



## AT THE CENTER

News and Notes from the  
Center for Earth and Environmental Science

Fall 2008

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### *Director's Note*

It is an exciting time for CEES. We are experiencing new opportunities that are bolstering our research and education efforts. We also have welcomed new research faculty and staff and two new community advisory board members. Education outreach efforts are continually fostering the next generation of environmental stewards while enhancing our local, natural environment.

As the 2008 year comes to a close, please consider making a tax-deductible contribution to support CEES' research and education efforts for 2009 through our Friends of CEES program. Enclosed in the newsletter is a self-addressed contribution envelope. We greatly appreciate your support to further CEES' mission. Thank you for your interest in our projects that are working to better understand our environment.

Regards,

Lenore P. Tedesco, Director

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### *Welcome New Faculty and Staff*

**Dr. Meghna Babbar-Sebens, Assistant Professor, Department of Earth Sciences**  
[mbabbars@iupui.edu](mailto:mbabbars@iupui.edu)

*Ph.D., 2006, Civil and Environmental Engineering, University of Illinois at Urbana-Champaign*  
*M.S., 2002, Civil and Environmental Engineering, University of Illinois at Urbana-Champaign*  
*B.E., 2000, Pulp and Paper Engineering, Indian Institute of Technology (Roorkee)*



The Department of Earth Sciences welcomes Dr. Meghna Babbar-Sebens as an assistant professor. The designation of CEES as an IUPUI Signature Center allowed for the addition of a new faculty member to further bolster research expertise in water resources. Dr. Sebens's research focuses on understanding how to mathematically model contaminants in water resources (e.g. groundwater, rivers, lakes, etc.) and the effect of such contaminants on the health of humans and ecology. Her research also uses computational techniques and algorithms in finding solutions for water resources planning and management problems. Some specific areas of research currently being explored by her include a) analysis of uncertainty when models are used to conduct spatially referenced systems-scale environmental assessments, b) incorporation of uncertainty analysis within decision support systems used for risk assessment and management, and c) optimization of water resources planning and management strategies for emergency response and water-borne disease prevention.



**Nicolas A. Clercin, Research Scientist - Phytoplankton Ecology**  
[nclercin@iupui.edu](mailto:nclercin@iupui.edu)

Nicolas Clercin joined the CEES team this past summer. He is monitoring algae dynamics in three reservoirs (Geist, Morse and Eagle Creek) providing water to Indianapolis. His current research focuses on the ecology of toxic Cyanobacteria and the environmental factors that may trigger their growth. Nicolas graduated in 2002 from University of Rennes (Brittany, France) with a Bachelor of Science. His

undergraduate research focus was freshwater phytoplankton taxonomy and ecology with emphasis on Cyanobacteria and related health hazards with toxins in raw water. He completed his Master of Science degree in 2005, focusing on watersheds and groundwater hydrology. His master's thesis "*Centre Armoricaïn de Recherche en Environnement*", studied the sedimentation of metals linked to cell walls of phytoplanktonic cells in a drinking reservoir in Brittany. Nicolas' past employment includes the National Institute of Agricultural Research (INRA), in Thonon-les-Bains (French Alps) where he studied competition for light between two different species of Cyanobacteria with allelopathy effect and the dynamics of bacterio- and viroplankton in Lake Geneva. He has additionally worked with *Anjou-Recherche* (Veolia Water, Paris) to study the algae dynamics in three reservoirs providing drinking water to the city of Rennes. The focus of the position was to study algae removal in drinking water plants where disruption in water production occurred during high algae biomass periods (algae blooms).



### ***Eagle Creek Watershed Alliance***

In September 2008, the Technical Committee hosted a tour of INTECH Park, the largest office park in Indiana and a leader in implementing low impact development for on-site stormwater management. The INTECH site, a Lauth development, utilizes "Parkology," defined as "the marriage between technology and nature" to address on-site stormwater management. INTECH has incorporated a number of measures that go above and beyond the minimal requirements for handling its on-site stormwater drainage issues including curb-less parking lot areas that route runoff into a carefully designed "treatment train" including vegetated islands within the parking lot (bioswales), a series of detention ponds, and finally, through a constructed wetland prior to entering the local storm sewer system. This tour demonstrated for members and decision makers of the planning and development communities a variety of successful and innovative BMPs that could be incorporated into site redevelopment or new development projects.

The Eagle Creek Watershed Alliance Education Committee celebrated the third water festival at the Eagle Creek Park Earth Discovery Center on Friday October 3, 2008. More than 150 5<sup>th</sup> grade students from Zionsville West Middle School joined 20 presenters and volunteers to learn how their actions make a difference in Eagle Creek Watershed. The students participated in five hands-on stations including water conservation, wildlife and water pollution, land use effects on watersheds, water testing techniques, and habitat restoration, all geared toward educating the students in ways in which their actions can make a difference in water quality, water conservation, and watershed protection. The Education Committee also has near term plans to help communities within the watershed install nearly 40 watershed signs along local roads and within Indy Park lands to help increase public awareness of the location of tributary streams and water bodies within the Eagle Creek Reservoir watershed and make the link between these water systems and the area's drinking water supply. These activities serve to help ECWA implement its mission of improving water quality through increasing public awareness of watershed issues as well as encouraging protection of the watershed's resources.

