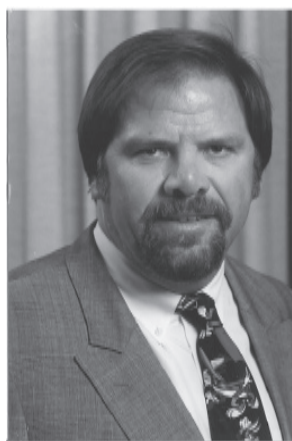




DIRECTOR'S CHAIR

Robert C. Knox



Dear Friends:

It is my pleasure to provide this annual report for the School of Civil Engineering and Environmental Science. Once again, the talented CEES faculty led the College of Engineering in almost every category of productivity. Our external research expenditures exceeded \$4.1 million last year, which equates to more than \$218,000

per faculty member. In CY2007, CEES faculty published 45 refereed journal articles or book chapters. This equates to an average of 2.25 refereed journal publications per faculty. Also in CY2007, CEES faculty publications were cited 800 times in the refereed literature, which equates to an average of 40 citations per faculty. Almost all of these productivity metrics equal or exceed those of our peer institutions in the Big 12.

CEES faculty continue to be recognized for their superior performance in the classroom and research productivity. In fact, the awards are too numerous to list here. All of the awards are listed starting on page 9.

Not to be outdone by the faculty, CEES students also have brought recognition to our school. We include an article about our latest NSF Graduate Fellowship recipient, Laura Brunson, who is working on a master's degree in environmental engineering. Of course, the ASCE Concrete Canoe team did its usual outstanding job and won a very exciting regional competition.

I have included several articles related to the work of students and faculty associated with the Water Technologies for Emerging Regions Center. The WaTER Center was voted to be the highest-priority research endeavor for the College of Engineering last fall, and several exciting developments are covered in this issue of the Communiqué, including selection of the recipient of the first OU International WaTER Prize. The student chapter of Engineers Without Borders participated in WaTER Center activities in Guatemala and Bolivia this past year.

You also will find articles about two very exciting projects being undertaken by CEES faculty. Members of the Center for Restoration of Ecosystems and Watersheds finished construction of the passive treatment system at the Tar Creek Superfund site in northeastern Oklahoma. The mine water upwelling at Tar Creek had previously been characterized as "untreatable." Associate professor Bob Nairn and his CREW team have proven that to be false. I have also included a note about a very exciting structural engineering project. Assistant professor Chris Ramseyer has teamed with world-renowned architect Hans Butzer to design the SkyDance Bridge as part of the continued revitalization of downtown Oklahoma City. I think you will find both projects to be very interesting.

Once again, I invite you to stay in touch with CEES. We would love to hear from our devoted alumni and friends.

Robert C. Knox, Ph.D., P.E.
Ted A. Kritikos Chair, Presidential Professor, Director
School of Civil Engineering and Environmental Science

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SCHOOL NEWS

ASCE Concrete Canoe Team Repeats as Regional Champions

The OU Concrete Canoe Team continues to lead the Mid-Continent Regional Competition as the team to beat. The 2008 Regional win marks the fourth-consecutive regional win and the fifth win in the past six years. The OU canoe, named *The Eliminator*, was built as a tribute to the hard work and determination individuals have to put forth to make the team successful as a whole. It was based on "The Eliminator," the final challenge contestants from the show "American Gladiators" had to face to prove their mental and physical supremacy.

Many of last year's team members returned to aid in mentoring the newer, less-experienced members. The returning collective knowledge



The Eliminator Canoe Display

base allows the team to remain a dominant force as older members graduate. This year's team included a core of 18 motivated students, under the direction of dual senior captains: Christopher Davis, a senior from Jones, Okla., and James "Marty" Farris, a senior from Norman, Okla. Dual captains were chosen out of necessity because neither captain had the ability to take full command due to time constraints from school and work.

With a new, larger group of students, OU's team had high hopes for the National Concrete Canoe Competition, but realized they must first

win regionals. Being technically proficient and innovative has been the foundation for success upon which OU has built for years. This year was no different as the team produced one of the most radical mix and hull designs seen at any level of the competition.

To keep the time on the mold construction to a minimum, a local company was used to fabricate a foam mold directly from a 3-D model. Starting with last year's hull design, slight changes were made to the nose of the bow and stern of the canoe based on feedback from the returning paddlers: the straight-line tracking of the canoe was improved, which slightly decreased maneuverability. Once again, Farris oversaw mold construction while mentoring younger member Shay Smith, an Edmond, Okla., junior.

