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The Bridge

*Newsletter for
Alumni of
Civil and Environmental
Engineering
UMASS - AMHERST*

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CEE News

A Note from CEE Department Head, Dr. Richard Palmer

As the new Head of Civil and Environmental Engineering I want to introduce myself to all of the alums of the department. I arrived on campus at the end of March after twenty-eight years as a faculty member at the University of Washington (Seattle). I received my Ph.D. from The Johns Hopkins University and my Masters from Stanford University. My research concerns water resources and drought management, including supply planning, hydropower production, climate change impacts, and the use computer models to aid in the negotiation of water conflicts. Fortunately my research has taken me throughout the US and to Korea, Japan, Egypt, Mexico, Scotland and Spain.



I am very excited about joining the outstanding faculty here in CEE at UMass. As an alumnus you know that the faculty is a very committed group of teachers who are also some of our country's leading researchers in civil engineering. These are very exciting times. Our undergraduate enrollments are growing, demand for our graduates has never been greater, and our department is experiencing a major influx of new faculty. During the past three years seven new faculty have been hired and we are hiring three additional faculty this spring, which will bring our total numbers to 24. Although there are many new faces in the department, rest assured that there is the same commitment as in the past to making CEE an outstanding undergraduate and graduate department where everyone student can grow to their full potential. I look forward to working meeting and working with all of the alumni and student groups next year, including ASCE, Chi Epsilon, and Engineers Without Borders. Please look for articles from me in THE BRIDGE in the future. If you are on campus, feel free to come by and meet me. I would encourage all of the alumni to consider ways in which they can stay involved with the department. This includes hiring our students for summer interns or as permanent employees, volunteering to speak in classes, providing faculty course material from your experiences or making a donation to the department. As I close, let me encourage you to read the note on the next page from Dr. David Reckhow as he concludes his term as Interim Head. Dr. Reckhow did an outstanding job in guiding the department over the last eighteen months and we all owe him a large debt of thanks.

Quote

"I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do."

Leonardo da Vinci



A Note from Dr. David Reckhow

With the arrival of Dr. Palmer, my term as Interim Department Head comes to a close. It has been a pleasure to work with the staff in CEE's main office over these past 15 months, and an honor to serve the students and faculty of CEE. The Department Head sees quite a bit of the day-to-day activities in CEE. For me it has been an eye-opening and uplifting experience. It gave me a renewed appreciation for our talented student body, faculty and staff. Thanks to all for your support and thanks in advance for your patience during the ongoing transition. I hope you all recognize how fortunate we are to have someone of Dr. Palmer's caliber as our new Department Head. Please introduce yourself to him if you haven't already, and welcome him to UMass.

ALUMNI AND FACULTY NEWS

Michael Chajes Named Dean of UD College of Engineering (BS 1984)

(except from Delaware University Daily <http://www.udel.edu/PR/UDaily/2008/may/chajes050508.html>)

Michael Chajes, who has served as interim dean of the College of Engineering since last October, has been named dean of the college after a national search, Provost Dan Rich announced today. His appointment is effective July 1.



"As UD embarks on the Path to Prominence, it opens the door for many exciting opportunities," Chajes said. "Our college is blessed with some of the most talented faculty in the nation, including six members of the National Academy of Engineering, and 23 NSF Career Award recipients. I am eager to work with my colleagues in the college and across campus to elevate us to an even higher level of achievement."

A graduate of the University of Massachusetts at Amherst, Chajes completed his master's and doctoral degrees at the University of California at Davis, where he was twice awarded that university's outstanding graduate student teaching award.

2008 NSF Career Award to Amy Cerato (MSCE, 2001 & Ph.D., 2005)

Civil Engineering and Environmental Science Assistant Prof. Amy Cerato, was awarded the 2008 NSF CAREER Award for her work on "The Role of Specific Surface Area and Cation Exchange Capacity in Understanding and Predicting Expansive Soil Behavior." The CAREER program is a Foundation-wide activity that offers NSF's most prestigious awards for junior faculty members, and which embodies NSF's commitment to encourage faculty to practice, and academic institutions to value, integration of research and education. Such activities should build a firm foundation for a lifetime of integrated contributions to research and education. In addition to the NSF CAREER award, Dr. Cerato recently passed the Oklahoma Professional Engineering Exam, and is now licensed to practice Civil Engineering in Oklahoma.



Contact Us

nofio@ecs.umass.edu

Dr. Cerato's area of research interests range from studying foundation design in problematic soils to grouted and helical anchor capacity under dynamic loading for use in alternative energy applications to clay mineralogy and soil stabilization. Dr. Cerato currently teaches courses in Soil Mechanics, Foundation Engineering, CE Measurements and Engineering Geology. Other recent awards include the prestigious American Association of University Women Fellowship for the 2004-2005 year, as well as the 2005 OU Junior Faculty Research Award. She graduated with her Ph.D. in Geotechnical Engineering from the University of Massachusetts-Amherst in 2005 under the advisement of Dr. Alan Lutenegeger.

