CEES Mission and Strategic Planning Initiatives

The CEES mission is to provide applied interdisciplinary environmental solutions to translate research into action while promoting environmental stewardship through education and public service programs. Applied research is important in bringing solutions to critical problems and gives CEES its uniqueness. CEES’ vision is to grow into an international leader providing environmental solutions to water resource issues both existing and emerging.

In order to maximize the efficient use of resources, CEES will pursue four strategic objectives in a manner that will further the universities goals of pursuing excellence in 1) research, scholarship and creative activity, 2) teaching and learning, and 3) civic engagement while also enhancing the resource base of the university.

*High priority* - The Center intends to place the highest priority on four strategic initiatives:
1. The Center will engage in cutting-edge research and training for mixed agricultural and urban watersheds
2. Evaluate and assess watershed Best Management Practices targeting atrazine, nutrients and emerging contaminants and pathogens
3. Establish a K-12 technology based science education program in water, air and energy
4. Work with state agencies on identifying watershed issues associated with Major Moves and other economic development initiatives, standards to be applied and training needs

*Medium priority* - The Center intends to make steady progress on the following four strategic initiatives:
1. Develop applied comparative research on sustainable integrated water resource management
2. Build partnerships with local and state government to support EPA collaborative watershed model and other federal models
3. Facilitate regional dialog to integrate stream and wetland mitigation efforts
4. Bridge a gap that exists between water resources and human health.

*Low priority* - The Center views two strategic initiatives as important and worthy of progressing, but at a slower pace than the high and medium priority issues:
1. Work with Indiana biofuels leaders to identify solutions to water resource issues
2. Become a source for longitudinal data on human health effects

*Foundational initiatives* - The Center has three foundational initiatives that are required to be resourced in order to maintain the ongoing credibility of the Center with influence leaders and academia:
1. Host research conferences on water resource management and human health issues
2. Develop CEES Regional Water Quality Monitoring Network and enhance mapping and visualization tools
3. Facilitate regional watershed management in central Indiana
CEES must bring research focus and pursue projects in the following areas in order to move toward the vision:

- Water Resource Evaluation and Watershed Management
- Assessment of Environmental Constituents
- Stream and Wetland Assessment and Restoration
- Environmental Data Management and Visualization
- Science Education and Public Outreach

2008 activities in the areas of research and education and outreach are aligned to further CEES’ strategic initiatives in the five core areas. The addition of two new hires during 2008 in the Department of Earth Sciences and CEES have further strengthened research expertise in water resources. The designation of CEES as a Signature Center allowed for a new faculty member to join the Department of Earth Sciences. Dr. Meghna Babbar-Sebens’ 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. CEES welcomed new research staff, Mr. Nicolas Clercin, M.S., as an expert in freshwater ecology and blue-green algae.

**2008 Research Project Activities**

**Publications**


**Magazine Articles**


**Abstracts**


Hosted Conferences and Workshops
Central Indiana Water Resources Partnership Spring Science Meeting, Indianapolis, April 2008.
Central Indiana Water Resources Partnership Fall Science Meeting, Indianapolis, January 2008.

Invited Talks and Tours
“Challenges of Monitoring Reservoir Water Quality: the Role of Watershed Inputs”, Indiana Water Monitoring Conference, IDEM and Purdue University, Indianapolis, IN, December, 2008.
“Challenges for Sustaining and Improving Water Resources in central Indiana”, Indiana University School of Public and Environmental Affairs, Bloomington, IN, November, 2008.
“Blue-green Algae and Algal Toxins in Central Indiana: An Emerging Threat to Water Resources”, Indiana Association for Floodplain and Stormwater Management, Brown County, IN, September, 2008.
“Blue-green Algae and Algal Toxins in Morse Reservoir”, Morse Waterway’s Association, Noblesville, IN, July, 2008.
“Blue-green Algae and Algal Toxins in Eagle Creek Reservoir”, Eagle Creek Watershed Alliance, Indianapolis, IN, July, 2008.
“Blue-green Algae and Algal Toxins in Geist Reservoir”, Senators Gard and Merrit and Representative Bosma Public Meeting for Area Residents, Indianapolis, April, 2008.
“Cyanobacterial Blooms and Algal Toxicity in central Indiana”, City of Indianapolis Board of Waterworks Technical Advisory Group, Indianapolis, April, 2008.
Research Grants

Upper White River Watershed Alliance’s Watershed Management Planning Project
L.P. Tedesco, Co-PI with Empower Results, LLC. and Context, LLC.
Indiana Department of Natural Resources, Lake and River Enhancement Program
1/08-12/09 $89,000.00

Cyanobacterial Ecology and Toxicology of Central Indiana Reservoirs
L.P. Tedesco and N. Clercin
Veolia Water Indianapolis
1/08-12/08 $178,048

Mapping Aquatic Vegetation with Hyperspectral Remote Sensing Imagery
L.P. Tedesco, J. Wilson and L. Li
Indiana Department of Natural Resources, Lake and River Enhancement Program
7/07-12/08 $49,995.00