The mix design team was once again led by Davis, who mentored younger member Chris Hill, an Edmond, Okla., junior, to take the reins next year. Building on last year's shrinkage compensating mix, this team came up with approximately 50 mixes to better the previous year's mix. Instead of compensating for shrinkage cracks, this year's mix remained expansive. This allowed for chemical pre-stressing of wire tendons that were placed in the top of the canoe gunwales, in effect, creating a pre-stressed concrete canoe. OU was the first to bring a shrinkage compensated concrete canoe to competition last year. This year, OU was the only team to bring a chemically pre-stressed concrete canoe. Once again, OU caught the eye of judges with their innovation. OU also was the only team at the competition to place its floatation in the gunwales (sidewalls) of their canoe.

Coming in to race day, the OU team held a fairly comfortable lead, but still wanted to perform to the best of its ability. The Men's Sprint was the first race of the day, and everything was looking promising for the team, until a paddler was placed too forcefully in the canoe, cracking through

the bottom. Luckily, OU had a layer of wire mesh that held the canoe together. The OU team was not deterred and was still able to outperform many of the racing teams with a canoe that had severe cracking. With many first — and second-place finishes, OU was still dominant in the racing, clinching the overall regional championship once again.

Individual Placements:

Design Paper – First Place
Presentation – First Place
Aesthetics – Second Place
Overall Races – Second Place

Individual Race Placements:

Men's Endurance – Second Place
Women's Endurance – Second Place
Men's Sprint – Fourth Place
Women's Sprint – First Place
Coed Sprint – First Place



Awards presented to Chris Ramseyer

After the regional victory, OU planned on attending nationals as a competing team. It had been decided to re-cast the canoe and take a penalty in the points so that they would still be able to attend and compete. Due to a vague discrepancy in the rules, the OU team was denied their re-cast and was not allowed to attend as a competing team. In spite of their disqualification, the team decided to attend the national competition to learn new techniques for canoe molds, new aggregates available, and display approaches. The team drove from Oklahoma to Montreal, Canada, to

attend the national competition.

With the knowledge gained from nationals combined with the new innovations of this year, the OU team looks forward to the 2009 competition. Leadership will be headed by senior Michaela Campbell, Norman, Okla., senior, with many returning members available to assist her. The leadership, teamwork and organizational skills learned through competitions such as these will serve our students well following graduation.



L-R: Back: Shay Smith, Brett Moran, Mark Emde, Marty Farris, Ted Huynh, Joe Tuttle. Front: Chris Davis, Russell Buhler, Casey Price, Lauren Parrish, Shannon Jenkins, Mallory Moore, Katie Daugherty, Jessica Callahan, Promise Janning, Michaela Campbell, Bryce Hanlon, Chris Hill.

WaTER Center and Engineers Without Borders

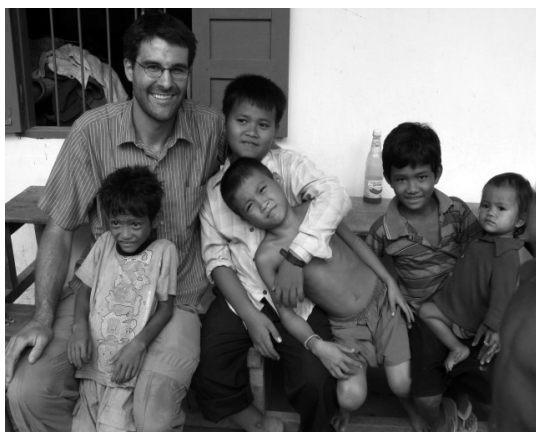
Cambodia

WaTER Center graduate student Christopher Cope of Denton, Texas spent three weeks during the summer in Cambodia learning about groundwater issues by working with a non governmental organization called Resource Development International. Parts of southern Cambodia suffer from elevated arsenic levels as high as 3500 parts per billion, which is 350 times the concentration recommended by the World Health Organization. In addition to arsenic, other elements — such as fluoride, manganese and barium — can be found in excessive concentrations. During his time with RDI, Cope was able to observe an innovative and multi faceted NGO in operation and look for future water-quality research collaboration opportunities. Cope learned that there are no easy solutions to the water-quality issues in Cambodia, but there are ways to help. The



Cope helps volunteers pick herb leaves for sustainable nutrition improvement supplements.

