As an academic, alumnus Hellmut Fleckseder (MS 1969) helped pave the path for biological wastewater treatment in Austria. After a career shift to public administration, he served as an official steward of the entire Danube River Basin, striving for equitable and sustainable management.

This aerial view of the Danube Delta is a 2400 ft² nature reserve.
A message from the Chair

Our profession matters. Imagine a world without buildings, without roads and bridges, without airports, without the energy to power activities of our everyday lives, with water so contaminated that consuming it may cause serious illness or death, and with raw sewage running freely across the landscape. If you can imagine this world, you have imagined a world without civil, architectural and environmental engineers. We design, build, operate, and maintain the physical fabric of society, that which shelters us, moves us, and keeps us healthy.

The importance of our profession is but one reason to be proud of the Department of Civil, Architectural and Environmental Engineering (CAEE) at the University of Texas at Austin. Our undergraduate and graduate programs in both civil and environmental engineering remain amongst the top-rated programs of their kind in the United States. We are a strong community. We have a vision. And we aspire to be leaders in addressing grand challenges that face Texas, the nation, and the world. Our CAEE community includes 770 undergraduate and nearly 430 graduate students who are the lifeblood of our community. They are why our community exists. And their educational experience at UT Austin will provide knowledge, skills, and pathways that will enable them to one day become leaders in their profession and to solve problems that improve the condition of humankind and the environment. I am pleased that nearly 40% of our CAEE undergraduate students are women and 27% are underrepresented minorities, figures that reflect a strong commitment by our community to providing exceptional educational experiences for those who have been historically underrepresented in STEM disciplines.

Our 55 tenure or tenure-track faculty members are leaders in the profession, engaging in cutting-edge research and serving on standard setting committees. But we also care deeply about teaching and consistently receive very good evaluations from our students while also providing an extraordinary number of research experiences for both our graduate and undergraduate students. I am excited about the energy and expanded expertise that six new faculty members are bringing to our CAEE community. They are featured in this newsletter. And our faculty is supported by additional adjunct professors and lecturers who also play an important role in helping to educate our students.

Our CAEE community is fortunate to include a tremendously dedicated staff that serves as glue that sustains and connects other parts of the community. Our 20 administrative, advising, information technology, and teaching staff members support students, faculty, and alumni activities. They often work behind the scenes, but deserve much credit for their dedication to helping so many.

And our 11,616 alumni are also a valued part of the CAEE community. They give back in many ways, including support of our department and our students. One cannot underestimate the value of our alumni and their professional efforts to the economy of Texas, and to their contributions to weaving the physical fabric of society. At almost any location in Texas one need only open their eyes and observe their surroundings to witness the exceptional work of CAEE alumni.

There is a lot of positive energy in our community. We have a new strategic vision that focuses on solutions to major challenges facing Texas and beyond, particularly those related to availability of water and energy of sufficient quantity and quality to serve the needs of rapidly growing cities. The strong connections between water, energy, and the growth of cities make solutions to related problems complex. But our community is up to the challenge and aspires to lead efforts that ultimately derive innovative solutions that harmonize societal needs while protecting the natural environment. And this vision is already being supported by faculty hires, new partnerships on and off the UT campus, new interdisciplinary research initiatives, curriculum enhancements, and exciting renovations to ECJ Hall. Additional information related to our strategic vision and ECJ renovations are found in this newsletter.

There should be no doubt that our CAEE community is on the move, and we plan on maintaining frequent updates of our activities on our website and through daily tweets @UT_CAEE. I hope that you will follow us and also enjoy the information about our students, alumni, staff and faculty provided in this newsletter.

With sincerity and a lot of Hook Em!

Richard L. Corsi
Chair and ECH Bantel Professor for Professional Practice
Endowed Professor

Charles Werth
Bettie Margaret Smith Chair in Environmental Health Engineering

Charlie will join the faculty of CAEE in August 2014 after 17 years in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. He received his BS in mechanical engineering from Texas A&M University (1988), his MS (1992) and PhD (1996) degrees in Civil and Environmental Engineering from Stanford University (1992), and a PhD minor in Chemistry from Stanford University (1996).

His research focuses on the reactive transport and fate of pollutants in water resources, including groundwater and urban lakes, and the development of sustainable technologies for pollution removal from impacted waters. He has taught graduate or undergraduate courses in environmental pollutant fate, remediation design and management, environmental transport modeling, sustainable urban engineering, and drinking water treatment processes.

Werth says “I am honored to join CAEE, and to hold the Bettie Margaret Smith Chair in Environmental Health Engineering. I am eager to start, and very excited by the many new collaborative research opportunities with outstanding faculty members in CAEE. I look forward to having an active and collaborative research program in environmental and water resources engineering, and to help address some of the unique water challenges in Texas and the Southwest, including water scarcity, water reuse, and the impact of energy on water quantity and quality.”

Assistant Professors

Patricia Clayton
Assistant Professor
Structural Engineering

Tricia joined the faculty of CAEE in December 2013 from the University of Washington, where she earned her MS and PhD degrees. Her research is focused on improving seismic performance of steel structures during earthquakes. This includes research on retrofit of existing structures that do not meet today’s seismic standards and development of structural systems to have limited damage. As a graduate research assistant, she participated in an experimental study of self-centering steel plate shear walls with the National Center for Research in Earthquake Engineering (NCREE) in Taiwan. “In my classes, I want students to see the engineering solutions in our everyday lives that we too often take for granted,” she says. “If students can look at real structures after a basic design course and say, ‘Wow, that looks more complex than the problems I’ve seen in class, but I can see why the engineer may have designed it this way,’ then I consider that a success.”