Mitigation of Contaminants in Rural and Semi-Rural Environments to Protect Surface and Groundwater (Aquisafe 07)
KompetenzZentrum Wasser Berlin
L.P. Tedesco, Y. Moreau-Le Golvan (KWB); G. Grutzmacher (KWB); and E. Soyeux (Veolia) (with P. Vidon and P-A Jacinthe – IUPUI)
7/073/09 $265,608.00

Empirical and Bio-optical Modeling of Hyperspectral Reflectance for Improved Mapping of Water Quality Parameters in Central Indiana Reservoirs
L. Li, L. Tedesco, J. Wilson
Veolia Water Indianapolis
4/07-6/08 $77,760

Contaminant Transport Dynamics During Storms in Medium to Large River Systems of the Midwest
P. Vidon and L.P. Tedesco
Veolia Water Indianapolis
4/07-9/08 $175,247

Watershed-Scale Evaluation of BMP Effectiveness and Acceptability: Eagle Creek Watershed, Indiana
L.P. Tedesco, J. Wilson, Co-PIs with R. Turco, Purdue University
US Department of Agriculture
7/06-7/09 $650,000 ($218,580 to IUPUI)

Eagle Creek Watershed Alliance: Phase I Watershed BMP Implementation, Education, and Public Outreach.
EPA 319 Grant Program/ Indiana Department of Environmental Management
3/2006-3/2009 $522,911.00 ($343,254 grant dollars to IUPUI)
**Research Contracts**

Development of Restoration and Mitigation Plans for Streams and Wetlands on Indianapolis Park Properties
Indianapolis Parks Foundation, Inc.
12/07-12/12 $13,500.00 (with pending amendments)

IUPUI Sustainability Benchmarking and Water Resource Research and Training
Veolia Water Indianapolis, LLC.
1/08 – 6/09 $112,447.00

**Service Grants**

Measurement of Cyanobacterial Toxins in Three Central Indiana Drinking Water Reservoirs
Indiana Department of Natural Resources
5/08-12/08 $21,025.00

**2008 Science Education and Public Outreach Activities**

**Abstracts**

Salazar, K.A., Furge, B.A., and Tedesco, L.P., Discovering the Science of the Environment - Advancing Environmental Science Education through Interdisciplinary Collaboration and Strategic Planning,

Tilton, A. and Salazar, K.A., To Mexico with Love: International Service Learning and Water Education,


**Hosted Conferences and Workshops**

“Intro to Wetlands, Hydrology and Soils”, IDEM Wetland Education Workshop, Albion, IN, August, 2008.

Discovering the Science of the Environment Teacher Professional Development Institute, Indianapolis, June, 2008.
Invited Talks


“Environmental Service Learning”, Environmental Education Association of Indiana, Camby, IN, November, 2008.


“Modification of Indiana’s Hydrologic Cycle”, Hendricks County Master Naturalists Course, Danville, IN, September, 2008.

“Water Quality in the Urban Environment, Urban Riparian Ecosystems”, Butler University, Department of Biological Sciences, White River at Butler University, Indianapolis, August, 2008.

“IUPUI Campus Sustainability Initiative: Opportunities for Enhanced Environmental Stewardship”, Office Max Environmental Sustainability Summit, Indianapolis, August, 2008.


Environmental Service Learning

The CEES Environmental Service Learning program engages IUPUI undergraduate students, university-wide, in interdisciplinary environmental stewardship field days at local natural areas with community partners.

CEES Service Learning was featured in WFYI’s Natural heritage of Indiana series on the restoration of Indiana released in the fall of 2008.

Spring and Fall 2008 Service Learning Tracking:

- 19 Projects
- 544 Students
- 12 Project Partners
- 11 Courses
- 24 Sections
- 6 Departments
- 4 Schools
- 2 Universities
CEES is the School of Science representative for the IUPUI To Mexico with Love Spanish language and culture immersion program to Cuernavaca, Mexico. CEES implemented an environmental science service site for the month-long program in 2008. CEES has been invited to play a key role in developing a science-based service learning component for future programs. 40 students and 10 faculty/staff attended the program in 2008.

**Discovering the Science of the Environment Program**

The Discovering the Science of the Environment program is an experiential, inquiry-based, outdoor laboratory focused science education program for 4th-9th grade classes in central Indiana. Utilizing a mobile resource trailer equipped with interactive technology tools, web interface, and GIS mapping capabilities, the DSE program travels to area schools to provide free educational programming at school ground natural areas.