WaTER Center hopes to partner with RDI to develop new or modify old technologies to contribute solutions to some of these chemically contaminated water issues. To learn more about his experiences and future research, contact Cope at crisco@ou.edu.



Cope with children at a village school where RDI – Cambodia and Coast2Coast VII of Singapore teamed up to build a rainwater harvester and conduct water, sanitation, health and hygiene courses.

Tanzania

Laura Brunson, a WaTER Center graduate student from Toledo, Ohio, traveled to Tanzania in June 2008 to learn more about rural water issues and seek future research and project opportunities for the WaTER Center. Approximately 78 percent of people in Tanzania do not have access to safe water sources. This is due to both microbial

contamination and elevated fluoride levels, depending on the location. Brunson visited Morogoro, a central region located near the Ulugulu Mountains. There, she was able to visit the ministry of water, professors and NGO leaders and travel to rural villages to observe daily water practices and water sources. Brunson also visited the Arusha area near Mt. Kilimanjaro, where elevated fluoride concentrations cause dental



Brunson tests river water samples for microbial growth.

and skeletal fluorosis for many people, especially children, in the region. The practice of using charred animal bones to remove fluoride from drinking water has been studied in the area, but to date minimal large-scale rural implementation has been successful. To learn more about this trip and future research, contact Brunson at lbrunson@ou.edu.



A donkey carries water from the same river to a village.

Bolivia

Intensive mining and processing of silver, lead, tin and zinc ores has occurred at Cerro Rico de Potosí, Bolivia, since 1545. Acid mine drainage and processing plant effluent are prime sources of water contamination in the headwaters of the economically and ecologically vital, yet highly impacted, Rio Pilcomayo watershed. Since 2006, William Strosnider, CEES environmental engineering doctoral student from North Braddock, Pa., has established an ongoing relationship with personnel at the Universidad Autónoma de Tomás Frías and Centro Investigación Minera Ambiental in Potosí. Based on his work, Robert Nairn, CEES associate professor, led a team of four graduate students from the Center for Restoration of Ecosystems and Watersheds on a three-week research, teaching and service trip to Potosi in July and August 2008. In addition to Nairn and Strosnider, environmental science doctoral student Leah Oxenford of Grand Junction, Colo., environmental engineering master's



Back row L-R: Garrido, Strosnider, Nairn
Front row L-R: Santamaria, Oxenford

student Alan Garrido of Neiva, Columbia; and environmental science master's student Beatriz Santamaria of Houston visited field sites near Lake Titicaca and Potosí. Travel was supported in part by OU Presidential International Travel Fellowships to each team member, with additional financial assistance provided by an OU Faculty Senate Development Grant, the OU chapter of Engineers Without Borders, the OU WaTER Center, CREW and CEES.

Each member of the team performed research related to mine water environmental impacts and their clean-up. In this high-altitude desert environment, research projects included studies on the effects of using contaminated irrigation water on staple crops, how the high altitude and excess solar radiation impacts mine water chemistry, the possibility of using locally available waste products (like llama dung) in mine water passive treatment, and the relative impacts on streams of mine water and untreated municipal waste water. Work occurred in close partnership with colleagues at UATF and CIMA, and laid the groundwork for further collaboration between these entities and CREW. Also, CREW donated used scientific monitoring equipment to the UATF. Since the group's return, four manuscripts have been prepared on this research, each with Bolivian co-authors.

With Bolivian colleagues, the CREW team also taught an intensive bilingual short course on mine water biogeochemistry and treatment. Attended by more than 70 students and professionals, the four-day course included a full-day field trip to active and abandoned mines and was considered a huge success. A formal exchange agreement was signed with UATF and work has begun on a dual graduate degree program.

Also while in Bolivia, the CREW team performed three project assessment visits for the OU student chapter of Engineers Without Borders. These projects all address sustainable water-quality improvement technologies for small indigenous villages in the Andes. The team was hosted by the non-profit Engineers in Action group, which will facilitate future student team visits to Bolivia.

Planning is well underway for a return trip to Bolivia. Efforts have begun to secure funding for not only research, but implementation of mine water passive treatment technologies.



