



## AT THE CENTER

### News and Notes from the Center for Earth and Environmental Science

Fall 2011

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#### *Director's Note*

This past Fall has been my first season at CEES, and from my view as the new director I can attest that it has been a busy one for the CEES staff. I stepped into the role of Director in time to witness honors bestowed on former Director, Lenore Tedesco, and CEES education outreach staff Brooke Furge and Kara Salazar at the first annual Upper White River Excellence in Watershed Stewardship Celebration. Four stewardship awards were handed out at the event. Leaving for The Wetland Institute with a bang, Lenore Tedesco received the Distinguished Member of the Year Award for Leadership. Brooke Furge and Kara Salazar received an award in the category of Outstanding Innovation in Policy or Program for the development and implementation of the Discovering the Science of the Environment program. It was a great honor to be included in the event and introduced by Dr. Tedesco as the new Director of CEES. Needless to say that everyone at CEES is sad to see Dr. Tedesco go and regret that I will not be able to work along side her, but we all wish her great work in her new role as Executive Director at The Wetlands Institute in New Jersey.

Dr. Tedesco handed over a thriving center and a full range of research and restoration projects, including environmental education programming. The input of the six full-time staff in addition to several part-time staff and interns gives a strong continuity to CEES' activities and presence in the community. Dr. Tedesco established partnerships with more than 30 community organizations, government agencies, corporations, foundations, watershed groups, museums, and schools and I hope to continue to foster these relationships and grow new ones. I have had the opportunity to begin to meet with our partners in these organizations and look forward to meeting others. From my short time at CEES and interacting in this community, it is clear that CEES staff bring critical expertise to statewide programs and I plan to demonstrate that CEES will remain the go-to resource on water resource and watershed issues, as well as environmental education and outreach.

While being a time of transition in leadership at CEES, Fall has also been a very busy time for CEES in the field and local classrooms. Fieldwork has been in full force on multiple projects, including the Flood Erosion Hazard program that CEES is working on with partners at the USGS and the blue-green algae monitoring at local reservoirs (updates below). Project details have been worked out with Citizens Energy Group to ensure that algal monitoring of central Indiana's drinking water supply reservoirs will continue into the future under their new ownership of the drinking water utility. We have begun monitoring at the constructed wetland system to treat agricultural runoff installed this past summer as part of an international research collaboration. The stream naturalization project introduced as a project in 2010 at Pleasant Run is underway. Discovering the Science of the Environment recently finished up its Fall season, which again was filled to capacity. We have also begun to initiate collaborations with new faculty in the Department of Earth Sciences and the School of Science, adding to the projects being brought online in 2012.

I hope you will continue to stay tuned to developments at CEES, and help me guide CEES in fulfilling the needs of this community. I look forward to sharing more about my background and interests as well how I plan not only to help shepherd ongoing projects but build on the many strengths of CEES in new directions. Enclosed is the annual Friends of CEES return envelope. We appreciate your consideration of our programs and look forward to new and exciting endeavors!

Sincerely,

Dr. Pamela Martin  
Associate Professor  
Departments of Earth Sciences and Geography  
Director, Center for Earth and Environmental Science  
Indiana University – Purdue University Indianapolis

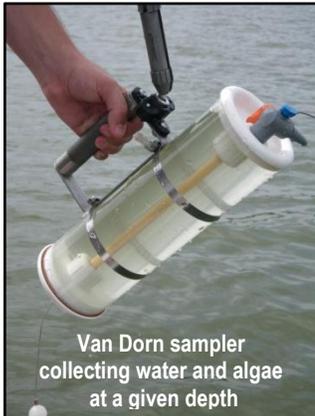
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## 2012 Algal Toxicology Research Project