During the Spring and Fall 2008 field seasons, science and technology programs with the Discovering the Science of the Environment trailer engaged:

- **10 schools**
- **20 teachers**
- **6 different grade levels**
- **2937 students**

**Education Outreach Events**

- CEES Faculty and Staff Featured in IUPUI TV Spot, Fall, 2008
- Environmental Education Association of Indiana, Indianapolis, November, 2008
- National FFA Convention Career Success Tours, October, 2008
- Eagle Creek Watershed Alliance Water Festival, Indianapolis, October, 2008
- Earth Day Indiana, Indianapolis, April, 2008
- Veolia Water Indianapolis Public Schools Committee, March, 2008
- IUPUI STEM UCASE Symposium, February, 2008
- Pike Community Schools Math and Science Night, February, 2008
- Hoosier Association of Science Teachers, February, 2008

**Education and Teaching Grants**

The GK-12 Urban Educators Program at IUPUI: Teaching and Learning Science through Research

K. Marrs, L.P. Tedesco, A. Gavrin, J. Watt, P. Crowell, S. Rhodes
National Science Foundation
2/08-2/12 $2,993,160.00

Wetlands Education Workshops
Indiana Department of Environmental Management
J.F. New and Associates, Inc.
5/08-9/08 $8,999.00
Discovering the Science of the Environment
Nina Mason Pulliam Charitable Trust
7/06-7/08 $170,000.00

Discovering the Science of the Environment
7/06-12/08 $345,500.00

Awards and Recognitions
Indiana Water Conservationist of the Year, Indiana Wildlife Federation, Tedesco
Howard Michaud Award for Lifetime Achievement in Environmental Education, Environmental Educators of Indiana, Tedesco
IUPUI School of Science Partners in Education Staff Award, Salazar

Advisory Boards and Committees

Professional
Laura Hare Charitable Trust, Trustee, 2006 – present, Tedesco
City of Indianapolis Indy Greenprint Commission, Commissioner, 2007 – present, Tedesco
Town of Fishers, Department of Parks, Ritchey Woods Nature Preserve Advisory Council, 2007 – present, Tedesco
WFYI, Indiana Natural Heritage Advisory Board, 2007 – present, Tedesco
Eagle Creek Watershed Alliance, Education Committee, 2006-present, Salazar
City of Indianapolis, Clean Stream Team Advisory Board, 2007 – present, Tedesco
State of Indiana Water Pollution Control Board, Department of Environmental Management, Wetland Science Advisory Group, 2004 – present, Tedesco
State of Indiana Solid Waste Management Board, Gubernatorial Appointee, 2003-present, Tedesco
Indiana Water Resource Research Center, Board of Directors, 2004 – present, Tedesco
Indianapolis Tree Board, 2006-present, Barr
Veolia Water Indianapolis Technical Advisory Board, 2003 – present, Tedesco
Science Education Foundation of Indiana, Board of Directors, 2005 – present, Tedesco

University
IU Bloomington-Indianapolis Environmental Collaboration Initiative, 2008, Tedesco
Campus Recycling Committee, 2003-present, Salazar
Campus Sustainability Initiative Steering Committee, Chair, 2005 – present, Tedesco
Campus Sustainability Initiative Steering Committee Member, 2005-present, Hall, Salazar
Mexico Interest Group, 2008-present, Salazar
Staff Council, 2008-present, Salazar
School
Bachelor’s of Science in Environmental Science, Program Director, 2006 - present, Tedesco Technology Committee, 1993 – present, Tedesco, Hall Center for Research and Learning, Board of Directors, 2004 – present, Tedesco

Student Activities

Scholarship Awards
Jacob Lemon, BS, Environmental Science, Carl H. Johnson Achievement Scholarship

Affiliated Graduate Students
Jonathan S. Bills
Research Focus: Carbon sequestration by native and invasive species in a wetland complex in south-central Indiana.
Advisor, Dr. Pierre-Andre Jacinthe

Angie Cowan, GK-12 Scholar
Research Focus: Physicochemical and biological assessment of Eagle Creek, Geist and Morse Reservoirs, Indiana.
Advisor, Dr. Lenore Tedesco

Andrew Gamble
Research Focus: Use of multivariate techniques to analyze water quality or water flow in the White River Watershed, Indiana.
Advisor, Dr. Meghna Babbar-Sebens

Susan Gidley
Research Focus: Use of Quickbird Satellite Imagery to map aquatic vegetation in northern Indiana lakes.
Advisor, Dr. Jeffrey Wilson

Joe Johnstone
Research Focus: Examining nutrient export patterns during storms in Eagle Creek Watershed, Indiana.
Advisor, Dr. Philippe Vidon

Deborah Morrison
Research Focus: Correlating high lead blood levels in children in an urban setting using geospatial analysis and geographically referenced health data.
Advisor, Dr. Gabriel Filippelli

Tony Robertson
Research Focus: Development of Bio-optical and Modified Gaussian Models for the prediction on cyanobacterial concentration.
Advisor, Dr. Lin Li
Andrea Schilling, *GK-12 Scholar*
Research Focus: Determining Paleo-ice flow paths using Zircon geochronology, West Antarctica.
Advisor, Dr. Kathy Licht

Allyson Smith, *GK-12 Scholar*
Research Focus: Investigating nutrient conversion from agricultural runoff using constructed wetlands.
Advisor, Dr. Pierre-Andre Jacinthe

Mike Stouder
Research Focus: Investigation of nutrient export dynamics in a large scale watershed dominated by agriculture, Upper White River Watershed, Indiana.
Advisor, Dr. Lenore Tedesco

Jeremy Webber
Research Focus: Using Digital Elevation Models and GIS to model surface runoff to improve water quality.
Advisor, Dr. Lenore Tedesco

