UF IFAS UNIVERSITY of FLORIDA

Florida

LAKEWATCH

CITIZEN SCIENCE SINCE 1986

Dedicated to sharing information about water management and the Florida LAKEWATCH Program: Volume 74 (2016)

Florida LAKEWATCH makes a strong showing at the 2016 Florida Lake Management Society Meeting

This year the FLMS Board of Directors created an award to recognize the valuable work that volunteers contribute across the state. They created the *Dr. Daniel E. Canfield, Jr. Volunteerism Award*. The award is named after **Dr. Daniel Canfield,** founder of Florida LAKEWATCH, the citizen-volunteer water quality monitoring program involving over 1,200 lakes statewide, which is now being emulated across the country. Each year this award will be presented to a volunteer organization or accomplished volunteer for their "contributions to the research, restoration and preservation of our water resources". Florida LAKEWATCH and its volunteers have been monitoring Florida's water quality since 1986 in 57 counties across the state.

Florida LAKEWATCH director Mark Hoyer and Regional Coordinator Dan Willis accepted the award on behalf of the program and its volunteers.

UF and Florida LAKEWATCH graduate student Chao Xiong receiving his award from FLMS President Ron Hart.

Current students are asked to present their ongoing research at each FLMS annual symposium during a student "Meet and Greet" session. Afterward, outstanding students are selected by FLMS judges and honored for these presentations. This year's winner among the poster presentations was Chao Xiong. Chao is currently a Master's student at UF working in the Florida LAKEWATCH program where he's working with staff to identify changes in water chemistry related to land use changes within watersheds.

Dr. Dana Bigham-Stephens collecting samples during her time conducting research with the Florida LAKEWATCH program.

Each year FLMS honors professionals in the early stages of their careers working with Florida's aquatic systems. This year's *FLMS Young Professional Award* was awarded to Dr. Dana Bigham-Stephens. Dana earned her Ph.D. while working with Florida LAKEWATCH at UF; where she currently holds a courtesy faculty appointment. She is the Director of the Mattie M. Kelly Environmental Institute at Northwest Florida State College where she examines the temporal and spatial shifts in aquatic ecosystems with focus on anthropogenic and natural drivers of change. Dana is missed here at LAKEWATCH, but we're happy to see her thriving at her new endeavors.

The FLMS 28th Annual Technical Symposium will take place June 6th—9th, 2017 in Captiva, FL. This meeting is open to lake management professionals, volunteers and any other interested group. Please visit the FLMS website for meeting details, deadlines, and costs at www.flms.net

LAKEWATCH staff will be there and we hope to see you there too!

Volunteer Bulletin Board

- Upcoming volunteer county meetings to be aware of:
  - Alachua, Hamilton, Bradford and Columbia
    - 9/20/2016 @ 5:30 pm
  - Hillsborough and Pasco
    - 10/6/2016 @6:00 pm
  - Putnam, Clay, Duval and St. John's
    - 10/27/2016 @ 6:00 pm
  - Highlands
    - 11/13/2016 @ 1:00 pm
  - Miami-Dade, Broward and Palm Beach
    - 12/10/2016 @ 11:30 am
- Please visit our newly updated website for more information about the Florida LAKEWATCH program. You can find lake data, staff contact and information, publications, meeting schedules, pickup locations, and much more at: http://lakewatch.ifas.ufl.edu/
- Don't forget that we made a small but important change to the datasheets. Please be sure to fill out the "Time" column when recording your vanishing point and water depth measurements at each station!

Citizen Volunteers Participate in Groundwater Quality Monitoring

By Rick Copeland

AquiferWatch Inc.

INTRODUCTION

A recent cooperative effort to sample groundwater in the Lower Santa Fe River Basin (LSFRB) in north-central Florida (Figure 1) was completed. It consisted primarily of the sampling of nitrate (NO_3 + NO_2 as N), along with total nitrogen (TN) and total phosphorous (TP) in wells and springs located within the basin. Sampling occurred in September 2014 and May 2015.