CREW team teaching at mine site

Guatemala

The quality of life in Rio Bravo, Guatemala, is diminished because of a lack of access to clean drinking water. This community of 19,000 people is transitioning into a better way of living, but is hampered because those with access to municipal water are unable to drink it without a high risk of exposure to parasites and harmful bacteria. Others are at even greater risk as they rely on river or shallow ground water sources, which expose them to Giardia and a variety of worms. Members of the OU student chapter and the Central Oklahoma professional chapter of Engineers Without Borders traveled to the Rio Bravo area in Guatemala in January 2008 to assess the water quality, infrastructure and human health of the region. They also made contact with local government representatives to coordinate a program to provide 7,500 people, over 35 percent of the community, with access to safe drinking water. Based on annual community health studies, between 2005 and 2007 more than 3,700 people suffered from various intestinal parasites. This included: 549 cases of Giardia, over 75 incidences of E. coli, 332 cases of worms, 32 incidences of malaria, one case of Dengue and over 3,000 incidences of amoeba-caused illness. EWB proposes to enhance the water quality for both urban and rural populations in order to improve community health. This includes implementation of a primary water treatment

system at two springs, as well as a study of the appropriate levels of secondary chlorine to be added to ensure residual chlorine throughout the system. A pilot project for 200 rural families will be conducted with point-of-use treatment and will be evaluated upon completion for the possibility of further expansion to more families. EWB also proposes exploration of deeper aquifers and to establish community wells as an alternative to point-of-use treatment system.



OU and Central Oklahoma Chapter EWB representatives with the mayor of Rio Bravo

WaTER Symposium and OU International WaTER Prize



Stephen Luby, OU
International WaTER
Prize recipient

The Water Technologies for Emerging Regions Center hosted the 2008 WaTER Symposium this past October. The symposium featured a panel of international experts from around the world who were selected as jurors to award the first OU International WaTER Prize. The panelists spoke about their experiences and expertise regarding

water and sanitation issues in remote villages of developing countries. The Symposium was then opened up to a question and answer session moderated by OU professor emeritus Paul Kleine. At noon, a luncheon was held at which Dr. Stephen Luby was announced as recipient of the first OU International WaTER Prize.

The purpose of the prize is to recognize and honor an individual who has made significant international contributions, either through research or teaching or service activities in the field of water supply and sanitation, with a focus on the world's poorest living in small villages/communities in rural or remote regions. The prize is a biennial award sponsored by OU's WaTER Center and made possible with generous gifts from alumni and friends. Luby will be officially presented with this award at the 2009 International WaTER Conference to be held in late October 2009. The prize includes a \$25,000 cash award, with half of the award going directly to Luby and half going to the water-related non-profit organization of his choice. Luby also will receive a replica of the WaTER symbol and a bronze plaque. This is one of the first and largest prizes dedicated to the field of water supply and sanitation in remote areas of emerging regions.

Luby has worked for the International Centre for Diarrheal Disease Research, Bangladesh, since 2004. He is head of the Program on Infectious Diseases and Vaccine Sciences and also functions as the head of the Agency for the Centers for Disease Control in Bangladesh. He earned a bachelor of arts degree in philosophy from Creighton University in 1981 and a medical degree from the University of Texas Southwestern Medical School at Dallas in 1986. He completed his internship and residency in internal medicine at the University of Rochester-Strong Memorial Hospital. Luby studied epidemiology and public health in the Epidemic Intelligence Service and the Preventive Medicine Residency of the Centers for Disease Control and Prevention. He has authored more than 120 scientific articles, the majority concerning communicable disease epidemiology in low-income countries.

The jurors for the OU WaTER Prize included Greg Allgood, Ph.D.; professor Michael Campana; Henock Gezahegn; Daniele Lantagne; and Malcolm Morris. Allgood is the director of Children's Safe Drinking Water at Procter & Gamble and the company's Senior Fellow in Sustainability. Allgood has been with P&G for 23 years and leads P&G's efforts to provide safe drinking water in the developing world. He holds a doctoral degree in toxicology from North Carolina State University and a master of science degree in public health from the University of North Carolina – Chapel Hill, where he did research in the water area. In 2007, the program that Allgood leads received the Ron Brown U.S. Presidential Award for Corporate Citizenship, the United Nations Association Global Leadership Award, the Grainger Challenge Bronze Award for Sustainability and the EPA Children's Health Excellence Award. Allgood is chair of the communications working group of the World Health Organization's International Network to Promote Household Water Treatment. He serves on the Advisory Board of Aquaya

Institute and the Global Health Focus of the Clinton Global Initiative.