*Student Interns and Employees*
Jennifer Cusick, BS, Engineering - *Funding by Sam H. Jones Community Service Scholarship Program as Service Learning Assistant*
Jacob Lemon, BS, Environmental Science
W. Ryan McAtee, BS, General Studies
Shruthi Munsunuri, MS, Engineering
Mark Sparks, BS, Geology
Nicolas Zatkoff, BS, Public Affairs - *Funding by Sam H. Jones Community Service Scholarship Program as Service Learning Assistant*

**Appendices**

CEES Community Advisory Board and Staff

CEES Researchers - Affiliated Faculty and Staff

Community Partners in Research and Education

CEES Financials Report
Dr. Lenore P. Tedesco  
Director, Center for Earth and Environmental Science / Associate Professor, Department of Earth Sciences  
Stream and Wetland Ecosystem Restoration, Water Resources, Environmental Education, Sedimentology,  
tedesco@iupui.edu

Community Advisory Board

Robert Bowen  
Chairman and Chief Executive Officer  
Bowen Engineering Corporation  
bob@bowenengineering.com

William Brown  
Associate Partner  
Browning Day Mullins Dierdorf Architects  
brown@bdmd.com

Susan Cornacchione  
Major Gifts Officer  
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Barbara Simpson  
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Executive Director  
Elanco Manufacturing  
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Staff

Robert Barr  
Research Scientist  
Hydrology, Fluvial Geomorphology, Wetland Science  
rcbarr@iupui.edu

Nicolas Clercin  
Research Scientist  
Algal Ecology, Limnology  
nclercin@iupui.edu

Brooke Furge  
Education Specialist  
Environmental and Outdoor Education  
bforge@iupui.edu

Bob E. Hall  
Systems Engineer  
Wetland Restoration, Water Quality Monitoring, GIS, Remote Sensing, Technology  
bhall@iupui.edu

Kara Salazar  
Education Outreach Coordinator  
Environmental Service Learning, Environmental Science Education, Ecosystem Restoration  
salazark@iupui.edu
Dr. Meghna Babbar-Sebens
Assistant Professor of Earth Sciences, IUPUI
Ph.D., University of Illinois at Urbana-Champaign, 2006
M.S., University of Illinois at Urbana-Champaign, 2002
B.E., Indian Institute of Technology, Roorkee, India, 2000
Water Resources and Environmental Systems Analysis,
Environmental Risk Assessment and Management, Contaminant Fate
and Transport Modeling, Uncertainty Analysis, Surface and Groundwater
Hydrology, Optimization, and Decision Support Systems

Research is focused on the fate and transport modeling of water-borne contaminants, and assessment and management of associated ecological and human health risks. Dr. Babbar-Sebens research focuses on 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 planning and management strategies for emergency response and water-borne disease prevention.

Dr. M. Pauline Baker
Associate Professor, School of Informatics and Computer Science Department, IUPUI
Ph.D., University of Illinois, 1990
M.S., Syracuse University, 1977
B.A., Cornell University, 1974
Information Technology, Computer Graphics, Visualization, Human-Computer Interaction

Research focus is on the use of advanced computer-graphics and user interaction methods for creating hardware and software environments for data exploration and for learning. Dr. Baker has particular interest in using ubiquitous computing technologies (sensors, mobile devices, etc.) to design learning environments suitable for informal education venues such as museums and discovery centers.

Robert Barr
Research Scientist
B.A., IUPUI, 2002
B.A., IUPUI, 1991
Center for Earth and Environmental Science, IUPUI
Hydrology, Fluvial Geomorphology, Wetland Science, Ecosystem Naturalization

Develop, implement, and coordinate hydrologic analysis of aquatic ecosystems, with particular emphasis on the physical hydrology of streams and wetlands and the systems analysis of watersheds. Outreach activities include conducting continuing education workshops for environmental science professionals and community members. Teach or coteach courses in stream and wetland ecosystems for graduate and undergraduate students. Primary research interests are stream and riparian corridor naturalization in the glaciated Midwestern United States and the hydrologic linkages between depressional wetlands and primary headwater streams.

Dr. William Blomquist
Associate Professor of Political Science, Management, and Institutions, IUPUI
Ph.D., Indiana University, 1987
M.A., Ohio University, 1979
B.S., Ohio University, 1978
Water Resources, Watershed Management

Research focuses on water management institutions and policies. Dr. Blomquist has studied and written about groundwater management agencies in Southern California; state water laws and agencies in Arizona, California, and Colorado; watershed management agencies in the United States; and river basin management organizations in other countries. His newest project is an exploration of the legal and political barriers to the development of desalination facilities in coastal areas of the U.S.
Research focuses on human alteration of natural vegetation, and the geography of the Caribbean. He has studied causes and consequences of deforestation in the Dominican Republic and comparative vegetation change in Haiti and the Dominican Republic.

