

On behalf of the
university sponsors ...

Welcome to the Dayton Water Conference

“Dayton Hub” Universities (w/in ~ hour drive):

- The Ohio State University
- University of Cincinnati
- Wright State University
- University of Dayton/UDRI
- Air Force Institute of Technology (AFIT)
- Central State University
- Miami University
- Wittenberg University
- Cedarville University
- Antioch College

Southern Ohio Council on Higher Education (SOCHE) is an alliance of academic organizations that provide higher education throughout the Southwestern Ohio communities. Each member is an advocate of innovation, opportunity and success. They strive to promote scholastic achievement through the development of new technologies and quality education.

Dayton's Research Triangle

Air Force Research
Labs (AFRL)/
Air Force Institute
of Technology
(AFIT)
(\$2.5 billion)

Wright State University
(\$100 million)

City of Dayton

University of Dayton/
University of Dayton
Research Institute (UDRI)
(\$100 million)

FY 2010
research/extramural
funding

Dayton's Research Triangle

Air Force Research
Labs (AFRL)/
Air Force Institute
of Technology
(AFIT)

Wright State University

Graduate programs among
these institutions are linked by
the Dayton Area Graduate
Studies Institute (DAGSI)

University of Dayton/
University of Dayton
Research Institute (UDRI)

Wright State University

- Founded in the name of the world-famous Wright brothers, Wright State University in Dayton, Ohio, continues their spirit of innovation. The university serves nearly 20,000 students, offering 118 undergraduate degrees and 91 master's, doctoral and professional degrees.

Schools and Colleges:

- Boonshoft School of Medicine
- Science and Mathematics
- Engineering and Computer Science
- School of Professional Psychology
- Education and Human Services
- Liberal Arts
- Nursing and Health
- Raj Sooin College of Business



Environmental Sciences PhD Program

Phone: (937) 775-3273 | Fax: (937) 775-3485

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Areas of Focus:

Environmental Biology

Environmental Earth
Science

Environmental Chemistry

Environmental Complexity

See why our program is right for you!

The Environmental Sciences Ph.D. program at Wright State is designed to provide skills and training to better understand and solve complex environmental problems, such as those caused by anthropogenic pollutants, invasive species, habitat fragmentation and loss of biodiversity, that can affect both human and ecosystem health. Our students receive training in preparation for careers in academia, state and federal agencies, industry, and non-profit organizations.

Through a rigorous core curriculum and dissertation research, our interdisciplinary program is designed to broadly expose students to both traditional and emerging areas of environmental sciences, and offers the ability to focus on research in a more defined area. Our program includes faculty in the departments of Biological Sciences, Earth and Environmental Sciences, Chemistry, Physics, Biochemistry and Molecular Biology, and Pharmacology and Toxicology.



Faculty Research on Natural Waters *

- \$4,000,000 in grant funding
- See list of current grants and recent publications at our table in the lobby

*(e.g. limnology, ground and surface water quantity and quality, the organic, inorganic and isotope chemistry of natural waters, anthropogenic influences on watersheds, riparian ecology, hydrology and climate change, ground and surface water flow and transport, oceanography, etc.)



Dr./Prof. Steven Higgins

Associate Professor of Environmental and Analytical Chemistry

Research Interests: atomic force microscopy of solid-liquid interfaces, study of interfacial chemical dynamics related to problems in environmental chemistry. Understanding the complex surface processes (e.g., diffusion, adsorption/desorption, dissolution/precipitation, and charge transfer reactions) that occur at the boundary between solid and fluid phases.

world's only laboratory with hydrothermal atomic force microscopy



Dr./Prof. Chad Hammerschmidt

Associate Professor of Earth and
Environmental Sciences

Research Interests: developing a quantitative understanding of the biological, chemical, and physical mechanisms and processes that affect the transport, transformation, and fate of mercury and other trace metals in the environment.

Ultra-clean lab for trace metals analysis

Wright State environmental scientist Abinash Agrawal, Ph.D. (right) and Michael Shelley, Ph.D., of the Air Force Institute of Technology at their wetland site at Wright-Patterson Air Force Base. The white tubes in the background represent some of the 200 monitoring wells where the researchers are studying how microbes can remove toxic compounds from groundwater and the soil.



By Richard Doty

Wetlands project between Wright State and the Air Force Institute of Technology has national implications

Nature's Kidneys



SCIENTISTS AT WRIGHT STATE UNIVERSITY and the Air Force Institute of Technology (AFIT) are conducting an experimental project at Wright-Patterson Air Force Base (WPafb) to demonstrate how wetlands can help clean up the environment by removing toxic compounds from the groundwater and soil.

"Our findings show that microbes are destroying very toxic chlorinated, organic compounds in our research site," said Abinash Agrawal, Ph.D., an associate professor in Wright State's Department of Earth and Environmental Sciences and principal researcher of the wetland project. "Many wetlands have been established by scientists throughout

America to control sediments and nutrients, but ours is the only wetland that I am aware of that has been established to investigate destruction of toxic organic compounds."