Campana is a hydrogeologist and international expert on a range of complex water management issues. He became director of the Institute for Water and Watersheds at Oregon State University in June 2006 after serving as the director of the Water Resources Program at the University of New Mexico. He has done extensive research on water resources in developing countries, transboundary water resource issues, water allocation and availability, and other areas. He also is founder and president of a charitable foundation that funds and undertakes water, health and sanitation projects in developing nations.

Gezahegn is marketing and technical services director for Population Services International, Addis Ababa, Ethiopia. Gezahegn has extensive senior management experience in both the private and public sectors. His experience in health services delivery includes social marketing of Point of Use water treatment and malaria prevention. He was instrumental in setting up the POU intervention in Ethiopia, from determination of chlorine demand all the way to setting up local production capacity with a co-packing arrangement.

Lantagne works for the Centers for Disease Control and Prevention in Atlanta. She received her environmental engineering degrees from MIT (BS '96, M.Eng. '01, PE '03) and is currently pursuing her doctoral degree at the London School of Hygiene and Tropical Medicine in addition to working at CDC. In her three years at MIT and four years with CDC, she has worked to implement and study chlorination, filtration and combined household water treatment implementations in more than 30 countries. She is a member of the board of directors for Potters for Peace.

Morris is chairman of Stewart Title Co. Morris oversees the financial stability and improvements in efficiency of the company's title insurer operations. He received his bachelor of business administration degree from Southern Methodist University and master of business administration and doctor of jurisprudence degrees from the University of Texas. He served as president of both the Texas Land Title Association and the American Land Title Associations. He also is an active civic leader, having served as chairman of Living Water International and founder and current chairman of the Millennium Water Alliance of America — non profit organizations with a common goal to bring clean water to 500 million people by the year 2015.

Laura Brunson Receives NSF Fellowship

Laura R. Brunson was awarded a National Science Foundation Graduate Research Fellowship in 2008. Brunson currently is finishing a master of environmental science degree in CEES and plans to use this fellowship to begin her doctoral degree.



Laura R. Brunson

The NSF fellowship includes a cost-of-education allowance and living stipend for three years of graduate study. Brunson said, "I am very grateful for the opportunity this fellowship offers me to continue learning and pursuing water quality research intended to help reduce the amount of people in the world lacking access to safe water."

Brunson is part of the WaTER Center; her graduate research focuses on sustainable fluoride - and arsenic - removal technologies for rural areas in emerging regions. She is investigating the use of such technologies as fish and cow bone char sorption, and

also is developing an economic model for technology implementation. In the summer of 2008 she traveled to Tanzania to investigate water quality issues and hopes to return in the future to conduct research on fluoride-removal technologies and implementation strategies. (See previous Tanzania section of WaTER Center and EWB article.)

Brunson grew up in Indiana and came to Oklahoma as a National Merit Scholar in 1997. She graduated summa cum laud with a business degree and plans to use both her business background and the skills and education she is gaining during her graduate studies to work in a leadership position for a non governmental organization focused on water quality. After graduate studies, she also is interested in teaching environmental science courses at the collegiate level. In addition to her current graduate work, Brunson is the vice president of the Board for Sustainable OKC, a nonprofit organization serving the Oklahoma City area.

Sabatini Honored



David A. Sabatini

Professor David A. Sabatini has been selected to receive the 2008 Outstanding Educator Award from the Association of Environmental Engineering and Science Professors. The award is given annually to “recognize and honor the development of innovative teaching methods, including the application of these

methods in the classroom and the dissemination of methods to the academic community.”

Preference is usually given nominees who have both developed and applied innovative and improved teaching techniques and disseminated these contributions to the educational community through appropriate and widely accessible means. This award is open to nomination at any rank. The award is sponsored by John-Wiley & Sons, Inc.

Sabatini is a David Ross Boyd Professor and holds the Sun Oil Company Endowed Chair in Civil Engineering and Environmental Science. He also is the director of the WaTER Center and associate director of the Institute for Applied Surfactant Research at OU. He also serves on the environmental advisory board for subsurface remediation for DuPont Chemical Co. and the Science Advisory Board of the Superfund Research Center at the University of Arizona.

