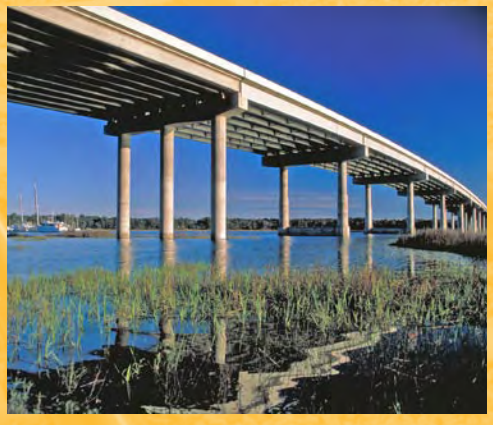
NC STATE UNIVERSITY

CCEE News

A NEWSLETTER FOR ALUMNI AND FRIENDS OF THE DEPARTMENT OF
CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING AT NORTH CAROLINA STATE UNIVERSITY



FALL 2006

FROM THE DEPARTMENT HEAD

Greetings from NC State. In July a year ago, I succeeded Downey Brill, my good friend and colleague, as head of the department. Downey more than ably led the department for 17 years, since 1988, through significant growth and the construction of new facilities. Downey has returned to being a regular faculty member and serves as the Director of the Center for Transportation and the Environment (CTE). NC State is clearly a great place to work; people like to stay, and because of that, I have not just one, but two extraordinary prior heads upon whom I can rely for institutional memory and counsel. Paul Zia, who preceded Downey, is also still active as an emeritus faculty member.

George List

NC State has a great program, as you already know. With 40 faculty members, 700 undergraduates, and 240 graduate students, ours is one of the largest departments in the country and also one of the best, ranking in the top 10 percent of all civil engineering departments nationwide, based on *US News and World Report*. It also has many distinctive assets such as the Constructed Facilities Laboratory, headed by Prof. Sami Rizkalla, and the more than 50-person Institute for Transportation Research and Education — another significant asset that attracted me here — headed by Prof. Nagui Rouphail. We're very proud of the things we do, and we're sure you are, too. As the newsletter articles amply demonstrate, we have great faculty, great students, a vibrant extension program, a growing distance education program, great facilities and the expectation of moving to Centennial Campus sometime in the next 10 years. Arguably, we're one of the most fortunate departments in the country today.

Before coming to State, I was chair of the Department of Civil and Environmental Engineering at Rensselaer Polytechnic Institute. I held that position for 9 years and for the 12 years before that was a faculty member. I received my bachelor's degree from Carnegie Mellon University in 1971, my master's degree from the University of Delaware in 1976 and my doctorate from the University of Pennsylvania in 1984, in transportation. Before joining RPI, I spent five years as an engineering consultant, and before that, four years as an officer and instructor in the US Navy.

Now, NC State is my home.

As you might expect, my role is to lead the faculty and staff in their quest to fulfill their dreams of scope, scale and stature. But as some of you may already recognize, department heads don't actually lead in the same way that military officers do, or corporate presidents. Instead, my role is to create collaborative visions, seek ways to open doors, help forge partnerships and help find the resources that the faculty and staff need to fulfill their aspirations.

This year was one of reflection and growth. For example, we engaged in strategic planning. Faculty groups made presentations about core competencies, strengths, weaknesses and aspirations. At our retreat on May 11, we forged these ideas into a vision for the future. Some commitments you might find interesting include making the construction program the best in the nation, adopting a theme of "engineering for sustainable civilization" and focusing on North Carolina-related problems in our research, especially the needs of the coastal region, with an eye toward helping North Carolina deal more effectively with hurricanes and other cataclysmic events and conditions.

We also had changes in our faculty. John Fisher, Ajaya Gupta and Malcom Rooney retired, and Allen Chao started phased retirement. Two new faculty arrived — Sankar Arumagam in water resources and Matt Evans in geotechnical engineering — and a third was hired, Rudi Seracino, in structural engineering. Searches are underway for faculty in construction engineering and coastal engineering, with hires expected this fall or spring.

In March we dedicated a brand-new environmental engineering research lab in the basement of Broughton Hall, and we installed a supercomputer cluster in the computer resource room on the third floor of Mann Hall. We have continued to conduct innovative events like the summer workshop for students from Venezuela and the summer camp for high school students. We're considering additional hands-on experiences, study-abroad ideas and K-12 outreach activities. Another note is that a Departmental Advisory Board is being formed. You might know one or more alumni who are industry leaders that would be ideal candidates for the board.

