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## SEMINOLE COUNTY LOVE YOUR LAKE GRANT PROJECT COMPLETE

Seminole County was awarded a \$4000 Love Your Lake grant in March 2010 to continue work on a restoration and public education project on Red Bug Lake. This lake is in the Lake Jesup watershed and is located 2 miles east of State Road 436 on Red Bug Lake Road.

Red Bug Lake Park is a 60 acre park adjacent to the 28 acre Red Bug Lake, and offers picnicking, playgrounds, fishing, hand carried boating, tennis, racquetball, basketball, sand volleyball, softball, flag football/soccer, exercise trails, and pavilion rentals. It is one of Seminole County's most utilized parks generating as much as 5,000 visitors in one weekend. For fiscal year 2009, 246,613 vehicles were tracked entering the park and park facility bookings generated 45,802 logged events.

The park contains approximately 1,500 linear feet of the lake's shoreline of which approximately 450 linear feet were restored with this LYL grant. The grant was managed by Gloria Eby, Senior Environmental Scientist with the Seminole County Water Quality Section and Dean Barber, Dean Enterprises of Orlando.



*Red Bug Lake Restoration Project, Seminole County*

The project had two main objectives: to return the lake shoreline to a natural vegetated community with native plants, and to provide an example to the public of a properly maintained shoreline for central Florida lakes.

The shoreline was enhanced by removal of nuisance exotic species and replanting with native aquatic plants. Several kiosks were constructed along the waterfront of the site, demonstrating properly vegetated and maintained shoreline and installation of a berm and swale system for best management practices. These components provide information that the public can visualize and bring to other lakes or streams they may live on or access for recreation.

Much of the work was completed using volunteer efforts of schools, Seminole County residents and Watershed Action Volunteer participants. The planting events were used as educational components for school age volunteers as well as local residents looking for experience in lake shore restoration.

This project is a collaborative interagency/community effort involving the following entities: Seminole County Lake Management Program, Seminole County Leisure Service, Seminole County Red Bug Lake Park, and Watershed Action Volunteer Program, Florida Fish and Wildlife Conservation Commission.

(photos on page 8)

## President's Corner



Shannon Carter Wetzel taking care of Florida's lakes

**"I consider it a privilege to serve as your President this year."**

Shannon Carter Wetzel



Given everyone's shrinking budgets, many local professionals have expressed an interest in FLMS providing a local meeting option throughout the year. One of the things I would like to see is more of a local presence from FLMS. Please consider hosting or helping your local chapter plan a discussion group or lunchtime meeting.

It doesn't have to be anything formal. One of the venues that has been successful is a roundtable discussion/brown bag lunch...just a few hours over lunch where everyone brings their own lunch and discusses current topics. The central chapter has been able to bring in smaller local governments and water resource professionals to this meeting that haven't typically attended the annual conference.

Check out the local chapter listing, and contact your area representative. The more professionals we bring into the group the greater our store of shared knowledge, and that can only lead to improved lake conditions statewide.

*Enjoy the holiday season, and invite a colleague to join FLMS,*

*Shannon Carter Wetzel*

## Local Chapter Contacts & News

### Central Florida Chapter

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Butler Chain of Lakes Reuse Water study completed by Harvey Harper. Other topics included the status of the NPDES Pesticide General Permit requirements and results of a recent public meeting with FDEP, FWC and FDACS reviewing the details of a proposed permit program that the State of Florida was submitting to USEPA. In the proposal, only a select group of agencies need to submit "Notice of Intents" for pesticide applications. All local governments and private applicators are covered under the State's approved permit and NOIs would not be needed.

Orange County and Seminole County discussed the results of projects to re-vegetate stormwater pond areas with native species. It was concluded that the first year required heavy maintenance but once established, the native species began to take a foothold against invasives. Continued monitoring was needed before a final conclusion could be developed.

Orange County discussed a new project to incorporate several "next generation" technologies into a nutrient reduction project. A Stormwater Reuse/Harvesting pond with a Solar Irrigation component is being planned for the Barnett Park at Lake Lawne.

