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# ICE Research News, Vol. 4, No. 1 - April 2014

Clemson University

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# ICE Research News

A Publication of the **Institute of Computational Ecology**

## New Urban Ecology Center Showcases ICE Technologies

*Collaboration between Clemson and Aiken will build green economy*

The Institute of Computational Ecology's new Urban Ecology Center in Aiken will demonstrate how innovative technologies can become economic generators at the small-city scale. The Center's mission is to infuse sustainability-based research, education and public outreach into the small city environment and its vital economic sectors. The Center was announced at the November 2013 Greater Aiken Chamber of Commerce meeting.

The Urban Ecology Center will be developing technology for the Intelligent City™ application using the Intelligent River® technology platform. This will enable entire cities to utilize sophisticated, computerized operational models and decision-making tools to manage urban infrastructure: roads, bridges, water systems, buildings, utilities, energy and green spaces.

Dr. Gene Eidson, ICE director, will direct the Urban Ecology Center. Clemson University and the Greater Aiken Chamber of Commerce are anchor institutions of the center. Key partners include the City of Aiken, Aiken County, the University of South Carolina-Aiken and Aiken Technical College. Clemson graduate students will study

in experimental learning settings, and collaborations with Aiken Technical College may provide workforce development opportunities focusing on sustainability and information technology.

"We are bringing an economic development center to Aiken. Our technologies are ready to be commercialized, and we want to showcase those technologies in a technology-progressive city," Eidson said.

The center will be housed by the Aiken Chamber of Commerce for up to two years, with support from the city, public-private partnerships and grants for research education and outreach. With the new office location, Eidson said the best part is he can take people to see the current project sites of the Intelligent River® suite, including River, Farm, Forest and City, in a 30-mile radius.

"The center will foster technology spin-offs that can lead to highly skilled and rewarding jobs for South Carolina," Eidson said.



## New Director to Lead Center for Watershed Excellence

Katie Giacalone was named the new director for the Clemson University Center for Watershed Excellence (CWE) this past November. She will continue to direct Carolina Clear, which is the watershed center program for stormwater education and awareness.



CWE was established in 2008 to develop site-based solutions that foster economic and environmental sustainability, and to provide watershed planning and management support for South Carolina municipalities and counties. CWE also provides faculty expertise in the areas of environmental and ecological sciences, engineering, community planning, marketing, behavioral sciences, economics and computer sciences. CWE is part of Clemson University's Institute of Computational Ecology (ICE) and is an EPA-designated Center of Excellence in Watershed Management.

"This is a significant transition for the Center," said Gene Eidson, Institute of Computational Ecology director and founder of CWE. "Katie's experience and commitment to the state's water needs for environmental sustainability and economic development are an ideal combination."

Giacalone has been involved in Clemson Public Service Activities natural resource programs since 2008. She holds an undergraduate degree in marine science and a master's in environmental science, and has specialized in monitoring and mitigating the effects of water pollution and working with communities to address regulatory mandates.

Eidson will continue as the director for ICE to concentrate on building the institute's Intelligent River® Research Enterprise, which has developed patent-pending technology that powers remote sensor networks and delivers computer-enhanced, real-time information for scientists, policy-makers, water managers, farmers and foresters.

# call for Abstracts

## 2014 S.C. Water Resources Conference

### Natural Resource, Community, and Economic Challenges ...

*How will your presentation inform strategic water planning?*

The fourth biennial statewide conference on water resources in South Carolina will be held October 15-16, 2014 at the Columbia Metropolitan Convention Center in Columbia. The conference purpose is to provide an open forum to discuss current water policies, research projects and water management in the state. The previous three events each brought together over 300 participants from various sectors including colleges and universities; municipal water authorities and entities; environmental engineering, consulting and law firms; state and federal agencies; nonprofit organizations; economic development associations; utility companies; and land trusts. The 2012 event featured over 120 oral and poster presenters.

Abstracts are being accepted through **April 16, 2014** at [www.scwaterconference.org](http://www.scwaterconference.org). Applicants who are planning to submit manuscripts for oral presentations can request consideration for acceptance in the 2015 issue of the new **S.C. Water Resources Journal**. Abstract acceptance notifications will be sent out in May. Oral presentations at the conference will be limited to 20 minutes each, with an additional five minutes allowed for questions. Posters are invited from professionals and students, and there will be a **Student Poster Competition**.

[www.scwaterconference.org](http://www.scwaterconference.org)

### Annual S.C. Water Resources Journal Will Feature SCWRC Papers

An annual journal highlighting presentations from the S.C. Water Resources Conference will be published beginning this year. The S.C. Water Resources Journal (SCWRJ) will provide an outlet for water research, policy and permitting, management, planning, and review papers with a South Carolina focus.