Arguably, we're one of the most fortunate departments in the country today.

See the mailback card on the back of the newsletter and feel free to send us your thoughts about what we should be doing and where we should be placing our emphases.

We look forward to hearing from you!

– George F. List
Professor and Department Head

NC State Environmental Engineering Researchers Use Gene Probing to Improve Wastewater Treatment

Municipal and industrial wastewater has to be effectively treated to remove organic and nutrient pollutants before discharge to streams and rivers. Using leading edge technology, environmental engineers at NC State University are improving our understanding of how microorganisms can be influenced to increase the performance of wastewater treatment plants.

One major role for microorganisms is the multi-step conversion of harmful ammonia nitrogen to harmless nitrogen gas. According to Francis de los Reyes III, assistant professor of Civil, Construction, and Environmental Engineering, treatment plants typically supply large amounts of oxygen to allow microorganisms to convert ammonia to nitrite, then nitrite to nitrate. Nitrate is then converted to nitrogen gas by denitrifying bacteria. However, de los Reyes says less oxygen is required if the process is circumvented by bacteria that use nitrite instead of nitrate. Determining the identity and function of these nitrite-reducing bacteria is a challenge.

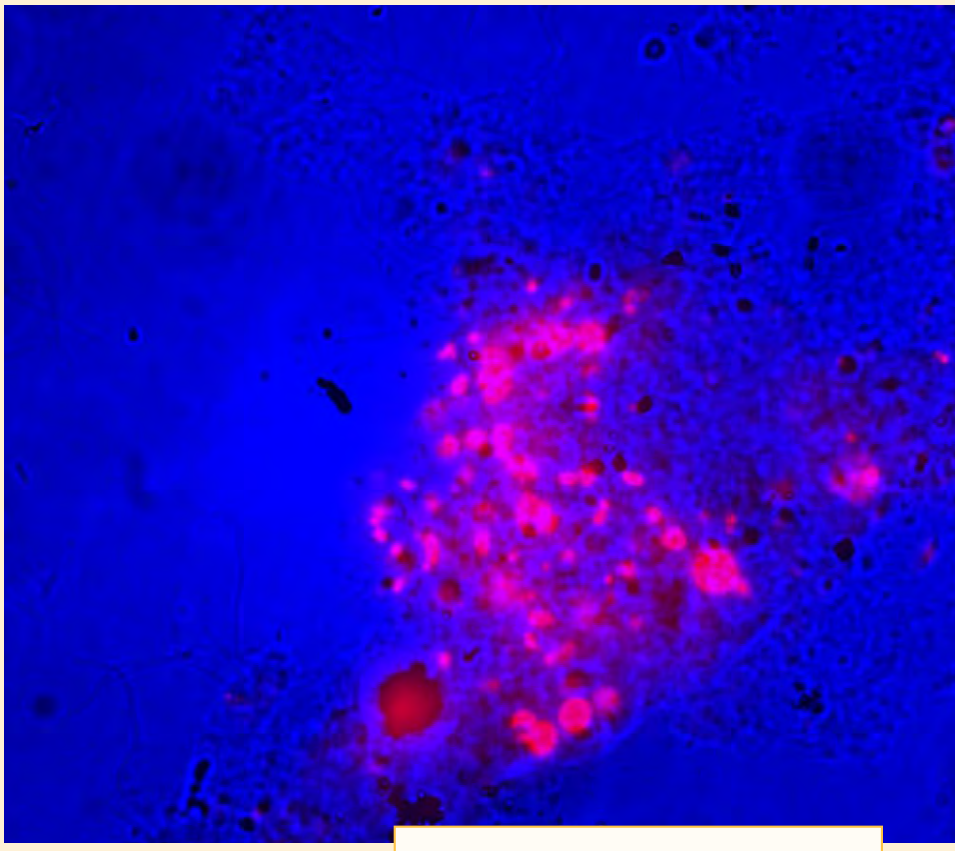
De los Reyes and NC State PhD student Cesar Mota are studying this problem using a gene-probing method that targets the messenger RNA of nitrite-reducing bacteria. Using a technique called mRNA-FISH (Fluorescence In Situ Hybridization), they are able to fluorescently tag active nitrite reducers in wastewater bioreactors. This technique targets the functional nitrite reductase gene and helps them identify bacteria responsible for nitrite conversion.