Van Dorn sampler  
collecting water and algae  
at a given depth

CEES research has focused on understanding phytoplankton (micro-algae) occurrence and dynamics in central Indiana reservoirs because several types cause taste and odor in finished drinking water. Taste and odor compounds (MIB and Geosmin) are likely familiar to you as the earthy and/or musty smell and taste sometimes present in drinking water. Nuisance algal blooms of taste and odor producing phytoplankton have been documented in Eagle Creek, Geist and Morse Reservoirs since at least 2000. In recent years, concern regarding the production and occurrence of blue-green algal toxins has grown in central Indiana and nationally. Since 2008, evaluation of phytoplankton community structure information from Eagle Creek, Geist and Morse Reservoirs has shown that potentially toxic blue-green algae comprise important parts of the phytoplankton communities in mid-late summer and fall in all three reservoirs. CEES studies have recently documented that algal growth in our reservoirs is often associated with toxin and taste and odor productions. CEES is collaborating with both Citizens Water and the Indiana Department of Environmental Management (IDEM) to conduct these studies. The 2012 Citizens Water partnership with CEES will document reservoir physical and chemical conditions, algal community dynamics, taste and odor compounds, and toxin analyses. Specifically, CEES will collect samples for algae identification, toxin analyses and will provide results to the state. We have

additionally collaborated closely with the Indiana Departments of Environmental Management, Natural Resources, and Health to provide information on the IDEM website ([www.algae.IN.gov](http://www.algae.IN.gov)) about potential risks associated with recreation in reservoirs with algal blooms. We are using the 100,000 cells/mL as a benchmark for advisories as this is a benchmark used by the World Health Organization to indicate a change to a high probability for acute adverse health effects from recreation.

The expertise of CEES researchers (Nicolas Clercin and Mike Stouder) will continue to provide important information and analyses with the help of Citizens Water's internal water lab. Our work has been important in that we have been able to provide information to State agencies, the Indiana legislature and the public. Future work will provide valuable information for the local water company in understanding the dynamics of taste and odor-producing algae occurring in our drinking water supplies every year and anticipating potential outbreaks in the drinking water distribution system.

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## Fluvial Erosion Hazard Project Update

As the year comes to a close, the team is pleased to report that 2011 has proved to be a very productive year towards the progress of the Flood Erosion Hazard (FEH) project. To date, project scientists from the USGS, CEES, and POLIS have successfully accessed and collected data from more than fifty of the most natural stream reaches the state of Indiana has to offer. This progress is extremely encouraging and puts group well on its way to achieving the project goal of seventy-two measured field sites. These sites, often located in national or state forests, nature preserves, parks, fish and wildlife areas, and regional land trusts, have been scattered across the state in order to accurately represent the physiographic diversity of Indiana streams. As the first FEH field season winds down, the team will focus on further analysis and refinement of these data as they begin to develop the state of Indiana's first comprehensive set of regional hydraulic curves. Additionally, as further investigation continues, the team will be able to determine and develop the needs and goals for the next field season approaching in the spring of 2012. This will ensure that all areas of the state are fully represented by this work and the subsequent products will be able to provide the best results as vital stream management tools.



Morgan Monroe State Forest, Indiana



Sugar Creek near Thorntown, Indiana

To date, nine introductory presentations highlighting the importance of this work have been given to a wide range of audiences across the state. These include a webinar for Purdue University's Watershed Academy and presentations delivered at the Indiana Association of Floodplain and Stormwater Managers and to the Wabash River Consortium. Presentations have also been given to a number of regulatory and resource management agencies. More presentations are set to follow. The program introductions will be followed by regional workshops starting next year. Finally, the team is excited to announce the upcoming launch of the Indiana Flood Erosion Hazard (FEH) Program web portal. Set to launch in early December, this website will serve to both provide a wide range of informational resources surrounding this work and similar projects from other areas of the country as well as keep the public informed of the Indiana group's continued progress. Look for more information regarding this development in the next newsletter.

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## Watershed Alliance Updates - Upper White River Watershed Alliance

### Clear Choices Clean Water Campaign Expands to Reach Wider Audiences



Last year, the Clear Choices Clean Water program launched with the goal of educating landowners on the benefits of using phosphorus-free fertilizer (or no fertilizer at all) on their lawns. This year, the campaign's focus has quadrupled – now also emphasizing the importance of picking up pet waste, properly maintaining septic systems, and planting native plants.