"There exists a body of work that is of excellent quality that may not fit in national or international publication outlets because of the regional, state, or local focus," said Timothy Callahan, SCWRJ editor and College of Charleston Associate Professor.

In odd-numbered years, the issue will include articles selected from the previous October conference proceedings. In even-numbered years, the issue will focus on a "state-of-the-state" water resources theme with an objective to preview the upcoming conference. The first issue will be published by late spring of 2014.

## Intelligent River<sup>®</sup>

*from observational to operational<sup>™</sup>*

**The Intelligent River<sup>®</sup> web portal will go live this summer, and work continues on enabling activation of the Intelligent River<sup>®</sup> Viewing Room. Other project updates are listed below:**

### Intelligent Forest<sup>™</sup> in Strawberry Swamp, Georgetown



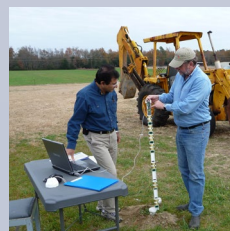
Scientists at the Baruch Institute for Coastal Ecology and Forest Science deployed an Intelligent Forest<sup>™</sup> pilot project in Strawberry Swamp at Hobcaw Barony in Georgetown. The work involved developing baseline level information on the swamp, establishing a sensor network to measure and locally log environmental data, and employing Intelligent River<sup>®</sup> sensor technology at two site stations. Current work involves expanding the soil monitoring network and adding two additional real-time remote data stations.

### Intelligent City<sup>™</sup> in Aiken, South Carolina



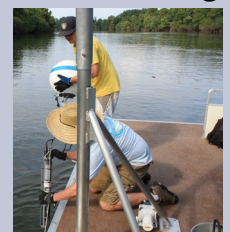
The Aiken Hydrological Evaluation project builds on the Sand River Headwaters Green Infrastructure project and provides continued steps to better understand the urban watershed boundaries and sources of stormwater discharge. The results will help prioritize future strategic green infrastructure installations. The project team has successfully installed a significant Wi-Fi mesh deployment and MoteStacks<sup>®</sup> using a combination of communication technologies.

### Intelligent Farm<sup>™</sup> at Edisto REC



The goal of the Intelligent Farm<sup>™</sup> is to link precision agriculture with Intelligent River<sup>®</sup> technology. This linkage will provide the latest tools to growers and consultants who can make better-informed decisions with regard to water and fertilizer needs. Software upgrades were recently completed on the MoteStack<sup>®</sup>, and soil monitoring probes will be installed before the cotton season begins.

### Intelligent River<sup>®</sup> Savannah NSF MRI



Pilot testing of the new Intelligent River<sup>®</sup> instrumentation within the Savannah River Basin began in August of 2013. The pilots provided important feedback that was used to improve the design of data buoys and establish deployment protocols. Full deployment of the enhanced buoys will be completed by the end of 2014.

## Contributors, Exhibitors, Presenters, Attendees

The 2014 S.C. Water Resources Conference (SCWRC) will be held October 15-16 at the Columbia Metropolitan Convention Center. The conference purpose is to provide an integrated forum for discussion of water policies, research projects and water management in order to prepare for and meet the growing challenge of providing water resources to sustain and grow South Carolina's economy, while preserving our natural resources.

2012 plenary speakers included S.C. Commerce Department Secretary Robert Hitt; SCDHEC Director Catherine Templeton; and SCDNR Director Col. Alvin Taylor - as well as a legislative panel moderated by Sen. Paul Campbell featuring Sen. Vincent Sheheen, Sen. Phil Leventis, Rep. David Hiott, Rep. Nelson Hardwick and Rep. Don Bowen.

Full Conference Registration	One-Day Registration
\$195 (before 9/16/14)	\$140 (before 9/16/14)
\$245 (after 9/15/14)	\$175 (after 9/15/14)

*Registration will open in May.*

*There will be a flat fee of \$50 for student registration.*

2012 Major Contributors included Clemson University Restoration Institute, Duke Energy, Santee Cooper, Charleston Water System, Greenville Water, YSI and the S.C. Energy Office. 2012 Supporting Contributors included Clemson University Strom Thurmond Institute Water Resources Center, Coastal Carolina University's Waccamaw Watershed Academy, College of Charleston Environmental Studies Graduate Program, SCDHEC Bureau of Water, S.C. Sea Grant Consortium, SCANA and U.S. Geological Society. *Eleven contributors from 2012 will return and two new contributors have pledged their support for 2014.*

For more information on becoming a contributor or exhibitor, visit the website at [www.scwaterconference.org](http://www.scwaterconference.org) or contact the SCWRC coordinator, Dawn Anticole White, at dawnw@clemson.edu or (864) 656-2618.