"Targeting functional genes is a big leap in this research area. In previous methods, you had to know the identity of the organism before you can tag it. Now, you can target the gene and ask the question of which bacteria are performing the function," said de los Reyes. "We are now extending the method to allow separation of the fluorescently labeled cells and subsequent identification of the species involved. Once the organisms are identified, we can then track them and see which factors can be used to influence their growth and, ultimately, reactor performance."

The new method, called mRNA FACS, also allows the researchers to spatially relate the different groups of organisms involved in the nitrogen conversions. Already, the researchers are seeing some interesting results, including some preliminary data showing that some ammonia oxidizing bacteria are also nitrite reducers.

"The finding is significant, since it means we can potentially run treatment plants with 60 percent less oxygen," said de los Reyes. "The process will be best for wastewater with high nitrogen and low carbon, since you can also save potentially up to 100 percent of the carbon requirements."

The current research is funded from a four-year National Science Foundation (NSF) Microbial Interactions and Processes grant. Future applications of this work include targeting other functional genes important in environmental cleanup. "We can potentially use the new method to identify and quantify the microorganisms involved in cleaning up groundwater contaminated sites or specific pollutants," said de los Reyes. "Very few engineers are using molecular methods in this way."



This fluorescence micrograph depicts active nitrite-reducing bacteria (red fluorescence) in activated sludge.

Ribbon-Cutting Ceremony Celebrates New Lab

The Department of Civil, Construction, and Environmental Engineering marked the opening of a new laboratory dedicated to environmental engineering research with a ribbon-cutting ceremony held in March 2006 in 2115 Broughton Hall.

The new 5,200 square foot facility will support the department's research programs in water and wastewater treatment, contaminant transport and site remediation, solid waste engineering and molecular microbial ecology. The laboratory has been designed to meet the department's needs with specially designed space to support the wide array of ongoing research. It features rooms dedicated to analytical instrumentation and pilot-scale work, greatly improved ventilation and hoods, large constant temperature rooms and specialized fume hoods to support pilot-scale research.

"Starting research in the new facility has been great," says Prof. Morton A. Barlaz, director of the laboratory. "It has been designed to address many of the limitations of the old laboratory, and the space is much more efficient."

During the tour, Barlaz explained that the new laboratory space is designed for flexibility, and he demonstrated one of the strategically placed, moveable mini fume hoods.

The ceremony was held in conjunction with the 2006 Water Resources and Environmental Engineering Graduate Research Symposium. This event featured a talk by N.C. Vasuki, chief executive officer of Delaware Solid Waste Authority. His lecture, "Solid Waste Processing and Disposal: Another Frontier in Environmental Management," preceded the ribbon-cutting ceremony and more than 25 poster presentations of graduate student research in various areas of environmental engineering, including water and wastewater treatment, risk analysis, solid waste management, watershed/groundwater management, environmental systems analysis, air pollution and coastal engineering.

Asphalt Pavement Modeling Research Draws International Acclaim

Pavement engineers at North Carolina State University have long enjoyed global recognition for asphalt pavement modeling and success at predicting the long-term performance of pavements. Indeed, research by Professors Richard Kim and Murthy Guddati of the Asphalt Materials Analysis Group and the Computational Mechanics Group at NC State has both national and international implications, as evidenced by two of their current projects, one funded by the Federal Highway Administration (FHWA) and the other by the Korea Highway Corporation (KHC). The Korean partnership is especially exciting, not only because the NCSU project is the first overseas pavement research project funded by the KHC, but also because of the potential for a long-term and expanding international relationship.

The NCSU team is working on the development of a three-dimensional VEPCD-FEP++ model, a structural pavement model used to predict asphalt pavement behavior.

The FHWA project incorporates full-scale Accelerated Loading Facility (ALF) testing on various asphalt mixtures, including polymer modified mixtures. The Korea Test Road project involves continuous measurement of environmental conditions and traffic loading on a 7.7 km section of instrumented test road on the Jungbu Inland Expressway, as well as periodic measurements of pavement responses under moving loads and the Falling Weight Deflectometer. The Korean project is significant, with construction costs at $19 million and a $3.75 million research budget. The NCSU research team's current work applies a newly developed model to both of these projects.