Sabatini also was recently named a co-Editor-in-Chief for the *Journal of Contaminant Hydrology*, an international journal publishing scientific articles on the physical, chemical and biological processes influencing the behavior of organic and inorganic contaminants in the subsurface. Sabatini served as associate editor for 10 years prior to his appointment as a co-editor-in-chief.

Faculty Awards

CEES faculty continue to receive both local and national recognition. OU initiated the Alumni Teaching Awards in 2007. These awards are designed to recognize excellence in undergraduate instruction. Professor Kim Mish and assistant professors Kianoosh Hatami and Chris Ramseyer received alumni teaching awards for fall 2007. Professor Randall Kolar and associate professor Tohren Kibbey received alumni teaching awards for spring 2008.



Kim Mish



Kianoosh Hatami



Tohren Kibbey



Baxter Vieux



Chris Ramseyer



Randall Kolar



Yang Hong



Thomas Kang

CEES was well represented at the spring Faculty Awards ceremony. Professor Kim Mish received the OU Regents' Award for Superior Teaching. Professor Randall Kolar received the Austin Presidential Professorship. Professor Baxter Vieux was awarded the Joseph A. Brandt Professorship.

Associate professor Yang "Eric" Hong received a Group Achievement Award from the National Aeronautics and Space Administration. Assistant professor Thomas Kang received the Wason Medal for Most Meritorious Paper from the American Concrete Institute Board of Directors. Assistant professor Chris Ramseyer was granted the BP Professor Award by summer Engineering Academy students.

SkyDance Bridge Project

Construction on the SkyDance Bridge — a \$5 million project that will reshape the Oklahoma City skyline as part of the Core to Shore plan — will soon be under way with the help of CEES assistant professor Chris Ramseyer. Ramseyer is part of a nine-person design team that recently was awarded the contract to design the pedestrian bridge which will span the new Interstate 40 alignment. “This project has helped me better understand the art of structural design. I will be able to bring aspects of this project into the classroom and give my students a better understanding of a structural engineer’s role in the design and construction process,” said Ramseyer.

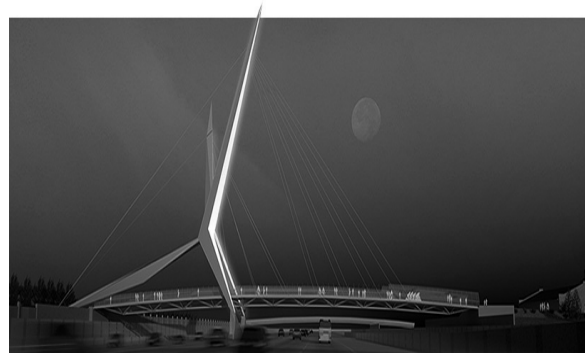
Butzer Design Partnership, led by Hans E. Butzer, OU College of Architecture professor and co-designer of the Oklahoma City National Memorial, beat out three other teams for the chance to design the 30-foot-wide, 185-foot-tall SkyDance Bridge. Ramseyer’s role in the project consisted of analyzing and completing the structural design to ensure the bridge could be built within budget and meet all strength and serviceability requirements. Ramseyer completed the structural analysis at the Fears Structural Engineering Laboratory, where he is the director. The Fears Lab is used to conduct research projects for private companies and government agencies. It also is home to the Oklahoma Department of Transportation’s Bridge Design Squad.

“The lab generates \$1 million in research annually,” said Ramseyer whose research focuses mainly on concrete and steel. He currently is investigating how flowable concrete affects reinforcement in such concrete structures as bridges. Also part of a team that monitors how bridges are holding up, Ramseyer is working on the Intelligent Bridge System project, which began about five years ago and enables researchers to check on the condition of several bridges from a laptop computer.

“Most people don’t realize that we have over 20,000 bridges in Oklahoma, and that their

condition is amongst some of the worst in the nation,” Ramseyer said.

With the SkyDance Bridge project, Ramseyer feels he is part of the team building one of the best bridges in the nation.



SkyDance Bridge Design

Tar Creek Passive Treatment Center Goes Online

Perhaps nowhere is the problem of ground and surface water contamination more evident than at the Tar Creek Superfund Site in far northeastern Oklahoma, the center of a three-state abandoned lead- and zinc- mining district. Environmental problems at the site include metal-contaminated mine water that originates from abandoned underground mines, some of which are 100 to 350 feet below ground. The toxic mine water flows up through abandoned mine shafts, bore holes and natural springs and discharges into Tar Creek and its tributaries.