There are over 53 million dogs in the United States, which would produce 6.3 billion pounds of waste per year. It would take a scoop the size of a football field and almost as tall as the Chrysler Building to dispose of that waste. Not only is the waste unsightly, it's dangerous, too – carrying parasites and bacteria that can be transferred to other animals and even humans. The Clear Choices Clean Water program encourages pet owners to pick up after their pets and dispose of the waste properly: by putting it in the trash, flushing it, burying it, or placing it in a pet waste digester.

Human waste is an equally important water quality issue. A failing septic system can discharge more than 76,650 gallons of untreated wastewater into Indiana's ground waters and surface waters per year. That means that the 200,000 failing systems in Indiana (estimated by the Indiana State Department of Health) are introducing approximately 15.3 billion gallons of raw sewage into the environment annually. By inspecting septic tanks every 1-3 years, pumping them every 3-5 years, and protecting the leach field area, septic system owners can do their part to protect our water quality.

Native plants are steadily gaining recognition for their environmental services, and the benefits they provide to our water quality are no exception. Utilizing native grasses and flowers in rain gardens or along shorelines can store runoff, stabilize soil, absorb pollutants, and provide habitat for beneficial wildlife. Native plantings also discourage nuisance Canada Geese, whose droppings are another source of water pollution.

The Clear Choices Clean Water campaign has added these three new components to the website ([www.clearchoicescleanwater.org](http://www.clearchoicescleanwater.org)) and pledges have started rolling in, proving once again that Indiana residents are eager to do their part for water quality! The website features pledge forms and interactive maps, answers to frequently asked questions, and many more resources for learning more about these important choices. A new Facebook page has also been created – just search for "Clear Choices Clean Water" and like the page to be kept updated with program happenings. Additionally, Clear Choices Clean Water has once again taken to the big screen, airing a 30-second commercial on pet waste in October that made 2.7 million impressions! With this combination of education, outreach, and marketing efforts, the Clear Choices Clean Water campaign is sure to continue growing and making a difference in Indiana's water quality. Be a part of the movement; visit the website and take a pledge today!

### Inaugural Upper White River Watershed Festival a Success!

If you were out and about in the month of September, chances are you were one of the over 3500 people that participated in at least one event that was tied to the inaugural Upper White River Watershed Festival coordinated in part by the Upper White River Watershed Alliance (UWRWA) with generous funding from the Nina Mason Pulliam Charitable Trust. Events included river clean-ups, workshops and bus tours, partner programs with the Indiana Museum of Art and the exhibit "Flow: Can You See the River?", a native American blessing ceremony, participation in the Hoosier Outdoor Experience, an awards celebration recognizing outstanding environmental projects and conservationists, and much more. Former CEES director, Dr. Lenore Tedesco, was presented with the Distinguished Member of the Year Award – a fitting departure for her and a great celebration of all that she has done to strengthen the UWRWA. Planning is already underway for next year's festival. If you are part of an organization interested in hosting a river/water/environmental stewardship themed event in September 2012, the UWRWA would like to hear from you. Be sure to visit [www.uwrwa.org](http://www.uwrwa.org) in the upcoming year to get involved in exciting 2012 river festival events!



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## Watershed Alliance Updates – Eagle Creek Watershed Alliance

### Eagle Creek Watershed Alliance (ECWA) Continues to Produce Results



The ECWA, with the support of CEES, continues to make strides in improving water quality in Central Indiana. One exciting new product of these efforts is a series of graphics depicting best management practices (BMPs) for agricultural, farmstead, suburban residential and urban commercial landscapes. The graphics, created by Green 3 (a landscape architecture firm), show landscape-scale improvements that can be implemented to improve soil and water quality and enhance wildlife habitat. Close-up images are also available to show bioswales, rain gardens, rain barrels, and two-stage ditches in more detail. These graphics are posted on the ECWA website for easy viewing, but are available for use in public presentations and other educational endeavors. Contact [coordinator@eaglecreekwatershed.org](mailto:coordinator@eaglecreekwatershed.org) if you would like to utilize these great educational tools!

