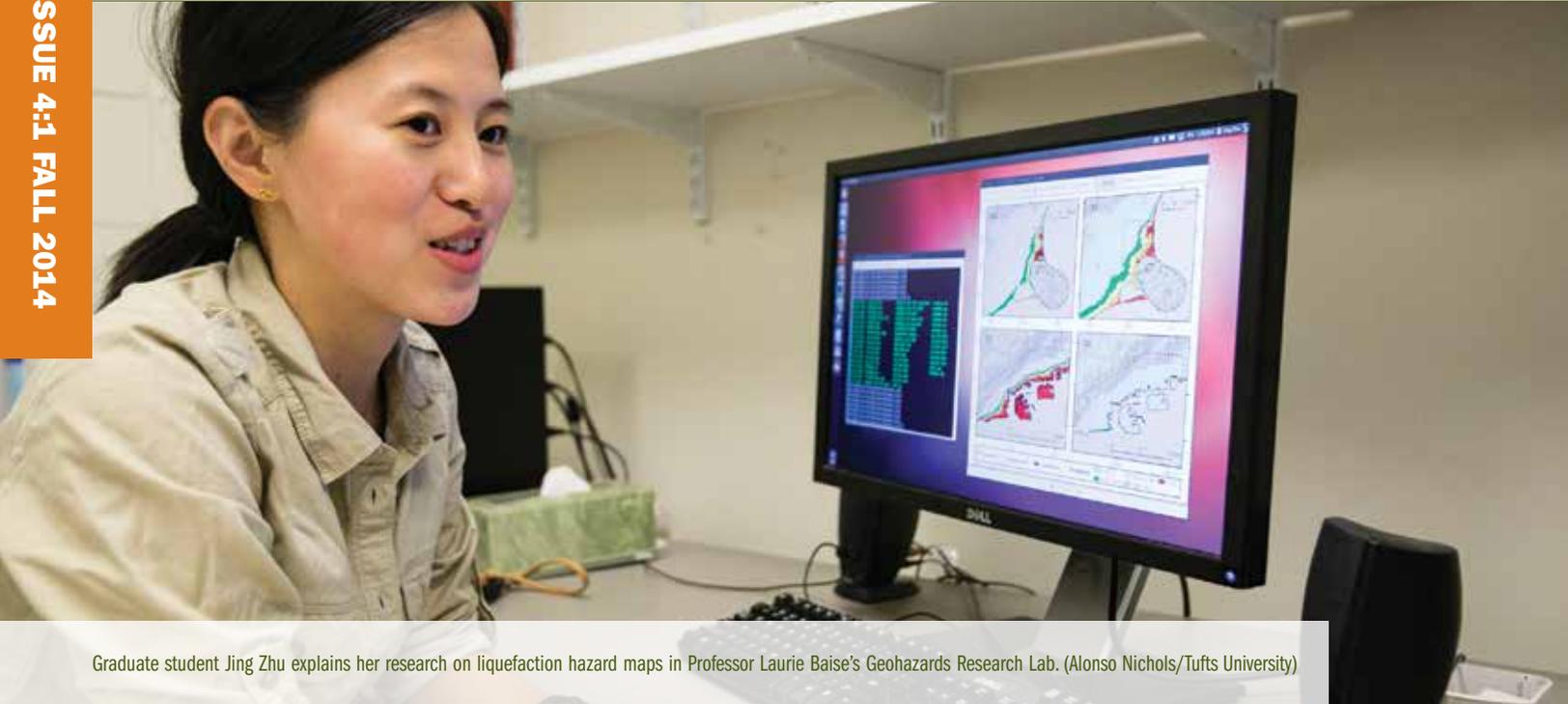


DEPARTMENT OF CIVIL + ENVIRONMENTAL ENGINEERING



Graduate student Jing Zhu explains her research on liquefaction hazard maps in Professor Laurie Baise's Geohazards Research Lab. (Alonso Nichols/Tufts University)

GEOHAZARD RISK ASSESSMENT

Working Toward a Global Liquefaction Hazard Model

In the event of an earthquake, rescue workers use rapid response maps to assess intensity and hazards such as soil liquefaction, which occurs when an earthquake exerts stress on water-saturated soil. Current liquefaction hazard maps are valuable in a disaster situation, but many at-risk areas lack the necessary geological data and resources to effectively use current models.

Associate Professor Laurie Gaskins Baise in the Geohazards Research Lab specializes in empirical and theoretical models to describe and predict natural hazards. Most recently, she has been developing a better model to predict the probability of soil liquefaction in the event of an earthquake. Baise and graduate student Jing Zhu recently published details on their model in the journal *Earthquake Spectra*.