For information about future CFLMS meetings contact  
Ronald.Novy@ocfl.net

### CFLMS Meeting November 2010

The Central Florida Chapter of FLMS and the Water Resources Technical Group-ECB Chapter held a joint brown bag lunch discussion November 4, 2010, hosted by the FLMS, City of Casselberry and Environmental and Water Resources Institute. A tour of Casselberry's Lake Concord Stormwater Park was conducted before the round table. Several topics were covered at the lunch after the tour, including the results from the Lake

## Meet a FLMS Member

Every quarter we will bring you an interview with a different FLMS member. Gloria Eby is our second guest and she works in lake management with the Seminole County government. She is also the immediate past President of the Florida Association of Benthologists.

How long have you been a FLMS member?

Since 2001

How did you find out about FLMS?

Workplace

How has FLMS affected your life, or why is FLMS important

to you?

FLMS is important to me because of the information-gathering, meeting-of-the-minds arena FLMS provides. Lake Management is dynamic and challenging yet rewarding all at the same time. We all have common goals and concerns that FLMS helps to address on a state level providing a tremendous resource for lake/water resource managers.

Who do you work for and what do you do for your living?

Seminole County Water Quality Section-Lake Management Program which focuses on watershed and lake assessments, water chemistry analysis, education and restoration

projects.

Any hobbies in your off hours that you would like to mention?

Well in-shore fishing was #1 now its mommy-to-be.

What is the largest single problem facing lake managers today, other than financial issues?

Largest single problem other than financial??? Education. Being able to reach out and connect to individual(s) (watershed or lakefront, young or not so young) and teaching the concept of their impact to lakes all the while trying to meet standards and criterias. But guess what drives that ☺



Gloria Eby, FLMS member

## Upcoming Conferences Other Organizations

Here are the dates for some other conferences you might be interested in attending.

American Society of Limnology and Oceanography, ASLO Aquatic Sciences Meeting, 13-18 February 2011 San Juan, Puerto Rico · USA

Everglades Coalition, January 6-9, 2011, Westin, Florida

Florida Stormwater Association Winter Conference, December 1-3, 2010, Tampa, Florida

Florida Stormwater Association Annual Conference, June

8 - 10, 2011, Sanibel , Florida

The National Conference on Ecosystem Restoration, August 1-5, 2011, Baltimore, Maryland

Send conference information to [sbrandt@sjrwmd.com](mailto:sbrandt@sjrwmd.com) for a listing in future newsletters.

**"[The largest problem facing lake managers is] teaching the concept of [individual's] impact to lakes ."**

-Gloria Eby



## Update on Lake County Water Authority's



NuRF Aerial Image

Lance Lumbard  
Water Resources Project Manager

The Lake County Water Authority (LCWA) recently made history by constructing one of the largest alum-based surface water restoration facilities in the world. Known as the Nutrient Reduction Facility (NuRF), the project is a cooperative effort between the LCWA, the St. Johns River Water Management District and the Florida Department of Environmental Protection. The aim of the \$7.3 million project is to reduce the migration of nutrients from Lake Apopka northward into Lake Beauclair and the rest of the Harris Chain of Lakes. Reducing downstream nutrient loading is expected to curtail persistent algal blooms that have degraded the Chain's quality for decades.

2009. The NuRF works in concert with other ongoing restoration efforts aimed at achieving the Total Maximum Daily Load (TMDL) goals for the entire Harris Chain of Lakes. The NuRF has demonstrated the ability to treat one-hundred percent of Lake Apopka discharge (up to 250 cubic feet per second) while removing nearly two-thirds of the incoming total phosphorus (TP) load.

years is provided in the graph below. Based on District data, Lake Beauclair TP concentration has already declined 36% since the NuRF began operating when compared to the previous eight-years.

NuRF operation is funded solely by the LCWA and annual operating budget is expected to average \$1.5 million. Alum is the primary expense for the facility and consumption is driven by rainfall and Lake Apopka stage. The St. Johns River Water Management District manages water elevation in Lake Apopka according to a seasonal schedule using remote-operated gate structures within the NuRF. Once the regulatory stage is exceeded, flow is increased from minimum until the lake returns to the prescribed level. Flow is detected by an acoustic Doppler sensor at the NuRF inlet and the appropriate amount of alum is dosed automatically. Alum concentration is typically 10 mg Al/L.

