AWRA Florida Section Meeting  
Friday, May 15 at Lake Worth Drainage District, Delray Beach, Florida  
Water Management in South Florida  

Join AWRA Florida and the Florida Engineering Society’s Florida Institute of Consulting Engineers (FICE) for an informative technical meeting focusing on the state of water management in south Florida. Topics will include local and regional water management challenges within south Florida, such as Lake Okeechobee, moving water to the Everglades and coastal estuaries, balancing water supply and environmental needs and a legislative update on the latest regarding the pending water policy bill. Invited speakers include an array of public and private water managers and experts representing local and state governments and environmental interests. The meeting will be held at the offices of the Lake Worth Drainage District (LWDD) in Delray Beach.

The LWDD was created on June 15, 1915 to provide water management to drain lands for the migration of inhabitants and lands for food production. Today agriculture no longer exists in the LWDD to only feed local residents, and the migration of people continues to increase annually. Thus, the Lake Worth Drainage District has modified its mission over the past century to meet the new demands of these two diversified communities. Much of LWDD’s emphasis today is on residential flood protection. While meeting the needs of agriculture and development can bring many challenges, it is because they co-exist that makes living and working in our community desirable.

Confirmed speakers/panelists include Bob Brown, LWDD, Tommy Strowd, LWDD, Ken Todd, Palm Beach County, Ernie Marks, Florida Fish and Wildlife Conservation Commission, Dr. Tabitha Cale, National Audubon Society, Kim Taplin, U.S. Army Corps of Engineers, Jeremy McBryan, South Florida Water Management District, Ernie Barnett, Florida Land Council, Tom MacVicar, MacVicar Consulting, Inc., and Greg Munson, Gunster. Two panel discussions are planned: one on Water Management Challenges in South Florida and the other on Lake Okeechobee and the Coastal Estuaries: Challenges and Opportunities.
Following the technical meeting, a networking reception is being planned at the Saltwater Brewery - 1701 West Atlantic Ave., Delray Beach, FL 33444, 561-865-5373.

Register online for the meeting at: http://www.awraflorida.org/event-1866523

An optional tour of the South Florida Water Management District’s L-8 Flow Equalization Basin (FEB) project, which is currently under construction in western Palm Beach County, is being planned for the morning of May 15.

The L-8 FEB, part of the District’s $880 million Restoration Strategies program to improve Everglades water quality, is a deep storage impoundment intended to improve the performance of Stormwater Treatment Areas 1E and 1W. Details are still being finalized – please check http://www.awraflorida.org/event-1866523 for more information and to sign up for the tour. Note: cost is $15 per person.

LODGING (CLICK FOR WEBSITE)

Hyatt
Colony Hotel
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Fairfield Inn

SPONSOR INFORMATION

The following is a link for sponsors to donate/pay sponsorships online: http://www.awraflorida.org/donations

For more information on meeting sponsoring opportunities, please contact Luna Phillips at LPhillips@gunster.com or 954-712-1478.

Construction is moving forward on the outflow pump station for the L-8 Flow Equalization Basin (FEB), one of several Restoration Strategies projects underway to improve Everglades water quality. Building on a strategically located 950-acre former rock mine, this deep-ground reservoir will be capable of storing approximately 45,000 acre-feet or 15 billion gallons of water.

Meeting Sponsors

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Friday, May 15 at Lake Worth Drainage District, Delray Beach, Florida
Water Management in South Florida

PRELIMINARY TECHNICAL AGENDA

**Thursday, May 14**
6:00 – 8:00pm  AWRA Florida Board of Directors Meeting - All are welcome to attend as the Board of Directors handles the business of the section.