“Liquefaction is predicted either at a specific location using in-situ tests (standard penetration tests or cone penetration tests) or regionally using surficial geology maps. Both are difficult if not impossible to get on a global scale,” said Baise, “Our model allows

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Our model allows you to predict whether liquefaction is expected anywhere in the world as soon as the earthquake happens.

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FROM THE CHAIR



Notables...

In recognition of his lifetime of achievement, teaching, advising, and service to Tufts University, Professor **Lewis Edgers** was awarded the Seymour O. Simches Award. Professor Edgers also received the "Faculty Member of the Year" award from the Tufts ASCE student chapter.

Professor **Elena Naumova** was elected a member of the International Statistical Institute (ISI)

Carolyn Talmadge received the Outstanding Graduate Contributor to Engineering Education (Master's Level) Award at the spring 2014 Tufts Graduate Student Awards ceremony.

Doctoral student **Tyler Marcet** was named a winner in Geosyntec's 5th annual Student Paper Competition for his research on "Electron Donor Release during Thermal Incubation of Soils." Marcet presented his work at the International Conference on Remediation of Chlorinated and Recalcitrant Compounds.

Associate Professor **Laurie Baise** was named President-Elect of the newly formed New England chapter of the Earthquake Engineering Research Institute. Professor of the Practice **Eric Hines** was elected one of the board's Directors at Large.

Doctoral student **Jory Hecht** was selected to receive a research award from the Hydro Research Foundation.

Dear CEE Alumni and Friends,

Welcome to the fall 2014 CEE newsletter, which highlights department activities and accomplishments during the past year. I am pleased to announce that David Gute was promoted to the rank of full professor and Babak Moaveni received tenure and was promoted to the rank of associate professor. We welcome Professor Dan Kuchma from the University of Illinois at Urbana-Champaign, who joins the Structural Engineering and Mechanics group. We also celebrated the careers of Lew Edgers and Lee Minardi, both of whom retired in August. On a somber note, it is with a heavy heart that I share the passing of Rachid Hankour, who served as a Professor of the Practice, and Bruce Hanes, who served as chair of the department from 1969 to 1971 and was instrumental in the creation of the Environmental Health program. We will celebrate the 50th anniversary of the Environmental Health program this fall.

Construction of the Science and Engineering Center (SEC), which will be connected to Anderson Hall through the main atrium, began in August. The new building is scheduled for completion in early 2017, and will house laboratories and computational space that will support interdisciplinary research and instruction in areas such as neuroscience and global environmental change.

At the annual Alumni and Student Awards dinner in May, we recognized the achievements of our alumni and graduating students, and welcomed three new Cataldo fellows who will conduct research during their senior year. Lew Edgers and Lee Minardi both received our Distinguished Service Award, and Professor Edgers also received the Outstanding Achievement Award. We are grateful for the continued alumni support, which allows us to provide our students with scholarships and awards to conduct independent research and recognize their achievements.

Please visit our departmental web page or Facebook page to follow department activities throughout the year. I hope to see you at our next Alumni and Student Awards Dinner to be held on Saturday, May 9, 2015. If you are ever in the area, please feel free to visit the department.

With Warm Regards,

Kurt



The 2014 CEE Softball Team, 9-2.

Geohazard *Continued from page 1*

you to predict whether liquefaction is expected anywhere in the world as soon as the earthquake happens.”

Since many parts of the world do not have detailed, comprehensive soil data, Tufts researchers are testing the viability of more easily obtainable information through remotely sensed data such as digital elevation models to help identify risk areas. Zhu examined well-documented cases of soil liquefaction in the 2011 Christchurch, New Zealand and 1995 Kobe, Japan earthquakes in order to build a predictive model based on geospatial variables, specifically distance from and elevation above bodies of water, and earthquake-specific parameters such as peak ground acceleration.

Zhu tested the reliability of the model using data from the 2010 Haiti earthquake. Since Haiti had insufficient preexisting data on soil properties, traditional liquefaction maps were not available to predict what areas were susceptible to liquefaction after the earthquake. However, Zhu’s model correctly predicted known instances of soil liquefaction using existing geographic data.

Zhu said, “I am currently working on expanding the database to include over 15 earthquakes and updating the model. This time, we explore many new parameters and perform a more thorough statistical analysis. The updated model will be more reliable in different geological environments.”