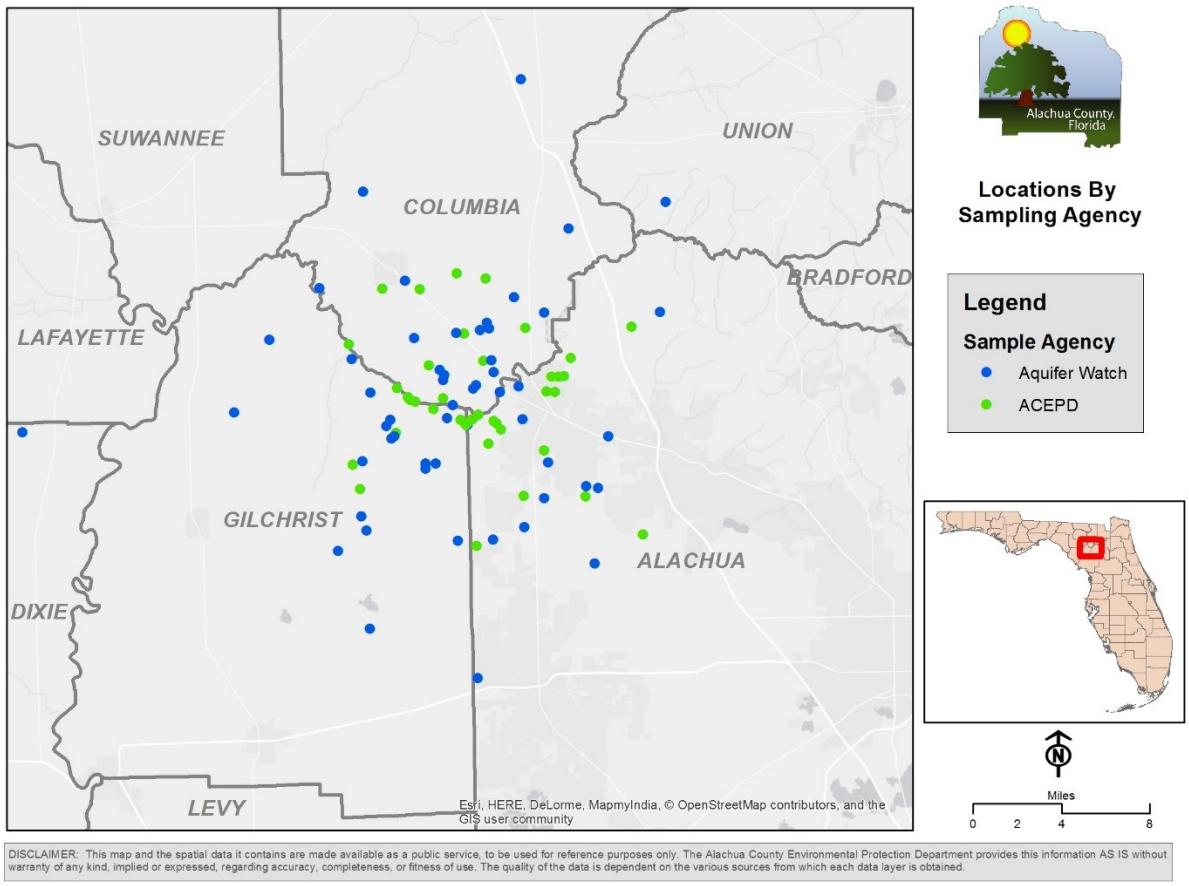

Figure 1. Sample locations in Lower Santa Fee River Basin. Samples obtained in September 2014 and May 2015.

Previous studies by the Chasar et al. (2005) and the Florida Department of Environmental Protection (DEP, 2012) demonstrated that nitrate concentrations are elevated in water from wells and springs in portions of the basin. Elevated nitrogen concentrations in the form of nitrate can potentially cause overstimulation of growth of aquatic plants and algae in spring runs and in surface water. Regarding drinking water, DEP has a standard of 10 mg/L.

As a response to the elevated nitrates within the basin, DEP initiated a Santa Fe Springs Restoration Focus Area monitoring effort in portions of the basin which contain the most likely sources of the nitrate (DEP, 2012). As a complement to the DEP effort, several organizations, including the Alachua County Environmental Protection Department (ACEPD), Florida LAKEATCH, Current Problems Inc., Karst Environmental Services Inc. (KES), and AquiferWatch Inc. agreed to organize and conduct an assessment of groundwater in a portion of the basin; the two synoptic sampling surveys. Again, the primary chemicals of concern were the nutrients nitrate, along with TN, and TP. The findings will assist governmental agencies better understand the temporal and spatial relationships of nitrates in groundwater within the basin. This article is an abridged version of a report being prepared by the ACEPD (in press).

Because of the expense for conducting surveys, including laboratory analyses, a question quickly arose, can citizen volunteers be used to reduce overall monitoring costs? With this in mind, the collaborating entities organized the two sampling events using volunteers. ACEPD, Current Problems, KES, and AquiferWatch found volunteers and wells for them to sample. AquiferWatch trained most of the volunteers how to obtain a good water quality sample. LAKEWATCH conducted the bulk of laboratory analyses.

DESCRIPTION OF SAMPLING PROJECT

Figure 1 displays the locations of the wells used to obtain water samples. Green dots represent wells sampled by ACEPD. Blue dots represent those sampled by volunteers, including KES. ACEPD selected groundwater sampling sites from a network of wells in the County. AquiferWatch and Current Problems were able to recruit approximately 40 volunteers. They agreed to sample their own residential supply wells on designated dates in September 2014 and May 2015. KES agreed to sample six wells in both events. All told, approximately 85 wells and six springs were sampled. Each volunteer agreed to not only sample their well during the appropriate time window, but to also deliver their samples to one of three drop-off centers: (1) KES in Gilchrist County, (2) Rum 138 Canoe and Kayak Rental Service in Columbia County, and (3) Extreme Exposure Dive Shop (High Springs) in Alachua County. AquiferWatch delivered all samples to the LAKEWATCH laboratory in Gainesville. A detailed description of quality assurance will be discussed in the ACEPD report.