The NCSU team is working on the development of a three-dimensional VEPCD-FEP++ model, a structural pavement model used to predict asphalt pavement behavior. The VEPCD (viscoelastoplastic continuum damage) model, developed by Kim, was the subject of the Emmons Best Paper award in 1997 and runner-up for the Emmons award in 2002 for its ability to predict pavement performance under various loading and environmental conditions using much simpler testing requirements than those needed before its implementation. The FEP++ (finite element program in C++), developed by Guddati, provides an excellent framework for Kim's VEPCD model. The marriage of the VEPCD model and the FEP++, i.e., VEPCD-FEP++, is a perfect bridge for laboratory asphalt mixture testing and the performance prediction of asphalt pavements. It is this VEPCD-FEP++ model that will be validated and calibrated using the field performance data

*(see "**Pavement**," page 11)*

Prof. Joel Ducoste leads the FROG project from NC State University.

Researchers Study FROG Problem in Sewer Systems

There is a FROG problem in the sewer systems. No, it's not the croaking kind but the slick, matted kind.

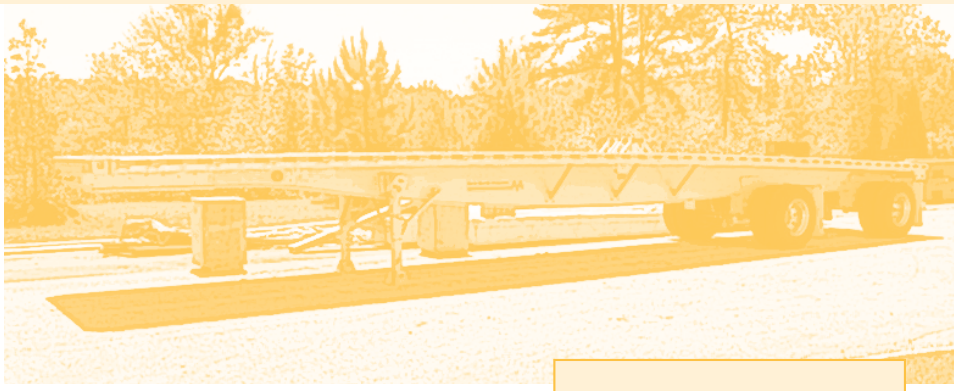
The accumulation of fat, roots, oil and grease (FROG) in sanitary sewer collection systems can lead to sanitary sewer overflows (SSOs). Ongoing sewer system maintenance by public utilities is required to prevent wastewater overflows that end up in creeks and rivers. Better ways of removing FROG during a pretreatment stage can help reduce maintenance costs.

Prof. Joel J. Ducoste, associate professor of civil, construction, and environmental engineering at NC State University, and a multidisciplinary team have received funding from the Water Environment Research Foundation to study aspects of FROG pretreatment. In particular, they will investigate ways to improve grease interceptor performance, analyze the surface chemistry of pipe surfaces to determine if one surface over another favors fat, oil and grease (FOG) accumulation and study treatments designed to reduce the regrowth of roots in pipes.

Joining Ducoste, who is leading the two-year project, are Prof. Kevin M. Keener, associate professor of food science at Purdue University; Prof. John W. Groninger, associate professor of silviculture in the Department of Forestry at Southern Illinois University; Leon Holt, utility pretreatment manager with the Town of Cary; and Barbara Oslund, senior engineer at Solutions-IES in Raleigh.

The primary focus of the FROG project deals with two types of blockages that cause SSOs. Ducoste said, "According to the EPA [US Environmental Protection Agency], blockages make up at least 40 percent of sanitary sewer overflows." The first type of blockage is caused by food-related wastes, FOG, that get into the sewer systems from food preparation and cleaning activities at food service establishments and, to a lesser degree, at private residences. The second is caused by plants, particularly tree roots that have penetrated sewer pipes through cracks. Root hairs combined with hardened fat create dense mats that build up in the pipes and eventually constrict or block wastewater flow. The team's multifaceted approach to tackling these issues includes surveys, field and lab work, pilot-scale testing and computer simulations.

First Composite Material Trailer Developed in US Is Evaluated by NC State University



Martin Marietta Composite Prototype Trailers have logged over 800,000 miles to date.

Testing has recently been completed evaluating the performance of a 48-foot platform trailer made almost entirely of Fiber-Reinforced Composite material. This testing was performed in the Large Scale Structural Systems Laboratory located at the Constructed Facilities Laboratory (CFL) at NC State University. The trailer is a prototype which was developed by Martin Marietta Composites, a company based in Raleigh, NC.