Despite the fact that Tar Creek has been an Environmental Protection Agency Superfund Site since 1983, no mine water treatment has taken place until now. In the fall of 2008, a team of environmental scientists and engineers from CEES completed construction of the region’s first mine water treatment system. The project was funded by the U.S. Environmental Protection



Mayer Ranch Site before construction

Agency, and OU hired CH2M-Hill as the design/construction consultant through a competitive bid process.

The water emerging from the abandoned mines contains elevated levels of metals, especially iron, zinc, lead and cadmium. These metals deteriorate water quality and adversely impact aquatic ecosystems.

The Mayer Ranch Passive Treatment Center is located on 10 acres at the edge of Commerce, Okla. The passive treatment system utilizes a series of natural biogeochemical reactions to treat the mine water. It's a multi-cell treatment system that precipitates the dissolved metals and buffers the pH of the toxic mine water. The contaminated water first enters an oxidation pond, where it remains for about eight days and elevated iron and zinc levels decrease. Next it moves to surface flow wetlands, where residual particulates are retained. From the wetlands the water passes through vertical flow bioreactors, where lead and cadmium removal is targeted, and then to re-aeration ponds that utilize windmill and solar panel - powered aeration units. After passing through these ponds, the water filters through limestone beds and then into a polishing wetland before emptying into a tributary of Tar Creek.

This is the first mine water treatment facility of any kind in the district," said Bob Nairn, associate professor of civil engineering and environmental science and principal investigator on the project. "Our project

involves design, construction and evaluation of the passive treatment system and would not be possible without the assistance of our generous private landowners. It is an application of ecological engineering – the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both. We have been working here for a decade and we're excited to see construction completed and the system operational," he said.



Aerial view of completed passive treatment center. Orange mine water flows from bottom of photo to clear water at the top.

"Our passive system is low-maintenance and it provides the proper environment for naturally occurring biogeochemical, biological, and physical processes to positively impact water quality. It represents a state-of-the-art ecological engineering research site for passive treatment of mine waters," Nairn said.

The water discharging into the Mayer Ranch treatment system generates about 200,000 pounds of iron, 14,000 pounds of zinc, 11 pounds of cadmium and 23 pounds of lead annually. Nairn estimates the remediation site could reduce the overall flow of metals into Tar Creek by about 25 percent.

"It's important to understand that this site represents just one point of contamination in the region," Nairn said. "Only time will tell, but we believe a year from now the amount of metals going into the creek from this location will be at very low levels. If it works here, this technology can be applied to virtually any mine discharge site in the world."



Environmental Science graduate students Darcy Lutes and Alissa Sutter take water samples from the passive treatment center.

Building: An Experience

The Donald G. Fears Structural Engineering Laboratory was enlarged last summer with the addition of a 1,800-square-foot lab building dedicated to studying shrinkage and curl of concrete slabs on grade. This construction process was unique for OU; it was built by CEES students. Five students - Kyle Haskett, Norman, Okla. senior; Chris Davis, Jones, Okla. senior; Chris Hill, Edmond, Okla. junior; Marissa Samaripa, Oklahoma City senior; and Michael Rice, Nacogdoches, Texas sophomore - spent the summer constructing the structure under the mentorship of assistant professor Chris Ramseyer.

The students dug the footings, laid out the anchor bolts and rebar, poured the foundation, erected the steel frames and secondary structural elements, and insulated and paneled the walls and ceilings. The only sub-contracted work was the casting of the interior slab and the electrical work. While the experience was guided by Ramseyer, he "did not double check any of the construction measurements." At first the students were hesitant about the process, but were allowed to learn from their mistakes. And yes, mistakes were made and corrected. "I didn't see any mistakes that hadn't been made at some point by a contractor. I'm proud of what these students have accomplished," Ramseyer stated. Students also learned some of the difficulties of construction and how to make corrections to problems in a timely fashion.

The new shrinkage and curl building at Fears Lab has seven test beds for studying the long-term behavior of concrete slabs on grade. The test beds allow 3-foot-by-20-foot slabs to be tested with full restraint at each end of the specimen while the top surface is exposed to a controlled environment and the bottom surface is exposed to soil temperatures and moisture. The construction of the test facility and the first series of tests are financially supported by CTS Cement Manufacturing Corp. of Cypress, Calif.



