

OUTLOOK

CIVIL & ENVIRONMENTAL ENGINEERING

ISSUE NO.3



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UNIVERSITY OF
DELAWARE

College of Engineering

DEPARTMENT OF CIVIL & ENVIRONMENTAL
ENGINEERING



LETTER FROM THE CHAIR



**HARRY (TRIPP)
SHENTON III**

BCE '82, MCE '84

PROFESSOR AND CHAIR

The end of summer always brings excitement as we gear up for the start of a new academic year. This past summer, however, was particularly unique.

One week before classes began; campus was rattled by the magnitude 5.9 earthquake that was centered northwest of Richmond, Virginia. Sitting at my desk on the third floor of Dupont Hall, I went for a pretty nice ride! The staff and I quickly made our way to The Green, where we met other faculty, students and staff. Within minutes, thanks to Wi-Fi and social networks, we knew what we had felt was an earthquake. Fortunately there was no damage, and after an "all's clear" from university police and facilities, we made our way back to the office. Just four days, later Hurricane Irene stormed up the east coast, causing wide-spread flooding and evacuations, postponing move-in weekend and delaying the start of the semester.

While we certainly don't like to experience these kinds of events, they can provide learning moments for our students. In this case, students and young engineers learned that while the probabilities of such events are low in our area, the risks are real, which is why we have to design for their occurrence. They also saw, in real life, the stresses that are placed on our infrastructure systems during extreme events. Finally, these events highlight how important civil and environmental engineers are to public safety and our way of life.

Our dedicated faculty continually strives to prepare students for real world engineering. Whether that involves using real examples like the recent earthquake or hurricane, introducing them to the latest design methodologies, exposing them to the newest design tools and software, or bringing research results into the classroom, we are working to graduate the best educated, most informed engineers possible.

This newsletter includes a tremendous amount of information about our students, faculty and alumni in a new, reader-friendly format that I hope you will enjoy. Here are a sampling of the highlights inside.

Outstanding faculty – During open house events and when meeting with prospective students and parents, I always remark that we have outstanding faculty in civil and environmental engineering. I know this because I work with them each and every day. This past year was a banner year, with five faculty members winning national awards. Professors **Kirby**, **Kobayashi**, **McNeil** and **Leshchinsky** all won ASCE awards, and Professor **Puleo** was awarded a Fulbright Scholarship. We are extremely proud of them and you can learn more about their awards on pages 4 and 15.

Engaged students – Our students were very active last year in a wide variety of competitions and student activities, competing in such events as the **ASCE Steel Bridge competition**, the **ASCE Geochallenge** and the **ITE Traffic Bowl**. The University's chapter of **Engineers Without Borders** is in the final stages of its first project, in Cameroon, and is making good progress on the bridge building project in Guatemala. Plans are already underway for this year's competitions – we look forward to stellar efforts by our students, once again.

These examples illustrate how generous contributions from our alumni, industry partners and friends enable the department to advance its primary mission of training engineering leaders. Your continued support is essential in our efforts to provide top-notch educational programs and student research opportunities, as well as to recruit and retain world class faculty. I am grateful for your loyalty and commitment to civil and environmental engineering.

As always, we are happy to hear from you. Please don't hesitate to email, call or drop us a note. To stay connected with the department, visit our website at www.ce.udel.edu or join our online community at www.udconnection.com.

Sincerely,

Harry (Tripp) Shenton III

PROFESSOR AND CHAIR

Content Direction

Harry (Tripp) Shenton

Design, Photography & Writing

Office of Communications & Marketing

NRC ranks UD-CEE doctoral programs 17th in nation for research

According to a 2010 National Research Council (NRC) study of doctoral programs in the United States, UD's doctoral programs in civil and environmental engineering rank 17th nationwide in terms of "research activity".

The statistical study included an intensive data analysis of 130 programs from 105 universities in the "civil and environmental engineering" category, drawing on information provided by administrators, faculty and students. Programs were ranked using both a *survey-based* approach ("*S*" ranking) and a *regression-based* approach ("*R*" ranking). Based on average, UD-CEE doctoral programs rank 26th in the country by the *S* ranking and 38th in the country by the *R* ranking for overall quality and effectiveness.

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Representatives from academia, industry and government attended the [UD-Technion 2010 Symposium on Sustainable Infrastructure](#), held Nov. 8-11, 2010 in Haifa, Israel.