RESEARCH HIGHLIGHTS

Tufts Innovation Institute Project

Professors **Elena Naumova** and **Kurt Pennell** are the project leaders for a new Tufts Institute for Innovation project titled, “Innovative Public Health Engineering Strategies to Reduce Water-Associated Disease Burden in Low-Income Countries,” a research collaboration between the School of Engineering and the School of Medicine. The goal of this project is to develop innovative approaches that reduce the public health burden of water-associated infectious diseases, and to improve the human condition by implementing these strategies in communities. Interdisciplinary research teams will build on existing infrastructure and ongoing research activities in India and Ghana.

Dorfmann Publishes Book on Mechanical Properties of Soft Materials

Associate Professor **Luis Dorfmann** published a book describing the mechanical properties of smart materials used in everything from high-speed actuators and sensors to artificial muscles. His book, *Nonlinear Theory of Electroelastic and Magnetoelastic Interactions*, written with Ray Ogden, presents an overview of the fundamental concepts of electromagnetic theory and nonlinear elasticity that can describe these unique properties for soft materials capable of large elastic deformations.

Pennell and Lantagne Present at CNSF on Clean Water

Professor and Chair **Kurt Pennell** and Assistant Professor **Daniele Lantagne** attended the 20th annual Coalition for National Science Funding exhibition on “Investments in STEM Research and Education: Fueling American Innovation.” Pennell and Lantagne presented an exhibit on “Engineering Solutions for Clean Water.”

Islam Delivers Water Diplomacy Lecture at Water Security and Peace Conference

On November 14, 2013, Professor **Shafiqul Islam** presented a lecture, “A Negotiated Approach to Managing Complex Water Issues,” at the Water Security and Peace conference at The Peace Palace in The Hague hosted by the Water Diplomacy Consortium: The Hague Institute for Global Justice, Clingendael Netherlands Institute of International Relations, UNESCO-IHE Institute for Water Education, UPEACE Centre The Hague, and the Water Governance Centre.

QUICK HITS



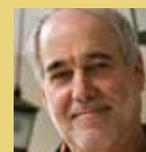
Professor Masoud Sanayei was named an associate editor for the *ASCE Journal of Bridge Engineering*.



Associate Professor Laurie Baise was reelected to the board of the *Seismological Society of America*.



Professor Elena Naumova delivered the welcome and keynote address at the *International Environment Conference* held at *Ajman University*.



Professor Richard Vogel’s paper, “A risk-based approach to flood management decisions in a non-stationary world,” was selected as an “*AGU Research Spotlight*.”

Faculty News: Retirements

Lewis Edgers

After more than four decades of contributions to Tufts University, Professor **Lewis Edgers** retired in August 2014. Lew earned his B.S. in civil engineering from Tufts in 1966 and completed his M.S. and Ph.D. from the Massachusetts Institute of Technology (MIT) in 1967 and 1973, respectively. Upon completion of his degree in 1973, Lew was hired as an assistant professor in the Department of Civil Engineering at Tufts. Lew was promoted to associate professor with tenure in 1975, which was followed by his promotion to full professor in 1989.

Lew's career can be best appreciated by considering the breadth of his activities, which extend from leadership roles at Tufts and professional organizations, undergraduate and graduate teaching, to his scholarship and professional engineering activities. Lew has held a number of administrative positions during his time at Tufts, including chair of the department and associate dean in the School of Engineering. While associate dean, Lew was responsible for coordinating preparations for the American Board of Education and Technology (ABET) accreditation of seven degree programs offered in the School of Engineering.

Lew Edgers and Lee Minardi were the 2014 recipients of the Distinguished Alumni Service Award, given to alumni who exemplify service to their profession and the CEE department. Edgers was also recognized with the Outstanding Alumni Achievement Award, presented to a CEE alumnus whose outstanding achievements in their chosen profession are a bright light that shines favorably on CEE and Tufts.



Chair Kurt Pennell with Professor Lewis Edgers and Associate Professor Chris Swan

As a licensed Professional Engineer (P.E.), Lew maintained an active presence in the civil engineering community throughout his career. Lew served as president of the Boston Society of Civil Engineers (BSCE), director of The Engineering Center Education Trust, and governor for the Foundation for Professional Practice of the American Society of Civil Engineers (ASCE). In recognition of his academic and professional contributions, Lew was elected as a fellow and a life member of ASCE.