The first sampling event was September 13th to September 17th in 2014. The second was May 15th to May 19th in 2015 (Table 1). In September 2014, 73 wells and six springs were sampled. In May 2015, 77 wells and 6 springs were sampled. Not all wells were sampled during both events.

RESULTS

The nitrate values ranged from 0.01 to 4.91 mg/L during September. The median value was 0.95. The average value was 0.99 mg/L (Table 2). For May, nitrate values ranged from 0.01 to 9.46 mg/L, with a median value of 0.76 and an average of 1.31 mg/L. The maximum value for TN was 9.50 mg/L in September, and 10.59 in May. The TP values ranged between 0.012 and 0.860 in September and 0.005 and 0.132 during May.

Table 1. Summary of Sampling Locations

County	September 2014	May 2015
Alachua	28	30
Columbia	26	26
Gilchrist	25	26
Union	0	1
Total	79	83*

* Analytical results are included for 82 samples (May). One sample was mislabeled and is not included.

Table 2. Summary of Parameters Analyzed by LAKEWATCH Laboratory

	September 2014			May 2015		
	$NO_2 + NO_3$ (mg/L)	TN (mg/L)	TP (mg/L)	$NO_2 + NO_3$ (mg/L)	TN (mg/L)	TP (mg/L)
Median	0.95	0.99	0.045	0.76	0.80	0.032
Average	0.99	1.54	0.060	1.31	1.49	0.037
Minimum	0.01	0.01	0.012	0.01	0.001	0.005
Maximum	4.91	9.50	0.860	9.46	10.59	0.132
Count	79	79	79	81*	82	82

* One sample for $NO_2 + NO_3$ was lost and not analyzed.

In general, wells located near the south side of the river showed higher nitrate concentrations in September 2014 (Figure 2a) and May 2015 (Figure 2b). The high spatial variability of nitrate among wells on adjoining or nearby properties confirmed that land use in proximity to the well itself may impact nitrate concentrations and can vary widely in a given area. There are a number of possible reasons for this difference. The Floridan aquifer system is unconfined in western Alachua and eastern Gilchrist counties and becomes semi-confined north of the Lower Santa Fe River. The confinement may afford some protection of the groundwater north of the river. The land area south of the river has a greater population density, primarily in western Alachua County. Well construction, especially depth, may be a factor in nitrate concentrations. Lastly, land use in proximity to the well affected nitrate values. Most of the private wells sampled were located in low density residential areas. Individual practices such as landscape or garden fertilization, and septic system location and condition may also affect nitrate concentrations.