Nicolas Clercin  
Research Scientist, Phytoplankton Ecology  
Center for Earth and Environmental Science, IUPUI  
Limnology, Phytoplankton ecology, Cyanobacteria, Toxicology, Nutrients Cycling, Algae Taxonomy

Research interests focus on the ecology of freshwater phytoplankton with emphasis on understanding the environmental factors triggering the growth of the microalgae. Algae blooms in freshwater are predominantly cyanobacteria (blue-green algae), some of which produce potent cyanotoxins and pose a potential risk to human health through exposure from recreational use, drinking water, fish consumption, and other vectors.

Dr. Kay Connelly  
Assistant Professor of Computer Science, Indiana University  
Lead, Security for Ubiquitous Resources Group (SURG), IU  
Associate Director, Center for Applied Cybersecurity Research, IU  
PhD, University of Illinois at Urbana-Champaign, 2003  
MS, University of Illinois, 1999  
B.S. and B.A., Indiana University, 1995

Research includes user acceptance of ubiquitous and mobile computing technologies where there is a delicate balance between such factors as convenience, control and privacy. She is currently investigating the following application domains: Convenience applications such as automatically configuring a cell phone's notification mechanism depending on the physical and social context of the cell phone owner; Health care applications to empower both the ill and the healthy to manage and improve their own health; Work and learning applications such as a tool to assist students in gathering environmental data while simultaneously supporting data analysis in the field.

Dr. Sapna Deo  
Assistant Professor, Chemistry and Chemical Biology, IUPUI  
Ph.D., University of Kentucky, Lexington, 2000  
Ph.D., University of Bombay, India, 1994  
B.S., University of Bombay, 1992

Dr. Deo’s research is at the interface of analytical chemistry and biological chemistry with the goal of developing novel bioanalytical techniques employing luminescent and fluorescent proteins. Specifically, she is working on development of sensing systems for different classes of RNAs, including microRNAs, mRNAs, rRNAs, and siRNAs. Research capitalizes on high sensitivity of detection associated with luminescent proteins and combining it with one step detection methods such as protein reassembly and bioluminescence resonance energy transfer in order to develop highly sensitive as well as fast detection methods for nucleic acids. The research interest of her group is interdisciplinary in nature, utilizing analytical chemistry, molecular biology, and protein engineering tools in the development of sensing technologies for targets of biomedical, diagnostics, and environmental relevance.
Dr. Gabriel Filippelli  
Professor of Earth Sciences, IUPUI  
Chairperson, Department of Earth Sciences, IUPUI  
Environmental Chemistry, Paleoceanography, Paleoclimatology

Research includes biogeochemical cycling in the environment and the connections between geochemistry and the geologic record of global climate change. Current research involves determining the effects of climate on weathering and terrestrial nutrient cycling; examining carbon and nutrient cycles on glacial/interglacial time scales; assessing industrial heavy metal inputs to near-urban wetlands; and examining the connection between soil lead, climate, and children’s health.

Dr. Timothy R. Filley  
Assistant Professor, Biochemistry, Purdue University  
Biogeochemistry

Research interests are primarily associated with the cycling of organic matter and nutrients in agricultural and forest soils, the processes controlling the formation of soils and the stabilization of soil organic matter, and controls on the export of organic matter in watersheds as dissolved, colloidal and particulate organic matter. With respect to watershed biogeochemistry, Dr. Filley is particularly interested in the controls that land use and hydrology (in the form of punctual hydrologic events) have on the nature and reactivity of allochthonous organic matter.

Brooke Furge  
Education Specialist  
Center for Earth and Environmental Science, IUPUI  
Environmental Education

Efforts include designing, developing and implementing environmental science education outreach programs to Central Indiana schools and teachers through the Center for Earth and Environmental Science’s Discovering the Science of the Environment program. Programs focus on local, technology-infused field science research experiences utilizing a mobile technology trailer, digital handheld data input devices, on-site student data upload, and comprehensive data sharing via the web.

Bob E. Hall  
Research Scientist, Systems Engineer, Technologist  
Center for Earth and Environmental Science, IUPUI  
Environmental Remote Sensing, Ecosystem Monitoring, Environmental Restoration, Data and Systems Administration and Design

Efforts revolve around facilitating faculty research with hydrologic monitoring of wetland, riparian, and lake ecosystems. Research includes: evaluating restoration strategies and efforts; environmental mapping, modeling, and visualization; data and environmental sensor network design, administration, and maintenance; and graphic, publication, and website design.

F. Vincent Hernly  
Research Scientist, Laboratory Coordinator, Department of Earth Sciences, IUPUI  
Glacial Stratigraphy, Soils, Geomorphology

Research is on Quaternary stratigraphy of the Midwest, with special emphasis on the use of paleosols as a stratigraphic tool and environmental indicator. Current interests are in the use of soils as wetland indicators, and in questions related to the development and persistence of hydric soils associated with both wetland restoration and wetland drainage.
Dr. Pierre-André Jacinthe  
Ph.D., Ohio State University, 1995  
Assistant Professor of Earth Sciences, IUPUI  
M.S., Ball State University, 1991  
Environmental Soil Science, Soil Biochemistry, Soil Geomorphology  
B.S., State University of Haiti, 1985  

Research interests include nitrate transformations in wetlands, carbon sequestration in natural and managed ecosystems, nutrient cycling and soil-atmosphere exchange of trace gases (carbon dioxide, methane and nitrous oxide) as related to land-use and management practices. His research has also focused on fates of eroded carbon (mineralization, entrapment in terrestrial deposits), and linkages between water, erosion and the global carbon cycle. A recently funded project involves application of selective oxidation procedures, stable carbon isotope and radiocarbon techniques to partition carbon pools in reclaimed mine soils into fossil and recently deposited carbon fractions.