Students know Lew as a rigorous instructor who provides a challenging and rewarding learning environment. In recognition of his teaching excellence, Professor Edgers received the Henry and Madeline Fisher Award in 2004, which is given to the "Engineering Teacher of the Year." This year, Lew received the "Faculty Member of the Year" award from the ASCE student chapter at Tufts. The department encourages you to share your appreciation and gratitude to Lew.

Lee Minardi

Following 25 years of service to Tufts University, Senior Lecturer **Lee Minardi** retired in August 2014. Lee earned his B.S. in mechanical engineering from the University of Massachusetts Lowell in 1968,

and then worked as a design engineer at the Naval Ordnance Station in Indian Head, Maryland. In 1969, he enrolled in the College of Engineering at Tufts University and received his M.S. in engineering design in 1972.

From 1972 to 1990, Lee worked for a number of firms that specialized in Computer-Aided Design (CAD), which at that time represented the forefront of engineering design and computing. While employed at Applicon, Lee traveled throughout the United States, Europe and Asia extolling the virtues of CAD. In 1984, Lee became the product manager for Computervision's Personal Designer, one of the first commercially-available three dimensional (3D) CAD systems for personal computers.

In 1990, Lee returned to Tufts as a lecturer in the Department of Engineering Design. When the College of Engineering was reorganized in 1993, Lee joined the Department of Civil and Environmental Engineering, and became responsible for teaching CAD to all engineering students. Since the mid-1990s Lee has taught the CAD and introductory computing courses to first-year engineering students. Enrollments in these classes ranged from 150 to 260 per semester for 20 years, and included training more than 50 teaching assistants. In 2012, he received the inaugural Tufts University UIT Teaching with Technology Award.

Lee has contributed to both university and department activities as faculty advisor to the student chapter of ASCE from 2008–2014 and a member of the Tufts Information Technology Committee, which he chaired from 2009–2012.

Lee is also an advanced-rated hang glider pilot and several of his journeys through the sky can be viewed on YouTube, complete with "point of view" landings. Lee's 42 years of hang gliding have taught him much about flying, weather, human anatomy, and fear. Lee recently purchased his seventh hang glider, which he hopes to make good use of during his retirement. Lee invites anyone who is interested in learning more about this natural form of flying to contact him.



Professor Steven Chapra, Senior Lecturer Lee Minardi, and Chair Kurt Pennell

Congratulations to Our 2013–2014 Graduates

Undergraduate Awards

Barbara (Polly) Murray received the Howe Walker Award from BSCES/ASCE.

Abigail Niesen received the William P. Morse Scholarship from BSCES/ASCE.

Emma Rubin was this year's recipient of the Max O. Urbahn, F.A.I.A. Scholarship from the Society of American Military Engineers (SAME) New York City Post.

Emy Bonilla, Jonah Harris, and Santiago Ossa received CEE Endowment Awards.

Littleton Awards

Abby Barker, Kevin Hebard, Anya Kaufmann, Abigail Niesen, Emma Rubin, Sarah Ruckhaus, Brooke Schreiber, Yukinobu Tanimoto

Bachelor of Science in Civil Engineering

Daniel Alles	Melody Lin
Margaret Bacon	Leticia Lopez-Benitez
Abby Barker	David McVeety
Aliandro Brathwaite	Barbara Murray
David Carson	Abigail Niesen
Alison Connolly	Ian O'Malley
Kaitlyn Davis	Emma Rubin
Corey Diamant	Sarah Ruckhaus
Hannah Garfield	Brooke Schreiber
Kevin Hebard	Carel Voltaire
Matthew Johnson	Yuanyuan Wang
Cynthia Lee	

Bachelor of Science in Environmental Engineering

Cameron Barclift	Camille Littlefield
Bonnie Bronenberg	Jennifer Mui
Anne Brown	Melanie Rubin
Evan Hallberg	Andrew Shapero
Anya Kaufmann	Yukinobu Tanimoto
Kathleen Kwasniak	Yi Xuan

Graduate Awards

Eliyar Asgari was awarded the Kentaro Tsutsumi Fellowship.

William Farmer was awarded the Jonathan Curtis Fellowship.