Martin Marietta Composites has combined two patented composite technologies to build a trailer that is lightweight and corrosion resistant. This trailer is 30 percent lighter than equivalent conventional aluminum or steel trailers which could result in a 5 to 15 percent savings in operating costs. The composite chassis was licensed to Martin Marietta Composites by Compositrailer n.v. of Belgium.

Martin Marietta Composites adds the body which is made of Transonite®, a fiberglass sandwich panel produced at their new 185,000 square foot production facility in Sparta, NC. The trailers are also manufactured at the Sparta facility. Composite trailer technology is the result of many years of research.

Martin Marietta Composites is an industrial member of the National Science Foundation (NSF) Industry/University Cooperative Research Center on the Repair of Buildings and Bridges with Composites (RB2C), which is based at the CFL and directed by Prof. Sami Rizkalla. Martin Marietta Composites collaborates with the research team at the CFL to further develop the material for a wide variety of applications. Much of the initial testing of the Transonite® product has taken place at the CFL since 2000.

The Alfred P. Norwood Chapter of Chi Epsilon at NC State welcomed 34 new members in 2005. Spring inductees were Donlawit Ariyasajjakom, Bradford Aycock, Gamze Gilez, Hartley Grimes, Amir Heidari, Ian Justice, Ian Johnson, Wan Soo Kim, Matthew Lamy, Bryan Loflin, Halit Mertol, Nuttapone Paoinchantara, Caleb Pike, Juan Recalde, Rabia Sarica, Elijah Smith, Alisha Taylor, Beth Visintine, Catrina Walter and Md Zahid. Chapter advisor Prof. James Nau was proud of the chapter's efforts in collecting over $2,000 in school supplies for children in Pascagoula, MS, affected by Hurricane Katrina.

Fall 2005 inductees are (front row, left to right) Justin Rowell, Meade Willis, Matthew Haley, Eleni Iverson, Michael Martin, Jordan Isenhour, Charles Aydlett; (back row) Joseph Barbee, Ernest Hahn, Pavan Immaneni, Phil Lewis, Jeremiah Smith, Michael Leggett, John Kells.

Congratulations to Inductees of the Alfred P. Norwood Chapter of Chi Epsilon

Inducted into Chi Epsilon on April 23, 2006

Carolina Marie Brady • Patricia Marie Clayton • Wesley Paul Corder • Charles Hunter DeVoto, III • David Benjamin Leonard • Jessica Marie McClure • Michael Lawrence McKenzie • Robert Laney Parker • Matthew Ryan Peterson • Kevin Shawn Ryan • Elizabeth Kay Waller

Inducted into Chi Epsilon on December 4, 2005

Charles Evans Aydlett • Joseph Andrew Barbee • Ernest Jin-Kyu Hahn • Matthew Timothy Haley • Jordan Kevin Isenhour • Eleni Marie Iverson • John Lee Kells • Michael Walter Leggett • Michael Eric Martin • Justin Edward Rowell • Jeremiah Lee Smith • Meade Hanes Willis • Venkata Pavan Kumar Immaneni • Michael Phil Lewis

North Carolina State University Chapter Faculty Guests and Officers 2005-06 are (front row, left to right) Elijah Smith (Marshal), Catrina Walter (Editor), Amanda Powers (President), Caleb Pike (Treasurer), Hartley Grimes (Vice President), Beth Visintine (Secretary); (back row) George List, Vernon Matzen, Jim Nau, Dave Parish.

NC State's ASCE Chapter Earns Honors from National ASCE

During the 2005-06 school year, NC State's American Society of Civil Engineers (ASCE) Chapter has greatly increased its presence on campus, and student membership is high. Based on its 2005 annual report, the National ASCE Chapter awarded the NC State student chapter with a "Letter of Significant Achievement" for participation in extensive activities including NC State's Shack-A-Thon. This fundraiser challenged student groups to build a shack out of wood and recycled materials and live in it for a week within a village of shacks located in NC State's brickyard. Someone was required to stay in the shack 24 hours a day and collect money from passing pedestrians. Along with TAPPI and AIChE, ASCE raised over $200 from this effort. The group also assisted with Habitat's Restore program by hosting a fundraiser for the Red Cross to benefit earthquake victims of South Asia.