Dr. James E. Klaunig  
Ph.D., University of Maryland, 1980  
Professor and Director of Toxicology  
B.S., Ursinus College, 1973  
Department of Pharmacology and Toxicology, Indiana University School of Medicine  

Environmental Toxicology and Chemical Carcinogenesis  

Research has focused on the mechanisms of chemically induced carcinogenesis and toxicology with emphasis on environmental toxicology and carcinogenesis. This has involved studies into the role of oxidative stress/oxidative damage, Kupffer cell activation, modulation of gap junctions, and cell growth/apoptosis in this process with emphasis toward human risk assessment.

Dr. Lin Li  
Ph.D., Brown University, 2002  
Assistant Professor of Earth Sciences, IUPUI  
M.E., Brown University, 2001  
Planetary Earth Sciences, Global Climate Change  
M.S., Institute of Remote Sensing Application, Academy Sinica, 1989  
Environmental Remote Sensing  
B.S., Jilin, University, China, 1986  

Research involves lunar and planetary Earth Sciences, environmental remote sensing and global climate change. Recent research focuses on wetland vegetation classification and invasive plant mapping with hyper-spectral remote sensing data, lunar soil mapping and impact mixing with multi-spectral imagery, and using radiative transfer models to derive the biochemical and biophysical parameters of vegetation and soils from hyperspectral remote sensing and MODIS data. Additional research interests involve the development/improvement of digital image processing algorithms for material classification and discrimination, and of radiative transfer modeling for the retrieval of material properties.

Dr. Kathy Licht  
Ph.D., University of Colorado, 1999  
Assistant Professor of Earth Sciences, IUPUI  
M.S., University of Colorado, 1995  
Quaternary Earth Sciences, Glacial Earth Sciences, Geomorphology  
B.S., St. Norbert College, 1992  

Research focus is on reconstructing the history of the Antarctic and Laurentide Ice Sheets over the past 30,000 years. Previous work has utilized sedimentology and stratigraphy to reconstruct ice extent, as well as 14C dating to constrain the timing of ice advance and retreat. A recently funded Antarctic project linked the mineralogical, geochemical, and isotopic characteristics of the sediments from Ross seafloor sites that were once covered by glacial ice to sediments collected from the source areas of ice in East and West Antarctica to determine past ice flow paths. This type of study contributes to the understanding of changes in ice sheet dynamics through time. Current projects also include studies of lake sediments in northern Indiana and southern Michigan to determine how regional climate has changed since the end of the last ice age.
Dr. Yvonne Rogers  
Chair of Human-Computer Interaction, Open University, UK  
Ph.D., University of Wales (UK), 1988  
M.Sc., University College London, 1984  
Research and teaching interests include the areas of human computer interaction (HCI), Computer supported cooperative work (CSCW) and pervasive computing. Research focuses on augmenting and extending everyday learning and work activities with interactive technologies that move "beyond the desktop". This involves designing enhanced user experiences through appropriating and assembling a diversity of technologies including mobile, wireless, handheld and pervasive computing.

Kara Salazar  
Education Outreach Coordinator  
Center for Earth and Environmental Science, IUPUI  
M.S.Ed., IUPUI, 2007  
M.P.A., Indiana University, 2002  
B.S., Indiana University, 1999  
Efforts include developing, implementing, and evaluating environmental science curriculum, outreach programs, and institutes for K-12 students and teachers, university students, community members, and environmental professionals with emphasis placed on urban and multicultural education. Outreach programs include environmental service learning coordinated in conjunction with community partners and the Discovering the Science of the Environment program. Environmental science research interests include implementation and monitoring of wetland, riparian, and prairie restoration projects, wetland delineation, vegetation monitoring, and environmental sustainability efforts.

Dr. Joshua Smith  
Assistant Professor of Educational Psychology, IUPUI  
Director, Center for Urban and Multicultural Education  
Ph.D., University at Albany, 2002  
M.S., University at Albany, 1997  
B.A., University at Albany, 1994  
Courses offered include Educational Psychology in the Teacher Education Program and graduate courses in qualitative and quantitative research methods. Research interests include student transition from middle school to high school, and the transition from high school to college. He currently coordinates six program evaluations in the Indianapolis region.