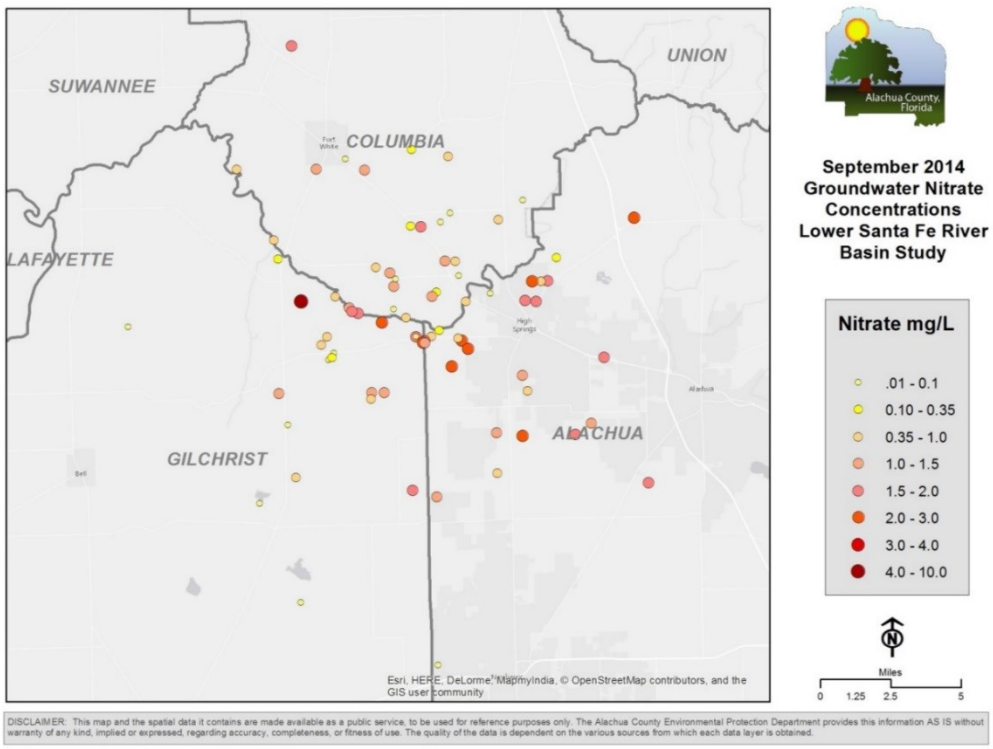

Figure 2a. Groundwater Nitrate Results Map, September 2014

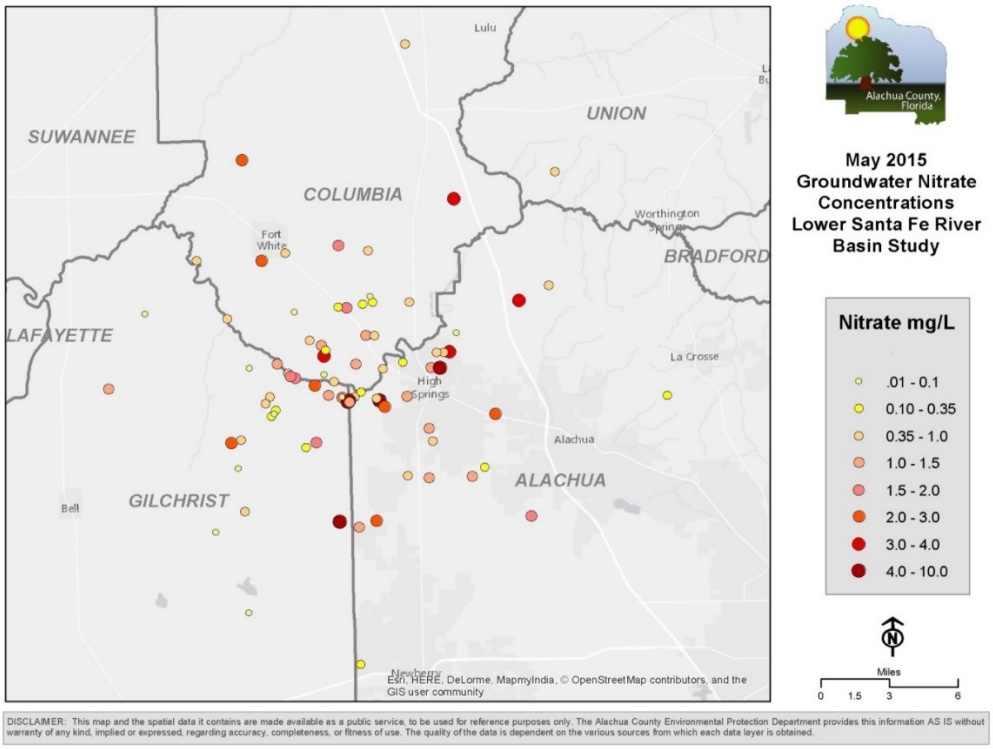

Figure 2b. Groundwater Nitrate Results Map, May 2015

FUTURE MONITORING ACTIVITIES

This project demonstrates the benefit of using citizen volunteers in the monitoring of groundwater. They greatly reduced the overall cost of the project.

The project was only funded through May 2015. Fortunately, in an effort to re-invigorate the project, in August 2016, LAKEWATCH agreed to conduct laboratory analyses for total nitrogen and laboratory specific conductance at no charge to the volunteers. In turn, ACEPD agreed to obtain groundwater levels from their network of wells. AquiferWatch and KES agreed to collect groundwater samples, along with the assistance of citizen volunteers. A total of 26 volunteers agreed to participate in the long-term project. The revised project will commence in the fall of this year.

I want to thank all of the individuals and organizations who assisted in this project and those who will do so in the future.

Dr. Rick Copeland

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REFERENCES

Chasar, L., Katz, B. and D. Griffin. 2005. *Evaluation of nitrate sources in springs of the Santa Fe River Basin using natural traces: geochemical, specific microbiological, and multiple stable isotopic indicators.* U.S. Geological Survey. Tallahassee, FL.

FDEP. 2012. *Basin Management Action Plan for the Implementation of Total Maximum Daily Loads for Nutrients Adopted by the Florida Department of Environmental Protection in the Santa Fe River Basin.* Prepared by FDEP. Tallahassee, FL. March 2012.

Best watch out, this place is full of moccasins!

