



The Droplet

Florida Water Environment Association Integrated Water Resources Committee

March 2012

Volume 4 Issue 1



Committee News & Information

The FWEA Integrated Water Resources Committee (IWRC) held our one-day conference on Thursday, January 26, 2012 at the Wyndham Resort in Orlando, Florida. The focus of this conference was on some of the current issues related to the water resources profession such as low impact development/green infrastructure, nutrient management, stormwater controls, state of Florida's regulations and much more. The conference was a great success and was well attended. Attendees earned 5 PDH credits for the conference. Thanks to those of you who were able to participate in the conference either as speakers or attendees.



An exciting aspect of the conference was the live updates via our blog and twitter account. Pictures and highlights were given throughout the day. After the conference, speaker presentations were uploaded to the FWEA blog (<http://fweablog.com>). In addition to the presentations, we will provide lessons learned from each speaker as a series of special posts on the blog. Two of these special posts have been completed already.

Special thanks to the conference organizing committee comprised of Leslie Turner, Leslie Gowdish, Elizabeth Perez, Nabil Muhaisen, Michael Gregory, and John Loper who worked tirelessly on conference details. Additional thanks to the IWRC who advertised, assisted with details the day of the event, and provided support to the organizing committee, including Gabriel Retana, Saurabh Srivastava, Lee Smith, Beth Whikehart, Joel Jordan, and John Herbert.

For more information or questions about the conference please contact Leslie Turner at TurnerLA@cdm.com



Chair:
Leslie Turner

Vice Chair:
[Vacant]

Secretary:
Gabriel Retana

Treasurer:
Leslie Gowdish

Newsletter Information

We are always looking for feedback from our readers regarding topics that are of interest to you, topics that you would like to be discussed in the newsletter in an upcoming issue or any general comment about the newsletter. Please email us your thoughts on the newsletter. To become an official sponsor of *The Droplet* or to consider becoming a member of the IWRC, please visit our website at <http://www.fwea.org/> or email Saurabh Srivastava at Srivastava@pbworld.com.

The Floating Wetland Technologies for Nutrient Control in Stormwater Runoff

The Stormwater Management Academy at the University of Central Florida (UCF) is working on a series of mesocosm and field experiments that intensively explore the possibility to using the floating wetland technologies in stormwater wet detention ponds and providing additional credits for nutrient removal in stormwater Best Management Practices (BMPs). The floating wetland technology is an emerging approach used for treating stormwater containing nutrients with various floating aquatic plants. Free-floating macrophytes provide shading of the water column, when uptaking nutrient fluxes as well as offering a habitat for fish and macro invertebrates. The hanging roots provide a large surface area for denitrifying bacteria creating an anaerobic environment, which can remove nitrate by a denitrification process, and these roots entrap fine suspended particulates that would otherwise remain in suspension in a conventional pond system.

Mesocosm Study

To explore the ultimate removal efficiency of nitrogen and phosphorus, the floating treatment wetland project includes 11 mesocosms in water tanks with various sizes, floating mat sizes, and the use of sorption media, all of which replicate the field conditions of detention ponds. With 11 mesocosms available, 11 scenarios have been created varying percent area coverage, littoral zone and water depth. Case-1 and Case-2 are without any floating macrophytes performing as control cases. Sorption media has been used in all the cases except Case-7b which is control case in this regard. Considering feasibility of actual pond, percent area coverage has been limited to 10%. Two different water depths are 36 inches and 22 inches associated with bottom sediment thickness of 20 inches and 12 inches, respectively. A slope of 1:5 was maintained toward the center of the cylindrical water tanks for the bottom sediment layer.

One of the conclusions of the mesocosms is to use at most 5% pond area coverage for the floating wetlands. To verify the efficacy of floating wetland technology with 5% coverage, actual pond sampling is conducted at a wet detention pond on campus of UCF. The results of the pond sampling are used to show the removal efficiencies of the floating wetlands based on water quality sampling before and after the introduction of the floating wetlands.

Field Experimental Setup

Adjacent to the pilot study site of mesocosms (0.3 mile West), pond 4M with the area of 0.63 acres was selected as an actual pond for field study. A concrete structure was constructed at the outlet of the 4M pond. Its inner dimension is 54-inch long, 36-in wide and 86-in deep (**Figure 1**).



Figure 1. Implementation of Floating Wetland Technologies in a Field Wet Pond

AUTHOR: Dr. Ni-Bin Chang, Director of Stormwater Management Academy and Professor of Dept. of Civil and Environmental Engineering at University of Central Florida.
Email: nchang@ucf.edu

(Continued on Page 3)

Calendar of Events

<i>Date</i>	<i>Description</i>
March 6, 2012	IWRC Meeting Teleconference
April 3, 2012	IWRC Meeting Teleconference
May 8, 2012	IWRC Meeting Teleconference
June 5, 2012	IWRC Meeting Teleconference

(Continued From Page 2)

Electronic equipments like flow rate meter (Georg Fischer Signet 2551 Magmeter Flow Sensor), water level sensor (Global Water WL400) along with common rain gage, evaporation pan were used to collect and monitor the hydrological data for the pond 4M. Data logger (Global Water GL500-2-1) was connected with the water level sensor and set to record the water level data at intervals of 15 minutes. The floating wetlands were deployed in Pond 4M on Apr 8th, 2011 with the coverage about 6.8 % to match the actual specification of the floating mats. Since Pond 4M is a kidney-shaped pond, algae species will probably aggregate at the two ends of the pond. Thus, two pieces of floating mats were deployed at both ends of the pond. And the third one was deployed close to the outlet to achieve a better outflow quality. Thousands of seedling including Canna and Juncus along with the flower and grass were planted on three integrated floating mats (**Figure 1**). The special sorption media designed for the enhancement of nutrient removal was added in each seedling container. The floating islands are expected to work as a kidney of nature for nutrient removal, providing a beautiful and peaceful habitat for birds and animals at the same time. The testing results confirm the promising performance of the floating wetland technologies in Dec. 2011. Field experiments have been ongoing till late 2012.



Officer Contact Information

Chair: Leslie Turner
turnerla@cdm.com

Vice Chair: [Vacant]

Secretary: Gabriel Retana
gretana@brwnald.com

Treasurer: Leslie Gowdish
leslie.gowdish@atkinsglobal.com

Website: Susan Gerena
susan.gerena@gmail.com

Newsletter: Saurabh Srivastava
srivastava@pbworld.com

listen. think. deliver.
CDM
www.cdm.com
 10 offices throughout Florida

Brown AND Caldwell
 advancing*innovation™
 Offices Nationwide
 100% Environmental | Employee Owned
BrownandCaldwell.com

PB Parsons Brinckerhoff
 Engineering | Planning | Construction
 125 YEARS

- Transportation/Transit Planning
- Civil/Structural/Traffic Engineering
- Water Resources/Water Supply
- Program Management
- Construction Management
- Construction Engineering/Inspection

100 E Pine St
 Suite 500
 Orlando, FL 32801
 407.587.7800
www.pbworld.com
 Contact : David Hoot, PE

Improving
 Quality of Life
www.jonesedmunds.com
 1.866.827.3653
JONES EDMUNDS
 ENGINEERS | ARCHITECTS | SCIENTISTS

UF TREEO Center
 UNIVERSITY OF FLORIDA
Interested in Water Conservation?
UF TREEO has training.
 For details contact: Laurel Brown
lbrown@treeo.ufl.edu or visit
www.treeo.ufl.edu/wct

WATER AND WASTEWATER
 solutions with the future
 in mind.
 Sarasota, FL (941) 365-5500
Stantec
 One Team. Infinite Solutions.