Between March 2009 and August 2010, the NuRF reduced average Lake Apopka discharge TP concentration from 99 ppb to 34 ppb. This is almost equal to the Lake Beauclair TP TMDL of 32 ppb. During this time, the NuRF treated 16 billion gallons (six times the volume of Lake Beauclair), injected almost 3 million gallons of alum and prevented more than 2,500 kg of TP from flowing north into Lake Beauclair. Average monthly TP concentration in Lake Beauclair for the past ten

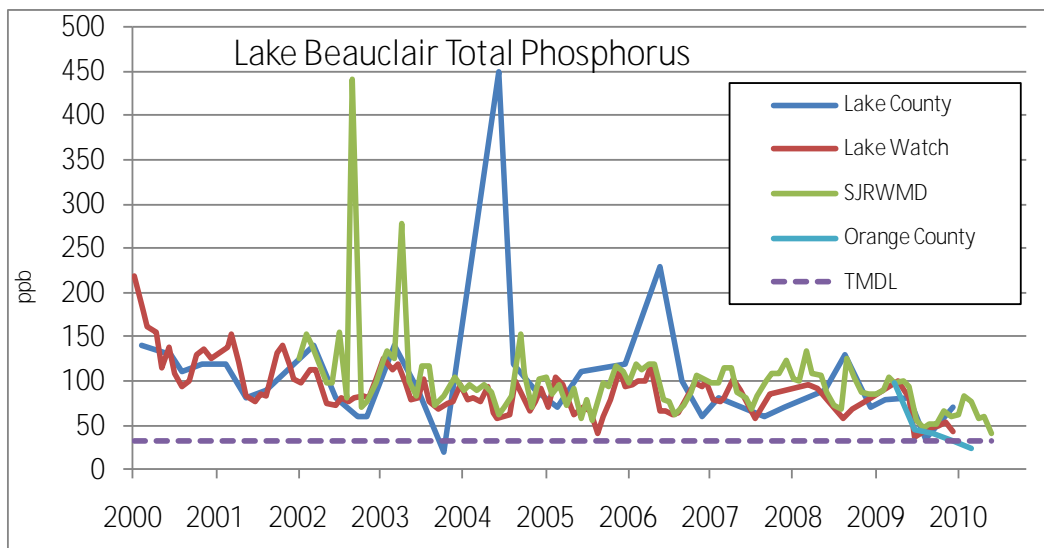


Dewatering centrifuge

Designed by Central Florida's own Environmental Research and Design, Inc., the NuRF began operating in March,



Alum Cake



## Nutrient Reduction Facility (NuRF)

Overall NuRF design is fairly simple and relies upon a gravity flow by-pass arrangement around the existing Apopka-Beauclair lock and dam (Figure 4). Once alum is injected, it is mixed with incoming water and begins to form a floc particle containing the target pollutants. The floc is retained by the facility as it passes through two 9-acre settling ponds (Figure 5). Treated water flows out of the settling ponds and returns to the Apopka-Beauclair Canal just north of the lock and dam. Generally, the Secchi depth of water leaving the facility is twice what it is entering and ranges from 1.2 m to 4.0 m.

Control of microfloc is an ongoing issue for the facility and several configuration

changes have made significant improvements.

Floc processing is the most challenging aspect of the NuRF. Because of the clayey soils on the site and high groundwater elevation, under-drain systems were not well suited for dewatering. Instead, the facility utilizes a large centrifuge with a 430 gpm capacity to produce a semi-dry cake material. When combined with suitable polymers, the centrifuge reduces the floc volume by approximately ninety-five percent and produces a material that can be transported using a track loader. The material is wind rowed within a 20-acre containment area at the facility where it further consolidates. Upon final drying, the floc

becomes a stable mineral which can be utilized to remediate soils containing excessive nutrients.