Symposium illustrates benefits of global partnership

Academic, government and industry researchers from across the globe gathered to discuss new developments in geomechanical pavement systems and bridges at the *University of Delaware-Technion 2010 Symposium on Sustainable Infrastructure* in Haifa, Israel, Nov. 8-11, 2010.

The symposium, offered as part of the [UD Institute of Global Studies](#) program, was co-sponsored by the [Department of Civil and Environmental Engineering](#) and [Technion-Israel Institute of Technology](#). Technion is an internationally known leader in engineering and science education, ranking among the top ten percent of academic institutions worldwide.

"Conducting collaborative research on a global scale and offering programs with international partners are especially important in helping UD achieve the goals set out in the University's Path to Prominence™," said [Harry "Tripp" Shenton](#), department chair. "This symposium is the first step toward developing relationships that we hope will result in student exchanges, joint degree programs and mutual research, among other things."

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Civil engineering students build bridge in Mississippi

Undergraduate students from the UD chapter of Chi Epsilon, a national civil engineering honor society, volunteered part of their 2010 Winter Session to build a pedestrian bridge for residents of Ocean Springs, Mississippi.

The UD seniors -- **Daniel Cacciola**, **Matthew Leone**, **James Mandala**, **Richard Savona**, **Jeremy Schinasi** and **Corey Shank** -- designed the pedestrian bridge on campus and then spent a week constructing the structure across a small coastal creek within a nature preserve under the guidance of Jack Puleo, an associate professor who serves as faculty adviser to the chapter.

Unanticipated site conditions forced the team to think on their feet to overcome problems in the field, illustrating the lesson that what may make perfect sense in design drawings and calculations may not actually work in construction.

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Society of Women Engineers honors UD graduate student

Doctoral graduate **Michelle Oswald**, Assistant Professor at Bucknell, received the 2010 Outstanding Collegiate Student Award at the [Society of Women Engineers](#) (SWE) Annual Conference for Women Engineers (WE10). During the conference, Oswald was also selected as a finalist for a poster presentation entitled "**Getting Graduate Students Involved!**" - Women in Engineering Graduate Advisory Committee.

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UD civil engineering senior **Christopher Manco** collects concrete samples from a bridge in Christchurch, New Zealand, that sustained damage during a 7.1 magnitude earthquake and subsequent aftershocks.

Student monitors structural effects of earthquakes in New Zealand

Christopher Manco, a senior civil engineering major, spent the summer investigating the structural impact of earthquake damage on bridges in Christchurch, New Zealand, an area wracked by seismic activity.

Located along the Pacific Ring of Fire, Christchurch experienced a 7.1 magnitude quake on Sept. 4, 2010. The event triggered more than two-dozen high magnitude aftershocks throughout the city and surrounding areas, exacerbating existing structural damage and causing over 180 deaths.

Manco participated in a two-month field investigation of the structural and geotechnical impact to the area under the guidance of Liam Wotherspoon, a research fellow at the University of Auckland. The team monitored damage progression of six bridges along the Avon River, collecting samples, measurements and photographs of bridge displacements and rotations.

The data was compiled in a comprehensive database, which Manco said he hopes will be used to help researchers, such as Wotherspoon, to enhance damage prevention strategies for the future.

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The 2011 ITE Collegiate Traffic Bowl is a competition amongst ITE student chapters, similar to television game shows such as the College Bowl or Jeopardy, but with transportation planning and engineering topics for the clues, questions and answers.

ITE Traffic Bowl competition

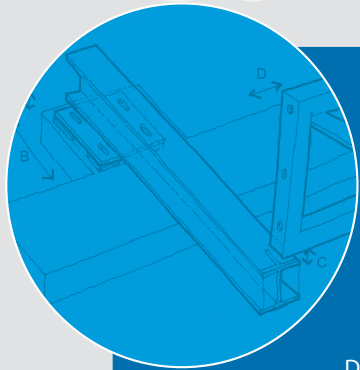
UD undergraduate students [Bob McGurk](#), [Elisa Kropat](#) and [Kerry Yost](#) were repeat winners in the *Institute of Transportation Engineers* (ITE) Mid-Colonial District Championship in April 2011. The event, now in its second year, tested the students' knowledge of transportation planning and engineering in a Jeopardy-style competition. The UD team was one of nine teams from across the nation to advance and compete in the **2011 International Collegiate Traffic Bowl** in August.

