

Greetings. You are receiving my director's letter, *At the Center*, a regular report of news and notes from the IUPUI Center for Earth and Environmental Science.

I'm excited about the role that CEES is playing in environmental stewardship in Central Indiana. We're directing major initiatives that are focused on water quality, remote environmental monitoring, wetland restoration and environmental science education and outreach. In this letter, I'll bring you up-to-date on these activities.

I hope you find value in the news you learn here. Because I value the many contributions you make to CEES, I want you to know about our Center, for CEES truly is a research and education center that prospers from the participation of many people, including you.

Let me know what you think about *At the Center* and how CEES is doing. You may contact me at: 317/274-7154 or ltedesco@iupui.edu.

Regards,
Lenore Tedesco
Director

Water Quality: Central Indiana Water Resources Partnership

CEES and **Veolia Water Indianapolis**, the manager of the Indianapolis Water Company, have formed the **Central Indiana Water Resources Partnership (CIWRP)** to study ways to improve water quality in Central Indiana. The 20-year research and development partnership, which includes funding for two research scientists and two graduate students, is initially focused on watershed studies and addressing algal bloom problems in Eagle Creek Reservoir.

Studies are designed to determine the amount of nutrients coming into the reservoir from the watershed versus the sediments. Researchers also hope to learn the likelihood that nutrient cycling within those sediments may act as a trigger for algal blooms. This research, which includes long-term monitoring and analysis, is important to the overall understanding of watershed and reservoir dynamics and their interaction. Ultimately, CEES research will help the Indianapolis Water Company improve the quality of our drinking water.

Now in its second year of work, CIWRP research is already providing important information about Central Indiana water resources and the cause of algal blooms in Eagle Creek, Geist and Morse Reservoirs.

Remote Environmental Monitoring: Creating a Dynamic Network

CEES has launched an environmental monitoring buoy in the southern portion of Eagle Creek Reservoir. Equipped with a radio transmitter, the buoy measures physical, chemical and biological parameters near the surface, middle and bottom of the reservoir every 15 minutes. Data output includes water temperature, dissolved oxygen, chlorophyll and a suite of other parameters. The buoy is integral to the Central Indiana Water Resources Partnership and studies of algal blooms in Eagle Creek Reservoir.

The Eagle Creek Reservoir buoy is just one instrument in CEES' rapidly expanding remote environmental monitoring network. The Center also has added water level and water quality probes to the White River, Fishback Creek, Eagle Creek and School Branch Creek. Additional probes are installed in ground-water wells at the Lilly ARBOR Project riparian restoration site and the Starling Nature Sanctuary wetland restoration site. Many of these probes are reporting conditions in near real-time and are accessible on-line at www.cees.iupui.edu.

Ecological studies depend on our ability to monitor an environment, collect data and analyze that data from diverse viewpoints. That's why CEES has partnered with the **IU Visualization and Interactive Spaces Lab**, under the direction of **Polly Baker**, to create the integrated environmental monitoring network. Our network of environmental sensors provides real-time data of real environments that is translated into visual components. Visualization allows researchers to thoroughly study data from a particular site, but it also provides an array of educational opportunities for K-12 students and teachers. The instrumented sites will be used to create analysis and presentation applications to foster community interest and participation in ecosystem restoration and water quality improvement projects.

Wetland Restoration: Scott Starling Nature Sanctuary

What happens when you remove 300 feet of agricultural drainage tile and plant more than 10,000 native wetland plants? You restore a lost wetland. That's exactly what CEES is doing at the Scott Starling Nature Sanctuary in Eagle Creek Park.

Settled in the mid-1800s, this area on the westside of Indianapolis was cleared of its natural forest and wetland plants to be converted for farming and other developments. By removing the agricultural drainage tiles, CEES is restoring groundwater levels and helping to re-establish areas that were historically a fen (or marsh) and a sedge (a grass-like plant) meadow. We anticipate that 60-70% of the 11 acre site will be returned to wetlands and associated habitats. The remaining area will be allowed to establish its own ecological setting based on ground wetness, elevation and relationship to surrounding vegetation communities.

Restoring a biologically diverse wetland provides educational, ecological and economic benefits — including improved water resources, which means better drinking water; a new living museum, where the dynamics of ecosystems can be observed and taught; and a commitment to environmental preservation and appreciation.

An array of individuals and organizations share CEES' commitment to environmental preservation and appreciation and helped with the Starling wetland restoration. **The Efroymsen Fund**, a donor-advised fund of the Central Indiana Community Foundation, made a \$29,000 gift to kick-start the project. Additional partners include: **Veolia Water Indianapolis, Spence Restoration Nursery, JF New and Associates, City of Indianapolis Department of Parks and Recreation**, and many IUPUI students and community volunteers.

Environmental Science Education and Outreach: Teaching Thousands

CEES research is helping the Indianapolis Water Company resolve issues related to drinking water quality and is helping Indy Parks restore and improve natural areas. In the process, we're teaching thousands of kids and adults about environmental science. The CEES educational and outreach program is discovery-based and makes science real and relevant to participants.

More than 2,000 IUPUI students and community volunteers have participated in CEES environmental service learning programs since 2003. During the 2004-05 school year, CEES Education Outreach Coordinator **Kara Salazar** will double the projects and the number of volunteers, stewarding an array of environmental sites around Indianapolis.

CEES education and outreach programs also impact K-12 students and teachers, more than 2,000 to be exact. Most recently, 160 students from **Washington Township Schools** engaged in hands-on learning at Starling Nature Sanctuary as part of the Learning Under the Sun Program. Summer camps, work-shops, site tours and campus visits provide students, teachers and volunteers with an array of opportunities to experience and learn about the environment.

Riparian Restoration Update: Lilly ARBOR Project

It's been four years since 1,330 native trees were planted along a one-mile stretch of the White River in downtown Indianapolis. Today, the site of the Lilly ARBOR Project, located on the east bank of the river between 10th and New York Streets, looks very different. A wildflower meadow and a shrub-sapling habitat is an inviting neighborhood for birds and butterflies.

The massive experiment is testing the best way to restore riverbanks by comparing the three most common methods for planting trees to restore native forests. The data collected each semester allows CEES research scientists to determine whether trends exist for the planting styles used, the species of trees planted, and the location of the trees, among other parameters. Understanding these trends is important to natural resource managers as they develop reforestation strategies locally, regionally and nationally. Additional monitoring programs have developed at the site, which includes plant and animal data collection, as well as ground water and river water monitoring.

The Lilly ARBOR Project experiment is offering answers about the best methods, but it's also restoring a lost forest. A floodplain in its natural form reduces the number and severity of floods, minimizes water pollution, filters storm water and provides a habitat for plants and animals. During high water events, some of the water is absorbed by the floodplains, helping to keep the river from overflowing. The absorbed water can then be returned naturally to the stream during times of low water.

Supported with significant gifts from **Eli Lilly and Company** and **The Rotary Club of Indianapolis**, the Lilly ARBOR Project is a model for university-corporate-community collaboration, for the scientific research and design plan actively involves university scientists and students, K-12 students and teachers, as well as corporate and community volunteers. Education outreach activities at the research site focus on science education and technology training and involve thousands of participants each year.

Educational signage is now displayed in each of the eight restoration plots. The signs describe the project and the environmental science techniques. I encourage you to take your family and friends to the river and learn more about the project — and enjoy the beautiful natural surroundings that the project has helped to create.