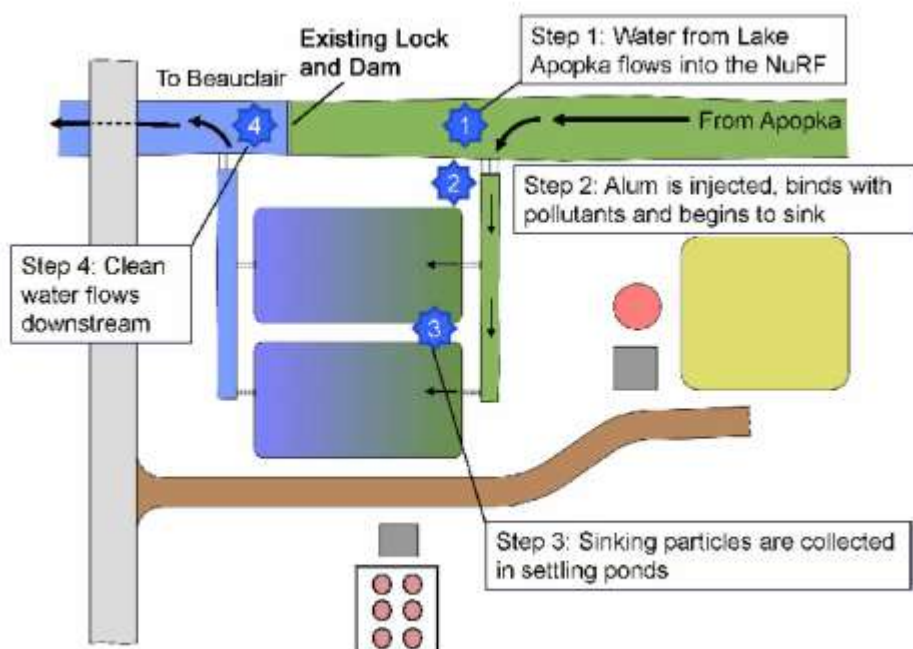
The NuRF will continue to provide downstream improvements in proportion to flow and rainfall. As nutrient concentrations decline in the downstream lakes, algal growth is expected to diminish resulting in increased light transmission and recovery of the historic submerged plant population. Cumulatively, these improvements are expected to result in achievement of TMDL goals for most of the lakes in the Harris Chain.

Questions?  
 Email: Lance Lumbard  
 [LanceL@LCWA.ORG]



The Harris Chain of Lakes

### NuRF Design Schematic



NuRF settling ponds



4.0 meter Secchi depth in settling ponds

# Shoreline Development Grants



Lake Tuskawilla

FLMS Shoreline Development Award Program provides funding for small lake restoration projects that are administered by county lake management staff. These awards are made each year in the amount of \$1000, with \$200 going to each of five projects selected by the county. Any county environmental resource manager can apply for these grants, as long as an application is submitted by March 1 of each year. Projects must be completed by February 28 of the following year.

Seminole County has received this award two years in a row and has sponsored many successful shore restoration projects. This year's five projects are now complete. All five sites will be monitored during the monthly aquatic plant surveys conducted by Seminole County Lake Management Program.

*Lake Tuskawilla* – Little Lake Howell watershed, Winter Springs, FL

Lake Tuskawilla, is a 92 acre waterbody surrounded by single family homes of concerned waterfront owners, who ac-

tively participate with Seminole County and other state and local agencies in management of their waterbody. The property restored was treated by the Seminole County Land Management Program herbicide contractor and re-vegetated with native aquatic plants by lake homeowners, volunteers and WAV in April 10, 2010. Revegetation included canna (*Canna flaccida*), pickerelweed (*Pontederia cordata*), duck potato (*Sagittaria lancifolia*), cordgrass (*Spartina bakeri*), bull rush (*Scirpus californicus/validus*) and other beneficial native aquatic plants.

This property, and other selected sites will be used to increase the number of waterfronts participating in native aquatic plantings and educate residents and volunteers on aquascaping. After restoration is complete Seminole County's herbicide contractor will continue to treat to prevent invasive aquatic plants from re-establishing.