"For two years in a row, these students have prepared for the competition and have been excellent UD ambassadors," said [Rusty Lee](#), assistant professor of civil and environmental engineering and the team's adviser. "I am extremely proud of them and look forward to a third appearance at the District Annual Meeting in April 2012."



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Competition



Concrete Beam Design

Two UD teams competed for the first time in a concrete beam design competition sponsored by the Eastern Pennsylvania and Delaware Chapters of the American Concrete Institute (ACI).

The UD-2 team of *Kent Davidson, Rich Hobbs, Steven Kyrick, and Anthony D'Alessandro* won the "*Highest Ultimate Load to Weight Ratio*" portion of the concrete beam design competition. The beam failed at a load of 4480 pounds and had a net weight of 39.48 pounds, for a ratio of 113.47. The second place beam had a ratio of 89.13.

The beam submitted by the UD-1 team supported 4760 pounds (the most of any beam), but was disqualified because the beam contained too high a cement content. Teams from Widener, Villanova, Swarthmore and the Pennsylvania Institute of Technology also competed in the event.

Mechanically Stabilized Earth Wall Design

Nine undergraduate student members from UD's Geo-Institute recently competed in the American Society of Civil Engineers (ASCE) Geo-Institute 2011 GeoChallenge in Dallas, Texas. The University of Delaware was the defending national champion in this competition, having taken home the prestigious Atterberg Cup last year.

The team included *James Bailey, Dan Cacciola, Jeremiah Cook, Tom Costabile, Olivia Dalton, Mindy Laybourne, Lauren Lobo, Bob McGurk* and *Curtis Smith*, accompanied by the team's graduate adviser, *Majid Kabbazian*. (Team members *Teresa Sandiford* and *James Taylor* were unable to attend, but were with the team in spirit.)

Students in the competition design and construct a scale-model reinforced soil wall using paper reinforcement layers, using techniques similar to those used to design full-scale "*Mechanically Stabilized Earth*" (MSE) structures in geotechnical engineering practice. While points are given for varying aspects of the design and construction, the winner of the competition has historically been the team that builds a wall that can handle the applied loads using the smallest amount of reinforcement without experiencing failure.

UD was in first place going into the construction phase of the competition, and watched as teams 2-6 experienced catastrophic failure and were disqualified from the competition. When it was finally UD's turn, the wall was constructed safely with no movement or loss of points, then vertically loaded, without budging. As the final step, the wall was loaded horizontally. As hundreds of people crowded around, watching and cheering, the last few pounds of horizontal load were applied, and the wall exploded, disqualifying UD's team.

Changed site conditions were determined to be responsible for the wall's failure, since a different sand than originally specified was used in the wall's construction. Routine in the real world, this sort of "switch" demonstrated for students a valuable lesson about the use of design safety factors!

Kudos to our outstanding students and their accomplishments

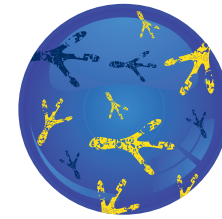
ASCE Steel Bridge Competition

Our UD teams are working hard to get ready for this year's upcoming regional steel bridge competition. If you are on campus and you have not yet seen this year's bridge, please go to the mezzanine over the structures lab. You will most likely see it in parts on the lab floor. Our teams have historically done very well in this competition.

We wish them luck again this year.



Thank you to all the faculty and staff that support the great efforts of our students! It is really wonderful to see them have such success, and they couldn't do it without your support.
-- Tripp Shenton,
department chair



UDconnection.com

Looking for an old friend? Want to share your latest news? Searching for information on upcoming alumni events such as Homecoming? Now you can do it all in one place, www.UDconnection.com.

UD and the UD Alumni Association (UDAA) have collaborated to bring alumni a vibrant online community—so register and get active! The online community allows you to search the alumni directory, post class notes, update your contact information, and see if there are any upcoming alumni events in your area. You can also take advantage of networking opportunities and ways to get involved with your alma mater!

Visit www.UDconnection.com today!



Walter F. Williams, BCE '51

Q & A

then CEO in 1986. After eight years as CEO, he retired in 1992. Walter has been a loyal donor to the College of Engineering for many years.

Q. What level of impact did your education at UD have on your career overall?

A. Everything that I learned from my classes and my professors, all contributed to a good education. My education helped me succeed whether I was working in steelmaking, shipbuilding, managing employees or interacting with unions. UD gave me the basic tools and insight to handle challenges throughout my career.