**Friday, May 15**
8:00 - 11:00am  Tour of the South Florida Water Management District’s L-8 Flow Equalization Basin *(Optional; Space is limited; Exact time still to be determined; cost is $15 per person)*
12:00 - 1:00pm  Lunch *(on your own)*
12:30 pm  Onsite Meeting Registration Opens
1:00 - 1:10pm  Welcome and Introduction – Gary Howalt, President, AWRA Florida
1:10 - 1:30pm  Lake Worth Drainage District: The First 100 Years - Bob Brown, Executive Director, Lake Worth Drainage District
1:30 - 2:45pm  Panel Discussion: Water Management Challenges in South Florida
2:45 - 3:00pm  Virtual Tour of the South Florida Water Management District’s L-8 Flow Equalization Basin and Coffee/Snack Break
3:00 - 3:20pm  Legislative Update - Greg Munson, Gunster
3:20 - 3:30pm  2016 AWRA Annual Water Resources Conference Update
3:30 - 4:45pm  Panel Discussion: Lake Okeechobee and the Coastal Estuaries: Challenges and Opportunities
4:45 - 5:00pm  Closing Remarks
5:30pm  Networking Reception - Saltwater Brewery - 1701 West Atlantic Ave., Delray Beach, FL 33444
http://www.saltwaterbrewery.com/

Save the Date - Upcoming Meetings in 2015

July 23, 24 - Key Largo
September 18 - Apalachicola
November 6 - Daytona

Mark your calendars for Friday, November 6, 2015 because you won’t want to miss the final Florida Section AWRA meeting of the year:
**SHORE 2015 – Sharing Our Research with Everyone!** A day-long symposium featuring the work of undergraduate students and high school seniors conducting research on the Indian River Lagoon (IRL) together with recognized scientists throughout the region.
Board of Directors Summary

AWRA Florida’s Board of Directors (BOD) met March 27, 2015 from 10:00 a.m. – 12:00 p.m. prior to the Technical Meeting held at Archbold Biological Station in Venus, Florida. The detailed agenda and minutes will be included on the Section website following BOD approval of the minutes at the May BOD meeting.

Highlights of the meeting include:

- **Executive Committee Elections:** A final vote on the nominees occurred and the AWRA Florida officers for 2015 are as follows: Gary Howalt, Environmental Services, Inc., President; Kristin Bennett, Tetra Tech, Inc., Vice-President; Mark Diblin, AMEC Foster Wheeler, Treasurer; and Jeremy McBryan, South Florida Water Management District, Secretary.

- **Treasurer:** Mark Diblin presented the financial report for Jan. 1 – Mar. 26, 2015. Total income during this period was approximately $10,410 and net expenses were $9,578.

- **Education Program:** The application deadline for the J.B. Butler Science Grant, William V. Storch Award, Sanford N. Young Scholarship and the High School Scholarship is May 15, 2015. Applications and instructions for filing are available on the section website. AWRA Florida was selected to receive all net revenue from the 24th Annual Southwest Florida Water Resources Conference held February 2015 in Fort Myers. The Education Committee will provide a recommendation at a future BOD meeting on how to disperse the funds.

- **National:** Finance and technical committees are being formed for the 2016 AWRA Annual Water Resources Conference that will be held in Florida (location is still to be determined). AWRA National recently initiated a new program to improve outreach to state and local AWRA sections.

- **Travel Policy:** The BOD approved a travel policy intended to assist in funding travel and attendance costs for active members of AWRA Florida who serve on the Board of Directors of the National American Water Resources Association.

- **Newsletter:** Kristin Bennett will prepare a draft policy to assist in soliciting and managing newsletter sponsorships for future BOD consideration.

Board meetings are open to all members of AWRA Florida and their guests. Members and guests are encouraged to get involved and increase the value of their AWRA membership.

“2016 AWRA National Conference to be held in Florida!”

“The 2016 annual National Conference of AWRA will be held in Florida. The location is yet to be determined, but rest assured that AWRA is working hard to identify a great location. The Conference Planning Committee is currently looking for water resources professionals that may be interested in participating in a leadership role in the preparations for this national conference.

Committee positions available include Technical Co-Chair, Finance Chair, Events Chair, and others. Please, contact Rafael Frias, AWRA National Conference Chair, at friasre@bv.com or (954) 465-6872, if interested in participating in a leadership role.
1) Lake Annie the REAL Headwaters of the Everglades
Hilary Swain, Executive Director, Archbold Biological Station

Archbold Biological Station (ABS) is a non-profit research and conservation/educational center with a mission to build and share knowledge to understand and protect the life, lands, and water in the waters that drain to Lake Okeechobee. ABS includes 19,438 acres of natural laboratories that have experienced many water-related studies. Hilary Swain has been Director of ABS for 20 years.

