowly been getting back to normal as COVID antibodies become more abundant in our population. The good news is that our Regional Meetings are back, and we have already had two excellent meetings, one in Alachua County and one in Orange County. LAKEWATCH staff were truly happy meeting face to face with our excellent volunteers as were the volunteers happy to meet with us.

The Regional Meetings will have almost the same format as before the shutdown. LAKEWATCH extension materials will be available on lake management issues (e.g., aquatic plant management, fish populations, water quality etc.). Extra parts will be available if your sampling kits are missing anything or if your hand pump has failed. To be cautious dinners will not be open Sonny's catering but will now be individual box dinners that Your Regional Coordinator will order after contacting you. As usual a short presentation will be given, this year's will describe how the data that LAKEWATCH Volunteers collect are used. Finally, there will be a round robin where you can ask questions or simply tell everyone what is happing with your lake.

We are truly looking forward to seeing you in person soon. Full meeting schedule will resume 2022

Mark Hoyer



TRYING TO DEMISTIFY NUTRIENTS IN THE HOME LANDSCAPE

BY LISA KRIMSKY

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In the world of water conservation and water quality, the home yard is a popular and complicated topic. Turf grass is a ubiquitous element within the urban (built) landscape. In fact, it has been estimated that there is more turf grass grown in the United States than corn and wheat combined. In Florida, where construction and development of residential areas is expected to cover up to a third of the state's landscape in the next 50 years, how these yards are managed, or not, can have a large impact on our fresh and coastal water quality.

Why is this? When it rains, excess water that does not soak into the ground runs off the land. This is called stormwater runoff. As the water runs off the land, it can pick up pollutants such as trash, chemicals, oils, sediments, grass clippings and leaf litter. Stormwater in Florida gets transported through a series of drainage systems, referred to as the municipal separate storm sewer systems or MS4s. The MS4 begins in the neighborhood and transports stormwater through a series of canals and natural rivers that eventually discharge into the coastal estuaries, the ocean, or the Gulf of Mexico.

Residential landscapes can be a beneficial component of the urban landscape as they are a permeable surface that allow for the infiltration of rain (and snow for those northern climes). However, when chemicals and fertilizers are applied incorrectly, stormwater can transport these and other pollutants to the downstream waterbodies via the MS4. This is a bad thing, as we have a nutrient problem in many of Florida's fresh and coastal waterbodies. Excess nutrients, primarily nitrogen (N) and phosphorus (P), can lead to water quality degradation and may result in eutrophication, low dissolved oxygen and fish kills, reduced water clarity, and/or algae blooms. Because of this, more than 50 Florida counties and municipalities now manage fertilizers through residential fertilizer ordinances.

While fertilizer is certainly a potential source of nutrients to our coastal water bodies, it is certainly not the only source attributed to the urban environment. Human sewage, pet waste, reclaimed water, organic materials, and atmospheric deposition are all potential contributors. For those who want to manage nutrient impairment through best management practices, it's important to understand where these nutrients are coming from and how much. With a team of colleagues, we wanted to investigate these questions with regards to the urban landscape.

In 2018, we partnered with residents of a waterfront community in Satellite Beach, FL to evaluate stormwater runoff from residential landscapes. We collected rainwater and runoff samples from a total of ten yards between May and August. Satellite Beach is in Brevard County which has a fertilizer ordinance that includes a wet season fertilizer ban prohibiting the application of N and P fertilizer to urban landscapes between June 1st and September 30th each year.

Figure 1. Location of Plant Root Simulator probes in home landscape. The probes provided a measure of nutrient supply rate that correlates to the plant available nutrient pools. Image credit: L. Krimsky, UF/IFAS.

The premise of fertilizer ordinance blackout periods is that wet season rains facilitate the transport of fertilizers into downstream waterbodies through stormwater runoff and leaching. By preventing the application of fertilizer, you eliminate the potential impact to surface waters. The fertilizer blackout period allowed us to compare the source and concentration of nutrients in the stormwater runoff before and during the fertilizer ban. Rainwater and runoff samples were also analyzed for the isotopic characterization of ni-

trate. This technique allows you to compare stable isotope values with those of known nitrate sources giving you the ability to assign sources of N in the samples to a specific source.

With the help of some amazing Master Gardener volunteers, we evaluated the landscape practices of the participating homes using a modified version of the Florida Friendly Landscaping™ (FFL) Home Landscape Recognition checklist. Landscapes were classified as either FFL or conventional which allowed us to compare nutrient concentrations in runoff from lawns with different management practices. Ultimately, we ended up with five yards classified as conventional and five as FFL.

