

# **Environmental Engineering Program Annual Report Summary 2003-2004**

## **STUDENTS AND GRADUATES**

The Environmental Engineering Program (ENVE) has 11 M.S. and 21 Ph.D. graduate students and 17 undergraduate ENVE majors. Seven new undergraduate students were admitted as environmental engineering majors for fall 2004. The majority of graduate students are full-time and financially supported. During the year, the ENVE program graduated two M.S. students, one Ph.D. student and one environmental engineering undergraduate in may 2004. Thirty-nine full graduate applications were received: of these, 17 were offered admission into the program and five have accepted admission, bringing our projected total of graduate students to 27 for fall 2004.

A team of ENVE and CEE undergraduates won the first-ever Metcalf & Eddy environmental engineering design competition. The winning team of Brian Canterbury, Dan Adanti, Jocelyn Michelini, Russell Ward, Haley Busch and Carlos Rexach beat out the other UConn team, which earned second place, and teams from Rensselaer Polytechnic Institute and Smith College. Both UConn teams were supervised by Dr. Barth Smets of Civil & Environmental Engineering (CEE).

## **FACULTY**

Detailed activities of the ENVE faculty can be found in the annual reports of their home departments. An indicator of their high level of collective scholarly activity is reflected in the more than 40 journal articles and book chapters written by our nine faculty members during the last year.

CEE Associate Professor Lanbo Liu joins us in July 2004. Dr. Liu was formerly with the University of Connecticut Geology & Geophysics Department, which was disbanded by the University in spring 2004. Dr. Liu brings expertise in geophysics focusing on wave propagation and ground penetrating radar for subsurface characterization. He will offer courses in Environmental Geophysics and Engineering Geology, filling in important knowledge gaps. Dr. Liu's strong collaboration with the Geophysics branch of the U.S. Geological Survey will enhance opportunities for collaboration and student training.

The ENVE program lost two faculty members. Dr. George Hoag, professor of Civil & Environmental Engineering (CEE), left the University in the spring; and Dr. Smets resigned in June to accept a faculty position in Denmark.

Across the program, external funding continues at an all-time high with expenditures in excess of \$2 million and active extramural grants totaling more than \$10 million, including prestigious national research awards such as NSF Early Career Development (CAREER) Awards. Our ENVE faculty hold many positions of administrative authority. Dr. Joe Helble holds the position of Department Head of Chemical Engineering, and Dr. Kenneth Noll of Molecular & Cellular Biology is Chair of the graduate program in Microbiology. Dr. Fred Ogden, associate professor of CEE, serves on the board of directors of the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI), a consortium of 88 research universities seeking to establish a national network of hydrologic observatories. Dr. Dani Or, graduate director of the ENVE program, holds several posts with the Soil Science Society of America and serves on the organizing committee for the Gordon Conference on Flow in Porous Media. Dr. Baki Cetegen of Mechanical Engineering (ME) is a member of the

Combustion Institute's executive board; Dr. Smets co-organized and chaired an NSF/Department of Energy sponsored workshop on "Horizontal Gene Flow in Microbial Communities."

Dr. Helble has appointments in the American Association for Aerosol Research and recently was selected a REVELLE Fellow by the American Association for the Advancement of Science; this fellowship provides Dr. Helble with opportunities to work on Environmental Policy issues at the executive and legislative branches of the U.S. government in Washington, DC. Dr. Jim Fenton (ChE) serves on numerous committees of the Electrochemical Society and Dr. Emmanouil Anagnostou (CEE) serves on NASA's Tropical Rainfall Measuring Mission peer review committee and the International Precipitation Conference Steering Committee. Dr. Nelly Abboud (CEE), director of the undergraduate ENVE program, is a board member of the American Arab Engineers and Scientists Society and the Natural Resources Council of Connecticut; she also serves on the National Education Committee for the American Filtration and Separation Society and on a Peer Review Panel for the U.S. EPA in Washington, DC. Dr. Can Erkey (ChE) serves on the Green Chemistry Division Committee of the American Chemical Society; Dr. Thomas Torgerson (Marine Science), serves as a program director for NSF until his return in December 2004 and holds the positions of editor-in-chief of *Reviews of Geophysics*, associate editor of the *Geochemical Journal*, and AGU Board of Journal Editors. Drs. Cristian Schulthess, James Bryers, Anagnostou, Amvrossios Bagtzoglou and Or serve as associate editors of *Soil Science Society of America Journal*, *Biotechnology & Bioengineering*, the *Journal of Applied Meteorology*, *Water Resources Research*, and *Vadose Zone Journal*, respectively. Drs. Abboud and Smets serve on the editorial boards of *Fluid/Particle Separation Journal*, *Soil Contamination*, and *Biodegradation*, respectively.