Trevor Hrynyk
Assistant Professor
Structural Engineering

Trevor joined the faculty of CAEE in December 2013 from the University of Toronto where he worked as a post-doctoral student within the VecTor Analysis Group. His research is focused toward improved assessment and design procedures for reinforced concrete (RC) shells and slabs. Relevant applications include building systems, tanks and containment structures, cooling towers, storage silos and offshore construction applications. He is also working on the development of analytical procedures for steel-concrete (SC) composite shell structures under general loading conditions as well as blast and impact.

Navid Saleh
Assistant Professor
Environmental and Water Resources Engineering

Navid Saleh joined the faculty of CAEE in January 2014 after serving on the faculty of the University of South Carolina. He was a postdoctoral scholar at Yale University after receiving his PhD degree from Carnegie Mellon University. His research lab primarily focuses on environmental fate, transport, and effects of engineered nanomaterials. The other key focus of this lab is application of nanomaterials in water treatment, remediation, sensors, and composite materials. Some key areas of research include aggregation and deposition behavior of carbonaceous and metallic nanoparticles; water treatment and remediation technologies; nano-bio interaction; composite materials (nano-reinforced cementitious materials); and engineering education.
Annika M. Bankston, MSEHE 1997

Established in 2003, the Outstanding Young Alumnus/Alumna Award recognizes a graduate of the Department of Civil, Architectural and Environmental Engineering under the age of 40 who has distinguished himself or herself with outstanding service and contributions to the engineering profession. Annika is the 2013-14 award recipient.

Annika M. Bankston is Superintendent of Water Plant Operations and Maintenance for the Minneapolis Public Works Department and is responsible for the production and delivery of high quality drinking water for the city.

After rising through the city’s public works management structure, she now oversees the operation and maintenance of the Minneapolis water treatment plants, pumping stations, residuals processing, storage reservoirs, water quality laboratory, and other miscellaneous facilities. Within the Water Treatment and Distribution Services Division, she guides capital planning and the asset management program.

Prior to joining the utility, Bankston was a Project Engineer at Malcolm Pirnie, where her work included membrane feasibility studies and pilot testing, and the design of a filtration plant upgrade. The City of Minneapolis employed this expertise to become one of the first US cities to install ultrafiltration membranes on a large scale in lieu of granular media filters into a water treatment process. Bankston was enlisted by the City to assist with this major change.

“The challenges required by this implementation required a superb knowledge of water chemistry and particle removal process, not to mention the ability to work well with a huge variety of people, from equipment suppliers to water plant operators,” says professor and former advisor Des Lawler. “Annika’s entire job is one of public service.”

Our undergraduate and graduate programs are routinely ranked among the top ten in the U.S. In the most recent U.S. News & World Report, our programs were ranked:

- #5 Undergraduate Civil Engineering
- #3 Graduate Civil Engineering
- #4 Graduate Environmental Engineering

ONE word.

Students, alumni and faculty were recently asked to provide one word to summarize their experiences at CAEE.

If you wish to participate, please send your one word to klopfenstein@mail.utexas.edu along with a brief explanation of why you chose that word.

We will select entries for inclusion on our website.
Department Awards

ARE Leadership Award
Carlos Rodriguez (2013)
Abdullah Alqaroot (2014)
Awarded to an architectural engineering student who demonstrated outstanding leadership in campus and community activities.

CE Leadership Award
Marc Soriano (2013)
Alexis Clark (2014)
Awarded to a civil engineering student who demonstrated outstanding leadership in campus and community activities.

Werner W. Dornberger Academic Excellence Award
John Surovik (2013)
Priscilla Nguyen (2014)
Awarded to an architectural engineering student who started at UT Austin as a freshman, has the highest GPA in class, and is completing a degree in four years.

John A. Focht Academic Excellence Award
Thomas Burchett (2013)
Sarah Seraj (2014)
Awarded to a civil engineering student who started at UT Austin as a freshman, has the highest GPA in class, and is completing a degree in four years.

Outstanding Teaching Assistant Award
Robert Chamra (2013)
Trevor Williamson (2014)
Presented to a TA who has shown exemplary dedication and motivation in their teaching.

Department Teaching Award
Eric B. Williamson (2013)
Paola Passalacqua (2014)
Presented to a faculty member who has excelled in teaching and has demonstrated exceptional motivation of students in the classroom.

Ervin S. Perry Student Appreciation Award
Richard L. Corsi (2013)
Maria C. Juenger (2014)
Presented to a faculty member who best meets the ideals of “an excellent teacher and a good friend.”

CAEE Staff Excellence Awards
Erick Fontenot (2013), Kristi Delaney (2013)
Presented to staff members who have distinguished themselves and who have contributed significantly to the CAEE Department’s teaching, advising, mentoring, and/or research efforts.

Professional Honors

Gregory L. Fenves was elected to the National Academy of Engineering in February 2014. He was recognized for contributions to computational modeling, creation of open-source software for earthquake engineering analysis and for academic leadership.

Coming Soon in 2015. . .

Joshua Apte
Assistant Professor
Environmental and Water Resources Engineering

Josh Apte will join the CAEE faculty in January 2015 from University of California, Berkeley, where he received his PhD and worked with the Energy and Resources Group. His research interests include sustainability in the built environment; methods for air pollution exposure assessment; atmospheric aerosols; environmental issues in low income countries (air pollution and climate change mitigation). He received a Fulbright-Nehru fellowship to the Indian Institute of Technology to characterize in-vehicle exposure to particulate matter.