Figure 2. Image of the surface water collection device installed in home landscapes. Image credit: L. Krimsky, UF/IFAS.

If you recall, during a precipitation event some rain (or snow) soaks into the ground. And it's likely that chemicals applied to the lawn will too. To account for this, we also sampled the soils in each landscape for soil nutrient pools (how much nutrients are collected over time) and nutrient supply rate (how much of those nutrients are available to plants).
As with most research studies, our results did not conclusively solve the big questions *Do fertilizer bans work* and *are FFL landscaping practices effective for reducing nutrient runoff*? This is likely due to the small sample size and the high variability we saw between our homes, but what we found may still interest and even surprise you.

Interesting finding #1: Despite our efforts to classify landscapes by management practices, we saw high variability in the concentration of nutrients in runoff across all our yards and this is likely attributed to different sources of nutrients in the home landscape. These results highlight how important individual behaviors are to nutrient management and our choices do matter. For example, in yards with very low fertilizer inputs, pet waste can become a significant contributor of nutrients to runoff.

Interesting finding #2: All of the lawn soils sampled had a significant supply of inorganic N

and P. Soil and organic N were also the dominant sources of nitrate in our runoff samples. These results show how the impacts from past behaviors may persist for a long-time in soil nutrient pools. Until those legacy nutrients are depleted, contemporary management may not be as effective as we'd expect, at least in the short-term.

Interesting finding #3: Atmospheric deposition contributed to 14% and 31% of the nitrate in the dry and wet season, respectively. While it is not surprising that the contribution of nitrate from rain increased in the wet season, what is perhaps sobering is that nearly one-third of all nitrate in the wet season comes from the rainfall itself. This finding is consistent with other areas in Florida and elsewhere.

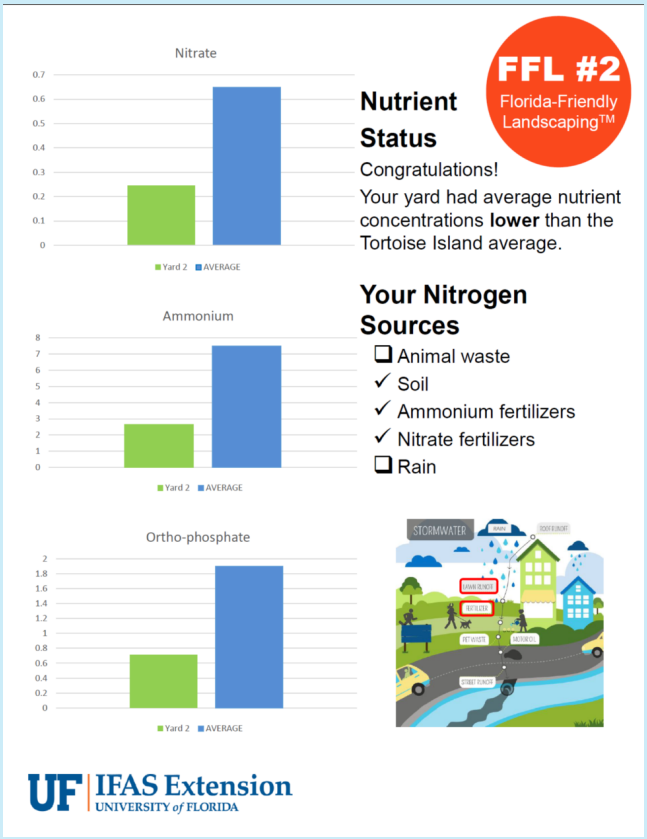


Figure 3. Homeowner report card. Individualized status reports for study homes to identify nutrient sources and opportunities for improvement. Image credit: L. Seals, UF/IFAS

Interesting finding #4: Ammonium and nitrate fertilizers make up a larger concentration of the nitrate in runoff in the dry season (compared to the wet season) and in conventional yards (compared to FFL yards). Despite these differences, fertilizers comprise ~8-29% of the nitrate in lawn runoff indicating that fertilizers can still be an important contributor to runoff, even during the fertilizer blackout period.

So, what's the big take-away? There is no magic bullet to nutrient management. Even at the parcel (home) scale, there are multiple sources of nutrients to surface waters. If we are to reduce our nutrient footprint, we need to effectively manage all sources of nutrients in the urban environment which means that everyone is responsible, even Fido.