Agrawal said the goal of this project has significant economic implications. "Chlorinated organic compounds are widespread groundwater contaminants that cause most of the groundwater pollution in this country," he explained. "This contamination affects drinking water quality at hundreds of thousands of sites in the United States. Since the cost of cleaning up these sites by existing techniques range in tens of billions of dollars, a passive treatment approach by natural processes using

the wetland is a cost-effective approach for groundwater remediation and site cleanup."

Agrawal works closely with Michael Shelley, Ph.D., a professor of environmental science and engineering at AFIT, and with James Amon, Ph.D., a Wright State professor emeritus of biological science, in this cooperative venture between Wright State and AFIT.

"In humans, our kidneys function to filter out the toxins from our body, and we are finding the wetland to be nature's kidneys that filter out toxic pollutants present in the water passing through it," explained Agrawal, a biogeochemist with more than 15 years of experience in studying the environment, particularly

wetlands, water quality, and groundwater contamination.

According to Shelley, "The wetlands are really nature's way of cleaning up many contaminants."

This experimental wetland research site is a small 70-by-100-foot parcel in Area C at the Air Force base. The project started in 1999 with conversion of the vacant land into a wetland marsh, dominated by standing water and brush and sponsored and funded by several government agencies.

The contaminated water in the experimental wetland flows upwards

"In humans, our kidneys function to filter out the toxins from our body, and we are finding the wetland to be nature's kidneys that filter out toxic pollutants present in the water passing through it."

—ABINASH AGRAWAL, PH.D.

to optimize the treatment process. Some 200 monitoring points have been established within the wetland, and a team of scientists from diverse disciplines is investigating the process of pollutant destruction in the shallow soil and groundwater.

"We are looking at the interactions between microbes and soil and water from a chemical and biological perspective," Agrawal said. "Microbes are present everywhere in our soil and water, but they are more active in a wetland environment, probably because of the greater availability of food

and moisture content these swampy areas possess."

Agrawal said seed funding for the laboratory work prior to building the wetland research site was provided by the Dayton Area Graduate Studies Institute. Further funding for field research is provided by AFIT annually. The funding for this project started out in the range of \$40,000 annually but now involves annual allocations in the \$200,000 range, in addition to analytical instruments and support for post-doctoral fellowships.

"Over the years, the grant total the project has received is between \$2 and \$3 million," said Shelley, who explained that over time the project would save millions of dollars for the Air Force and billions of dollars for industry across the country. ☐



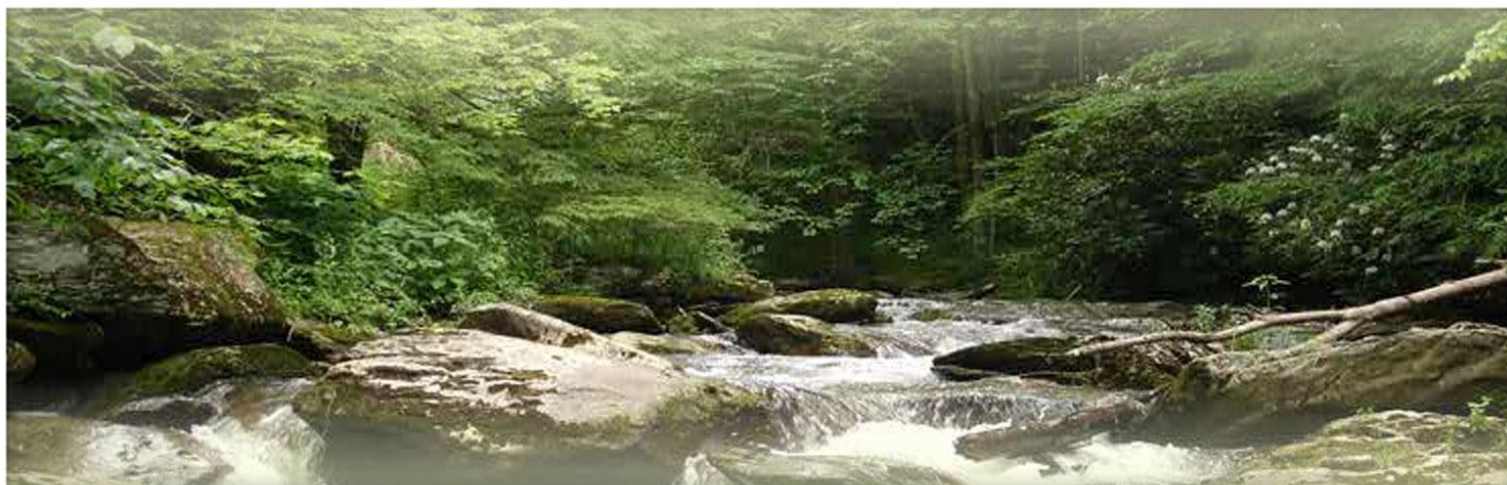
Dr./Prof. Yvonne Vadeboncoeur

Associate Professor of Biological
Sciences

Research Interests: the importance of energy linkages among habitats in freshwater ecosystems. Function of benthic, or bottom, habitats in both lakes and streams.