By Mark Robertson

Florida's Cottonmouths, sometimes known as Water Moccasins, are easily the most vilified and misunderstood snakes in the southeast. Few swamp denizens evoke more hair-raising campfire stories, ranging from the legendary "ball of cottonmouths" that instantly kills anything it comes in contact with to the overblown belief that these snakes are highly aggressive and attack on-sight! Lots and lots and lots of stories…

To be perfectly honest, snakes in general have a bit of an image problem. None more so than these chunky, misunderstood opportunists that inhabit Florida's lowlands. Ignore, for a moment, the fact that we also have a dozen or so other aquatic snakes living here in the state…to many people, if it's in or near the water, it's a ***moccasin!***

Florida has two distinct species; the more common Florida Cottonmouth (*Agkistrodon conanti*) that inhabits the majority of the state and the scarcer Eastern Cottonmouth (*Agkistrodon piscivorus)* that only occurs in the western panhandle. Both are heavy bodied with large, well pronounced heads. Adults tend to average from 24" to 48" in length with a record of 74.5". Juveniles are tubby little things, averaging from 10" to 12" long at birth. It should be pointed out that newborns have a much brighter copper/red color than the adults. Also, the tip of the tail is greenish/yellow, used to 'caudle lure' prey within easy striking range for a quick snack! Juvenile Cottonmouths are very often mistaken for their close northern relative, the Southern Copperhead. It should be noted that Copperheads are rather scarce in the state, only inhabiting the Apalachicola River drainage, north of I-10. So if you see something that looks like a Copperhead anywhere else in Florida, it's most assuredly a baby Cottonmouth.

Cottonmouths are highly adaptable and, arguably, Florida's most common venomous species. They're found throughout the state, including the Keys and most of our barrier islands. While they have no problem crossing salt and brackish water, they don't prefer marine environments since they still require freshwater for drinking purposes. These snakes thrive in most wetland habitats and are considered to be a semi-aquatic species. What's not commonly known is that they're also quite terrestrial and will inhabit areas such as highland hammocks and pine flatwoods, far from standing water.

Being consummate opportunists, Cottonmouths will eat just about any animal they can fit into their mouths. Rodents, birds, fish, snakes and amphibians are all common food items. They'll also consume carrion and road kill if the opportunity presents itself; fussy eaters they are not! This is why it's not a good idea to leave a stringer of fish in the water overnight in Cottonmouth country.

Some quick facts about Cottonmouths:

- The name "cottonmouth" comes from the snake's tendency to flash the bright, white interior its' mouth as a visual warning to a perceived predator that has gotten too close. It serves the same purpose as a rattlesnake's rattle or a coral snake's bright pattern; stay back, I'll bite!
- As a secondary warning, they'll also half-heartedly wiggle their tail and emit a cucumber-like musk when disturbed. This musk can travel more than 10' on the wind, so if you suddenly smell cucumbers, there may well be a disgruntled snake in the area.
- While this will be hard for most people to believe, Cottonmouths are one of the least likely of our venomous snakes to actually bite in self defense. Yes, they bluff and put on a show in an attempt to keep you at bay, but they'll do everything in their power to avoid a confrontation if given a chance. They, like most animals, will defend themselves if forced to do so. Even a cute little squirrel will send you to the ER if you grab him!
- Oh, BTW, I don't endorse squirrel grabbin'!
- Even though Cottonmouths are semi-aquatic snakes, they're not exactly the most 'elegant' of swimmers. They usually have a very distinctive profile when viewed from a distance, floating 'high in the water' with their heads elevated for a better view. Yes, they can dive and swim beneath the surface, but that's normally done for a quick escape, not to sneak up and attack you!
- Yea, about that…Cottonmouths don't chase people, either! If they're heading in your general direction, it's because you're blocking their escape path. No, they're not out to get you, regardless of the tall tales your Grandpa told you!
- These snakes can also climb out onto branches overhanging the water; they're just not really good at it when they get larger and, ahh, fatter! The very vast majority of snakes you'll see basking during a sunny day are non-venomous watersnakes. Some, like our large Brown Watersnakes, look even more intimidating to some people, with their broad, triangular heads and pronounced eyes.
- While primarily nocturnal in nature, Cottonmouths can also be found during the day, especially if the barometer's falling as a storm comes through.

So, how do you avoid unwanted contact with Cottonmouths (or any other venomous snakes)? It's quite simple, actually, if you follow a few basic rules:

- Keep your eyes open and be aware of where you are and what you're doing!
- While hiking, look down at the trail in front of you.
- Stand still when you want to look around and admire the scenery!
- Wear shoes and long pants, especially around tall weeds and brush.
- Never reach into a dark hole or underneath an object lying on the ground.
- When darkness falls, always use a good light!
- Don't leave a stringer of fish in the water overnight!

The most common question is what to do if bitten. While this is a very rare occurrence, accidents do happen and need to be dealt with properly. A book could be written about all the things you shouldn't do if bitten, so let me give you the condensed version of what actions should be taken:

- This sounds rather obvious, but back away from the snake and leave it alone!
- Don't try to catch or kill it, you'll probably just get bitten again (that's a bad thing).
- If possible, take a quick photo of the snake and bring that with you to the hospital.
- Regain your composure and remember that very few bites in the U.S. are fatal.
- Rinse the bite area with water and try to keep that area lower than your heart.
- Walk, don't run! Keep the heart rate as low as possible.
- If you have a snakebite kit, now is a great time to throw it in the trash…it's safer there!
- No cutting, sucking or tourniquets allowed; these only will make things worse.
- No alcohol or drugs of any kind!
- If at all possible, have someone else drive you directly to an ER. If not, call 911.
- I should point out that it's not helpful if you get killed in a traffic accident on the way to the ER! Slow down, drive safe.
- When you arrive at the hospital, calmly explain to the attending physicians what happened and prepare for lots of questions. This is when having a photo of the snake that bit you will be helpful.
- Most snakes are not properly identified. You don't want to accidently start treatment on a bite from a non-venomous species!