David Tipping (MSCE, 2001) Panelist at the Helsinki Process Review Conference 2007 (Excerpt from Report from the Helsinki Process Review Conference 2007)

Mr. David Tipping presented the research of the Water for Life project, which has been investigating the historical perspective and evolution of water and sanitation systems as a foundation for global health protection. The research has shown that access to water and sanitation should be a global priority, because over 1.2 billion people currently lack access to water and over 2.7 billion lack access to sanitation—in practice half the human race. Lack of access to water and sanitation leads to ill health, undermines efforts to reduce poverty and even creates new security risks. Rapid urbanization especially in developing countries means that the lack of water and sanitation will affect even more people in the future, unless effective programs are developed to provide water and sanitation to slums – the cholera outbreaks in East Africa in the late 1990's are a striking example of the cost of inaction.

Mr. Tipping also noted that the challenge of providing fresh water and sanitation is not limited to the developing countries, and that many developed countries have major issues in properly maintaining the integrity of water and sanitation systems as well as upgrading current systems. In conclusion, Mr. Tipping stressed that the future of water is contingent on a strategic response to three great driving forces that will influence global health in the 21st century: globalization, urbanization and the environment. There is a need to declare access to water and sanitation a public good at the national and global levels, because this will allow the global governance challenges to be brought together with the local governance issues. There is also a need to bridge governance interfaces at all levels, to start erecting sustainable development and to mobilize global political will, leadership, and innovation for success. Mr. Tipping suggested that the Helsinki Process could mobilize political will to address these issues.

Professor Sarina Ergas' Research

Greetings from Haifa, Israel where I've spent the last six months as a Fulbright Fellow and Visiting Professor in the Faculty of Civil and Environmental Engineering at the Technion, Israel Institute of Technology. I've had a very interesting and rewarding time here.

Last summer, I spent time learning Hebrew in an intensive language program at Haifa University. It was great being a student



Dr. Ergas consults the map in the Negev

again, learning a new language and being with students from all over the world. We had a lot of homework but fortunately I had a wonderful teacher and I was able to get together with my chevri (study partners) every evening in the moadon (community room in the dormitory). Much of my time in Israel was spent learning about water reuse technologies. Because they



The beautiful city of Haifa.

live in an area with very scarce water resources, Israeli Civil and Environmental Engineers have a lot of experience with using advanced technologies, such as membranes, for wastewater reuse and seawater desalination. I was hosted by Dr. Carlos Dosoretz and his students at the Technion and conducted research on control of biofouling in membranes for water reuse applications. Biofouling occurs because microorganisms stick to membrane surfaces, plug up membrane pores and cause decreases in permeability and increases in energy requirements. In some of my work I was able to test novel membranes being developed in Dr. Todd Emrick's lab in the Polymer Science and Engineering Department right here at UMass.

Israel is a small country with a lot of problems. There are a lot of environmental problems, especially with air pollution and ground water contamination. Over the last two years there has been a student strike, a faculty strike and a war, so the students have had tremendous difficulty getting their degrees. Women engineers have an even more difficult time in Israel than in the US, dealing with sexism and trying to balance their work and family lives. Yet I was also struck by the resourcefulness of the Israeli researchers (every Technion student thinks they are MacGyver), the cooperation I saw between Israeli, Jordanian and Palestinian scientists and engineers, the economical and efficient public transportation system (I didn't have a car) and the warm welcome I received wherever I went. Please feel free to stop by my office if you want to hear more about my work in Israel.

Panel Advising Chancellor on Environmental Issues

From the UMass online newsletter, In the Loop, 3/31/2008

A new, 10-member campus-wide panel has been established to advise the chancellor on a range of environmental issues, Joyce Hatch, vice chancellor for Administration and Finance, told the Faculty Senate March 27. While many institutions have created advisory groups to formulate strategies for reducing their carbon footprints, Hatch said the Environmental Performance Advisory Committee (EPAC) has a broader mission that includes recycling, energy consumption, water conservation and sustainability. "Carbon neutrality doesn't look at water," she said. "We're trying to include all environmental issues."

The panel is chaired by Craig Ruberti of Environmental Health & Safety, who has been involved in tracking the campus' carbon footprint for some time in preparation for the startup of the new Central Heating Plant, said Hatch. Hatch said the campus has already made progress in reducing its water and energy use since 2004, when officials began tracking the results of a \$42 million conservation and utility management contract with Johnson Controls. After more than three years, she said, water consumption is down 40 percent, steam use declined 24 percent and electrical consumption dropped 15 percent, even with the addition of four new residence halls last

year. To date, the conservation efforts are generating about \$5 million in savings annually, which will pay back the money borrowed to pay for the contract.

The other members of EPAC are Al Byam, director of Transit Services; Steve Goodwin, dean of the College of Natural Resources & Environment; Jim Cahill, director of Facilities and Campus Planning; Patrick Daly, director of Physical Plant; Brian Fitzpatrick, manager of EH&S Environmental Management Services; Susanne Hale, student representative; Josh Stoffel, president of Students for Environmental Awareness and Action; **Scott Civjan, Associate Professor, Civil and Environmental Engineering**; and Roger Rideout, professor of Music and chair of the Campus Physical Planning Committee.

