



# Florida Agricultural and Mechanical University

College of Engineering Sciences, Technology and Agriculture  
Center for Water and Air Quality  
Tallahassee, FL 32307-4100



## The Flow

Volume 7 Issue 1

Water and Air Quality Newsletter

Spring 2009

### Center for Water and Air Quality Advisory Board Meeting will be held April 17, 2009

### Faculty Travel to Apalachicola...

#### Crystal Carter, M.S.

Center faculty traveled to Apalachicola to meet with the RiverKeeper Organization and the Apalachicola National Estuarine Reserve in December 2008. The meetings were planned to facilitate networking among the Center

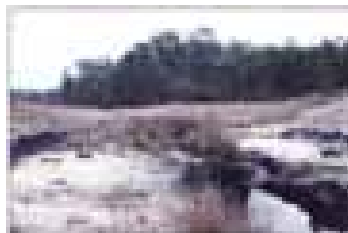


and the groups and to learn more about the research and monitoring activities in the Bay. A group of faculty also attended the RiverKeeper Town Hall meeting in Apalachicola. ■

### Macroinvertebrate Sampling...

#### Andy Rasmussen, Ph.D.

Andy Rasmussen, is helping biologists from the Florida Department of Environmental Protection to sample and identify aquatic macroinvertebrates from Kelley Branch in Liberty County. The most recent macroinvertebrate sampling was carried out February 11, 2009. This work is part of a project conducted by Dr. Steve Harrington of the Nature Conservancy to remove the dam on Kelley Branch and restore the stream to its natural state. Macroinvertebrate sampling is one of the methods being used to document the recovery of the stream to natural conditions. ■



### Center Seminar Series...

#### Margaret Gitau, Ph.D.

The Center welcomed the following guests for the seminar series:

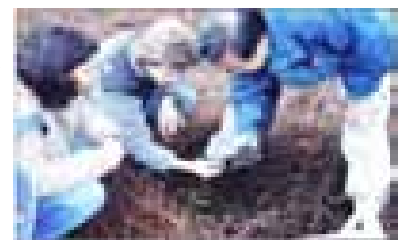
- Alejandro Bolques, FAMU Cooperative Extension, "Nitrate Leaching and Runoff from Container Nurseries", Sept. 2008.
- Chuck Hess, US Forest Service, "Effects of Controlled Burning on the Apalachicola National Forest". Oct. 2008.
- Linda Young, Director, Clean Water Network of Florida. "Water Quality Issues Facing Florida". Nov., 2008.
- Margaret Gitau, E. Muhammad, Perspectives on the Apalachicola River Watershed: watershed management and modelling, Feb. 2009.
- Seth Blicht. Manager, Estuarine Research Reserve, Research. "Monitoring in the Apalachicola Watershed". March 2009.
- Richard Lowrance. USDA-ARS, "Factors Controlling Dissolved Oxygen In Coastal Blackwater Streams Draining Agricultural Watersheds". March, 2009.
- Kevin Craig. FSU Marine Laboratory, May 2009. ■



### Summer Program for Teachers...

#### Katherine Milla, Ph.D.

The Center has obtained a competitive grant from NOAA to conduct a summer program focused on education and conservation of the Gulf of Mexico coastal region. The two-week summer program, which will be developed for middle and high school teachers, will focus on conservation of the Apalachicola watershed, specially a six county riparian area of the Apalachicola River. The Center has partnered with the ANERR and the Apalachicola Riverkeeper. Dr. Katherine Milla, PI and Crystal Carter, Co-PI will direct the work of this project. ■



## Wetland Ecology News...

*Y. P. Hsieh, Ph.D.*

Dr. Y. Ping Hsieh gave an oral presentation “Chemical Signature of Biomass Burning Emitted PM<sub>2.5</sub>” during the 24<sup>th</sup> Tall Timbers Fire Ecology Conference that was held in Tallahassee, FL. On January 11-15, 2009. The conference served as an international forum for discussion on the future of prescribed fire use in the face of wildland-urban interface expansion, stricter air quality regulations, and concerns about the effects of fire on carbon sequestration and mercury cycling. As part of the conference, Dr. Glynnis Bugna was also invited to give a field demonstration on the sampling methodology of prescribed fire-emitted PM<sub>2.5</sub> at the Tall Timbers Research Station and Land Conservancy. ■