Dr. Lenore Tedesco  
Associate Professor of Earth Sciences, IUPUI  
Director, Center for Earth and Environmental Science  
Ph.D., University of Miami, 1991  
B.A., Boston University, 1984  
Research focuses on regional watershed and water quality issues with a focus on surface water and drinking water resources. Current research efforts are evaluating the distribution of emerging contaminants and cyanobacteria toxins in central Indiana surface waters. Wetlands and wetland restoration including evaluation of restoration strategies and wetland function are important research interests. This includes studies of urban riparian reforestation, fen wetland restoration, and on the distribution of anthropogenic pollutants. Dr. Tedesco is working with the Pervasive Technology Labs and CEES staff to develop an autonomous environmental monitoring network measuring water quality throughout central Indiana. Environmental education based on restoration research and environmental monitoring is an important part of her research interests.
Dr. Philippe Vidon
Assistant Professor of Earth Sciences, IUPUI
Hydrology, Biogeochemistry, Wetlands, Riparian Zones

Research focuses on the hydrological and biogeochemical functioning of wetlands and near-stream zones. He is interested in determining how landscape characteristics affect the ability of these ecosystems at mitigating pollution by anthropogenic contaminants in rural areas. Interests also include research on structures to mitigate floods and improve water quality in freshwater systems at the watershed scale.

Dr. Xianzhong Wang
Assistant Professor of Biology, IUPUI
Plant Physiological Ecology, Soil and Environmental Sciences

Research focuses on the effects of global environmental changes, including rising CO₂ concentration in the atmosphere, on plant physiology and growth at different organizational levels. Research is interdisciplinary in nature and aims at understanding the responses of plants to environmental disturbances caused by human activities.

Dr. Jeffrey S. Wilson
Associate Professor of Geography, IUPUI
Chair, Department of Geography
Geographic Information Systems, Environmental Remote Sensing

Research interests are in environmental remote sensing, geographic information systems, and human/environment interactions. Current research involves remote sensing of cities; 3D modeling of urban environments; land cover dynamics and urban sprawl; and relationships between the physical environment and human health.
CEES Community Partners in Research and Education

**CEES Partners in Research**
- Purdue University
- Indiana Water Resources Research Center
- United States Geological Survey – Indiana Water Science Center
- Indiana Department of Environmental Management
- Indiana Department of Natural Resources
- Indiana University School of Medicine – Center for Environmental Health
- Veolia Environment Research Centers – Paris, Adelaide, and Berlin

**CEES Partners in Education**

**Not-for Profits**
- Central Indiana Land Trust Incorporated (CILTI)
- Science Education Foundation of Indiana
- Indiana State Fair
- Keep Indianapolis Beautiful (KIB)
- WFYI Public Television
- Life Science Education Center at Marian College (LSEC)
- Indiana Audubon Society
- Indiana Wildlife Federation
- Friends of White River (FOWR)
- Rotary Club of Indianapolis
- Efroymson Fund of the Central Indiana Community Foundation
- Nina Mason Pulliam Charitable Trust

**State and Local Government**
- IDNR – Natural Resources Education Center
- Indiana Department of Environmental Management
- Indiana State Museum
- City of Indianapolis - Department of Public Works – Office of Environmental Services
- Indy Parks and Greenways
  - Hub Naturalist Program
  - Office of Land Stewardship
  - Division of Resource Development - Park Planning and Design
  - Earth Discovery Center of Eagle Creek Park
- Hamilton County Parks
- Noblesville Parks Department
- Zionsville Parks Department
- Marion, Hamilton, Boone, Hendricks County SWCD

**Corporations**
- Eli Lilly and Company
- Veolia Water Indianapolis
- Dow AgroSciences

**Universities**
- Butler University
- Marian College - EcoLab
- University of Wisconsin – Madison Arboretum
- Purdue University
- Indiana University
- University of Indianapolis – Center for Excellence in Leadership and Learning

**Schools**
- Numerous IPS and Township Schools
- Indiana School for the Blind
- Several Indiana Charter Schools
### REVENUE & EXPENSE REPORT - FISCAL YEAR 2005-2008

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Government Grants and Contracts</td>
<td>$9,982</td>
<td>$64,128</td>
<td>$158,916</td>
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<td>Non-government Grants and Contracts</td>
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<td>$336,683</td>
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<td>Foundation Gifts</td>
<td>$189,850</td>
<td>$35,000</td>
<td>$200,350</td>
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<td>Corporate Gifts</td>
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<td>$2,725</td>
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<td>Individual Gifts (36, 42, 29, 27)</td>
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<td>$27,008</td>
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<tr>
<td>Program Service Revenues</td>
<td>$10,348</td>
<td>$22,080</td>
<td>$30,602</td>
<td>$44,291</td>
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<tr>
<td>IUPUI Support (Staff)</td>
<td>$91,417</td>
<td>$102,799</td>
<td>$69,218</td>
<td>$72,746</td>
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<tr>
<td>ICR Income</td>
<td>$30,731</td>
<td>$61,462</td>
<td>$61,462</td>
<td>$30,731</td>
</tr>
<tr>
<td>Interest on Endowed Foundation Funds</td>
<td>$546</td>
<td>$659</td>
<td>$764</td>
<td>$822</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$600,544</td>
<td>$682,483</td>
<td>$968,485</td>
<td>$1,205,107</td>
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</table>