## 2014 S.C. Water Resources Conference

Informing Strategic Water Planning to Address  
Natural Resource, Community, and Economic Challenges

Call for Abstracts Deadline - April 16

## Upcoming Regional Events

### Carolinas Climate Resilience Conference

April 28-29, 2014

Charlotte, NC

[www.cisa.sc.edu/ccrc/](http://www.cisa.sc.edu/ccrc/)

*Early registration ends March 28!*

### Charleston Area Stormwater Pond Management Conference

May 22, 2014

Trident Technical College - N. Charleston, SC

[www.clemson.edu/public/carolinaclear/consortiums/acsec\\_home/pond-conf.html](http://www.clemson.edu/public/carolinaclear/consortiums/acsec_home/pond-conf.html)

## Upcoming Training Opportunities

The Smith-Lever Act was groundbreaking legislation that established the system of cooperative extension, a state-by-state national network of educators who extend university-based knowledge to the people. This year, Clemson Extension will celebrate the 100th anniversary of the national Cooperative Extension Service in many significant ways. One hundred years ago, information was being distributed to farmers across the state by train. With funding through the 2013 Lever Initiatives, the Center for Watershed Excellence (CWE) will establish a new vehicle for information delivery that seeks to educate target audiences, save audiences money, improve quality of life and protect natural resources.

CWE will launch online and hybrid courses and certification programs that blend distance learning

with hands-on field activities. These programs are tailored for developers, contractors, city planners, commercial landscapers and industry professionals. They will enhance watershed restoration and protection, increase application of best management practices, reach new audiences and foster economic growth.

Learning content for these initial courses is currently in development. Information on the new programs will be posted on the CWE site at [www.clemson.edu/watershedcenter](http://www.clemson.edu/watershedcenter).





# Linking Land Use, Water, Energy and Climate Change

The **Institute of Computational Ecology (ICE)** is applications-driven, bringing together an entrepreneurial and interdisciplinary faculty with an applied focus to develop, pilot and package innovative solutions for watershed ecology, green infrastructure, cyberinfrastructure, ecological restoration and sustainable natural resources. Major programs include the EPA-designated Center for Watershed Excellence and the Intelligent River® Research Enterprise. ICE is affiliated with two SmartState Program™ Centers of Economic Excellence: the Sustainable Development Center and the Urban Ecology and Restoration Center. ICE supports Clemson University's sustainable environment focus area by expanding opportunities for faculty and students to participate in statewide watershed management programs.

The ICE offices on campus are located at 230 Kappa Street. ICE has a satellite office location at the Edisto Research and Education Center in Blackville to assist faculty in developing the Intelligent Farm™ and its associated technologies, and in October 2013, ICE announced the establishment of the Urban Ecology Center in Aiken.

The institute was renamed in 2013 to better reflect the big-data focus of the institute's research, education and economic development initiatives, while underscoring strong interdisciplinary connections to Clemson's Public Service Activities; College of Agriculture, Forestry and Life Sciences; College of Engineering and Science; and the Restoration Institute.



Vamsi Gondi and Jason Hallstrom represent ICE and Intelligent River® at the January 2014 Consumer Electronics Show in Las Vegas.



Dan Hitchcock, a faculty member for the Aiken Hydrological Evaluation project team, surveys stormwater drains in Aiken.

## *The Institute is growing - meet some of our newer staff members ...*



**Dr. Vamsi Krishna Gondi** is a Research Associate and Network Operations Specialist for the Institute. He received his Ph.D. in Computer Science from University of Evry, France, a Master's in Electrical Engineering from INT Telecom, France and an undergraduate Engineering degree from JNTU, India. His work with Intelligent River® Research Enterprise involves designing and developing wireless infrastructures for remote environmental monitoring.



**Charles T. Cook** is the Senior Software Engineer for the Institute. He holds a Master's and Bachelor's of Science in Computer Science from Clemson University. Chuck designs, implements, and administers cloud-based software solutions for the intelligent River® Research Enterprise.



**Michael Griffin** is the Course Coordinator for the Center for Watershed Excellence. He holds a B.S. in Biochemistry from the University of Notre Dame and an M.S. in Environmental Studies from the College of Charleston. Michael brings dual backgrounds in information technology and hydrology to the Center for Watershed Excellence, where he is coordinating the setup of an online learning platform and assisting in the development of eLearning material for water-resources hybrid courses.

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**Deputy Director**  
Jason O. Hallstrom, Ph.D.

**Marketing Communications & Program Coordinator**  
Dawn Anticole White, M.M.C.

**Senior Software Engineer**  
Charles T. Cook

**Network Operations Specialist**  
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