Christian Claudel
Assistant Professor
Transportation Engineering

Christian Claudel will join the CAEE faculty in January 2015. He received his PhD at UC Berkeley and has served as an assistant professor at King Abdullah University of Science & Technology (KAUST) for the past four years. His research interests focus on solutions to traffic flow models and optimization-based traffic state estimation and control. He will add new dimensions to our transportation engineering program with his expertise in wireless technologies and the use of unmanned aerial vehicles for real-time traffic flow sensing.
The Academy of Distinguished Alumni in the Department of Civil, Architectural and Environmental Engineering was established in 2003 to recognize the professional achievements and contributions of our graduates. Academy members are leaders within their professional communities and serve as role models for our students. Each active member holds at least one degree in civil, architectural, or environmental engineering from the University of Texas at Austin. Honorary members had distinguished careers on the faculty in the department.

Chia-pei Chou MS 1983, PhD 1988 joined the faculty in the Department of Civil Engineering at National Taiwan University, the country’s top-ranked university, where she is a Distinguished Professor. As a faculty member, she has been active in scholarly research in areas related to highway and airport pavements as well as motor vehicle size and weights for over two decades. She developed the Pavement Management Systems for the National Freeway Bureau and the Taiwan Taoyuan International Airport. Her work formed the basis for the runway skid resistance inspection and measurement specification for the Civil Aviation Administration of Taiwan. She recently served her government as the Director of the Division of Science and Technology, Taipei Economic and Cultural Offices in the U.S. for the National Science Council of Taiwan.

Samuel G. Dawson BS 1983 has spent his entire professional career working for Pape-Dawson Engineers, starting as an engineer and working his way up to his current position as CEO. His professional background includes providing design, technical support, and management for a wide range of civil and environmental engineering projects. Since graduation, Dawson has always maintained a strong commitment to his profession and alma mater. He has held many leadership positions within San Antonio Chapters of the Texas Society of Professional Engineers and ASCE. He is currently serving as Chair of the Engineering Advisory Board for the Cockrell School of Engineering and serves on the Engineering Task Force and Chancellor’s Council for the UT System. He is also a leader in San Antonio civic affairs and the city's business community.

Gregory G. Deierlein PhD. 1988, John A. Blume Professor at Stanford University, has been a transformative leader in the development of computational and experimental methods for stimulating nonlinear structural performance and characterizing structural material and component behavior. He has applied his research to the development of performance-based design for earthquake and fire hazards. Since 2003, he has served as Director of the J.A. Blume Earthquake Engineering Center. His research has influenced the development of national codes and guidelines related to stability and collapse of buildings and other structures. He received the ASCE Norman Medal in 1994, 2002, and 2008. In 2013, he was elected to the National Academy of Engineering in recognition of his many contributions to the profession.

Hellmut R. Fleckseder M.S. 1969 returned to his native Austria after graduation, to complete a Ph.D. at TU Wien/Vienna. His dissertation focused on the treatment of pulp mill effluent, which was the country’s most severe water pollution problem. He continued as a researcher and university professor, going abroad to Finland, Switzerland, Bangladesh, and Sri Lanka. He also authored many notable research papers on wastewater treatment and water pollution control for the Danube River and waters of Austria. In 1994, he moved from applied academia to public administration and was dispatched to the Secretariat of the International Commission for the Protection of the Danube River. As the official steward of the entire river basin, he managed water quality issues while striving for equitable and sustainable water management.

Stuart W. Hudson BS 1982 began his career as a project engineer with Austin Research Engineers (ARE) performing technical functions on multiple projects related to bridge and pavement research, engineering, and management. In his first assignment, he spent a year in Nigeria developing a pavement evaluation unit for the Federal Ministry of Works under sponsorship from the World Bank. He became President of Texas Research and Development Foundation in 1993 which evolved into AgileAssets, Inc. of which he is founder, President and CEO. This global provider of engineering systems develops, supplies, and updates asset management technology and software to transportation agencies and public works groups.
Candice E. Koederitz BS 1978 joined Exxon Chemicals as a project engineer in Baytown, Texas shortly after graduation and later supplemented her engineering skills with an MBA from Harvard Business School. She joined Morgan Stanley and has been there for over 30 years. In her role as Managing Director, Head of Capital Markets, she has been involved in new and innovative developments in finance including interest rate swaps, the securitization of the mortgage market, the first global bond, and several new equity-based securities. She raised capital to finance growth by restructuring or recapitalizing for companies around the world and across many industries. She spent four years in Asia when capital markets for China opened and during the Asian currency and economic crisis, serving as the chief executive officer in Southeast Asia for two years.

Roberto T. Leon PhD 1973 is the David H. Burrows Professor in Construction Engineering at Virginia Tech and is one of the leading researchers in the field of steel-concrete composite structures and earthquake engineering. His work has affected numerous national and international design codes. The quality of his research has been recognized several times, including the ASCE Norman Medal in 2000 and the ASCE State-of-the-Art Award in 1996 and 2000. A dedicated instructor and research advisor, he is well-respected and sought out as a graduate advisor as reflected by the large number of students he has advised or co-advised. His commitment to his profession through technical societies and committees has led to numerous leadership positions, including president of the Structural Engineering Institute.

Sher Ali Mirza MS 1968, PhD 1974 is professor emeritus of civil engineering at Lakehead University, Thunder Bay, Canada. His research on safety, stability, and modeling of reinforced concrete and composite steel-concrete structures has received international recognition. The results of his research have been incorporated into several structural codes of practice and he has distinguished himself through his technical and professional contributions to civil engineering learned societies. He invented the confined capping system for compressive strength testing of high-performance concrete for which he holds American and Canadian patents and developed methods that are widely used for design of bridges employing inverted T-girders. His overall service was acknowledged with the Order of Ontario, the province’s highest official honor.