Curling and shrinkage lab construction

ALUMNI NEWS

John Derick Thompson grew up in east Texas until high school, when he and his family moved to Davis, Okla. He graduated from Davis High in 2000, then moved to Norman and attended OU, where he received his bachelor of science degree in civil engineering in 2005. He currently is



Derick Thompson

working on his masters degree in civil engineering and plans to finish in spring 2009. As a graduate student, Thompson worked with assistant professor Chris Ramseyer to research methods to enhance the bond

performance of pre-stressing tendons in pre-tensioned concrete. While at OU, Thompson was an officer in the student chapter of ASCE and worked on the Concrete Canoe Team for three years. He also was admitted to the Chi Epsilon honor society.

In 2004, Thompson began his engineering career at Crafton, Tull and Associates, a civil engineering firm in Oklahoma City. However, in 2006, career opportunities led him to Houston to work for Haynes Whaley Associates, a firm with a primary focus on structural engineering. Houston is home to Haynes Whaley Associates' corporate headquarters and has provided engineering services for more than 30 years.

Early in his career for Haynes Whaley, Thompson designed *Bay Lake Tower - Disney Contemporary Resort*, a DVC resort

hotel for Walt Disney World in Lake Buena Vista, Fla. After design for the hotel was complete, he had the opportunity to relocate to Orlando to serve full-time onsite as a threshold inspector for construction of the hotel. Being onsite everyday in this role for nearly two years provided Thompson with valuable field experience that has redefined his design approach for future projects. While working in Orlando, he met and married his wife, Jennifer, and is now living with her in Houston once again. Since moving back to Houston, Thompson has been promoted to director of client development for Haynes Whaley Associates.

Thompson is a devout Oklahoma Sooners fan and a perpetual student and plans to return to school to receive his MBA. While OU may not be the school he returns to for his degree, he will never forget the faculty and staff in CEES and all of their support which he says went above and beyond the role of the student-professional relationship.

We'd love to hear from you! If you have news to share in the next issue of *Communiqué*, please contact us:
334 Carson Engineering Center
202 W. Boyd St.
Norman, OK 73019-1024, or cees@ou.edu

2008 GRADUATES

Spring

B.S. Architectural Engineering

Shelby Pankop Eric Waskewitz
Marissa Samaripa

B.S. Civil Engineering

Brandon Birch	Chris Hickman
Charles Bright IV	Ted Huynh
Russell Buhler	Daniel Knickmeyer
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AWARDS AND HONORS

- **Laura Brunson** received a NSF Graduate Research Fellowship.
- **Laura Brunson** received an Outstanding Paper Award for her presentation at the National Groundwater Association meeting in Memphis.
- **Russell Buhler** received the Outstanding Senior in Civil Engineering Award.
- **Kianoosh Hatami** received an Alumni Teaching Award.
- **Yang Hong** received a Group Achievement Award from the National Aeronautics and Space Administration.
- **Thomas Kang** received the Wason Medal for Most Meritorious Paper from the American Concrete Institute Board of Directors.
- **Tohren Kibbey** received an Alumni Teaching Award.
- **Amanda Kilmer** received the Outstanding Senior in Environmental Engineering Award.
- **Kristin Knapp** received the Outstanding Senior in Environmental Science Award.
- **Randall Kolar** received the Lloyd and Joyce Austin Presidential Professorship.
- **Randall Kolar** received an Alumni Teaching Award.
- **Kim Mish** received the Regents' Award for Superior Teaching.
- **Kim Mish** received an Alumni Teaching Award.
- **Thu Nguyen** received the Honored Student and the Manuchehr Eijadi Awards from the American Oil Chemist Society.
- **Shelby Pankop** received the Outstanding Senior in Architectural Engineering Award.
- **Tri Phan** received the S&D Division Student Travel Award from the American Oil Chemist Society.
- **Chris Ramseyer** received the BP Professor Award by summer Engineering Academy students.
- **Chris Ramseyer** received an Alumni Teaching Award.
- **David Sabatini** was named co-editor-in-chief of the *Journal of Contaminant Hydrology*.
- **David Sabatini** won the Outstanding Educator Award from the Association of Environmental Engineering and Science Professors Foundation.
- **Baxter Vieux** received the Joseph A. Brandt Professorship.

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Contributing writer and editor: Robert Knox, Ted A. Kritikos Chair, Presidential Professor, Director, School of Civil Engineering and Environmental Science
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