Lake Annie was purchased by ABS in 1983. It is 90 acres in size with a maximum depth of of 21 m. Ninety percent of inflow is groundwater seepage. It is a subtropical monomictic lake (mixed in winter and stratified in summer). Sediments beneath the lake go back 44,000 years which provides long term data on paleo environmental conditions including climate, fire, mercury deposition, and vegetation.

Rigorous sampling of water quality started when ABS purchased the lake in 1983. The lake was incredibly clear as late as 1995 but began to lose clarity after that. As the result of a wetter climate phase that began in the later 1990s, groundwater levels have increased, which increased the lake level and brought more organic carbon into the lake. This reduced light penetration and the thermal profile of the lake and reduced water clarity.

Sensors were put into the lake in the mid 2000s for continuous monitoring. This allows multiple research avenues into the role of episodic events. The monitoring has indicated that the lake is cooling because water clarity has decreased and that mixing is driven by temperature not by wind.

2) Florida’s Water Quality Credit Trading and Numeric Nutrient Criteria
Daryl Joiner, Florida Department of Environmental Protection (FDEP) Division of Environmental Assessment and Restoration

The rationale behind trading is that market forces drive restoration more cheaply and more quickly than regulation. A pilot program was implemented in the St. Johns River Water Management District. A buyer or seller had to have a wastewater or stormwater permit and the (FDEP) set the environmental value of the permit.

Recent legislation authorized expansion of program to any watershed with an adopted Basin Management Action Plan (BMAP) or Reasonable Assurance Plan (RAP). Some basic principles of the program are that trading must occur within watershed or segment where the credits are needed, trading must be enforceable, and nutrient reductions must be quantifiable. A credit is the amount of entity’s future nutrient load reduction below its baseline. Baseline is threshold nutrient load below which credits may be generated. Credit sellers must provide reasonable assurance that nutrients will be reduced. Credits retain value only as long as activity resulting in its creation continues to provide at least the same level of nutrient load reduction.

Credits can be generated through water pollution control equipment, operational changes such as implementing the use of reclaimed water, structural nonpoint source BMPs, enhanced agricultural BMPs, and land use changes.

The requirement that at least one of the trading parties has an individual wastewater or stormwater permit has been dropped. Trades are allowed between two non-point sources which can be authorized in BMAP or RAP. Credits for permitted entities are authorized when reflected in the permit. Sellers are allowed to submit an affidavit to get the FDEP to approve that credits are available for sale. This will better support a true marketplace.

The status of the FDEP’s numeric nutrient criteria (NNC) was also discussed. NNC went into effect on 10/27/2014 except criteria for estuaries because they were challenged. FDEP has an implementation document available.
Lake Okeechobee 10-Years After
Chuck Hanlon, Sr. Environmental Scientist, Southwest Florida Water Management District

This presentation focused on how Lake Okeechobee was impacted by hurricanes in 2004 and 2005. Lake Okeechobee has three zones; the vegetated zone, nearshore zone, and pelagic zone. The pelagic zone mixes daily; bottom sediments are fluidized muds easily suspended back into the water column. There is a strong relationship between suspended solids and phosphorus content which is highest in the in central mud zone. The hurricanes stirred up sediments that stayed suspended for 2 years, which resulted in higher total phosphorus and total suspended solids.

Prior to 2004, there were problems with blue-green algae. After the hurricanes it was largely removed from the lake and diatoms now dominate. Blue-green algae is only now starting to come back.

The District wants to see 40,00 acres of submerged aquatic vegetation. Vegetation decreased significantly after the hurricanes because of physical uprooting and inability to reestablish due to muddy water. Hurricanes also reduced fisheries due to loss of micro zoo plankton and habitat. The acreage of emergent marsh is highly dependent on lake stage. Seventy one percent of the lake area is currently inundated. Cattails and other invasive vegetation are managed by burning and spraying. The lake is providing critical snail kite habitat and their numbers are increasing. Optimal lake level fluctuation should be between 12.5 and 15 feet. The District is evaluating reservoir storage north of the lake to slow inflow and provide significant ecological benefit.