Jonathan T. Motherwell MS 1976 is a consulting engineer with more than 35 years of experience in environmental and geotechnical engineering. He worked on numerous projects around the world related to the oil and gas, mining, power, and chemical manufacturing industries. He started his career with D’Appolonia Consulting Engineers and focused on project siting and development in Europe and the Middle East. After moving to Houston for a project assignment, he also became involved with contamination and remediation projects in the U.S. and Latin America. Since forming his own company in 2008, he has focused on project siting, development and construction in a sustainable manner which integrates engineering, environmental, social issues, and satisfying the performance standards required of international finance.

Franz N. Rad BS 1968, MS 1969, PhD 1973 joined the engineering faculty at Portland State University (PSU) in 1971 and was elected Department Head of Civil and Environmental Engineering in 1979. He was re-elected seven more times consecutively by the departmental faculty. Under his near quarter century of leadership, the department expanded faculty/staff, student enrollment, and research productivity on a large scale. He is currently a professor at PSU with research interests in earthquake-resistant structural engineering and forensic engineering. In 2003, in recognition of his extensive contributions to engineering education and research at PSU, and service to his professional community, he was received the first endowed Professorship in the Maseeh College of Engineering and Computer Science.

To nominate a CAEE graduate, please contact Laura Klopfenstein at klopfenstein@mail.utexas.edu or 512-471-1279.
The Graduates Linked to Undergraduates in Engineering (GLUE) Program is a unique mentoring program established within the Cockrell School of Engineering (CSE) to promote the retention of undergraduate students in engineering and to provide undergraduate engineering students with their first research experience. This mentoring program relies on one of our greatest assets – graduate student researchers who volunteer their time to work one-on-one with undergraduate students on a semester-long research project.

Initiated by CAEE Professor Kerry Kinney and the Women in Engineering Program in 2002, the program began with 26 participants from three departments within the CSE. By 2014, nearly 600 undergraduate and graduate students from every department in the Cockrell School have participated.

This program targets second-year engineering students, particularly women, who have had no prior research experience. The program links each undergraduate with a graduate student mentor conducting research in their field of interest. These matches are often interdisciplinary in nature with graduate students in one field (electrical engineering or chemical engineering) working with an undergraduate student in another field (civil engineering), for example. Projects reflect the incredible variety of research being done in the CSE. For instance, some students are developing sound dampening walls while others are investigating nerve regeneration mechanisms.

In addition to working on research, each undergraduate GLUE student participates in the GLUE seminar where they present the results of their research to their peers from across all departments and participate in the Undergraduate Research Poster Competition. They also learn about graduate school options as well as opportunities that an advanced degree makes possible in industry and academia.

The GLUE program has been quite successful at providing our undergraduates with a hands-on introduction to their field and for providing meaning to the fundamental concepts they learn in first year courses. It is also a valuable experience as they look for additional internship and research opportunities in their third and fourth years. The GLUE course routinely receives exceptionally positive feedback from the undergraduates and the retention data indicates that nearly 90% of the undergraduate participants ultimately graduate with a degree in engineering. Over 30% of the undergraduate participants who have graduated from UT Austin plan to (or are) attending graduate school. In fact, a few students who participated as undergraduates in the GLUE program are now graduate students volunteering as mentors. Many of the graduate GLUE mentors have an interest in pursuing an academic career and have gone on to become faculty members and others to industry where they benefit from supervisory experience they gained as mentors.

This experience has made me consider grad school more than I had before. It also encourages me to try things that I never imagined just to see what my interests are. My project is very hands-on and keeps things interesting. This encourages me to work harder in my engineering classes.

– 2nd year CE student
Oguzhan Bayrak was elected to the University of Texas at Austin Academy of Distinguished Teachers. He is one of only six new members on the UT campus elected to the Academy this spring.

Amit Bhasin received the CUTC-ARTBA New Faculty Award. This award honors individuals who have made outstanding teaching and research contributions to the transportation field. He also received a 2013 Regents’ Outstanding Teaching Award from the UT System.

Chandra Bhat received the Humboldt Research Award from the Alexander von Humboldt Foundation, in recognition of fundamental discoveries, new theories, or insights that made a significant impact on an academic’s own discipline. He also received the Pyke Johnson Paper Award from the Transportation Research Board, for the best paper in the area of planning and environment.

Carlos Caldas and his team of colleagues at the Construction Industry Institute (CII) Construction Productivity Research Program have been recognized by Engineering News-Record (ENR) as one of The Top 25 Newsmakers.

Richard Corsi is the 2013 recipient of the Lockheed Martin Aeronautics Company Award for Excellence in Engineering Teaching, given to a faculty member in the Cockrell School of Engineering who dedicates time and energy to teaching undergraduate and graduate students.

Kevin Folliard received a 2013 Regents’ Outstanding Teaching Award from the UT System.

Todd Helwig was selected by ASCE’s Structural Engineering Institute to receive the 2014 Shortridge Hardesty Award for his “wide ranging and substantial impacts in the field of structural stability.”

Kara Kockelman received the ASCE’s James Laurie Prize in Transportation Engineering for “innovative data acquisition and analysis efforts, outstanding contributions to the study of highway safety and crash occurrence, travel behavior, vehicle and driver characteristics, road pricing, spatial statistics, and energy and climate issues”

Fernanda Leite received the Outstanding Early Career Researcher Award from FIATECH. She also received the 2013 Dean’s Award for Outstanding Teaching by an Assistant Professor from the Cockrell School of Engineering.