Littleton Awards

Bradford Berry, Kyle Flynn, Christopher Paetsch, Alexandra Reiff, Carolyn Talmadge, Tianqi Qu, Jeffrey Walker

Master of Engineering

Isabella Carter

Karen Loweth

Monica Mejia

Yuqi Tang

Ang Li

Zhaohuan Li

Bo Zhang

Master of Science

Elizabeth Erdman

Jessalyn Nelson

Tyler Marcet

Shuo Zhao

Alexandra Kulinkina

Ali Khaloo

Li Xiang

Jiang Yudan

Vinita Bose

Ariel Newman

Stephanie Galaitsis

Christopher Follen

Ruiro Wu

Anish Kayiparambil Pushpangadan

Doctoral recipients

Kyle Flynn

Dissertation: "Methods and Mathematical Approaches for Modeling Cladophora glomerata in Rivers"

Advisor: Steve Chapra

Faith Kuria

Dissertation: "Uncertainty Analysis of Estimates of Water Supply Reservoir Yield"

Advisor: Rich Vogel

Christopher Paetsch

Dissertation: "Nonlinear Modeling of Active Biological Material"

Advisor: Luis Dorfmann

Jeffrey Walker

Dissertation: "Web Applications for Interactive Environmental Modeling"

Advisor: Steve Chapra

Allison Patton

Dissertation: "Developing Time-Resolved Models for Predicting Atmospheric Concentrations of Ultrafine Particles in Near-Highway Urban Neighborhoods"

Advisor: John Durant

Sandeep Sathyamoorthy

Dissertation: "Influence of Sorption and Nitrification Processes on Pharmaceutical Attenuation During Biological Wastewater Treatment"

Advisor: Andrew Ramsburg



NEW FACES DANIEL A. KUCHMA

Daniel A. Kuchma comes to Tufts from the University of Illinois at Urbana-Champaign, where he was an associate professor in the Department of Civil and Environmental Engineering. He holds a B.A.Sc., M.A.Sc., and Ph.D. in civil engineering from the University of Toronto. Professor Kuchma was the recipient of a National Science Foundation CAREER Award on "Tools and Research to Advance the Use of Strut-and-Tie Models in Education and Design." His research interests include the design and behavior of reinforced and pre-stressed concrete structures subject to complex states of stress. In addition, Kuchma is studying how advanced instrumentation methods can be used in physical experiments for the development, calibration, and validation of more comprehensive and reliable numerical models.

ALUMNI UPDATES

'72 **Anthony D. Cortese**, E68, EG72, received a Lifetime Achievement award from the Environmental Protection Agency at the 2013 Environmental Merit Award ceremonies. Cortese received another Environmental Merit Award on behalf of Second Nature, an organization based in Boston and committed to promoting sustainability through higher education where he is a senior fellow.

'77 **David Reckhow**, E77, professor at UMass Amherst College of Engineering, has joined the CEE department's external advisory board. His current research interests include general aquatic chemistry, chemical oxidation of organic compounds in water, coagulation processes, removal of chemical pollutants in water, and aquatic organic matter in natural systems and drinking waters.

'95 **Jason Kass**, E94, EG95, environmental engineer and the founder of the organization Toilets for People, wrote an op-ed in *The New York Times* (published 11/18/13) on the urgent need for sustainable toilets in the developing world.

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'95 **Sharon D. Beard**, EG95, received the 2013 Lorin Kerr Award at the Annual Awards Luncheon of the Occupational Health & Safety (OHS) Section of the American Public Health Association (APHA) on November 5, 2013. Beard, an industrial hygienist with the National Institute of Environmental Health Sciences (NIEHS) Worker Education Training Program, helped establish the NIEHS Minority Worker Training Program and has developed safety and health training programs for low-income workers, particularly those in highly hazardous occupations.

'96 **Leslie Cohen**, E96, Senior Vice President, Development, for Samuels & Associates, was named to *Boston Business Journal's* "40 under 40" list in October 2013. The honor is given to business and civic leaders who collectively represent the next wave of talent and commitment in the Boston economy. Cohen specializes in suburban retail and mixed-use real estate development projects.

'07 The EPA released a long-awaited software package for decision-oriented watershed management modeling, based on the thesis research of **Viki Zoltay**, EG07. The objective of the Watershed Management Optimization Support Tool (WMOST) is to serve as a public-domain, efficient, and user-friendly tool for local water resources managers and planners to screen a wide-range of potential water resources management options across their watershed or jurisdiction for cost-effectiveness, as well as environmental and economic sustainability.

4 ways to share the events of your life with your classmates

1. Join us each May for the annual **CEE Alumni and Student Awards Dinner**
2. Email classnotes@tufts.edu
3. Visit Tufts Online Community: www.alumniconnections.com/tufts (go to "Classnotes," then click on "Submit/Edit a Class Note")
4. **Follow us on Facebook**, and send us a message!