Southwest Florida Water Management District Lakes Program
Ed Call, Environmental Scientist, Springs, and Environmental Flows Section, Southwest Florida Water Management District

The lakes on the Lake Wales Ridge are sinkhole lakes that are relatively deep with steep sides, unlike most lakes in Florida. The dominant land uses on the Ridge are agricultural (42 percent) and urban (25 percent). Urbanization is increasing, which results in ditching and draining, loss of wetlands, loss of vegetative buffers, stormwater runoff, erosion and sediment transport.

Nitrate levels are very high in ridge lakes resulting in the need for a regional management plan, which includes the complete assessment/screening of lakes to document existing conditions. Components of the assessment include water quality over time, habitat quality, and stormwater impacts. Lakes are ranked high, medium, and low in terms of quality. For those ranked high, the District implements proactive measures to protect the lakes. For medium ranked lakes, the District intends to hold the line to prevent additional degradation. For low ranked lakes, the District formulates and implements restoration projects.

Infrastructure for managing stormwater in the small lakeside communities was never planned for future growth. The District retrofits these systems using a number of tools that mitigate point sources of stormwater. These include check dams, bio swales, french drains, baffle boxes, and reestablishment of native vegetation along shorelines that reduce velocity, redirect stormwater into the ground, settle sediments out, and provide some level of water-quality treatment. These systems have resulted in significant reductions in total suspended solids.

The Lake Hancock Outfall Wetland Treatment System was also discussed. This is a very large project that has a goal of improving the quality of water that leaves the lake and flows into the Peace River. The project was recently completed and is intended to remove 27 percent of annual nitrogen loading.

Algal Turf Scrubber as a Nitrogen and Phosphorus Control
Mark Zivonivich, Hydromentia Inc.

This presentation was an overview of Algal Turf Scrubbers and their capabilities to improve water quality. Algal Turf Scrubbers are composed of a filamentous green algae turf that is effective at removing nutrients. Water from an impaired source is pumped onto a flow way and as it travels down the flow way, nutrients are stripped out and oxygen is added. The biomass, which contains the nutrients, is periodically harvested and can be used to produce biofuels, livestock feed, compost, organic fertilizer, and potting media. An economic analysis of these different uses of the biomass was provided to show what is most cost effective.
One measure of performance of the system is the amount of biomass removed. Nutrient removal increases with inflowing concentration and removal efficiency of nitrogen and phosphorus increases over time as the system matures.

One of the most important uses of Algal Turf Scrubbers is to take the effluent from an advanced wastewater treatment plant and reduce its nitrogen and phosphorus concentrations to background levels.

**Official Measures of Lake Health: Water Quality Standards:**

Russ Frydenborg, EcoLogic, LLC

An overview was provided of Numeric Nutrient Criteria (NNC), what existed prior to NNC, comparison of narrative and numeric standards, what the NNC parameters are and their standards, and problems and limitations.

The Clean Water Act requires states to protect physical, chemical, and biological integrity of their water. In Florida, this is accomplished through water quality standards (Chapter 62-302, Florida Administrative Code (FAC)) and the Impaired Water Rule (Chapter 62-303, FAC). Water quality standards establish expectations for a waterbody relative to its designated use and the Impaired Waters Rule provides an assessment methodology to determine when standards are exceeded.

Water quality standards consist of 1) designated uses for each waterbody, 2) numeric or narrative criteria designed to protect this designated use, and 3) an anti-degradation policy. Most lakes are labeled as Class III waters and the designated use is to support and maintain healthy biological communities and to provide for recreation in and on the water.

The impaired Waters rules consist of an assessment methodology, including data sufficiency requirements, that evaluate exceedences of water quality criteria (and other factors) to determine, with confidence, that a waterbody is either healthy or impaired.

Numeric criteria exist for the physical parameters, water chemistry parameters, and biological parameters. Data must be collected and analyzed according to the Quality Assurance Rule (Chapter 62-160, FAC). Sampling must be relevant, samples must be representative, and the integrity of the sample must be maintained.

The narrative nutrient criterion is maintained and numerically interpreted using best available information on a specific basis using a systematic, hierarchical approach. Narrative states that in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

Lake criteria are based on the relationship between nutrients and chlorophyll. The criteria is based on limiting phytoplankton growth (chlorophyll) for natural groupings of lakes and allow a range of total nitrogen and total phosphorus if biology is healthy.