Lance Manuel was elected Fellow of the American Society of Mechanical Engineers in recognition of his outstanding achievements and contributions in the fields of wind energy and offshore mechanics.

Jorge Prozzi received the 2013 Wilbur S. Smith Award from the Transportation and Development Institute of ASCE for advancement of knowledge and understanding of performance of highway pavements.

C. Michael Walton was inducted into the Texas Transportation Hall of Honor. He is the 40th member of the Hall of Honor since its inception in 2000 to recognize “the state’s true transportation leaders.”

Ying Xu received the 2014-15 New Investigator Award from the American Society of Heating, Refrigerating, and Air conditioning Engineers (ASHRAE).

Jorge Zornberg received the 2014-15 Mercer Lecture Award from the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) and the International Geosynthetics Society (IGS).
Building Environments: Pinpointing Contaminant Exposure Sources in a Virtual Home

Because of the widespread use of phthalates in the environment and the potential for detrimental effects on human health, an urgent need exists to identify the most predominant sources and pathways of exposure. Methods to measure concentrations of chemicals in humans, known as bio-monitoring, can be costly and burdensome. CAEE researchers created a model of a hypothetical residential house with adjustable airflow systems to illustrate how phthalates released by a specific source might be predicted. They developed an innovative micro-chamber method to quickly measure parameters needed for the model.

Phthalates are a class of chemicals used in numerous consumer products, including floor and wall coverings, car interior trim, clothing, gloves, footwear, wire insulation, artificial leather, and toys. Data from the Centers for Disease Control and Prevention suggest that more than three-quarters of the U.S. population may be exposed to these suspected endocrine disrupting chemicals. Children experience 2 to 10 times greater exposure than do adults.

Assistant Professor Ying Xu and graduate students Yirui Liang and Chenyang Bi built on an earlier model that described how benzylbutyl phthalate (BBzP) and diethylhexyl phthalate (DEHP) are released from vinyl flooring into air and sorbs strongly to adsorb strongly interior surfaces (e.g., walls, ceilings, windows, cloth, and furniture) and suspended particles. They developed a novel method to measure key model parameters controlling phthalate emissions to air, which significantly reduced the test duration from several months (using conventional methods) to less than three days. The research team conducted actual measurements in the UTest house to validate and refine the model; the UTest house is a 3 bedroom, 2 bath full-scale research house located at the J.J. Pickle Research Campus.

To test which parameters might change the amount of phthalate exposure through different routes, the researchers varied model parameters such as the amount of ventilation and velocity of air moving through a home. They concluded that a fan pushing air through the house would cause more skin contact with phthalates by increasing the release rate from vinyl surfaces to indoor air. Air flow from fans also thins the boundary layer of air adjacent to skin, thus making it easier for phthalates from air to contact skin. In addition, the researchers found that temperature has a great influence on phthalate emissions; an increase of room temperature from 20°C to 30°C can increase human inhalation exposure to phthalates by an order of magnitude.

The team’s research efforts indicate that levels of phthalates measured in adults and children may result in part from contact with surfaces such as clothing and dust that adsorb high concentrations of phthalates. Furthermore, phthalate exposures arising from a single product (vinyl flooring) may differ by as much as 40 times depending on indoor environmental conditions such as temperature, home ventilation rates, and more. This variability underscores the wide range of potential exposures across the population, and the uncertainty of relying on human bio-monitoring alone to identify the most harmful sources.

Although their work to date focuses on vinyl flooring, the fundamental approach that Dr. Xu and her students have developed will generalizable to a host of materials and products emitting various endocrine disrupting chemicals. The research provides an effective and economical way to identify the most important sources of phthalate exposure in the general population. It will be of value to architects and engineers who wish to specify low-emitting materials for use in healthy buildings, and allow the use of validated models for developing standards of product environmental performance or green labels.
Hurricanes vs. Offshore Wind Turbines
Partnering with the National Renewable Energy Laboratory

In 2008, the US Department of Energy (DOE) embarked on a research and development program that seeks to increase the portion of energy generated by wind to 20% by 2030. Of the projected 300 GW (1 GW = 1 gigawatt = $10^9$ watts) needed to meet this goal, 54 GW is expected to come from offshore wind energy, enough to power about 16 million homes. Already, land-based wind energy generation realized since 2008 has exceeded DOE’s projections. On the other hand, not a single offshore wind turbine has been installed in U.S. waters to date. This is expected to change within the next 5-10 years.

There are many reasons why offshore wind energy is especially important today. Land-based wind energy sites are often far from load centers. Our energy needs are greater near heavily urbanized regions which are often close to coastlines. Siting wind turbines offshore reduces the need for long transmission lines that are essential when wind energy has to be delivered from distant rural sites (as is the case in Texas, energy produced in the Panhandle region with its excellent wind resource is delivered to cities like Austin and Dallas). Avoiding such infrastructure costs as well as inevitable losses in the transmission is possible with offshore wind energy development. Additionally, winds over oceans are often stronger, more sustained, and smoother or less turbulent—this translates to a higher quality wind resource that, at the same time, puts less structural demands on the wind turbine system.

Still there are many technical challenges with offshore wind. Offshore wind projects in other parts of the world have not had to deal with deep waters (at many potential US coastal sites, the continental shelf drops off more steeply) that require more innovative turbine support structures compared to situations abroad where simpler monopole foundations have been adequate.