## Water Quality Monitoring in the Ephemeral Ponds in the Apalachicola National Forest - Forest Service Project...

*Amita Jain, Ph.D.*

Water samples from the selected ephemeral ponds (Pond 1, Pond 5, Pond 6 and FAMU1 Woodville Highway) in the Apalachicola National Forest were collected in November 2008 and January 2009. In addition, the water samples were collected from fresh water springs namely Blue Spring to compare its water quality with that of ephemeral ponds. Temperature, pH, electrical conductivity, and dissolved oxygen were measured in the field. All water samples were analyzed for hardness, turbidity, alkalinity, biological oxygen demand (BOD), dissolved organic carbon (DOC), nitrate, phosphate, TKN, TP, and metals (Ca, Mg, As, Cu, Al, Zn, and Pb) in the water quality laboratory. Water in the ephemeral ponds had a lower pH (5.3 – 5.8), electrical conductivity, dissolved oxygen, and hardness but higher biological oxygen demand, total nitrogen and dissolved organic carbon than the Blue Spring water. Water chemistry differed among the four ephemeral ponds, mostly with respect to concentration of TKN, TP, DOC, and BOD. Nitrate and phosphorus concentrations were below the detection limits. However, total nitrogen and total phosphorus ranged from 1 to 15 mg L<sup>-1</sup> and 0.12 to 0.7 mg L<sup>-1</sup>, respectively. The concentration of DOC ranged from 15 to 22 mg L<sup>-1</sup>. FAMU1 pond had the higher biological oxygen demand than other ephemeral ponds, which is consistent with the higher organic carbon determined in FAMU1 pond. ■



## Aquatic Ecosystem News...

*Manuel L. Pescador, Ph.D.*

Dr. Maria Marleny

Chacón, a Professor of Tropical Ecology, Laboratory of Insect Ecology, Dept. of Biology, University of de los Andes, Venezuela, is spending one year sabbatical in the Laboratory of Aquatic Entomology, Center for Water and Air Quality, CESTA to study the systematics and distribution of the mayfly fauna of Venezuela. She is working with Dr. Pescador and she is about finished a research manuscript titled: **The Adult and Redefinition of the Genus *Prebaetodes* Lugo-Ortiz & McCafferty (Ephemeroptera: Baetidae), and Description of a New Species from Venezuela.** In addition to her work on systematics, Dr. Chacón is actively involved in sampling of aquatic insects of ephemeral ponds in the Apalachicola National Forest.



Drs. Manuel Pescador and Andy Rasmussen, Professor and Research Associate, Aquatic Entomology and Center for Water and Air Quality attended and presented papers at Florida Association of Benthologists 22<sup>nd</sup> Annual Meeting in Crystal River, FL on December 8-11, 2008. Dr. Pescador, a member of the Executive Committee of the association, also participated in the committee meeting at the conference. ■

One undergraduate student has been working in the aquatic laboratory on a water quality related research project. Mr. James Richardson, an undergraduate Entomology major, is assisting in the sorting and samples collected as part of an ongoing CWAQ research project on ephemeral ponds in the Apalachicola National Forest. The U.S. Forest Service currently funds the project. ■



## A Study of Suwannee River Hydrology...

*Nnaji, G.A., M.W. Gitau, and W. Huang*

The two possible extreme conditions associated with river hydrological processes are flood frequency during high flows and drought return years during low flows. The combined effect of these two extremes has made the Suwannee River coastal ecosystem vulnerable to environmental degradation. This study investigates the extent to which these hydrological processes have affected the Suwannee coastal ecosystem as established through hydrological analysis of river flows in the Suwannee River. Analysis are being conducted for 77-year flow using the Weibull fitting position for flood frequency analysis and the USGS 7Q10 method for low-flow frequency analysis, statistics from which are often used in regulation and management decision making. This study will help us understand

the possibility (likelihood) of having low flow periods in the future, which will have implications for water management in the basin. ■