Q. What do you remember most about your undergraduate experience?

A. I remember one unusual experience that occurred during my admission process. I had to write a theme paper for English placement. After submitting it, I was

Walter Williams credits his education at the University of Delaware for a successful career with Bethlehem Steel.

After earning his bachelor's degree in civil & environmental engineering in 1951, he interviewed with Bethlehem Steel for a job designing bridges and buildings. Instead, he landed a job as an engineer in their steel plant in New York. Shortly after starting with the company, since he was in the ROTC program at UD, he served two years in the Army during the Korean War. Throughout his career at Bethlehem Steel, Walter held various positions in engineering and eventually became president, director and

advised to skip English and take a class in old English literature. I was the only engineer reading and studying old English books that year. Being a long term math student, that course was very beneficial – UD broadened my education!

Q. What was the most rewarding aspect of your career?

A. After working for Bethlehem Steel for seventeen years as a steel plant engineer, I was asked to take over the shipbuilding division. Bethlehem Steel built more ships than any other company in the world during World War II. In the 1970s, there were still nine shipyards left for building and repairing ships as well as building offshore oil drilling rigs. Managing the shipyards during this period was rewarding since the market increased for about fifteen years. We built six of the largest tankers ever built in the U.S. and also built a new shipyard for drill rigs in Singapore, which doubled rig production.

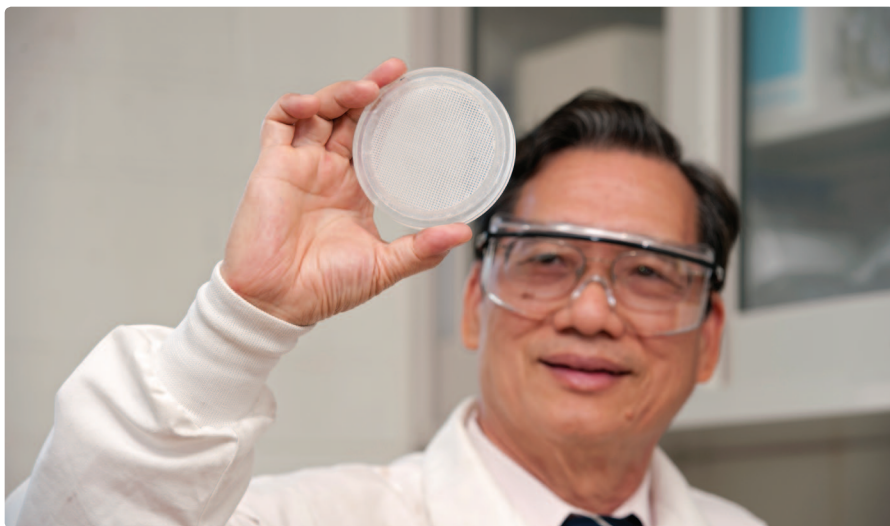
As to the rewarding aspect of my career, building a steel plant, managing and marketing shipbuilding, and managing Bethlehem Steel were all rewarding and challenging. But, they were this way for one reason – the privilege of working with good workers and an outstanding staff. Teamwork, cooperation and equality were my key attributes while in the Army and also during my career at Bethlehem Steel, and it all started with my education at UD.

Q. You have been a dedicated supporter to the College of Engineering, can you tell us what motivates you to give to the college?

A. Since leaving many years ago, I have felt that UD is underrated – especially the College of Engineering. We have come a long way in facilities, college expansions and quality of faculty. But we have the ability to go further and attract more engineering students. I felt it was a good opportunity to give back. The current plan for engineering is a good start so let's keep moving.



C.P. Huang, seated center in pink shirt, has been honored for lifetime achievements in aquatic chemistry. --Photo courtesy Chuck Weng



C.P. Huang honored for lifetime achievements

Former students paid tribute to the extraordinary accomplishments of **C.P. Huang**, Donald C. Phillips Professor in the Department of Civil and Environmental Engineering at the University of Delaware, during a [career retrospective workshop held Oct. 3-4, 2010, in Taichung, Taiwan](#).

The event, sponsored by the National Chiao Tung University and the National Chung Hsing University in celebration of his 70th birthday, detailed Huang's achievements in aquatic chemistry and his passion for mentoring students.

Stephen Shu-Hung Shen, administrator of Taiwan's Environmental Protection Agency, opened the event calling Huang "a great master" and "a highly respected and world renowned scholar" who has "nurtured numerous elites in the area of environmental science and engineering, including 38 doctors and more than 60 masters."