Biological criteria for lakes includes bacteria, lake vegetation index, biological integrity, toxicity and bioassays. In theory, bacteria are indicators of potential human pathogens which may cause illness. Unfortunately, recent EPA studies show that poor correlation exits between Fecal Coliform and human health risk.

The Lake Vegetation Index is a rapid measure of lake vegetation community health.

Biological Integrity Criterion prohibits diversity in test sites from decreasing more than 25 percent compared to control values.

Potential Issues with lake Impairment listings include 1) are data available, 2) were data collected following appropriate SOPs, and 3) is the standard appropriate?

Conclusions: Must check whether a proposed lake impairment listing is appropriate and consistent with water quality standards and QA Rule. This is a complex procedure prone to potential errors. It is more cost effective to ensure assessment is correct than to perform unneeded pollutant reductions. Accurate assessment allows limited funding to be directed to the lakes in need of mitigation and helps focus efforts on appropriate restoration strategies.
Performance of Denitrifying Biofilters for Stormwater Treatment  
Tom Lynch, USF Post Doc

This presentation provided an overview of the presenter’s research on the design and implementation of biofilters for stormwater treatment.

Biofiltration – reduce runoff volumes, provide attenuation, and provide treatment. Types include conventional (poor nitrate removal) and modified (includes denitrifying layer to promote NO3 removal).

Design issues include 1) inadequate conveyance, 2) nutrient leaching 3) maintenance requirements, 4) long-term performance, 4) intermittent operation, 5) dynamic flow rates, and 6) sizing requirements.

Nitrate removal is affected by 1) media mixture, 2) acclimation, 3) dissolved oxygen, 4) dispersion, 5) detention time, and 6) influent nitrate concentration.

Media materials for denitrifying layers include mixed sand, pea gravel, and wood chips. Unsaturated media exports total N and saturated media removes nitrate so denitrifying layer must be kept saturated.

Methods for evaluating biofilters using a column study to simulate storm events were presented. Nitrogen removal was evaluated under different conditions such as different depths.

The procedures used to model biofiltration were outlined and the results were explained.

Conclusions

- Nitrate removal rates – gravel-wood was compared to sand-wood media and saturated media was compared to unsaturated media
- Nitrate removal – detention time and antecedent dry conditions
- Process based model available to designers
- Field study currently underway
The following people have renewed or joined AWRA Florida since the release of the February 2015 newsletter:

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<tr>
<th>Name</th>
<th>Organization/Position</th>
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<tr>
<td>Deedra Allen</td>
<td>Mosaic Fertilizer, LLC</td>
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<tr>
<td>Carolyn Ansay</td>
<td>Torcivia, Donlon, Goddeau &amp; Ansay</td>
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<td>Les Bromwell</td>
<td>Amec Foster Wheeler</td>
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<td>Gillian Carney</td>
<td>City of Venice</td>
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<td>David R. Clementi</td>
<td>United States Air Force</td>
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<td>Marisa Corrozzo</td>
<td>Conservancy of Southwest Florida</td>
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<td>Richard Creech</td>
<td>Creech Consulting</td>
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<td>Mark Diblin</td>
<td>Amec Foster Wheeler</td>
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<td>Hydro-Environmental Associates, Inc.</td>
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<td>University of South Florida (student)</td>
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<td>Allison Lewis</td>
<td>CH2M HILL</td>
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<td>Camille Liebnitzky</td>
<td>CH2M HILL (student)</td>
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<td>Roger Rumenik, Sr.</td>
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<td>Chuck Walter</td>
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<td>John S. Yeend</td>
<td>John S. Yeend, PE</td>
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<td>Hans Zarbock</td>
<td>Polk County</td>
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Thank you for your participation!

**Joanne Chamberlain**

Membership Services Coordinator

jchamber@sjrwmd.com • 561-707-8301
The Archbold Biological Station in the Lake Placid area is a very interesting place for the research that they are doing there and was a great venue for our second meeting of 2015. If you were not able to make it to the meeting, the technical presentations were very informative. The executive director of Archbold Biological Station is a very dynamic speaker and very passionate about the station and the work they are doing there. I will definitely recommend that we come back here for another meeting in the future.