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EARTH & ENVIRONMENTAL SCIENCES

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Wright State University is now offering a Master's Degree program in the field of renewable and clean energy.

Facilities

Collaboration

Collaboration

The Dayton Area Graduate Studies Institute (DAGSI) provides collaboration opportunities through the graduate engineering courses, faculty, and research resources of the Air Force Institute of Technology, the University of Dayton, The Ohio State University and the University of Cincinnati.

Graduate Assistantships

Degree Requirements

Courses

Renewable & Clean Energy Master's Program

The Department of Mechanical and Materials Engineering offers a program of graduate study leading to a Master of Science in Engineering (M.S.E.) degree with a focus in renewable and clean energy. This increasingly critical field of engineering focuses on alternative energy technologies that hold promise of becoming a substantial source of energy for the United States. These technologies include solar energy, wind power, hydrogen fuels, fuel cells and nuclear energy.



SUSTAINABILITY

DIGGS LABORATORY

Welcome. We invite you to learn more about sustainability and efforts to develop a greener Wright State University campus. Visit often for the latest sustainability news, events, and information.

VISION

At Wright State University's core is a set of values that drives our priorities and decision-making. Among these core values is the concept of Sustainability that the 2008 Wright State University Strategic Plan defines in part as "the necessity of preserving our planet [which] compels us to weigh the impact of our decisions, both short term and long term."

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HOW DO YOU MEASURE UP?

LEARN HOW YOU CAN MAKE A DIFFERENCE »

How sustainable is your lifestyle now? What actions and behaviors can you target to reduce your carbon footprint? [Learn more »](#)



SUSTAINABILITY NEWS

Apr 30 [Spring Adopt-A-Highway Cleanup Event](#)

Apr 25 [RecycleMania 2011 Results](#)

Apr 22 [Earth Day Photo Content Winners](#)

Apr 20 [ANNOUNCING Zimride Social Network for Ridesharing](#)

March [Opportunity for Summer Internship](#)

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SUSTAINABILITY EVENTS

May [Biking for Enthusiasts \(PDF\)](#)

May 16-17 [Dayton Water Conference](#)

May 19 [The Wayne Carmichael Lecture in Environmental Sciences](#)

Ongoing [Wright State Master Plan](#)

[More events »](#)

A COMMITTED UNIVERSITY

In May 2010, President Hopkins signed the Talloires Declaration, committing Wright State to a series of sustainability initiatives, serving as a tangible sign of our



Your daily actions speak louder than words.

HOW YOU CAN MAKE A DIFFERENCE EVERY DAY

Throughout the year, we will reflect on topics and themes related to sustainability.

Looking back at Earth Day Week 2011 on Campus and EcoNuts!

April 18-22 there were many Earth Day Week events on campus. Thanks to Dick Robertson, Environmental Health and Safety; Dr. David Dominic, Dept. Chair, Earth and Environmental Sciences and the EcoNuts committee at the Dunbar Library for hosting events. [More »](#)

WRIGHT STATE UNIVERSITY

presents

The Wayne Carmichael Lecture in Environmental Sciences



Thursday, May 19, 2011

Ghandi Auditorium, White Hall

Wright State University

Reception 5:00 p.m.

Lecture 6:00 p.m.

“Science and Policy of Biological Invasions: From Kudzu to Carp”

Dr. David Lodge, University of Notre Dame

David M. Lodge is a Professor in the Department of Biological Sciences, Director of the Center for Aquatic Conservation, and Director of the new Environmental Change Initiative at the University of Notre Dame. Lodge is a freshwater ecologist whose research focuses on ecosystem services and ecological forecasting to better inform environmental risk analysis, bioeconomics, policy, and management. Lodge completed his D.Phil. at Oxford University as a Rhodes Scholar, is an Aldo Leopold Leadership Fellow, and was the first chair of the US national Invasive Species Advisory Committee. Lodge’s research, published in over 150 scientific papers, has been featured in many videos, TV news including NBC Nightly News and *Nightline*, radio shows including NPR’s *All Things Considered*, magazine articles including the *New Yorker*, and newspapers including *The New York Times*. He has frequently provided testimony on invasive species to US congressional committees.

Lodge lab: <http://www.nd.edu/~lodgelab/>

Center for Aquatic Conservation: <http://aquacon.nd.edu/>

Sponsored by The Environmental Sciences PhD Program, The Department of Biological Sciences, The Department of Earth and Environmental Sciences, The Society of Sigma Xi and the College of Science and Mathematics.
For more information, please call 937-775-3273.



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