Huang joined the UD faculty in 1974, and today, he is known worldwide for his work in environmental physical chemistry. He is credited with conducting pioneering research not only on the fate, transport and behavior of pollutants in aquatic environments, but also on treatment and remediation methods.

Many former graduate students honored Huang in a commemorative book distributed at the event. Some excerpts from the book include:

"His personal concern for the welfare of his graduate students led to a close personal relationship with him and the memory of my graduate experience is a pleasurable and rewarding one," wrote **Herschel A. (Chip) Elliott**, class of 1979.

Heung-Jin Choi, class of 1998, described Huang as an inspiring educator whose "diligent life pattern and sincere passion for his research were always a great inspiration for his students."

Jih-Hsing (Richard) Chang, class of 2000, said he often "led me to rethink my research direction to gain insights into the scientific truth."

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ASCE recognizes Kirby, McNeil for industry expertise

The American Society of Civil Engineers (ASCE) recently recognized **James T. Kirby Jr.** and **Sue McNeil** for exceptional career contributions to their fields.

Kirby, Edward C. Davis Professor in the Department of Civil and Environmental Engineering, was awarded the

2011 John G. Moffatt-Frank E. Nichol Harbor and Coastal Engineering Award, in recognition of his impact on the understanding of coastal processes and the optimal design, construction and maintenance of marine infrastructure.

McNeil, professor in civil and environmental engineering, received the **ASCE Transportation and Development Institute's 2011 Harland Bartholomew Award** for pioneering contributions to the redevelopment of brownfield sites and for infrastructure management education and research.

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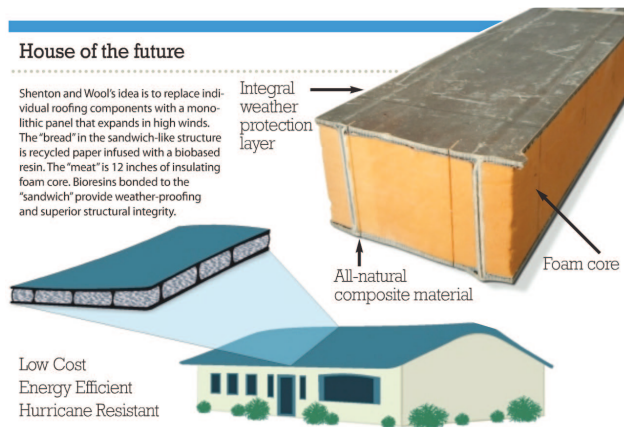
winning top, national awards

Civil & Environmental Engineering *faculty nationally recognized in 2010-2011*

<p>JIM KIRBY ASCE Moffatt-Nichol Award</p>	<p>SUE MCNEIL ASCE Bartholomew Award</p>	<p>NOBU KOBAYASHI ASCE International Coastal Engineering Award</p>	<p>DOV LESHCHINSKY ASCE Kapp Award</p>	<p>JACK PULEO Fulbright Scholarship</p>
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Advanced roofing materials offer disaster resistance with an environmental twist

Harry "Tripp" Shenton (right), chair of the Department of Civil and Environmental Engineering and **Richard P. Wool**, professor of chemical engineering and director of the **Affordable Composites from Renewable Research** (ACRES) program, are developing green, disaster-resistant roofing materials. The South African government is considering the technology for low-cost housing. Their work also has inspired "houses in a box," which could be deployed in the thousands by the Red Cross.



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"It is low-cost, energy efficient, made from renewable resources and contains fabulous engineering properties that impart disaster resistance in an efficient and environmentally friendly way."
--Richard Wool



Puleo studies sand movement in UK as Fulbright scholar

Jack Puleo, associate professor in civil and environmental engineering at UD's [Center for Applied Coastal Research](#), has developed a sensor to capture data about the transport of sediment (in this case beach sands) on critical land-ocean boundaries. He will take his research to a new level this fall when he deploys the sensors under natural conditions for the first time – in a landmark field study conducted as part of his 2011-2012 Fulbright scholarship at the University of Plymouth in the United Kingdom.

The sensors, which earned Puleo a *National Science Foundation Early Career Award* in 2009, record the movement of sediment in and just above the sea bed on beaches. Already on his third prototype, Puleo's work has led to new results obtained from scaled, laboratory experiments.