*Myrtle Lake* –Soldiers Creek watershed, Longwood, FL

Myrtle Lake, a TMDL associated 55 acre waterbody is surrounded by over 12 residential subdivisions of concerned waterfront owners, who actively participate with Seminole County and other state and local agencies in management of their waterbody. Myrtle Lake is one of Seminole County's Lake Management Program's model lakes, having completed an extensive organic sediment removal with shoreline and wildlife island revegetation in one of the lake's four major lobes. The property was re-vegetated with native aquatic plants by lake homeowner volunteers and WAV in May 2010.

*Lake Howell* –Howell Creek watershed, Casselberry, FL

Lake Howell, a 394 acre TMDL waterbody, is surrounded by several residential subdivisions, single family residences, and condominium/apartment complexes of concerned waterfront owners. This waterbody has an active lake's Board of Directors who conduct annual meetings while working closely with state

**"A lake is the landscape's most beautiful and expressive feature. It is earth's eye; looking into which the beholder measures the depth of his own nature."**  
–Henry David Thoreau



Before (left) and during (right) pictures of the Shoreline Development project at Prairie Lake in Altamonte Springs, Seminole County



## Shoreline Development Grants (con't.)

agencies, Seminole County and the City of Casselberry. Over the last several years, they have struggled with management of the invasive aquatic plant, hydrilla (*Hydrilla verticillata*), whereby, the lake is currently over stocked with triploid grass carp. The lake presently has approximately two percent aquatic vegetation consisting mostly of torpedo grass (*Panicum repens*) and spatterdock (*Nuphar luteum*). Six exclusion habitats (1 meter cubes) have been established to determine submersed aquatic vegetation survivability inside and outside of these structures. After six months, four of the structures that were planted with eelgrass (*Vallisneria americana*) and two with lemon bacopa (*Bacopa caroliniana*) are doing very well. The same species that was planted outside of the enclosures are not doing as well. The eelgrass is gone and the bacopa is reduced by 30-50 percent.

*Prairie Lake* –Gee Creek watershed, Altamonte Springs FL.

Prairie Lake, a 123 acre TMDL associated waterbody, is sur-

rounded by several residential subdivisions, single family residences, of concerned waterfront owners. This waterbody has an active lake's Board of Directors who conduct annual meetings while working closely with state agencies and Seminole County. Over the last several years, they have struggled with management of the invasive aquatic plant, hydrilla (*Hydrilla verticillata*). The Prairie Lake management plan is updated annually by Seminole County Lake Management Program in conjunction with lakes liaisons that conduct annual meetings. Several of the waterfront lots have already been cleared of exotic and invasive aquatic plants and re-vegetated with native aquatic plants. These sites are currently managed by homeowners under a Florida Fish & Wildlife Conservation Commission Aquatic Plant Control Permit.

The property shoreline was treated for exotics like torpedo grass (*Panicum repens*) and re-vegetated with native aquatic plants by lake volunteers and WAV in September, 2010.

*Springwood Waterway* – Little Wekiva watershed, Altamonte Springs, FL

SpringWood Waterway a 2 acre waterbody, surrounded by fifty four residential homes comprised of concerned waterfront owners who actively participate with Seminole County and other state and local agencies in the management of their waterbody. Springwood Waterway is a waterway off of Lake Destiny that eventually discharges into Spring Lake, a TMDL lake. Their participation has consisted of management of the invasive aquatic plants hydrilla (*Hydrilla verticillata*) and torpedo grass (*Panicum repens*) through herbicide treatments. The property was cleared of invasive aquatic plants and treated for Hydrilla prior to replanting. Replanting with beneficial native aquatic plants was completed in October, 2010.

In the next newsletter, projects completed by Hillsborough County will be highlighted.



Springwood Waterway

**"Dirty water cannot be washed."**

~African Proverb



*Pictures of the Shoreline Development project at Prairie Lake in Altamonte Springs, Seminole County. Left: removal of non-natives and invasive vegetation Right: Final project with native plants*



# Love Your Lake Grant (con't.)



Gloria Eby, project manager, in restoration mode

The details about this grant project are on the first page of the newsletter. This project is

located on Red Bug Lake in Seminole County. Gloria Eby and Dean Barber submitted a

proposal for the project that was awarded \$4000.