Agriculture Liaison Harold Thompson has also been hard at work promoting the Eagle Creek Watershed Alliance Cost-Share Program to producers in the watershed, and as the second year of the current three year Eagle Creek Watershed IDEM 319 Grant comes to an end, quite a bit of progress has been made spending down the available cost-share funds. Nearly \$66,000 of the awarded \$191,500 has been spent, with approximately \$71,000 earmarked for projects in the works. Eleven projects have been completed ranging from cover crops to no-till equipment modifications, impacting nearly 4,200 acres of land. Nearly 14,705 tons of sediment per year, 9.25 tons of phosphorus per year, and 18.5 tons of nitrogen per year will be averted from the lakes and streams of the Eagle Creek Watershed. This is equivalent to approximately 730 tri-axle loads of soil and 6,153 50lb bags of 12-12-12 analysis fertilizer!

As always, education and outreach activities are underway to continue spreading the message of the alliance. Six presentations were given this summer and fall, educating 95 residents on the impacts their actions have on our water quality. A Healthy Water, Healthy People workshop was also held on October 7; sixteen interested individuals toured the United Water Belmont Advanced Wastewater Treatment Facility and learned important facts and statistics about water quality and public health. More information on these projects and how you can help with this important environmental work is always available at [www.eaglecreekwatershed.org](http://www.eaglecreekwatershed.org). Visit the website now to get involved!



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### Pleasant Run Update

Construction has started on the Pleasant Run project at Pleasant Run Golf Course (PRGC), located 7.6 miles upstream from the confluence of Pleasant Run with White River. This project was introduced in the Fall 2010 newsletter, but work was delayed by weather concerns until October 2011. Pleasant Run is a 27 square-mile watershed on the east side of Indianapolis. It is one of several watersheds identified by the Indianapolis Department of Parks and Recreation (IndyParks) for naturalization. The ultimate goal is to return these urban streams to multifunctional stream corridors, thereby reversing a century long tendency of treating city streams as storm and wastewater conduits. In the Pleasant Run watershed, initial studies identified three primary reaches, or sections, of the stream that showed signs of significant physical instability, with unstable banks and excessive sediment input into the stream. IndyParks and CEES are attempting to work from the headwaters downstream in these projects. The currently identified project areas in Pleasant Run contain over 3.5 miles of stream, or 25% of the length of the main channel of Pleasant Run. The initial project reach at PRGC is over a mile long. The Pleasant Run watershed provides a remarkable laboratory to investigate a systems approach to improving urban streams. Leadership from IndyParks, combined with an ongoing commitment from Citizens Water to resolve the City's historic problems with combined sewer overflows (CSOs), and a strong local watershed group, all help to provide the opportunity to fully address the many problems in the Pleasant Run watershed. The plan is deceptively simple; IndyParks and CEES will naturalize the physical stream corridor while Citizens Water improves water quality by reducing the CSO discharges. The combination of physical stream stability and improved water quality leads to a healthy biological community and overall stream health. In reality, the project is a complex long-term experiment in urban aquatic ecosystem restoration. Pleasant Run is the first phase in what IndyParks envisions as the renaturalization of the streams in Indianapolis and Marion County. Funding and support is being developed for the next phases. CEES is coordinating research objectives with colleagues in academia, and city, state, and federal agencies, to help us better quantify and document the results of this remarkable experiment. Our goal is for these watersheds to be the laboratories where we learn how to reverse the urban stream syndrome. We invite your support and participation.

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## ***Discovering the Science of the Environment***

Discovering the Science of the Environment (DSE) at CEES is wrapping up a wonderful fall season! Below are just a few of this season's highlights and upcoming summer opportunities:



### **DSE Wins Local Stewardship Award!**

The DSE program is proud to be the recipient of the 2011 Watershed Stewardship Award for Outstanding Innovation in a Policy or Program as awarded by the Upper White River Watershed Alliance at their Inaugural White River Watershed Stewardship Celebration! We have worked very hard over the past five years to make this program a success. We are extremely proud of the recognition we received for our ability to offer innovative and quality environmental education outreach programming to our local community, students and teachers.