Celebrating the CEE Alumni and Student Awards Dinner

Clockwise from top left: Linda M. Abriola, Lin Brown; Cynthia Lee, Cataldo Award Winner; 2014 Undergraduate Littleton Award Winners; Michelle Stevens (L) and Barbara (Polly) Murray (R) present Lewis Edgers with the ASCE CEE Faculty Member of the Year award.



IN MEMORIAM

N. Bruce Hanes



April 23, 2014
Professor Emeritus of Civil and
Environmental Engineering

Bruce joined the Tufts community in 1961 after completing his Ph.D. in water microbiology and public health at the University of Wisconsin-Madison. Upon his arrival, Bruce was charged by Professor and Chair

Earle F. Littleton to develop a program in environmental engineering. This past fall marked the 50th anniversary of Tufts School of Engineering's Environmental Health Engineering program, which Bruce initiated.

In 1969, Bruce was appointed department chair and served for 12 years. During this time, he was instrumental in developing the joint master's program in engineering and public policy. Bruce also fostered the growth of the interdisciplinary undergraduate environmental studies program and the establishment of the Tufts Center for Environmental Management. As a member of the ABET Board, the governing body that oversees the accreditation of undergraduate engineering degrees in the United States, he worked diligently to incorporate health and safety topics into engineering design courses and refine the criteria used to evaluate environmental engineering programs. He retired from Tufts with the Seymour O. Simches Award for Distinguished Teaching and Advising in 1992.

Though he had officially left Tufts, Bruce never truly left the department. He faithfully attended the annual CEE Alumni and Student Awards Dinner and continued to mentor students and faculty in the department. In 1994, Bruce received the Centennial Award for Distinguished Professional Service that marked the 100-year anniversary of the School of Engineering.

As Lin Brown, his successor as CEE chair, wrote in Bruce's official statement of retirement: "His legacy to us is simple and clear: to see the best in people, to view change as an opportunity, and to take risks by investing in people and programs."

Rachid Hankour



December 17, 2013
Professor of the Practice of Civil
and Environmental Engineering

In 1988, Rachid earned his M.S. in civil engineering with a geotechnical concentration and three years later, his Ph.D. from Tufts University School of Engineering. After receiving his doctorate from Tufts, Rachid spent nearly a decade teaching courses on

mechanics of engineering materials, soil mechanics, foundation engineering, and the laboratory testing of soils, among others. He received accolades from students and peers alike.

While providing valuable contributions as lecturer at Tufts, Rachid worked as a geotechnical engineer and in 1994 joined Geotesting Express, a branch of Geocomp Corporation. In 2007, Rachid moved to the Geocomp headquarters in Acton, Mass., where he served as vice president and director of Laboratory Systems.

In 2011, Rachid was named professor of the practice, bringing his wealth of technical knowledge to the department, improving laboratory instruction and providing a basis for research collaborations within the Geotechnical and Geoenvironmental Engineering (GGE) and Structural Engineering and Mechanics (SEM) groups.

Professor Emeritus Lin Brown wrote of Rachid: "Rachid Hankour is one of the very best part-time faculty members that we have had in the department. [...] Good practitioners who are also good teachers are especially uncommon."

50th ANNIVERSARY A History of the Environmental Engineering Health Program

In the early 1960s, Earle F. Littleton, professor and chair of the department, recognized a growing interest in the environment and public health. Earle recruited N. Bruce Hanes, who later served as chair of department from 1969 to 1981, to develop an academic program in Environmental Engineering, which at that time was known as "Sanitary Engineering." During the 1963-64 academic year, the first graduate students entered the Environmental Health program with support from a U.S. Public Health Service (PHS) training grant in water pollution. The program continued to grow throughout the 1960s and 70s with grant support from the PHS, National Science Foundation (NSF), and Environmental Protection Agency (EPA). In 1970, Bruce recruited

Linfield C. Brown who created a master's degree program in Hazardous Materials Management (HMM), and later served as chair of the department from 1981 to 1992. In 1993, the name of the department was changed from "Civil Engineering" to "Civil and Environmental Engineering" and in 1995, the department began offering a Bachelor of Science degree in environmental engineering accredited by ABET, Inc. True to our interdisciplinary heritage, the department currently offers programs of study in Environmental Health, Environmental Water Resources Engineering, Geosystems Engineering, and Structural Engineering and Mechanics.

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Environmental Engineering
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SAVE THE DATE! Saturday, May 9, 2015
Next year's Alumni and Student Awards Dinner



In January, seniors working on their capstone projects took a site visit to the ongoing construction at the Assembly Square development in Somerville. (Alonso Nichols/Tufts University)