Mark Robertson

Florida LAKEWATCH helps Lake Ossa Watch Initiative: a paramount necessity for sustainable fisheries and wildlife management in Lake Ossa Wildlife Reserve, Cameroon.

By Aristide Kamla

In 1968, the Lake Ossa Wildlife Reserve was established and Lake Ossa represents 90% of the surface area of the entire reserve. Lake Ossa is one of the largest lakes of Cameroon after Lake Chad, with a surface area of about 4000 ha. It is located about 50 km east away from the Gulf of Guinea and about 12 km west from the city of Edea, in Cameroon. The morphology of the lake is very complex with multiple basins (Figure 1). The forest on the watershed is related to the climate, altitude, soil type and topography and is dominated by two species: *Lophira alata* (a tree also known as Azobé or red ironwood) and *Saccoglottis gabonensis* (bitter back tree). Much of the natural forest has been replaced with agro-industries growing rubber plants (*Hevea sp*.) and oil palm (*Elaeis guneensis*). The rest of the land is used by the local population for subsistence agriculture where they seasonally farm plantain *(Musa spp)*, cassava (*Manihot esculenta),* and coco-yam (*Colocasia esculenta)*.

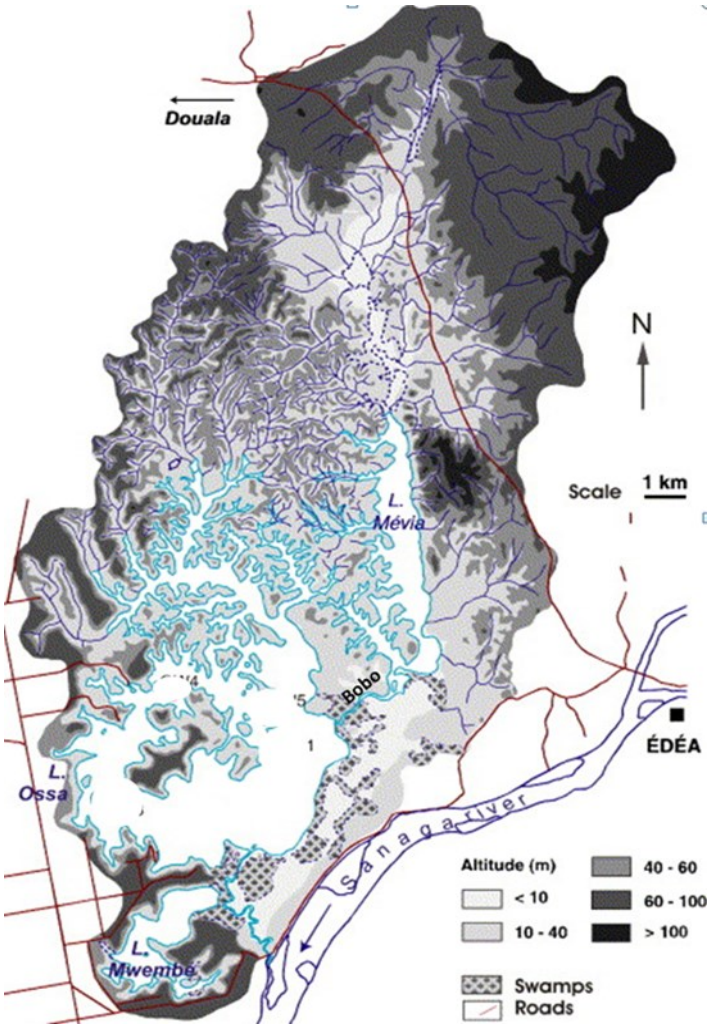


Figure 1: Topographic map of the The Lake Ossa complex showing the three lakes (modified from Giresse, 2005)

Lake Ossa supports over 18 families of fish dominated by Cichlidae and Mormyridae. Fish is the main source of proteins for thousands of people who live around the lake. About 400 fishermen are active in Lake Ossa using different sorts of fishing techniques including gillnets, purse seines, and Chinese bamboo traps. Fishermen have noticed a general decrease in fish stocks as their parents historically describe much bigger catches of larger fish with much less effort. Although no empirical comparison has been conducted, the report from fishermen is an indication that the fisheries of Lake Ossa are in decline and research needs to be conducted to determine causes.