### **Mobile Technology Trailer Program Updates!**

With the fall programming season at full capacity, the DSE mobile technology trailer program worked with 1785 students in 69 classes in grades 4<sup>th</sup>-8<sup>th</sup>. We are happy to have visited Creekside Middle School, Columbus Signature Academy in partnership with the Indiana State Museum, Saint Thomas Aquinas, Franklin TWP MS East, Sunnyside Elementary, Brook Park Elementary, Westfield Intermediate and Danville Middle School. Students from these schools participated in Plant Photosynthesis and Biodiversity, Prairie Bird Observations, Woodland Tree Monitoring, Woodland and Wetland Ecosystem Investigation, Riparian and Wetland Chemical Water Quality Assessment and Biological Water Quality Monitoring. As this season winds down, we will begin to make both technology and content improvements in preparation for spring!



### **Professional Development Institute Updates!**

#### **Now Accepting Teacher Applications for Summer 2012!**

Our sixth annual Professional Development Institute will be held June 25 – 29, 2012. This week- long comprehensive training will give teams of teachers the tools they need to successfully create and implement an action plan that will aid them in the construction of a schoolyard outdoor learning laboratory. The week will be filled with interdisciplinary environmental science education activities, community resources networking, strategic planning and an introduction to the basic principles of ecosystem restoration. Upon completion of the institute, each team is eligible for grant funding from the Dr. Laura Hare Charitable Trust to assist with implementing components from their action plan. This opportunity is free of charge and open to teams of teachers in the nine county Central Indiana region.



### **Water Resources Field Trip to Lake Michigan Updates!**

#### **Now Accepting Student and Teacher Applications for Summer 2012!**

The DSE program is once again partnering with the DJ Angus-Sciencetech Foundation to offer a summer water resources field trip to Lake Michigan June 15 – 17, 2012. Students and teachers can travel to Grand Valley State and the Annis Water Resources Institute on Lake Michigan for three fun-filled days that include: a cruise on Lake Michigan and Muskegon Lake aboard the Jackson, hiking and dune ecology at Hoffmaster State Park, and swimming and picnics at Lake Michigan and Spring Lake. The boat cruise affords students and teachers the opportunity to collect, analyze and interpret chemical and biological water quality data using research grade equipment housed on the boat. This opportunity is free of charge and open to all students and teachers within the nine county Central Indiana region.



### **In Other News: The DSE Facebook Fan Page Reaches over 90 Fans!**

The DSE fan page features descriptions and photos of all the opportunities provided through the DSE program including the mobile technology trailer student programs, professional development institute for teachers and our water resources field trip to Lake Michigan. If you are a member of the Facebook community, please join our over 90 fans in showing your support. You can like our page by visiting: [www.facebook.com/IUPUI.DSE](http://www.facebook.com/IUPUI.DSE)

For more information related to any of the opportunities provided through the DSE program, please visit [www.cees.iupui.edu](http://www.cees.iupui.edu). Click on Discovering the Science of the Environment.

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## ***Environmental Service Learning***

IUPUI undergraduate students participating in the CEES Environmental Service Learning program continue to enhance central Indiana natural areas and protect water resources within the Upper White River Watershed. This fall, 150 undergraduate students collectively completed seven projects with four community partners. The program provides opportunity for students to work directly with environmental managers and research staff to solve urban environmental issues. 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. Fall projects consisted of invasive exotic plant species removal at Southwestway Park (Indy Parks) and Oliver's Woods Nature Preserve (Central Indiana Land Trust). Native wetland plant installation occurred at the fen wetland restoration of Scott Starling Nature Sanctuary - Eagle Creek Park (Indy Parks). To bring awareness to residents of the connectivity of storm drains and waterways, storm drain markers were installed with the message – No Dumping, Drains to River - in neighborhoods around Michigan Road and 86<sup>th</sup> Street with the Indianapolis Department of Public Works. A new partnership with CICOA Aging and In-Home solutions provided opportunity for participation in their annual Safe At Home Event, which provides service to homeowners over the age of 60 or to persons of any age with a disability to help make their homes safe and accessible for daily living. CEES Environmental Service Learning students worked at homes in the Haughville, Hawthorne, and Stringtown neighborhoods of Indianapolis. Activities consisted of removing invasive exotic plant species and conducting general yard maintenance to make the exterior safe for the homeowner. The diversity of service learning experiences provides a rich enhancement to learning outside of the classroom and engaging in important activities to protect and learn about our natural resources. 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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### ***Contact Us AT THE CENTER***

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