In April NC State chapter members competed in the annual Carolinas Conference in Charleston, SC, and finished the competition in second place overall this year, which is the highest it has placed in over a decade. The two most notable events include the National Concrete Canoe Competition and the National Student Steel Bridge Competition. The Concrete Canoe team placed second and once again qualified for nationals at Oklahoma State. Other NC State Chapter teams fared well with a first place finish in the Environmental Design Competition, second place in the Knobmore Challenge and second place in the Student Mead Paper.

Students Groups Stay Connected to Private Sector

The NC State student chapters of the Associated General Contractors (AGC) and the National Association of Home Builders (NAHB) worked together this year to host several campus lunches with invited talks from the following companies: The Berger Group, Scott Cooper Builder, Perry Builders, Kimley-Horn, Ashland Construction, BovisLendLease, Mark Massengill Builder, HNTB, Turner Construction, Palladium Homes, PB Constructors, John R. McAdams Company, Forensic Engineering and Brasfield and Gorrie.

AGC student leaders, Ben Burgess, Justin Ramsey and Derek Kristeller also attended the national conference in March with student advisor Ed Weaver and Prof. David Johnston in Palm Springs, CA, where they heard Gov. Arnold Schwarzenegger speak.

The NAHB students were busy this year assisting professionals and promoting NC State at the Ideal Home Show at the NC State Fairgrounds, as well as marketing signup for FE Exam, one of its fundraisers.

Schroeder Receives Three Awards

Bastian Schroeder, a graduate student working in the Institute for Transportation Research and Education (ITRE) in the College of Engineering at NC State University, is the recipient of three fellowship awards and has been awarded a mentored teaching assistantship. A PhD candidate in civil engineering, Schroeder has been named a 2006 Eisenhower Graduate Fellow, a 2006 Eno Fellow and a 2006 Transportation Founders Fund (TFF) Fellow.

The fellowships will provide opportunities for Schroeder to attend national meetings in Washington, DC, and interact with top-level transportation executives. Only 20 students nationwide are selected to receive Eno Fellowships, and Eisenhower Fellows receive tuition and travel expenses to attend the Transportation Research Board (TRB) Annual Meeting. TFF awards fellowships each year to top students in the Department of Civil, Construction, and Environmental Engineering at NC State.

Schroeder will also participate in the Mentored Teaching Assistantship program in fall 2006. Nagui Rouphail, professor of civil, construction, and environmental engineering and director of ITRE, will serve as his mentor.

Amir Heidari

Heidari Wins Prestigious Melosh Medal

Amir Homayoun Heidari (PhD CE '05) won the 18th annual Robert J. Melosh Medal for the best student paper in Finite Element Analysis. Six finalists were invited to present their work to a panel of distinguished judges at Duke University in April 2006. Other finalists were students/graduates from Stanford, Berkeley, Texas A&M, Ohio State and RPI. Homayoun's winning paper resulted from his PhD research on novel subsurface imaging algorithms, conducted under the supervision of Murthy N. Guddati. The paper, based on Guddati's arbitrary wide-angle wave equations (AWWE), makes significant progress towards solving the problem of accurate detection of hidden objects in elastic media. Homayoun has developed imaging algorithms that are applicable to the field of seismic exploration for the detection of hydrocarbon reservoirs. This technique is also important because of its potential to identify hidden cracks in structures before they might lead to failure (nondestructive evaluation) as well as its eventual application in medical ultrasound. Heidari now works for Atlantia Offshore Limited.

Graduate Student News

In fall 2004, the number of CE graduate students, which had fluctuated between 189 and 212 over the previous four years, increased to a record 238. This level continues with spring 2006 enrollment of 242, including 150 master's students and 92 PhD students. The increase in master's students is largely a result of enrollments in the MCE degree offered by distance education which was initiated in fall 2002. The PhD increase is our response to the University's goal to increase the emphasis on the PhD programs.

To date, 50 distance students have been admitted to the MCE; the first two distance students graduated in December 2004 with 10 more graduating through May 2006. Over 115 individuals were enrolled as distance students in CE graduate courses during the 2005-06 academic year. Some were admitted to the MCE degree, and others were enrolled as PBS students trying out the program or taking a course to meet PDH requirements of PE licensure. The distance students live in North Carolina, Virginia, South Carolina, Georgia, Florida, Tennessee, Ohio, Pennsylvania, New York, Connecticut, Michigan, Indiana, Illinois, Minnesota, Nebraska, Colorado, Texas, Nevada, California and Washington.