A far greater concern has been the need to design turbines to withstand hurricanes, especially for potential Gulf of Mexico and Atlantic Seaboard sites. Professor Lance Manuel and PhD student Eungsoo Kim are collaborating with the National Renewable Energy Laboratory (NREL) and the University of Miami’s Rosenstiel School of Marine & Atmospheric Science (RSMAS) on a two-year DOE-funded project that is seeking to assess the structural demands on offshore wind turbines for coupled wind, wave, and current inputs during a hurricane. The team is undertaking studies involving numerical simulation of Hurricane Ike (see figure inset) and the associated response of hypothetical wind turbines that experience Ike’s extreme winds and coupled ocean wave and current fields. They are also studying risks to jacket platform-supported wind turbines at several potential mid-Atlantic coastal sites during Superstorm Sandy where complex wind, wave, currents, and storm surge patterns were observed.

Findings from this research study are expected to provide useful guidance to DOE, in terms of design standard definition, and in making decisions related to future offshore wind energy development in US waters.
Julia Roberts, a PhD student under the supervision of Kenneth Stokoe, is studying how soils behave during earthquakes. She is concerned with accurately predicting whether or not soils will liquefy during an earthquake. This research involves traveling to areas that have high seismic risks as well as soils susceptible to soil liquefaction. She then performs a series of in situ tests with the purpose of understanding what soil conditions translate to a high or low risk of soil liquefaction. Earthquake-induced soil liquefaction can trigger landslides and foundation failures for bridges and buildings, sever underground utilities such as sewer and water pipes, and destroy roadways. Current methods for predicting soil liquefaction are not yet accurate enough or used widely enough to prevent millions of dollars of damage to the built environment during large earthquakes. “My goal is to conduct research that has an immediate impact on improving public safety during earthquakes and minimizing costly damage to the built environment,” she says. “I would also like to promote education in STEM fields by being an advocate as well as a mentor and continue to pursue a career full of exciting challenges and learning opportunities.”

Chloe Wooldridge is currently pursuing a master’s degree in Environmental Engineering under the supervision of Mary Jo Kirisits and Kerry Kinney. Her research focuses on characterizing the microbiome of showers. Although water is treated to remove microorganisms at water treatment facilities, infiltration and regrowth in distribution lines results in the presence of a variety of microorganisms by the time water reaches our taps, some potentially pathogenic or allergenic. In addition, some of these microorganisms are able to form biofilms in areas such as shower heads, walls, floors, and ceilings. She will consider fungal and bacterial species, with specific interest in those that are potentially harmful to immunocompromised individuals, by utilizing culture and culture independent methods. This research will help to clarify human exposure risk to inhalation of these microorganisms while showering, what species are present, and the source(s) of the microorganisms. After graduation, Wooldridge plans to work in consulting for a few years, applying her technical expertise in the field before returning to pursue a PhD.

In Memoriam: Charles A. Sorber

Charles A. Sorber (PhD 1971) Professor Emeritus in Environmental and Water Resources Engineering at UT Austin, passed away on October 18, 2013. His distinguished career in academia spans three decades. He was a veteran academician and administrator who successfully served as the chief administrative officer of three University of Texas System academic institutions.

Sorber began his professional career with the U.S. Army, serving in a number of positions in Europe with the U.S. Army Medical Research and Development Command. His service earned him the Meritorious Service Medal with two Oak Leaf Clusters as well as other honors. He joined the UT System in 1975, serving in a number of academic, research, and administrative positions at UT San Antonio; he was Associate Dean, College of Engineering at UT Austin from 1980 to 1986 when he was appointed Dean of Engineering at the University of Pittsburgh. He returned to the UT System in 1993 when he was appointed as president of UT Permian Basin, serving as the fourth president of the institution from 1992-2001. He returned to The University of Texas at Austin in 2001 where he held a number of positions including interim president of The University of Texas at Arlington from 2003 to 2004. In 2009 he was asked to come out of retirement to serve as interim president of The University of Texas-Pan American.

Sorber authored or co-authored more than 130 papers and reports in the areas of land application of wastewater and sludge, water and wastewater reuse, water and wastewater disinfection, and higher education.
Undergraduate Research

Although water access in Sub-Saharan Africa has improved, the region is behind in comparison to every other developing region across the globe in terms of water and sanitation coverage. However, inexpensive methods for water system designs using local, easily accessible supplies can help these communities become healthy as well as self-sustaining.

CAEE researchers have partnered with the University of Illinois at Urbana-Champaign to create economically feasible and technologically simple solutions to clean drinking water problems by creating a basic charcoal filter that can be easily replicated by Sub-Saharan African communities lacking in resources.

By engaging Ntisaw, a village in Cameroon's Northwest Region, the research collaborative proposed a case study to test the effectiveness of charcoal made from Eucalyptus tree sawdust as a filter media to remove contaminants in water.

During the Spring/Summer 2014 semester, Colleen Lyons, an environmental and water resources engineering graduate student and National Science Foundation fellowship recipient, will assess the efficiency of low temperature conversion of Eucalyptus sawdust to charcoal while in Ntisaw. She will also construct a pilot-scale filtration system off of a public tap stand to test the effluent water quality for pH, turbidity, nitrate, ammonium, alkalinity, bacterial removal rates and breakthrough curves as well as the run times.

Under the supervision of Associate Professor Mary Jo Kirisits, Lyons identified and trained her own research team, which includes civil engineering junior Maddie Edwards. Maddie will have the opportunity to present her findings this fall at the Engineers Without Borders regional conference. As an undergraduate research assistant, she will gain hands-on experience that furthers her education as a future engineer.