This research was done in collaboration with M. Lusk, H. Abeels, and L. Seals with funding from a National Estuaries Program grant from the United States Environmental Protection Agency through an agreement with the IRL Council. The full article is available at: https://doi.org/10.1016/j.scitotenv.2020.142320

SEMINOLE ENACTS REGULATIONS TO PROTECT LAKE SHORELINES

BY MARTIN E. COMAS, ORLANDO SENTINEL

Over the past few years, Debbie Smith has seen a degradation in the water quality of the small lake near her home in south Seminole County because of nearby development and the clearing of aquatic plants along the shoreline that act as filters for the pollutants flowing with stormwater runoff.

“The shoreline has been wiped out and the water quality has gone down,” Smith said. “I’m just worried about our little lakes [in Seminole County] because they’re really taking a beating,”

This week, she and others were pleased to see Seminole commissioners enact new regulations designed to protect the shorelines of lakes less than 160 acres in unincorporated areas.

Under the new “shoreline alteration” ordinance approved unanimously by board members on Tuesday, property owners would have to obtain a county permit before clearing any vegetation along more than half of the shoreline bordering their property or more than 50 feet — whichever is less.

They also would have to obtain a permit to use herbicides or other chemicals to clear out vegetation to create a pathway along a shoreline for boaters, kayakers or swimmers.

Property owners also would not be allowed to build a retaining wall or change a shoreline by adding or digging out dirt, unless it is done as part of an approved building permit, such as building a new patio or home, according to the ordinance.

Kim Ornberg, manager of Seminole’s watershed management division, said aquatic plants along shorelines play an important role in preventing algae blooms, decreasing the growth of invasive species and protecting the surrounding ecosystem.

Seminole County commissioners have enacted an ordinance to protect the shorelines of small lakes like Lake Florence. Property owners will now have to obtain county permits if they want to make any changes. Photo by Willie J. Allen Jr./Orlando Sentinel

“They can protect shoreline property from erosion,” she said. “This is why it’s important to have rules governing their controls and management.”

County officials moved to enact the ordinance after the Florida Fish and Wildlife Conservation Commission revised its rules in November 2018 to say the agency will only regulate shorelines for lakes that are 160 acres or larger in size. That leaves most of the water bodies in Seminole without shoreline protection from the state.

“This ordinance will bridge the gap of protection for Seminole County shorelines that are no longer under Florida Fish and Wildlife’s protection,” said Kris Campbell, an FWC biologist. “Shoreline areas are crucial areas for fish and birds, and it is imperative that they are protected.”

In a memo, county officials said that unrestricted construction on shorelines — whether they are publicly or privately owned — “is not in the best public interest.” Seminole is dotted with dozens of small lakes, most within residential neighborhoods.

County Commission Chairman Lee Constantine called the new regulations “just another step in protecting our water quality” in Seminole.

In early 2017, Seminole enacted restrictions aimed at reducing the amount of fertilizer washing off lawns, yards, driveways and sidewalks, and ultimately, into lakes and rivers, where the nutrients can spur algae growth and pollute the water for fish and wildlife.

Under those restrictions, property owners are prohibited from applying fertilizers with nitrogen or phosphorous from June 1 through Sept. 30. They also are not allowed to fertilize if there is a tropical storm or hurricane warning or in an area that is expected to receive at least two inches of rainfall within a 24-hour period.

Under the new shoreline protection ordinance, a property owner would be required to construct a berm or swale system when adding an impervious service of 500 square feet or more, such as a patio or structure, near a water body.

Commissioners will determine the cost of a shoreline protection permit at a future meeting. Violators would first receive a warning. Repeat offenders could be ticketed by code-enforcement officers with fines up to $500 for each violation

“Education is our primary goal,” Ornberg said. “If we see something we try to educate people…. The fine is the last resort. I think most people want to do the right thing when they understand how it helps their water bodies.”

Seminole resident Gabrielle Milch, who lives near the Wekiva River, praised commissioners for the new regulations.

“This is a great ordinance in many aspects,” she said.

This story was written by Martin E. Comas (mcomas@orlandosentinel.com) and reprinted with permission from the Orlando Sentinel.

