
THE REDLINE

NEWS FOR ALUMNI AND FRIENDS
OF THE UNL DEPARTMENT
OF CIVIL ENGINEERING



FALL 2014

FROM THE DEPARTMENT CHAIR



Welcome to the first of what we hope are many editions of THE REDLINE, the University of Nebraska-Lincoln's Civil Engineering newsletter! We intend to use the THE REDLINE to inform *you* about the many wonderful achievements by students, alumni, faculty and staff affiliated with the Department of Civil Engineering. We are

hopeful that, by reviewing these activities, you will feel engaged in our successes and proud of what we are doing.

Before highlighting a few aspects of this inaugural edition, I'd like to briefly introduce myself. When you receive this, I will be in my second academic year as Department Chair, having come to UNL from Penn State University, where I served as a structural engineering faculty member for 14 years. I was attracted to the Chair position due to the strong Civil Engineering history at the university and the wonderful faculty, students and alumni I encountered during my visits. After one year of service, my initial attraction hasn't waned in the *slightest* and, in fact, every day I am reminded what a great place UNL is. I truly believe that this department continues to build on its strong tradition and many great accomplishments are coming in the future.

As you review the contents of THE REDLINE, you will notice that the department continues to do many wonderful things to advance the field of Civil Engineering via technical services offered domestically

and abroad by our award-winning Engineers Without Borders Student Chapter; by completing innovative research for a number of funding

entities, including the National Science Foundation, the U.S. Department of Transportation, and even Google; by delivering innovative and experiential teaching; and by honoring and supporting deserving, high-performing undergraduate and graduate students through the awarding of over \$25,000 in scholarships.

You may also notice that I have not been the only new faculty member in Civil Engineering. Three other faculty also joined the department in the fall of 2013, with Dr. Joshua Steelman and Dr. Richard Wood joining our Structures emphasis area in Lincoln. Dr. Chittaranjan Ray, who directs the Nebraska Water Center, joined our Environmental emphasis area in Lincoln as a full Professor. This fall, Dr. Jinying Zhu joined our Structures emphasis area in Omaha as an assistant professor.

Finally, I would be remiss if I did not thank Bruce Dvorak, Professor and Interim Chair prior to my arrival, for all of the assistance he provided during my initial period as Chair. His institutional knowledge and support has been invaluable.

I hope you enjoy reading this initial edition, and thank you for your continuing interest in, and support of, the Department of Civil Engineering at the University of Nebraska-Lincoln.

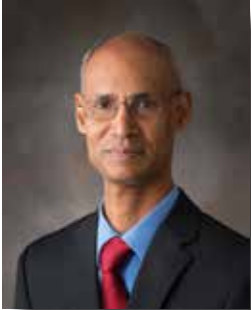
Best regards,

Daniel Linzell, Ph.D.

Voelte-Keegan Professor and Chair

FACULTY ADDITIONS

Since Fall 2013, the Department of Civil Engineering has added five new faculty members, including new chair Dr. Daniel Linzell. These professors add to the department's engineering research and teaching in the areas of environmental, geotechnical/materials, structural, transportation and water resources.



Chittaranjan Ray, Ph.D.

Dr. Ray joined the department as a professor and serves as the Nebraska Water Center director with the Robert B. Daugherty Water for Food Institute.

Ray was a professor of Civil Engineering at the University of Hawaii at Manoa, where he also served as interim director of the Water Resources Research Center at UH.

In Hawaii, Ray also was director of the university's Environmental Center and chief environmental engineer for the Applied Research Laboratory, affiliated with the U.S. Navy. His Ph.D. in Civil Engineering is from the University of Illinois.



Joshua S. Steelman, Ph.D., P.E.

Dr. Steelman is an assistant professor. His Ph.D. and M.S. degrees in Civil Engineering are from the University of Illinois at Urbana-Champaign.

Previously, he worked at Hodnett Hurst Engineers, Inc., a structural consulting firm in Huntsville, Ala.

His research interests include structural risk and reliability at the component, structure, and regional levels; response of structures to extreme events and innovative methods for structural protection; experimental investigation of structural response; and performance-based structures evaluation and design.



Richard L. Wood, Ph.D.

Dr. Wood came to UNL as an assistant professor from the University of California, San Diego, where he was a postdoctoral research fellow in the Department of Structural Engineering.