Civil engineering senior Wiley Jennings is working with mentors Professor Lance Manuel and PhD student Jae Sang Moon to study and statistically analyze complex flow fields in wind plants. The team is seeking to develop derived design “parameters” that describe mean wind and turbulence field simulation inputs for specific downwind locations where units may be placed and under well-defined free-stream conditions.

They also plan to relate their newly developed framework with ongoing efforts involving a “dynamic wake meandering” model proposed by researchers at the Danish Technical University with field studies and design standards work. Manuel is currently collaborating with the National Renewable Energy Laboratory (NREL), a leader in wind farm modeling research, to formulate a U.S.-based research initiative that addresses the previously mentioned performance issues. The work falls under a new NREL and Department of Energy strategic research initiative, Atmosphere to Electrons (A2e).

Wiley Jennings was selected as an undergraduate research assistant after completing a summer internship with Clean Line Energy Partners in Houston, Texas.

Wind turbine arrays or “wind farms” generally consist of linear, rectilinear, or other spatial arrangements of multiple wind turbines. Depending on the direction of the prevailing wind, a single turbine unit may have to operate in the wake of one or more upwind turbines. A reduction in the captured wind energy results for any such downwind turbines due to what is termed a wind speed “deficit.” As if that were not bad enough on its own, downwind turbulence is also enhanced relative to upwind free-stream turbulence. This enhanced turbulence can be harmful and damaging to turbines in the wakes of other turbines.

Design criteria must reflect our understanding of the complex physics associated with such flow fields in order to increase an array’s overall efficiency.

If you would like to create your own Legacy Fund, please contact Michael Barasch at michael.barasch@austin.utexas.edu or 512-471-0469.
We wish to express our sincere gratitude to the individuals and organizations who donated to the Department of Civil, Architectural and Environmental Engineering in 2013. Your gifts enhance our students’ educational experiences, and help them become the next generation of international leaders. All gifts processed by Dec. 31, 2013

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Ned H. Burns
Eugene H. Dawson
Hugh M. Farmer
Royce W. Faulkner
Claude H. Garrett

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Neal E. Armstrong
James L. Barnard
John E. Breen
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Nicholas W. Classen
Larry O. Cleve

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Renovation of Ernest Cockrell Jr. Hall
AN OPPORTUNITY TO INSPIRE DISCOVERY AND COLLABORATION

The construction of the new Engineering Education and Research Center (EERC) will trigger significant renovations within Ernest Cockrell Jr. Hall (ECJ). Once complete, ECJ and the EERC will operate as a connected neighborhood on the lower three levels, elevating the visibility of the Department of Civil, Architectural and Environmental Engineering (CAEE) and creating a departmental presence on the main entry floor with new public and student spaces.

The pending renovation will also transform the learning experience and environment within CAEE. Relocating classroom and lab space currently scattered throughout the upper floors to a more public and accessible location on the lower levels will create a strong sense of community that will further inspire collaboration and discovery.

ENGINEERING EDUCATION - 1ST FLOOR
This level will be designed for academic instruction and contain university, interdisciplinary and dedicated CAEE classrooms. This floor will be a center of education where students will complete core courses. It will anchor ECJ with an engaging academic environment that fosters community and learning.

MAIN ENTRANCE AND LOBBY FOR CAEE - 2ND FLOOR
The second floor becomes CAEE’s new front door. This area is designed to be an open, light-filled lobby and will connect directly to the EERC via a broad corridor that will house the Center for Innovation. The CAEE study lounge, meeting rooms and computer labs will be featured prominently on this floor. These work and meeting spaces will foster collaboration and community among faculty, students and staff. Interview rooms for the Engineering Career Assistance Center (ECAC) will also be housed on level two. The second floor will provide welcoming and functional space for students, visitors, faculty, and engineering recruiters. A student project display area will also be featured.

ACADEMIC HUB AND DESIGN STUDIOS - 3RD FLOOR
This level will house four CAEE classrooms, a multipurpose room, and the Architectural Engineering Suite. The multipurpose room will provide space for interactive student learning, student project teams, and group study, as well as faculty meetings. Defining the identity of the third floor, the Architectural Engineering Suite will include glass wall views into the seminar room with primary entry for the studio areas immediately off the elevator lobby. Two spaces are dedicated to individual and small-group tutoring and academic support. The consolidation of CAEE classrooms to the third floor will create a vibrant learning community where students can study, collaborate, and engage with faculty and classmates.

IMPACT FOR CIVIL, ARCHITECTURAL, & ENVIRONMENTAL ENGINEERING

If you have questions or would like to make a gift, please contact Henna Tayyeb at 512-471-4046 or hennat@austin.utexas.edu
Civil, architectural and environmental engineers are, at their very core, people who care about how society builds, maintains, and operates the infrastructure for the 7+ billion people sharing our planet. We are in the middle of a multi-century shift in the way humans live, and we are developing and testing new ideas for sustainable infrastructure in this increasingly urban world. The faculty in the Department of Civil, Architectural and Environmental Engineering (CAEE) at the University of Texas at Austin believe that the complex problems surrounding the nexus of cities, water, and energy will challenge engineers for decades, and we aspire to be leaders in developing innovative solutions to these problems. Indeed, what starts here will change the world.

**Why the nexus of cities, water and energy?**

**Water** makes life possible, **energy** makes cities possible, and **cities** allow our planet to support its growing population.

**Water** quality and quantity might be the ultimate control on urban growth. We are developing 21st century tools and a new understanding of the interactions between cities, energy needs, water supplies, flooding, water treatment, and waste disposal that are critical to sustainable urban growth.