About 120 of the current graduate students are supported during their studies. Research contracts and grants garnered by the faculty supported 85 as research assistants; teaching assistantships supported 26 during their studies. In addition, during 2004 and 2005 the following students were supported fully or partially as recipients of prestigious fellowships awarded in national or university competition:

National Science Foundation Graduate Fellowships – Michael Cropper, Elizabeth Harris, Gretchen Lear, and Ana Baeza-Freer • Eisenhower Fellowship U. S. Department of Transportation – Benjamin Shane Underwood • Emol Fails Graduate Fellowship in Construction – John Victor O'Janpa and Bart Grasso • Environmental Research and Education Foundation Fellowship – Bryan Staley • Governor and Mrs. Dan K. Moore Fellowship to Keep North Carolina Beautiful - Bryan Staley • College of Engineering Dean's Fellowships – Gerald Bridges, Zachary Clark, Michael Cropper, Alixendra Demers, Daniel Findley, Charles Johnson, Andrew Lacroix, Gretchen Lear, Gregory Lucier, Anthony Miller, John Victor O'Janpa, Jason Patrick, Brent Robinson, Preston Royster, Bastian Schroder, Matthew Sumpter, and Jarod Wheeler • Alumni Association Graduate Fellowships – Michael Cropper, Gregory Lucier, and Brent Robinson • Sean McGrath Memorial Fellowship - Dennis Rorie • American Association of University Women Fellowship – Emily Zechman • GE Faculty of the Future Fellowship – Emily Zechman • Transportation Founders Fund Fellowship – Elizabeth Runey, Zachary Clark, and Daniel Findley • Kimley-Horn/Ed Vic Fellowship – David Keilson • Southeastern Transportation Consortium Fellowships – Jongdae Baek, Chun Chen, Zachary Clark, Hazim Dwairi, Jin Ki Eom, Daniel Findley, Todd Fischer, Yang Han, John Horner, Yuan Xiong Huang, Mark King, Jae-Joon Lee, Jisun Lee, Sangyum Lee, Luis Mata, Mostafa Momen, Jae-Pil Moon, Rajit Ramkumar, Bastian Schroeder, Shashank Shekhar, and Baohong Wan.

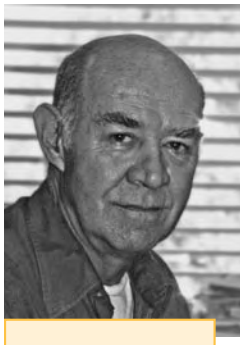
Kimley-Horn Steeped in NC State Tradition

Born out of the family of the NC State Department of Civil, Construction, and Environmental Engineering, Kimley-Horn and Associates has become one of the top engineering firms in the nation. Original partners Bob Kimley (BS '50, MS '51) and Bill Horn were transportation engineers. Kimley worked for the NC State Highway Commission while Horn was on the faculty of the NC State Civil Engineering Department. He was regarded as an indispensably creative engineer and outstanding teacher whose strengths would prove vital to the company as he nurtured young professionals.

Robert Wright

After the firm had been open for one year, the pair was joined by one of Horn's graduate students, C.E. "Ed" Vick, Jr. (BS '56, MS '60), known for his technical genius and gracious personality, which would lead to significant client relationships from coast to coast.

Through the combined strengths of its founders, and under the leadership of Vick as President and later President/Chairman, the business steadily grew during the 1970s and 1980s as it added new expertise and a broader range of services. It doubled twice in size from 1988 to 2004, and today Kimley-Horn employs over 2,000 people in more than 50 offices and is one of the nation's most comprehensive, highly respected engineering and land-planning firms. It has received numerous awards of honor and merit, as well as being named among the "100 Best Companies to Work For" in 2005 and 2006 by *Fortune*.



Bill Horn

In 2001 the family of Bill Horn created a $25,000 endowment in his memory to benefit and encourage young faculty in his home department at NC State — true to his spirit.

Vick would go on to receive the NC State University's Distinguished Engineering Alumnus Award, honoring his success and loyal support of NC State and the College. Working in the presence of a great leader produces a great leader. Case in point: Bob Wright (BS '68), now Chairman of Kimley-Horn and past-president of the NC State Engineering Foundation, Inc.