He earned his Ph.D. and M.S. from the University of California, San Diego in Structural Engineering and a B.S. at Clarkson University in Civil Engineering.

His research focuses on structural dynamics and earthquake engineering: numerical simulation and experimentation of buildings and nonstructural components; and use of laser scanning within structural assessment.



Jinying Zhu, Ph.D.

Dr. Zhu joins the department this fall as an assistant professor. She received her Ph.D. from the University of Illinois at Urbana-Champaign.

Zhu's research areas include nondestructive testing and evaluation (NDT/NDE), wave propagation, sensor development and sensing technologies, as well as material characterization using ultrasonic waves. In the past few years, she has been working on grant-funded researching totaling more than \$1.5 million.

She recently received the American Society of Non-destructive Testing (ASNT) Fellowship Award, 2012-14 and the ACI-James Instruments Research Award from the American Concrete Institute.

Kilic, Google partner on climate initiative

Dr. Ayse Kilic, associate professor with UNL's Department of Civil Engineering and the School of Natural Resources, is part of the new U.S. Climate Data Initiative, a project using Google resources and national researchers to create tools to help provide real-time information on water consumption by vegetation around the globe.

Kilic produces advanced high-resolution models for water use mapping and water resources management and is a leading contributor in the partnership. The maps will support water conservation and be a key factor in developing drought monitoring inside Google Earth Engine for the continental U.S. She will build on her group's experiences from applications along the Platte River.

"IT IS EXCITING TO WORK WITH THE NEW TECHNOLOGY OF GOOGLE EARTH ENGINE BECAUSE IT HANDLES SO MUCH INFORMATION ABOUT OUR PLANET," KILIC SAID. "GOOGLE EARTH ENGINE IS A WATER RESOURCES ENGINEER'S DREAM."

Kilic's work focuses on evapotranspiration, or how water moves through the atmosphere as it evaporates from soil and water and transpires from plants.



In 2013, she began a five-year term with an elite international team of 25 scientists supporting NASA's Landsat Data Continuity Mission Satellite, or "Landsat 8."

She said Google has collected the entire modern Landsat archive's images of the planet, dating to 1984, which is "a tremendous and convenient resource for our application."

Other members of Kilic's UNL team include Baburao Kamble, research assistant professor; Ian Ratcliffe, a remote sensing specialist with the survey division of the School of Natural Resources; and Doruk Ozturk and Yao Ki, graduate students.

Civil Engineering students construct rainwater harvesting system



During the spring 2014 semester, students in a new Sustainable Engineering Infrastructure course designed and built a rainwater harvesting system at City Sprouts, a community garden located in the Orchard Hill neighborhood in Omaha. This course, co-taught by Shannon Bartelt-Hunt and Elizabeth Jones, included topics such as environmental sustainability, community development and appropriate technology.

Eighteen undergraduate and graduate civil engineering students developed the rainwater harvesting system from an initial site visit and client meeting through to final construction.

The students' work included sizing of the collection tank, design of a tank foundation and first flush system, installation of gutters on a neighboring home for collecting rainwater, and design of a rain garden to collect the tank overflow. Throughout the process, they worked with Roxanne Williams, director of City Sprouts, to ensure that the design would meet the needs of the organization.

ACCOMPLISHMENTS / RESEARCH

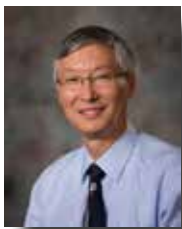


Professor **Mohamed Dahab** was appointed to the Nebraska Environmental Quality Council for a term lasting through June 2017. The Environmental Quality Council (EQC) is a 17-member public body appointed by the governor to represent specific interests and adopt regulations that are then administered by the NDEQ.



Aemal Khattak, associate professor and affiliated Nebraska Transportation Center faculty member, was appointed Area Editor for the *Journal of Transportation Safety and Security* (JTSS) by the Journal's Editor-in-Chief, Dr. Stephen Richards. JTSS is an initiative of the Southeastern Transportation Center,

the University of Tennessee, Beijing Jiaotong University, and publishers Taylor and Francis LLC.



Tian Zhang, professor, was notified by the American Academy of Environmental Engineers and Scientists that he is now a "Board Certified Environmental Engineer".