Before

After



**"I'm an old-fashioned guy... I want to be an old man with a beer belly sitting on a porch, looking at a lake or something."**  
-Johnny Depp



Volunteers working on Red Bug Lake Love Your Lakes grant restoration





## Lake Tibet Reclaimed Water Irrigation Study

Dr. Harvey Harper presented a summary of the Lake Tibet Sub-basin 1 and 2 Study during our Butler Chain of Lakes Advisory Board Meeting on July 19, 2010. Monitoring of the lake and runoff from the golf course receiving reclaimed water was completed by Environmental Research and Design, Inc. for Orange County between August, 2008 and February 2009. Water samples and flow measurements were taken biweekly during the 6-month study.

This period was dryer than normal, receiving less than half the average rainfall for these months. However, discharge from the golf courses was constant, and, on average, delivered 1.87MGD runoff to the

lake.

The study indicated that the average nutrient discharges from two of the sub-basins were 10x higher than the nutrient concentrations found in the lake and that the total phosphorus concentrations in the reclaimed water at the Bay Hill Golf Course were 100 times greater than the average phosphorous concentrations seen at Lake Tibet (1,558 vs. 14 micro gram / liter of total phosphorus). Phosphorus loadings from the golf course had 1,478% greater phosphorus than loadings from residential areas onto the golf course area.

The stable isotope analysis concluded that the majority of nutrients originated from or-

ganic sources. reclaimed water is typically categorized as organic in origin, while turf fertilizers are typically from inorganic sources.

Concentrations of both soluble and total phosphorus were substantially higher downstream of golf course areas than in more upland portions of the two sub-basin areas. The majority of phosphorus present in groundwater appeared to be in the form of soluble phosphorous which is readily available for biological uptake by algae and plants and detrimental to the water quality of the lakes.

For more information, contact Sergio Duarte,

[Sergio.Duarte@ocfl.net](mailto:Sergio.Duarte@ocfl.net)



*Reclaimed water irrigation on golf course*

## Not Too Early to Plan for FLMS 2011

FLMS 22nd Annual Conference will be held at [Renaissance Resort World Golf Village](#), just west of St. Augustine from June 14 – 16, 2011, with workshops on June 13. Room rates are \$99 per night.

Bring your family because there are a lot of things nearby for everyone to enjoy. Just around the corner is an IMAX theatre, and two outlet malls are just one exit away on I-95. Beautiful beaches are less than 30 minutes away and several state reserves spanning from the intracoastal waterway to the ocean are also nearby.

We will be offering the Lake Vegetation Index training workshop again with Florida Department of Environmental Protection staff. Weather allowing, this will be conducted at the Gold Head Branch State Park.

Check out the poll on the back page and let us know what else you would like to see next year. You may think its way too early, but we need lots of time to get things in motion. Hope to hear from you about excursion ideas for you and your family and look forward to seeing you there.



St. John's County Conference Center

# Florida Lake Management Society

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Check out our website: [FLMS.net](http://FLMS.net)

You may now join FLMS by simply completing our online [form](#):

Newsletter Editor: Sherry Brandt-Williams  
Send articles or ideas to [sbrandt@sjrwmd.com](mailto:sbrandt@sjrwmd.com)

## Personal Opinion Poll

Please help us make our next conference even better than last year's by selecting all of the options below that you would like to see at the 2011 conference. Please participate even if you were not able to attend in 2010. Cut and paste your choices into an email to [flmshome@aol.com](mailto:flmshome@aol.com). Thanks!!

- \_ A family oriented dinner excursion Wednesday evening
- \_ Prearranged kayak or canoe trips the weekend or Monday before the conference
- \_ Concurrent sessions with more papers overall
- \_ A narrated trip on the St. Johns River
- \_ An excursion to the outlet malls during the conference for family members
- \_ A sailing excursion Wednesday evening
- \_ Field trips on Monday to nearby restoration projects or nature parks
- \_ Field trips during the week to nearby nature parks focused on kid's activities

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See all the latest FLMS merchandise!

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