### Dr. Adrienn Cooper, New BASE, and Center Faculty...

#### Adrienne Cooper, Ph.D.

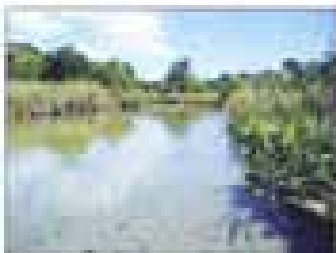
Dr Cooper joined the faculty of the Biological and Agricultural Engineering Program as an associate professor in January 2009. "I am so excited about being at Florida A & M University and have fallen in love with being a Rattler." Prior to joining the faculty at FAMU, Dr. Cooper taught Environmental Engineering at the Temple University and University of South Carolina. She is a recipient of a National Science Foundation CAREER Award for young investigators and was also a research fellow in the National Science Foundation Summer Research Institute in Japan. Her primary area of research is the engineering development of catalytic process for environmental sustainability. ■



### Study Investigates Bacteria Fate and Transport...

#### Margaret Gitau, Ph.D.

The presence of disease causing microorganisms within Florida watershed is an issue of increasing concern, especially as it impacts on water quality. In the Juniper Creek of Northwest Florida, for example, fecal coliform counts often exceeds the 400cfu/100ml criteria with the contamination primarily (90%) being linked to livestock operations in the surrounding area. Ms. Kenya Rolle, one of the graduate students at CW AQ, is studying the fate and transport of fecal coliforms in Juniper Creek watershed. Ms. Rolle is a recent graduate of CESTAs Biological and Agricultural Systems Engineering (BASE) Program. In this study, initial assessments involved column experiments in the laboratory. Laboratory fecal coliform transport data are currently being analyzed using the mobile/immobile two-region model. Results from these preliminary analyses will provide transport parameters for use in subsequent modeling efforts. This study will provide information that can be used to support the development of strategies for land application of animal waste, while also providing the data and tools necessary for further water quality research in the area. ■



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### Research Opportunities for Graduate & Undergraduate Students...

#### Margaret Gitau, Ph.D.

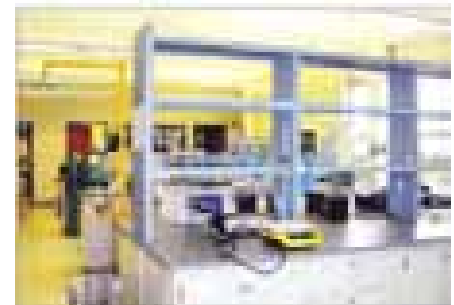
Dr. Gitau 's research team currently comprises two graduate students/research assistants (Kenya Rolle and Gideon Nnaji) and one undergraduate research assistant (Emil Muhammad). These students

are involved in data development and hydrologic and water quality modeling and analysis within individual study watersheds. New graduate students are encouraged to contact Dr. Gitau and other faculty for research opportunities. ■

### Wetland Lab Renovation...

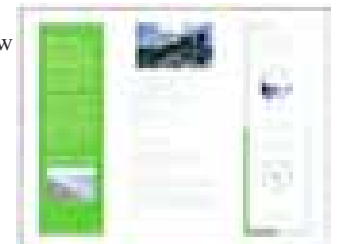
#### Djanan Nemours

The Wetlands lab Center for Water & Air Quality received new updates. Some of the updates included a new fume hoods (fume hood structure was overhauled from the lab to the Perry-Paige rooftop), new lab benches (all the cabinetry was replaced and they have added extra cabinets for glassware), new safety shower and eyewash, light fixtures, office space was created and shelving added to storage rooms. ■



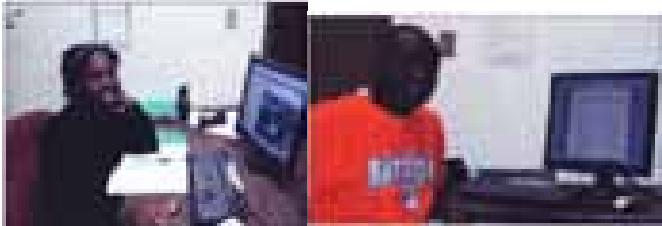
### Center Brochure...