Professor Emeritus **Istvan Bogardi** was invited to participate in the Budapest

Water Summit in October 2013. He described the forum as a gathering of "a prestigious group of water scientists from all over the world."

FALL 2014 ENROLLMENT

Undergraduate Students

480 (Lincoln: 272 / Omaha: 208)
(up 16 students from fall 2013)

Graduate Students

Master's: 48

Ph.D.'s: 56

(up 16 from fall 2013)

College of Engineering

2,993 = 8.5% increase in undergraduate students
(both campuses), including a record 666 first-time freshmen.

UNL team studying climate change and groundwater quality



A UNL team is studying how climate and agricultural changes influence groundwater quality. Above, from left, are faculty **Yusong Li, civil engineering**; Zhenghong Tang, community and regional planning; **Shannon Bartelt-Hunt, civil engineering**; **Xu Li, civil engineering**; Dan Snow, Nebraska Water Center; and Eric Thompson, economics. Not pictured is David Rosenbaum, economics.

The team received a \$600,000 Water Sustainability and Climate Program grant from a joint National Science Foundation-U.S. Department of Agriculture program that takes an interdisciplinary approach to understand and predict climate change-water system interactions. UNL's team includes faculty with expertise in engineering, economics, water science, and community and regional planning.

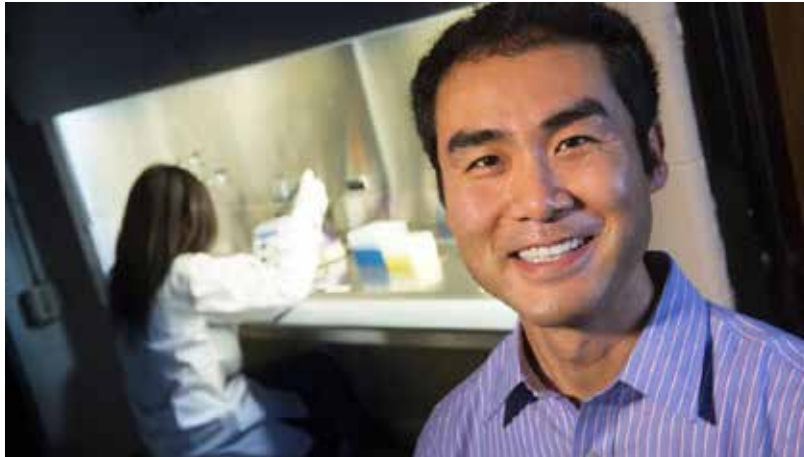
The team will study climate's direct and indirect effects on atrazine, a widely used crop herbicide, as well as the antibiotic sulfamethazine and artificial hormone estrone, both used in animal production. Atrazine is applied directly to fields, while the other two are applied through manures used as a fertilizer.

CAREER Award: Reducing impact of bacteria and antibiotics on the environment

Antibiotic-resistant bacteria are a growing public health threat, infecting at least two million Americans each year and killing 23,000. A UNL civil engineer's research to understand how bacteria and antibiotics interact in the environment may one day help reduce the danger.

Dr. Xu Li, engineering, \$400,000 Development National continue his

These awards faculty role of outstanding education and and research.



assistant professor of civil recently earned a five-year, Faculty Early Career Program Award from the Science Foundation to research.

prestigious NSF CAREER support pre-tenure who exemplify the teacher-scholars through research, excellent the integration of education

Hospitals have long been implicated as a major source of antibiotic-resistant bacteria, but antibiotics in the environment now also are recognized as a significant contributor. Human and livestock wastes are considered major sources of the antibiotics in the environment.

Microbes interact with antibiotics differently, whether in the gastrointestinal tract, water, soils and other settings, but those interactions are not well understood, Li said. He's using an approach called quantitative proteomics to understand how antibiotics and microbes interact under different nutrient levels and types.

Decreasing antibiotic use also is critical to reducing public health and environmental threats. Li's award allows him to pursue several outreach and educational programs aimed at Nebraska livestock producers and rural students.

"Antibiotics are used extensively in the livestock industry, but a lot of the antibiotics are not absorbed by the animal, so it ends up in the waste," he said. "Without proper waste management, it's directly introduced to the environment. If we can raise awareness among livestock producers and help them develop waste management practices, maybe we can reduce the total load of antibiotics in the environment."