I would like to thank Jeremy McBryan for accepting the nomination of Secretary for the Florida Section of AWRA and the board officially approved the full Executive Committee for 2015. See the Board of Directors Summary for additional information on this month’s board meeting. Remember to pass the word to all the students and teachers you know that this year’s scholarship and grant applications are being accepted until May 15, 2015.

Our next meeting will be May 15th at the Lake Worth Drainage District in southeast Florida. Luna Phillips and her group have put together a great agenda for the meeting and I hope to see everyone there.

Gary Howalt
ghowalt@ESINC.CC

With approximately 500 miles of canals and 20 major water control structures, the Lake Worth Drainage District is one of the largest drainage districts in Florida.
A Message from the Education Committee

The Rosanne Clementi Education Program

**Education Committee**: Rosanne Clementi, Clementi Environmental Consulting; Kristin Bennett, Tetra Tech, Inc.; Kelly Clark, Kimley Horn; Mark Diblin, AMEC Foster Wheeler, Jeremy McBryan, SFWMD

**Applications for the 2015 Grants, Awards and Scholarship are Now Available**

The JB Butler Science Grant, William V. Storch Award, Sanford N. Young Scholarship and the High School Scholarship applications are now available on the Section website – www.awraflorida.org. **The application deadline is May 15.** Applications may be submitted anytime up to May 15, 2015.

The **J.B. Butler Science Grant** is awarded to pre-Kindergarten through 12th grade teachers and environmental centers to aid in water resource education. Each year, approximately five $500 grants are awarded. As of this year, AWRA Florida has awarded nearly $47,000 in J.B Butler Science Grants. This program has provided assistance to dozens of teachers and thousands of students.

The **William V. Storch Award** is given to graduate and undergraduate students to support educational activities. Since its inception, approximately $41,000 has been awarded to students by AWRA Florida. There are two awards available each year, each at $1,500.

The **Sanford N. Young Scholarship** is an endowed fund designed to provide funding for at least one $2,000 scholarship each year. It is available to both graduate and undergraduate students. To date, AWRA Florida has awarded $14,000 in Sanford N. Young Scholarships.

AWRA Florida began offering a **High School Scholarship** for Florida high school seniors in 2013. As of this year, a total of $2,000 has been awarded to high school students. Each year, AWRA Florida will award at least one $1,000 scholarship to a Florida high school senior who has demonstrated outstanding achievements in academic performance and community involvement and has an intent to pursue academic studies in the water resource related fields of geology, engineering, ecology and/or marine biology at a Florida college or university. The scholarship recipient will also be awarded an annual student membership to the Florida Section for the following year. The Scholarship will be awarded upon confirmation of enrollment in a Florida college or university.

**Continued financial support for the Rosanne Clementi Education Program***

Financial support for the education program comes from meeting revenues, directed donations and proceeds from the Silent Auction. The Silent Auction traditionally is held during the Annual Meeting held in July.

**You can help** support the AWRA Florida Section Education Program and the students by continuing to attend the AWRA Florida Section bi-monthly meetings, by sponsoring the bi-monthly meetings, by donating to and purchasing silent auction items and by making directed donations to the education program. You can make a donation directly from the website at www.awraflorida.org. **Every amount helps the students.** No amount is too small or too large. **Thank you for your ongoing support of the AWRA Florida Section Rosanne Clementi Education Program.**

*The AWRA Florida Section is a 501(c)(3) entity and contributions may be tax deductible to the extent allowed by law. The AWRA Florida Section is registered as a charitable organization with the Florida Department of Agriculture and Consumer Affairs. FDACS Registration Number CH39023. A copy of the official registration and financial information may be obtained from the Division of Consumer Services. Registration does not imply endorsement, approval or recommendation by the State of Florida. Registration information may be obtained by calling 1-800-HELP-FLA (1-800-435-7352) and at www.800helpfla.com*
the Watershed Editor:
Gregg Jones, Technical Director/V.P.
Cardno
3905 Crescent Park Dr. • Riverview, FL 33578
Phone (813) 664-4500 • Fax (813) 664-0440
gregg.jones@cardno.com

Contact Upcoming Meeting Chairs Regarding Sponsorship or Assistance

May 15 – Delray Beach
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