The brochure for the center is now available. It contains information about various center programs and other related areas. Contact the office for copies. ■



## Student Training ...

Four undergraduate students, Mr. Emil Muhammad, Mr. Errol Tshabe, Mr. J'Que Jones and Ms. Briana Causey and four graduate students, Mr. Kenneth Livingston, Ms. Iwona Gajewska, Mr. Gideon Nnaji, Mr. Erin, and Ms. Kenya Rolle are working in the Center of Water & Air Quality. Student support was received from USDA/NRCS, FS and CSREES. ■



Kenya Rolle

Gideon Nnaji

## Center Faculty...

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## Publication & Presentations...

- Denson, D.R., A.K. Rasmussen, and S.C. Harris. *Caddisflies of greatest conservation need in Florida: A statewide survey*. 22<sup>nd</sup> Annual Meeting of the Florida Association of Benthologists. Dec. 2008, Crystal River, Florida.
- Gitau, M.W., W.J. Gburek, and P.L. Bishop. 2008. Use of the SWAT model to quantify water quality effects of agricultural BMPs at the farm-scale level. *Transactions of the American Society of Agricultural and Biological Engineers*. 51(6): 1925-1936.
- Jain, A., Sharma V.K., and Mbuya, O.S. 2009. Removal of arsenite by Fe (VI), Fe (VI)/Fe (III) and Fe (V)/Al (III) salts: Effect of pH and anions. *J. Hazardous Materials*. (In press)
- Pennington, J.H., M.A. Steele, K.A. Teague, B. Kurz, E. Gbur, J. Popp, G. Rodriguez, I. Chaubey, M. Gitau, and M.A. Nelson. 2008. Breaking ground: A cooperative approach to data collection from an initially uncooperative population. *Journal of Soil and Water Conservation*. 63(6):208A-211 A.
- Odemari Mbuya, William Mwegoha, Amita Jain, Teferi Tsegaye and Ngowari Jaja. 2008. Effect of perchlorate concentration on phytoremediation and phytotoxicity.

*Journal of Environmental Monitoring and Restoration*. 5 : 67-77.

- Oghenekone U Onokpise, Don Rockwood, Susan K. Bambo, and Amita Jain. 2008. Performance of Cottonwood (*Populus deltoids Bartr.*) Clones as a woody biomass crop for phytoremediation. *Journal of Environmental Monitoring and Restoration*. 5: 141-148.
- Pescador, M.L., A.K. Rasmussen, S.K. Pancholy. 2008. Aquatic Insect Inventories on Florida Public Lands and Protected Areas. Final Report Submitted to Southeastern Forest Service Station. A Cooperative Research Agreement # 000857 and 000833.
- Pescador, M.L., A.K. Rasmussen & M.M. Chacón. *Taxonomy of the mayflies (Ephemeroptera) of North America: Current Status*. 22<sup>nd</sup> Annual Meeting of the Florida Association of Benthologists. Dec. 2008, Crystal River, Florida.
- Rasmussen, A.K., D.R. Denson, M.L. Pescador. *The genus Molanna (Trichoptera: Molannidae) in Florida: Geographic distribution and description of the larva and pupa of Molanna ulmerina Navás*. The 56<sup>th</sup> Annual Meeting of the Entomological Society of America. Nov. 2008. Reno, Nevada.
- Rasmussen, A.K., M.L. Pescador, D. Denson, and S.C. Harris. *Update on the Caddisflies (Trichoptera) of Florida*. 22<sup>nd</sup> Annual Meeting of the Florida Association of Benthologists. Dec. 2008. Crystal River, Florida. ■

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