<table>
<thead>
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<th></th>
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<tbody>
<tr>
<td>Faculty Salaries</td>
<td>$54,081</td>
<td>$78,082</td>
<td>$103,813</td>
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<td>Student Academic Salaries</td>
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<td>Professional Salaries</td>
<td>$105,808</td>
<td>$125,523</td>
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<td>Biweekly, and Hourly Wages</td>
<td>$41,671</td>
<td>$107,171</td>
<td>$125,178</td>
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<td>Benefits &amp; Payroll Taxes</td>
<td>$59,879</td>
<td>$74,321</td>
<td>$71,438</td>
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<td>Student Fee Remission</td>
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<td>$13,893</td>
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<td>$13,149</td>
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<tr>
<td>Consultants/Professional Fees/Subcontracts</td>
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<td>$10,634</td>
<td>$5,684</td>
<td>$14,083</td>
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<tr>
<td>Office Supplies and Expenses</td>
<td>$11,770</td>
<td>$19,766</td>
<td>$16,107</td>
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<td>Printing, Copying</td>
<td>$595</td>
<td>$6,123</td>
<td>$7,094</td>
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<tr>
<td>Research, Lab and Field Supplies</td>
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<td>$112,460</td>
<td>$44,156</td>
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<tr>
<td>Equipment &lt;$5,000 &amp; Maintenance</td>
<td>$63,281</td>
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<tr>
<td>Capital Equipment</td>
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<tr>
<td>Travel &amp; Training</td>
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<td>$29,219</td>
<td>$29,071</td>
<td>$41,889</td>
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<tr>
<td>Project Development</td>
<td>$4,003</td>
<td>$10,634</td>
<td>$5,684</td>
<td>$14,083</td>
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<tr>
<td>ICR Expenses</td>
<td>$88,931</td>
<td>$99,602</td>
<td>$90,652</td>
<td>$148,022</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>$562,351</td>
<td>$866,235</td>
<td>$848,148</td>
<td>$1,087,021</td>
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</tbody>
</table>

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Endowed Foundation Funds</td>
<td>$14,320</td>
<td>$16,103</td>
<td>$19,407</td>
<td>$21,056</td>
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<tr>
<td>Account Reserves (Unspent Funds)</td>
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<td>In-Kind Support</td>
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<td>$196,026</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>$439,153</td>
<td>$365,074</td>
<td>$537,699</td>
<td>$567,435</td>
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</tbody>
</table>

^ Income actual based on existing grants/gifts

Revenue from contracts and grants is based on award amount evenly divided among fiscal years of award. This does not match expenses.

Note - no Internal Grant Funds Shown
Contracts and Grants $259,982
ICR Income $30,731
Interest on Endowed Foundation Funds $546
Program Service Revenues $10,348
Philanthropic Grants and Gifts $207,520
IUPUI Support (Staff) $91,417

REVENUE 2004/2005
$600,544

Philantropic Grants and Gifts
$207,520
Program Service Revenues $10,348
ICR Income $30,731
Interest on Endowed Foundation Funds $546
Contracts and Grants $259,982
IUPUI Support (Staff) $91,417

EXPENSES 2004/2005
$562,351
Salaries $291,832
Project Development, $4,003
ICR Expenses $88,893
Travel and Training $22,569
Operational Supplies and Expenses $12,365
Consultants $-
Research Supplies and Expenses $142,689
**REVENUE 2005/2006**

- IUPUI Support (Staff) $102,799
- Program Service Revenues $22,080
- Philanthropic Grants and Gifts $64,733
- ICR Income $61,462
- Interest on Endowed Foundation Funds $659
- Contracts and Grants $430,750
- **Total Revenue** $682,483

**EXPENSES 2005/2006**

- Salaries $460,038
- ICR Expenses $99,602
- Consulting $29,219
- Project Development $10,634
- Research Supplies and Expenses $238,353
- Operational Supplies and Expenses $25,889
- Consultants $2,500
- **Total Expenses** $866,235
REVENUE 2006-2007
$968,485

- IUPUI Support (Staff): $69,218
- Program Service Revenues: $30,602
- Philanthropic Grants and Gifts: $310,840
- ICR Income: $61,462
- Interest on Endowed Foundation Funds: $764
- Contracts and Grants: $495,599

EXPENSES 2006-2007
$848,148

- Salaries: $522,132
- ICR Expenses: $90,652
- Project Development: $5,684
- Travel and Training: $29,071
- Research Supplies and Expenses: $125,308
- Operational Supplies and Expenses: $23,201
- Consultants: $52,100
- Interest: $764
REVENUE 2007-2008
$1,205,107

Program Service Revenues $44,291
IUPUI Support (Staff) $72,746
ICR Income $30,731
Interest on Endowed Foundation Funds $822
Contracts and Grants $808,619
Philanthropic Grants and Gifts $247,898

EXPENSES 2007-2008
$1,087,021

Salaries $562,172
ICR Expenses $148,022
Project Development $14,083
Research Supplies and Expenses $249,778
Consultants $33,033
Operational Supplies and Expenses $38,044
Travel and Training $41,889