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Tracking water pollutants

C.P. Huang receives grant to explore engineered nanoparticles in wastewater

Chin-Pao Huang, Donald C. Phillips Professor of Civil and Environmental Engineering at UD, is principal investigator (PI) of a \$599,000 STAR grant from the U.S. Environmental Protection Agency (EPA) exploring whether engineered nanoparticles (ENP) are present in ground wastewater.

The UD research team is using a new experimental technique to collect and characterize wastewater and sludge samples from four major municipal wastewater treatment plants in Philadelphia, Baltimore, Washington, D.C., and Wilmington.

The results will assist wastewater process design engineers in developing new treatment processes to eliminate solids such as titanium dioxide from wastewater and prevent it from leeching into the environment where its effects, as yet, are unknown. It will also help public and private sector decision makers in revising wastewater treatment quality standards.



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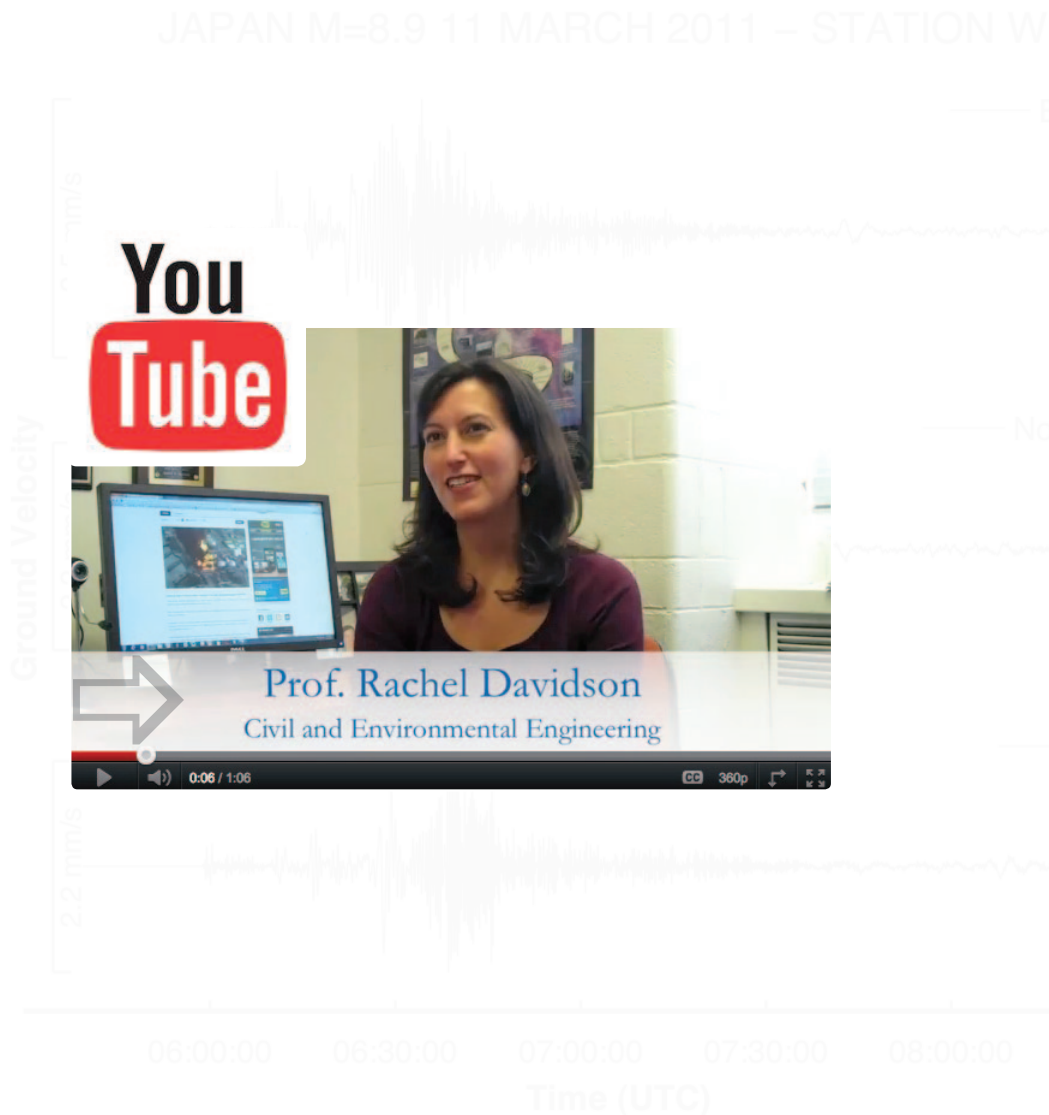
Rachel Davidson studies post-earthquake fires in Japan