Lake Ossa supports many types of aquatic plants but the system is dominated by emergent vegetation called antelope grass (*Echinochloa pyramidalis*) followed by the Seashore paspalum (*Paspalum vaginatum*) and bia (*Sclerosperma manii*). These aquatic plants provide excellent habitat for many wildlife species such as manatee, freshwater turtles, crocodiles, monitor lizard, snakes and many aquatic birds. The African manatee, the most emblematic species of the lake, feed mainly on aquatic plants. The abundance and availability of these plants for habitat is strongly dependent on lake morphology and water quality characteristics. Yet there are no historical data available on the yearly or seasonal variation in water quality of Lake Ossa.

Figure 2: Photo of the southern most part of Lake Ossa during the dry season. This part of the lake became completely dry and could not be accessed by manatees until it flooded again during the rainy season.

The general water quality of the lake varies among basins and seasons. In the southeast, water is opaque and has a brown muddy color because of the influence of the Sanaga River during the rainy season, as they are connected by a narrow 3km-channel. Water in the North and west is more transparent with a dark apparent color reflected by its black muddy bottom. The water level in the lake depends mainly on the discharge rate of the adjacent Sanaga River and rainfall. During the rainy season, water will flow from Sanaga River into the Lake Ossa system impacting water quality and bringing fish and other organisms into the lake from the river. During the dry season, the lake level drops and water flows from the lake into the river. The dynamic nature of Lake Ossa should be characterized by carefully monitoring the impacts of the Sanaga on lake water chemistry and wildlife populations. This information is desperately needed for the proper management the Lake Ossa Wildlife Reserve, to protect the unique nature of Lake Ossa, and to optimize the sustainable use of the lake.

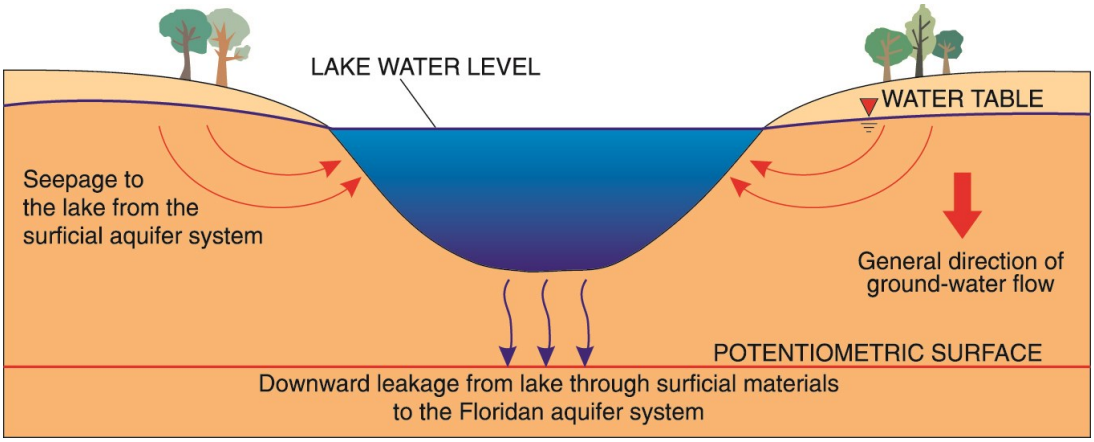
Aristide Kamla, a graduate student and Fulbright Scholar at the University of Florida College of Veterinary Medicine and President of AMMCO (African Marine Mammal Conservation Organization), has initiated the Lake Ossa Watch initiative in cooperation with the Florida LAKEWATCH program at the University of Florida School of Forest Resources and Conservation. The purpose of the Lake Ossa Watch is to monitor key water quality parameters that will help explain or predict ecological changes in Lake Ossa. The key parameters being monitored include water depth, Secchi depth, true color, chlorophyll, total nitrogen (TN) and total phosphorous (TP). The Florida LAKEWATCH program has been assisting the Lake Ossa Watch team in the monitoring of water quality. Florida LAKEWATCH has provided supplies including Secchi Disks and Nalgene bottles for water collection. In addition, LAKEWATCH has been providing laboratory analysis of the water samples collected and brought to the U.S. from Lake Ossa, Cameroon.

The Lake Ossa Watch team collected preliminary samples to established baseline data on the current water chemistry of Lake Ossa last year. These samples were collected at four sampling sites between May and September 2015, and additional locations and samples will be collected in the future. The following water parameters were analyzed for preliminary samples: pH, Alkalinity, specific conductivity, TN, TP, color, and turbidity. In the future chlorophyll samples will also be collected and analyzed. In addition to monitoring water quality, the Lake Ossa Watch team will also begin monitoring water levels, temperature, rainfall and aquatic plant abundances. The result of this monitoring initiative will provide valuable information that will empower the management of the fish stock and wildlife resources of the Lake Ossa Wildlife Reserve.

Spring-fed or not?