At the international level, Dr. Anagnostou serves as an advisor to the National Observatory of Athens; Dr. Ogden continued his collaboration with the Technical University of Panama and the Canal Authority through funding by the U.S. Army Research office. The project involves active student participation. In March, Dr. Ogden and two of his graduate students spent seven days of rustic field work in a remote jungle watershed in Panama. As in previous years, the ENVE faculty had significant involvement in international conferences, including the joint AGU-EGU spring meeting in Montreal, which featured presentations by more than 10 ENVE faculty and students, and participation in numerous other international conferences. Dr. Abboud serves on the Board of Advisors for Arab Healthy Water Association, and served on the organizing committee of the international conference in Lebanon. In addition, our faculty developed several new international research proposals with colleagues from Denmark, Israel, Greece, Italy and the United Kingdom.

## **OUTREACH**

Dr. Abboud continued to organize, chair and participate in many outreach activities and events for the undergraduate program. These activities included school career fairs, the CPTV Expo, the Connecticut Construction Career Fair, the Engineering 2000 summer program, YESS workshop summer program, the ENGR 100 environmental workshop, and visits to high schools throughout the state. Furthermore, she organized and hosted fun yet educational events for many senior and junior high school students and their families, from schools located in Connecticut, Massachusetts, Rhode Island, Pennsylvania and New York. Dr. Abboud initiated the "UConn CEE Partners in Education Program," which involves collaborating with Connecticut civil and environmental firms and identifying corporate partners who are willing to offer internships and host field trips for Connecticut high school students. The program was well represented at the fall and spring open houses at the Storrs, Waterbury and Stamford campuses. During the year, Dr. Abboud was also invited to deliver a presentation for 12 female students and their teacher at Somers High School during their visit to the Storrs campus. The ENVE program supported and assisted in organizing many other events, including the engineering open houses, the Connecticut Invention Convention, and Engineering 2000.

## **PROGRAM**

Revision is well underway for the graduate program structure, governance and procedures. The graduate curriculum was revised during the year, and we have been working with other units on campus to expand course cross-listing. A new graduate brochure and ENVE website are well underway with assistance from the Dean's office and staff. We have established and maintain regular monthly ENVE forum meetings to discuss academic and research strategies and approve changes in the program. The weekly seminar series has been a success, as evidenced by high and steady attendance: it fosters interactions and enhances visibility. Through the dedicated efforts of Jon Drasdis (research associate), and support of the School of Engineering and CEE Department, we have formed an Environmental Measurement Laboratory (EML) that serves as a focal point for measurement-related teaching activities as well as open house and other recruitment activities.

ENVE faculty members were involved in several multi-investigator activities throughout the year to support research and education in Environmental Engineering. Our faculty submitted, as PI or co-PI, three separate proposals involving multi-disciplinary teams led to the 2004 Provost Grant Competition. A joint Johns Hopkins University-UConn-University of Maryland "Center for Hazardous Substances in Urban Environments," funded by EPA with a total budget of \$6 million for five years, entered its third year with participation by Drs. Helble, MacKay and Smets.

NSF's Division of Undergraduate Education provides joint support with the Willimantic Water Commission for research on "Studies of Nutrient Loading to the Mansfield Hollow Reservoir, Connecticut." This research is led by Drs. Ogden, Bagtzoglou and Glenn Warner (Natural Resources Management & Engineering). Growing collaboration between ENVE and other elements of CEE resulted in joint NSF-NASA proposals with structures, transportation and mechanics (Drs. Lisa Aultman-Hall, Michael Accorsi and Ramesh Malla) and with other units on campus.

Significant participation of ENVE faculty and students in national and international conferences, high-profile publications in archival journals, and involvement in seminars and collaborative research have helped the ENVE program gain national recognition and respect. The integration of new faculty and completion of curriculum revisions is gradually bringing the program to maturation, thereby providing students with an active research and academic environment.