**Energy** use in cities is strongly impacted by infrastructure, system operations, and building design. We are innovating the next generation design and building methods that reduce the energy required to build and maintain sustainable cities.

**Cities** are challenged by the decay of 20th century infrastructure and the need to rethink, redesign, and renew for the 21st century. We aspire to innovate materials, methods, and integrated systems needed for cost-effective, adaptable, and resilient infrastructure.

**Connections across the CAEE department and the world**

There are important and emerging connections between these themes that underscore opportunities for innovative city-scale, systems-based approaches to dealing with emerging issues of urban growth. These connections offer opportunities for inter-disciplinary collaboration for faculty and students within CAEE, across the University of Texas at Austin, and around the world. These themes represent core strengths of expertise of today’s CAEE faculty. We are well-poised to develop and continue our leadership in these three thematic areas and their connections in the future. These issues are neither short-term nor driven by the latest “hot topic” – these are problems, issues, and societal needs that have developed slowly over the past 50 years and will continue to challenge civil, architectural and environmental engineers well into the 21st century.

**Moving forward**

Much as delivering clean potable water and effectively removing wastewater was the principal urban infrastructure challenge of the early 20th century, we see developing a path for urban growth with sustainable use of water and energy as the key infrastructure challenge of the early 21st century. To affirm its commitment to leadership, value-added education for our students, and societal solutions to related problems, the cross-cutting themes described above will play a major role in several future endeavors of CAEE. These include:

- Faculty hiring
- Changes to curricula that reflect importance of these cross-cutting areas to our students, their future employers, and society
- Development of strategic partnerships on the UT campus and with other universities and institutions that strengthen opportunities in each of the cross-cutting themes and their connections
- Continued embracing of Austin as a working laboratory for which strains surrounding growth, water, energy and their connections provides great opportunities for education as well as innovative cross-disciplinary solutions to
CAEE alumni have varied professions and interesting careers. Faculty, current students, and fellow graduates are always interested in learning about the lives alumni lead after they leave UT.

If you have an update you’d like to share - a career change, promotion, retirement, marriage or baby, please e-mail Laura Klopfenstein at klopfenstein@mail.utexas.edu or visit our website at www.caee.utexas.edu/alumni.

60’s

**Ernesto Espino** (PhD 1968) was honored by the American Academy of Environmental Engineers & Scientists by being the first recipient of its International Honorary Member Award which recognizes contributions to environmental engineering and professional achievements.

70’s

**James Broaddus** (BSCE 1970, MSArE 1976, PhD 1991) was named the Texas Society of Professional Engineers-Travis Chapter. He was also appointed by Governor Rick Perry to serve on the Office of Small Business Assistance Advisory Task Force for the State of Texas.

Bilal Hamad (MSCE 1979, PhD 1990), mayor of Beirut, was honored by the American University of Beirut as a Distinguished Alumnus. His family celebrated at his side.

90’s

**Julia Alred Coonrod** (PhD 1998) is the Dean of Graduate Studies at the University of New Mexico. She also continues to teach a GIS in Water Resources Engineering course.

**Julia M. Harrod** (MSArE 1994), President of MWM Design Group, was presented with the 2013 Engineer of the Year award by the Texas Society of Professional Engineers-Travis Chapter for her significant contributions to the profession, specifically her work to promote education in math and science.

**Ana Maria Rodriguez** (MSCE 1998) was appointed as Manager of the Construction Industry Community of Practice at Project Management Institute (PMI).

**Clinton S. Wilson** (MSEHE 1994, PhD 1997) has been on the faculty in the Louisiana State University Department of Civil and Environmental Engineering for almost 15 years (now a full Professor) and was recently appointed as the Director of the Engineering Design and Innovation Program at the Water Institute of the Gulf.

00’s

**Katherine Alfredo** (MSCE 2008, PhD 2012) received a U.S. Department of State Critical Language Scholarship for the study of Hindi.

**Luis Gotelli** (MSCE 2011) is currently working as Project Management System Coordinator at COSAPI S.A. Lima, Peru. He is working on the implementation of an Execution Plan Standard which includes management process, tools, templates & procedures.

**Felipe Guerra** (MSCE 2011) is a Project Engineer at Collahuasi Mining Company in Santiago, Chile, as part of the management team.

**Christopher Kahanek** (BSArE 2003) has been promoted to senior associate at Thornton Tomasetti’s Christchurch, New Zealand office.

**Angela Matthews** (BSCE 2002) is a Senior Engineer/Project Manager at Hayden Consultants in Dallas, Texas.

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Let us know about your future engineer and we’ll send you a free t-shirt, compliments of the Friends of Alec Annual Giving Program.

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*Emma, daughter of Elizabeth Lowry Perez (BSArE 2001)*
Last summer Professor Des Lawler and his wife Alice were invited by three former students, Mooyoung Han (PhD 1989), Jinkeun Kim (PhD 2004) and JiHyang Kweon (PhD 2002), who are faculty members at different universities in Korea, to visit their institutions and their country. The visit began with a welcome dinner attended by 17 EWRE graduates!

During the following week, Des gave lectures at five different universities, including the three where his students are on the faculty: Seoul National University, Jeju University, and Konkuk University. The lectures made it a “working vacation,” but he says that it was the most spectacular vacation of his life, being treated like a king for a week. He mentioned this idea to his hosts, and they explained that it was true—the three people held in highest and equal respect in traditional Korean culture are one’s father, the king, and one’s teacher!