This article was provided courtesy of the Waterways newsletter, City of Winter Park, FL

Probably the single most common misconception lakefront residents have about their lake is that it is spring-fed, but is it? In Central Florida the answer is often "No."… and "Yes." This confusion arises over our understanding of Florida's geology and our perception of what constitutes a spring. A spring is an opening in the earth's crust which is directly connected to an aquifer, a natural, underground storage area for water. In most of Central Florida we have two aquifers, the Floridan and the surficial. The Floridan aquifer is made up of porous limestone bedrock filled with water. The water seeps down from the surface in areas where there are connections and can remain underground for long periods of time. In many parts of the state the Floridan aquifer is under pressure due to confining layers off clay or rock, that prevent the water from moving up or down as it travels through the porous limestone. When this pressurized water is punctured with a well or encounters a natural opening, the water surges upward. When the water rises high enough to flow freely from the opening, it is called an artesian well or spring. Large magnitude springs like Wekiwa Springs or Blue Springs are examples of artesian systems. Surficial aquifers are shallow, from the near surface to about 100 feet deep or less, and are comprised of water contained in sand, shell and/or limestone. Surficial aquifers typically do not have confining layers above them and make up what is known as the water table, the portion of the aquifer that rises or falls with rainfall or drought. Most lakes in Central Florida are essentially portions of the surficial aquifer that are open to the surface. The level of the surficial aquifer and the lakes associated with it are dependent upon rainfall and fluctuate accordingly as weather patterns change.



Groundwater seepage

(U.S. Geological Survey Department of the Interior/USGS)

When most people hear the word "spring", they think of artesian springs like Wekiwa that continuously boil over with clear water from the Floridan aquifer. While Winter Park does sit atop a porous cap of limestone bedrock, and interaction between ground and surface waters is a common feature of our lakes, none of the lakes in Winter Park are actually spring-fed, at least not by artesian springs. While our lakes do have connectivity to groundwater, the association is primarily with the surficial aquifer and inputs are usually groundwater seepage, not spring flow. Most lakes in this area have water seeping in from the water table and out to the Floridan Aquifer (recharge). In some lakes, there are confining layers that restrict seepage inflow from the surficial aquifer to isolated locations instead of across broad areas of the lake bottom. In cases like these, the groundwater may create what are known as a surficial springs where water is expelled forcefully enough to create a visible boil, or be felt by swimmers.

There are many ways in which springs and lakes are very different from one another, and these differences help explain why people are often confused about the conditions they observe in their lake, particularly if they were led to believe it is fed by an artesian spring.

- **Clarity** - Artesian springs discharge water that is crystal clear. Spring water is emerging from deep underground after having been filtered through bedrock and soil many years ago. The water in our lakes is made up of surface water (river or creek flow), groundwater seepage, stormwater runoff and precipitation. Lake water is rarely going to have the clarity that spring water does because it is constantly transporting and processing sediment, nutrients, and debris from these various sources.
- **Lake levels and outflows –** Artesian springs generally produce enough water to keep the basin in the immediate vicinity of the spring at a relatively constant level and there is typically a creek or river run created by the excess water spilling from the spring. If a lake contained a spring of significant magnitude, there would likely be a permanently flowing outfall and levels would not fluctuate much, if at all. Lakes that are part of the surficial aquifer are ultimately dependent on rainfall and rise and fall with the water table.
- **Temperature** - Springs which are constantly being fed by deep groundwater, remain at 72 degrees Fahrenheit year round. Our lakes on the other hand are exposed to the atmosphere and sunlight long enough for water temperatures to reach 85 degrees or more in summer. Sometimes swimmers will feel a layer of cool water when they dive down to deeper parts of the lake and attribute this temperature change to spring inputs. What they are actually encountering is thermal stratification, a condition that occurs in most Florida lakes during the warmer months. As summer approaches, sunlight heats the upper layer of the lake faster than the lower layer causing difference in density that keeps the two layers separated until the lake cools again in winter. Depending on how far sunlight penetrates in a particular lake, this stratification can occur anywhere from four to ten feet below the surface and the temperature differential between the layers can be substantial.

Unfortunately many people are told when they buy their house that the adjacent lake is spring fed, but they are not given any detailed information on how the lake is really supplied. This misinformation can lead them to believe that they will enjoy many of the characteristics that artesian springs provide and cause disappointment when their lake behaves like a lake. It is important to keep in mind that lakes and springs are actually different habitats with very unique features born of differences in local geology. Both are entirely natural and both provide extensive environmental benefits and ample recreational opportunities.

This newsletter is generated by the Florida LAKEWATCH program, within UF/IFAS. Support for the LAKEWATCH program is provided by the Florida Legislature, grants and donations. For more information about LAKEWATCH, to inquire about volunteer training sessions, or to submit materials for inclusion in this publication, visit us at:

http://lakewatch.ifas.ufl.edu/

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Or email: fl-lakewatch@ufl.edu

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