Rachel Davidson, associate professor in the [Department of Civil and Environmental Engineering](#) and a core faculty member of UD's internationally renowned, interdisciplinary [Disaster Research Center](#) (DRC), is principal investigator of a team collecting and analyzing data on 345 reported fires that occurred subsequent to the magnitude 9.0 Tōhoku, Japan earthquake that occurred on March 11, 2011.

Early data collection is critical to creating a permanent record about the locations, timing, causes and other characteristics of the fires, also known as ignitions. The project will almost double the available ignition data documented in previous earthquakes, substantially improving scientific ability to forecast future ignitions.

Funding for the project is provided through a one-year grant from the National Science Foundation's Rapid Response Research (RAPID) program, which enables quick-response research on natural or anthropogenic disasters and similar unanticipated events.

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Joseph T. Wojdak

CEE '97 joins DeLisi Fitzgerald, Inc.

John T. Wojdak, P.E. has joined DeLisi Fitzgerald Inc., a multiservice consulting firm with specialties in land use planning and civil engineering, as vice president of engineering. Wojdak, who earned his bachelor of science

degree at UD, has more than 14 years experience in engineering services as a consultant for both private and public sector clients and a project manager for a commercial development company. Prior to joining DeLisi Fitzgerald, Wojdak served as the engineer of record for the utility corridor serving Southwest Florida International Airport's new Aircraft Rescue and Fire Fighting Facility, master planning of the Children's Hospital of Southwest Florida and the Allied Health Sciences building at Edison State College, Collier County campus.

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Urban Engineers, Inc. names Scott J. Diehl vice president

Scott J. Diehl, (BS '97) is now vice president of Urban Engineers, Inc. Diehl, who joined the firm in 2007, brings more than 18 years of experience to the position, focuses

primarily on expanding the firm's traffic-related services and capabilities. He will continue as the firm's chief traffic engineer responsible for managing traffic efforts throughout the company.

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Melissa Stewart wins NSF Fellowship

Melissa Stewart, BCE 2010, is one of three UD alumni to be awarded the prestigious National Science Foundation's Graduate Fellowship in 2011. Considered among the nation's premiere awards for outstanding graduate students, the NSF fellowship is considered a great predictor of future success in the scientific, technology, engineering and mathematics workforce. Stewart is currently an MS candidate in the geotechnical engineering and geomechanics program at the University of Colorado, Boulder. Her research involves centrifuge modeling of soil-structure interaction in energy foundations. Following completion of her master's degree, she plans to pursue her doctorate, focusing on the impact of heat exchange on the deformation response of geosynthetic-reinforced soil structures.

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Pictured are, from left, Perri Freeman, Katherine Boehret, David Elkins, UD President Patrick Harker, **Colmcille DeAscanis**, Laura Byham-Gray and Nicholas Vrolijk. Not pictured was Natalie Durrett Crawford, who addressed the gathering via a video feed.

Colmcille DeAscanis was one of seven alumni honored in 2010 with the University of Delaware Presidential Citation for Outstanding Achievement award.

Colmcille, who earned a bachelor's degree in civil and environmental engineering in 1996, serves as president and CEO of CDA Engineering. He also has established a scholarship to assist students in the College of Engineering.

"What I like about UD is the chance to work with others," DeAscanis said. "You can do great things, but you can't do them without help from others, and the University has been great at that."



Alumni & Friends

We wish to thank the many CEE friends and alumni who have made generous contributions over the past year. Your gifts are used for many worthwhile purposes, including support of our research and educational programs.

Please visit www.engr.udel.edu/alumni to learn how you can make a difference. To make your gift today, click **Donate** and if you wish to designate your gift to CEE, select other from the list provided and specify Civil and Environmental Engineering.

► You may also forward your gift to:

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SAVE THE DATE
ALUMNI WEEKEND
JUNE 1-3, 2012

2012 Reunions at UD

VOLUNTEERS ARE NEEDED

If you're interested in volunteering time to help make your reunion celebration extra special, please contact Alex Hoffmaster at arhoff@udel.edu or 302-831-6340.