Li will work with UNL Extension educators to give presentations and provide educational material to livestock producers. He will also develop related educational materials for rural high school students and their teachers. He hopes to encourage rural students to pursue environmental engineering degrees because their backgrounds could help them both develop appropriate technologies and aid in promoting new approaches in rural communities.

-- Article by University Communications

"THE OVERALL GOAL IS TO MINIMIZE BOTH THE MICROBIAL RESISTANCE AND THE ANTIBIOTICS — THE CHEMICAL ITSELF — IN THE ENVIRONMENT."

Nebraska EWB Student Chapter receives numerous honors



Civil Engineering Professor **Dr. Elizabeth “Libby” Jones** (at left), who serves as co-adviser to the Engineers Without Borders University of Nebraska Student Chapter (EWB-NU), received EWB-USA’s Peter J. Bosscher Faculty Advisor Award for Outstanding Leadership.

Student chapter members praised her level of encouragement, inspiration and ability to help them navigate both at the university level and across cultures with their community partnership in Madagascar.

The accolades don’t stop there, however. The University of Nebraska student chapter was named an EWB-USA Premier Chapter for 2014. UNL also recognized the chapter with the 2014 Student Organization Award for Philanthropy and Service. The chapter also recently entered into a five-year commitment with Kianjavato, Madagascar. This remote community in the African island nation’s interior is where Omaha’s Henry Doorly Zoo operates a field station near a threatened ecosystem that is home to critically endangered lemurs.

HOW YOU CAN HELP: EWB is grateful for the financial support of alumni and friends to help with travel and implementation costs for their projects. To donate or for more information, visit their website: <http://ewb.unl.edu/home>.



ALUMNI REUNION AND FACILITY TOURS

The Department of Civil Engineering hosted an alumni reunion last spring and our faculty, staff and students enjoyed the opportunity to meet with former students and show off some of our facilities and research projects, including the SAFER barrier testing, concrete lab and the Nebraska Transportation Center.

Nebraska Transportation Center partners in new rail safety center

The Nebraska Transportation Center is a partner with the University of Texas-Pan American (UTPA) and Texas A&M University (TAMU) in a \$3 million U.S. Department of Transportation-sponsored University Transportation Center for Railway Safety.



NTC will receive approximately \$900,000 as its share of the research, education and technology transfer activities.

The center will conduct research on how to make railways safer for both operators and the public. Each partner will focus on specific components of the railway system: UNL will focus on operations safety, UTPA on mechanical components and TAMU on civil infrastructure.

Railroads are becoming an increasingly important component of the U.S. freight system,” said Laurence Rilett, P.E., who is serving as the center’s associate director. “This center will allow Nebraska Engineering students and faculty to engage in cutting edge research as they pertain to railway safety. The focus for the first year will be on at-grade railway crossing safety, which is of particular importance to the citizens of Nebraska given that we host the largest railway freight corridor in the world.”

One of the unique features of the UTC for Railway Safety is the educational component. Undergraduate students from UTPA spent the summer as part of the center’s Research Experience for Undergraduate Students program. Also, four undergraduate engineering students from UTPA came to UNL to work on various NTC railway-related research projects for 10 weeks.



Student organizations enhance Civil Engineering experience

Our Civil Engineering majors are active outside of the classroom, participating in such student organizations as the American Society of Civil Engineers, American Water Works Association/Water Environment Federation, Engineers with Borders, Institute for Transportation Engineers, Society of Women Engineers, and others within the department, the college and university-wide.

At left (building this year’s concrete canoe), our students participate each year in the Concrete Canoe and Steel Bridge Competitions held regionally and nationally each year. The support of alumni and friends allows our students to be actively involved, academically and in cocurricular opportunities.

SUPPORT THE DEPARTMENT OF CIVIL ENGINEERING

The Civil Engineering Department is grateful for the financial support of alumni, corporations, foundations and friends to help enhance our programs, facilities, and technology to benefit our students.

In the past year, \$25,000-plus in scholarships were awarded to more than 20 students, thanks to donations from alumni and friends. These funds help us attract and retain bright, active students who are eager to earn a degree from our program.

Please consider supporting the Civil Engineering Department, in any of the following areas: student support, graduate fellowships, or faculty support.

For more information or to donate, go to the University of Nebraska Foundation: nufoundation.org/civilengineering.