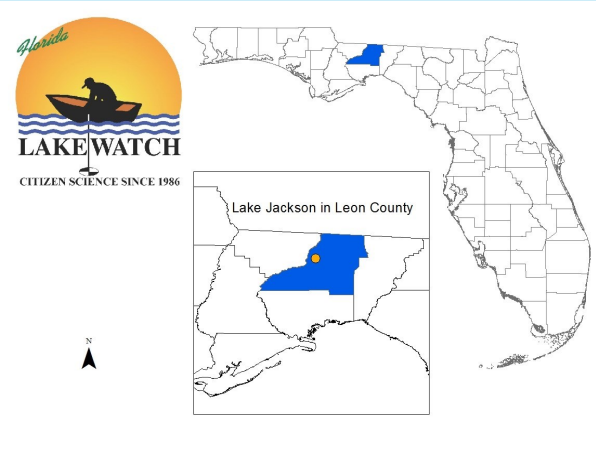
DISAPPEARING LAKE JACKSON

BY JASON "MO" BENNETT

Figure 1. Lake Jackson with low water level. Photo credit: Martin and Paisley Pryor

The summer and early fall of 2021 have been very wet for much of the state. This has caused high water for all types of waterbodies; from retention ponds, to lakes, and rivers. However, one lake in Northern Florida has had a completely different type of issue this year. Lake Jackson; located north of Tallahassee in Leon County, nearly drained away.

The lake was known to the Seminole Tribe as Okeehempkee, which means "disappearing water". It has two sink holes, one of which; the Porter Hole, opened up again this summer allowing the water to quickly drain into the open sink hole. https://floridadep.gov/rcp/aquatic-preserve/locations/lake-jackson-aquatic-preserve This exposed the lake bed and gave visitors the opportunity to see parts of the lake that are usually inaccessible.



Map of lake Jackson in Leon County, Florida. Photo Credit Jason Bennett

In addition to the things you would normally expect to find in a drained lake, human remains were also found near the now exposed sink hole. After law enforcement con-

Figure 2. Lake Jackson after sink hole drainage event 2021. Photo credit: Martin and Paisley Pryor

ducted the initial investigation it was determined by state archaeologists that the two human skulls found on the dry lake bed were of Native American Ancestry and are being handled according to federal and state guidelines. https://www.tallahassee.com/

The sink holes in Lake Jackson can open and close as sediment and clay flows in to the holes as groundwater and the aquifer level below rise or fall. According to the Florida Department of Environmental Protection, who manages the lake as part of an aquatic preserve, it is possible that the sink holes are slowly draining constantly. However, heavy local rains can counter this drainage and refill the lake relatively quickly once sediment moves in to block the opening again. At the time of the release of this article the lake had started to refill. However, given the history of this lake, this is unlikely to be the last time this occurs.

Figure 3 and 4. Lake Jackson after sink hole drainage event 2021. Photo credit: Martin and Paisley Pryor

LIFE CYCLE OF A LAKEWATCH SAMPLE

BY MARINA SCHWARTZ

LAKEWATCH staff sampling a lake

LAKEWATCH is made of many moving parts, and we want to take the time to dive in and tell you about the journey your samples take to go from collection to data.

The life of a sample actually starts when a Regional Coordinator trains a new volunteer. Using the approved LAKEWATCH techniques (https://lakewatch.ifas.ufl.edu/for-volunteers/training/) the newly trained citizen scientist collects water samples, which then get frozen and delivered to a local collection center. These collection centers are located throughout the state and samples are picked up bi-monthly or quarterly from these locations by Regional Coordinators and technicians and transported to the LAKEWATCH water lab where they are stored in a freezer until processing.

Laboratory technicians organize the samples and run nearly 2000 tests a week, analyzing the water samples for Total Nitrogen, Total Phosphorus, Corrected and Uncorrected Chlorophyll, color, and conductivity.

The results of these analyses are then compiled and organized by the data managers for storage and use by Florida LAKEWATCH and uploaded into the Department of Environmental Protection's Watershed Information Network https://floridadep.gov/dear/watershed-services-program/content/winstoret

Once a year these data are compiled in annual reports for volunteers that include information on the Numeric Nutrient Criteria, Nutrient Zones, and the historic data of each water body (if 5+ years of data exist). These data and reports are free and available on the LAKEWATCH website at https://lakewatch.ifas.ufl.edu/datareports/

The life of your data is a complex journey, and your water sample passes through many hardworking hands to become the data given back to you. This would not be possible without the efforts of the LAKEWATCH staff and our invaluable citizen scientist volunteers around the state!

Keep up the great work!

Have a great photo from a day out on the water?

An inspiring story to share?

A fun fact or recipe?

We would love to see what you've got. Send your submissions to:

FL-LAKEWATCH@UFL.EDU

Florida LAKEWATCH

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