### ***Upper White River Watershed Alliance***

The Upper White River Watershed Alliance (UWRWA) has been busy securing grants and initiating the start of other grant projects. Locally lead steering committees from both the Morse and Geist watersheds are in the process of reviewing proposals and selecting contractors to complete their upcoming watershed management plans. The plans will require the engagement of numerous stakeholders across many counties. UWRWA Officers and contractors are actively participating in these steering committees to help build the capacity of these local groups and insure coordination with larger regional planning in the Upper White watershed. The UWRWA is also working to build a regional partnership with many of the regulated stormwater communities (MS4s) in the watershed via a coordinated public education and outreach program. At the heart of the program will be a web-based stormwater resource education center. A recent grant received from the Laura Hare Charitable Trust is allowing for the complete overhaul of the UWRWA website and development of several web-based tools. More details will be available as soon as a website contractor is selected, which is expected in late November. The UWRWA was pleased to help coordinate the efforts of many local groups that allowed for the first ever watershed-wide river clean-up day. The Partnering to Protect the White River Clean-Up event drew nearly 2,000 participants across five counties. What an incredible effort by local groups – an important united front that raised awareness of how many are connected by the river!





### *Discovering the Science of the Environment*

The Fall 2008 Discovering the Science of the Environment (DSE) program season experienced extreme changes in temperature, varied amounts of wind and rain, and the occasional perfect Autumn day! Despite the unpredictability of the weather, approximately 1300 students in 51 classes from four Central Indiana schools braved the elements to participate in the program.

With 90 degree, full sun, high humidity days, 14 7<sup>th</sup> grade science classes at Creekside Middle School in Carmel, Indiana conducted photosynthesis and respiration experiments on selected plants in their newly planted prairie plot. Students used carbon dioxide and oxygen gas sensors to quantitatively measure changes in gases as both photosynthesis and respiration occurred. All students survived the heat and collected detailed and accurate data! As the season continued at Craig Middle School in Lawrence, Indiana, temperatures cooled and rain increased! In spite of soggy conditions, 16 6<sup>th</sup> grade science classes completed a comprehensive stream water quality analysis of a small portion of Indian

Creek that passes through their school grounds. Students looked at the physical, biological and chemical aspects of the stream, collected qualitative and quantitative data and drew conclusions about the overall water quality of the stream. Following the rain and mild temperatures, the rest of the programming season saw significantly cooler temperatures and strong winds! Approximately 180 fourth, fifth and sixth grade students at Washington Irving IPS #14 in Indianapolis, Indiana conquered the wind to participate in groundwater analysis, tree monitoring and ecosystem investigations, respectively. As winter approached, the Fall program season came to an end at Clay Middle School in Carmel, Indiana where 14 6<sup>th</sup> grade science classes conducted wetland and woodland soil studies and woodland ecosystem investigations. Using the wetland soil and ecosystem data collected by former 6<sup>th</sup> grade students in the Spring of 2008, the current students were able to analyze and compare Spring 2008 and Fall 2008 data to begin to look for changes or trends in measurements like soil temperature, soil moisture, soil pH, plant biodiversity, and soil percolation.

As the program continues to grow, the amount of student data that is collected and available to analyze is continually increasing. Any data can be downloaded and used to enhance science and math studies in the classroom. To view or download the data collected during any of the programs mentioned above or other programs conducted throughout the previous DSE program seasons, please visit the DSE data share page at: <http://www.cees.iupui.edu/education/dse/resources/kiosk/datashare.htm>. For more information or to schedule a program, contact Brooke Furge, CEES Education Specialist, at [bfurge@iupui.edu](mailto:bfurge@iupui.edu).



### *Environmental Service Learning*

The CEES Environmental Service Learning Program continues to enhance central Indiana natural areas and protect water resources while providing a rich educational experience for IUPUI students. This fall season, 270 IUPUI undergraduate students from 12 course sections (university-wide) participated in nine projects with five community partners. Long-standing partnerships with Indy Parks and Recreation, Indianapolis Department of Public Works, and the Central Indiana Land Trust allow for continual work on restoration projects and public awareness activities within key parks and natural areas of the Upper White River Watershed. Fall activities such as installing native wetland plant species at Southwestway Park, removing invasive exotic honeysuckle in Scott Starling Nature Sanctuary and installing storm drain markers, both on the IUPUI campus and within Wayne Township neighborhoods, are collectively making an important contribution to regional ecological health. Visit [www.cees.iupui.edu/service\\_learning](http://www.cees.iupui.edu/service_learning) to view project locations, activities, and images.

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## *Environmental Service Learning in Mexico - To Mexico With Love*



Not only are IUPUI students working to improve the Central Indiana environment, they are traveling abroad to learn and serve. CEES has expanded the environmental service learning program to include a service site in Cuernavaca, Mexico as a partner in the IUPUI To Mexico with Love Spanish language and culture immersion program. During May and June 2008, a total of 40 students and 10 faculty/staff attended the month-long program. CEES staff Kara Salazar and Earth Sciences graduate student and IN Project WET Coordinator, Angie Tilton, led an environmental education program with IUPUI students at Don Bosco, a local Cuernavaca secondary (middle) school. The IUPUI students acted as teacher-mentors for the middle school students and led them in water resources education activities through *Encaucemos el Agua* (Project WET Mexico). Future program efforts in Cuernavaca will focus on environmental education activities as well as stewardship projects in local parks and natural areas. Visit the IUPUI To Mexico with Love website for 2009 information: <https://mexico.uc.iupui.edu/>

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## *CEES Community Advisory Board*

The CEES Community Advisory Board has undergone changes within the past year. Thank you to John Wilkins and Jhani Laupus for all of their work to support CEES through their board involvement over the past several years. They have both stepped down to pursue new project directions. The Advisory Board welcomes two new members - Robert Bowen, Chairman and Chief Executive Officer of Bowen Engineering Corporation and William Brown, Associate Partner of Browning Day Mullins Dierdorf Architects. CEES looks forward to their involvement.

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## *Contact Us AT THE CENTER*

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