Professor Lutenegger and Professor Arwade to receive NSF Grant

Professor Lutenegger and Professor Arwade are receiving a \$150,000 National Science Foundation grant to work on the project "Adaptive Use of Historic Truss Bridges."



This project seeks to increase understanding of the structural performance of historic truss systems and materials, erect a second historic truss on the UMass campus, and incorporate historic bridge rehabilitation and analysis in to the CEE curriculum.

Reckhow Team Studies Drugs in Drinking Supply

A team of researchers from our Civil and Environmental Engineering Department is currently studying the drinking water supply in areas across southern New England to determine if it contains measureable amounts of pharmaceuticals that treatment plants have failed to remove. The work is part of a \$150,000 research project funded by the American Waterworks Association Research Foundation, the Massachusetts Department of Environmental Protection and participating public water utilities.. Researchers in the Department of Veterinary and Animal Sciences are also assisting on this project as are engineers from Earth Tech, Inc.

Among other purposes, the research will analyze how well existing public water-purification systems filter out drugs. The study will also try to determine if the treatment systems removal all traces of endocrine activity in drinking waters when they removal the parent pharmaceuticals.

"We will be looking at a dozen drinking water utilities and the concentration of pharmaceutical and endocrine disrupters in them," says **Dr. David Reckhow**, a professor in CEE. "I think this is something important for us to look at and for scientists to research, to make sure the problem isn't serious."**Dr. Reckhow** says he doesn't expect to find high levels of pharmaceutical drugs, but he does think they will see trace amounts of common drugs like Ibuprofen and caffeine in some source waters. "There isn't a lot of information on the occurrence of these compounds in New England waters," says Reckhow.

The researchers will also look for ways to treat the water and remove the drugs. While municipal treatment plants are well designed to remove the risk of pathogenic microorganisms in water, facilities aren't as well

equipped, or required, to filter out trace pharmaceuticals.

The research project is especially timely after a recent investigation by the Associated Press revealed that a vast array of pharmaceuticals have been detected in minute levels in the drinking water supplies of 24 major metropolitan areas. Even in small amounts, the chemical cocktail has raised concern over what might happen to humans from prolonged consumption.

After a five-month investigation, the Associated Press reports that a variety of drugs -- from ibuprofen and antibiotics to prescription drugs and hormones -- end up in drinking-water supplies after getting flushed down toilets and washed down sink drains. An estimated 90 percent of pharmaceuticals in the environment come from consumers, AP reports.

Reckhow's research on pharmaceuticals in the drinking water has recently been covered on Channels 3 and 40 in Springfield, WFCR Radio in Amherst, Channel 6 in Providence, the Hampshire Gazette, the Lowell Sun, the Worcester Telegram & Gazette, and the Associated Press.

While he can't disclose testing locations for the AWWARF study, Reckhow confirmed that several are in Eastern Massachusetts. Ed Coletta, a DEP spokesman, did say the state agency will partner with national water-quality analysts, the U.S. Geological Survey, and the Lowell Wastewater Treatment Plant to test raw water from the Merrimack River starting in May.

The tiny amounts of pharmaceuticals present in drinking water, measured in parts per billion, doesn't seem to imply any kind of public-health threat at the moment, according to Dr. Reckhow.

CEE Helps Local High Schoolers

(from News at the College of Engineering website)

Professor David Reckhow and two of his graduate students in the Civil and Environmental Engineering Department are helping out a couple of Greenfield High School students by donating a day of their time, expertise, and laboratory facilities. Reckhow and his graduate students, Kirsten Studer and Boning Liu, set aside most of the day on February 6th to help Greenfield students Matthew Beres and Alden Winn study different ways of removing pharmaceuticals from water for their science fair project. "Ultimately, we want to be able to test samples from local water ways," said Beres when requesting help from Professor Reckhow. "The main problems that we are experiencing are that we need to find a way to test estriol levels in the water. We are very willing to come to UMass and work very hard."

CEE CAREER FAIR, SPRING 2008



On February 28th 2008, the Civil Engineering Department hosted more than 35 companies in its semi-annual Civil Engineering Career Fair. Students from all years braved the blustery winds to speak with recruiters, many of whom were UMass alumni.

One alum, now employed by Camp Dresser & McKee, writes "The Civil Engineering Career Fair at UMass Amherst is the reason why I am now currently employed. Here I am, almost three years later and happier than I ever thought I would be with my career. Just attending the career fair opens so many doors of opportunity."

Career fairs are a great way to find information about potential employers, practice good communication skills, and make connections. The next Civil Fair will be held next fall, so watch for event updates! For questions previous career fairs, please contact Jodi Ozdarski @ ozdarski@ecs.umass.edu

Locate and Name This Bridge!



This bridge is 352 meters long and is comprised of over 2200 metric tons of structural steel. It is the region's longest cable-stayed bridge, and is "widely regarded as one of the most impressive feats of Civil Engineering" in the area. It also has a number of innovative features, such as wind shielding and unpainted enclosed steelwork.

Email your answer to nofio@ecs.umass.edu by May 23, 2008 for a chance to win a prize!