"Ed is my mentor," said Wright, "and has always been a dedicated supporter of the College and of NC State, so it follows that I would be too." Kimley-Horn led the effort to create the Ed Vick Civil Engineering Fellowship, which supports a graduate student in transportation. "When Ed retired, we wanted to honor him and his many years of service, so we thought it appropriate to follow his lead by supporting the department with his named fellowship," said Wright.

Ed Vick

The success at Kimley-Horn continues, as does the impact its leaders have had in the College of Engineering at NC State. "In 2004, during the second year of his tenure as President of the NC State Engineering Foundation, Bob Wright proposed and spearheaded a major restructuring of the board of directors in an effort to make their volunteer work more substantive and meaningful," said Ben Hughes, Executive Director of Development and College Relations in the College of Engineering. "Thanks in large part to the new organizational structure initiated by Bob and agreed to unanimously by the board, its members have significantly increased their personal involvement with, as well as their individual giving to, the College."

The NC State connection continues at Kimley-Horn — currently it employs 121 NC State alumni, approximately 81 of which are graduates of the Department of Civil, Construction, and Environmental Engineering.

"I continue to be amazed at the quality of students that come here each year. They are well-prepared and have a tremendous work ethic," said Wright.

About the Cover

Background: DART Light Rail Line West Oak Cliff Section 1 (Zoo Station) (Dallas, Texas). For Dallas Area Rapid Transit Authority (DART), Kimley-Horn provided civil and structural design services for a 13,000-foot long section of this new light rail facility. The project also included two side platform stations for Marsalis Zoo and Tyler/Vernon. *(Gary Zvonkovic)*

Top: Indian River County South RO Water Treatment Plant Modifications (Vero Beach, Florida). Kimley-Horn recently completed modifications to Indian River County's south RO water treatment plant. *(Steve Uzzell for Kimley-Horn & Associates)*

Middle: Town and Country Development at Stonebrier (Frisco, Texas). Kimley-Horn provided engineering, planning, design and surveying services for this 380-acre mixed-use development. Scope included assisting with the rezoning and entitlement of the tract, providing engineering services for a four-lane divided thoroughfare and planning the extension of the roadway across adjacent properties. *(Gary Zvonkovic)*

Bottom: Cross Island Parkway (Hilton Head Island, SC). Kimley-Horn was retained to provide a wide range of engineering services for the South Carolina Department of Transportation, which resulted in the 5.5-mile Cross Island Parkway, South Carolina's first toll facility. *(Cameron Davidson/CameronDavidson.com)*

Student Chapter Hosts Event to Express Gratitude to C.T. Wilson Construction Company

Attending the ceremony honoring Charles T. Wilson Jr. are (left to right) Dean Nino Masnari, Charles T. Wilson Jr., Prof. George List, Justin Ramsey and Prof. David Johnston.

Charles T. Wilson Jr. was honored in February for his company's $50,000 gift to endow the NC State University / AGC Student Chapter. Student members hosted the event, which included nearly 100 attendees. Wilson, president of C.T. Wilson Construction Co. in Durham, told the crowd, "I want to congratulate you for your involvement in the Construction and Engineering Management program here at State. There's plenty of construction work out there for you, and I don't think we are in danger of being outsourced," Wilson said.

The principal from an endowment is never spent, and approximately five percent of its earnings are used each year for the donor's designated purpose while any excess is returned to the corpus to grow the fund. Prof. David Johnston said the income from the endowment will enhance the student experience by enabling them to participate in Carolinas AGC and AGC of America activities.

Johnston told attendees that he did not know of any other families who had three consecutive generations of graduates from the department: Charles Wilson Sr. (BS '30), Charles Wilson Jr. (BS '65) and Charles Wilson III (BS '93). The NC State AGC chapter, chartered in 1930, was the first in the nation, and Wilson's father was one of the students who received the charter in Washington, DC. The founding members also met President Herbert Hoover at the White House to recognize the event.

Achieve! The Campaign for NC State

We invite you to invest in the achievement of the department by making a tax-deductible gift. Please mail checks payable to the "NC State Engineering Foundation, Inc." to Campus Box 7901, Raleigh, NC 27695, and write "CCEE" in the "for" line. A secure, online gift may also be made by visiting **www.acs.ncsu.edu/scripts/Advance/af_makeagift.pl** and designating it for the Department of Civil, Construction, and Environmental Engineering.

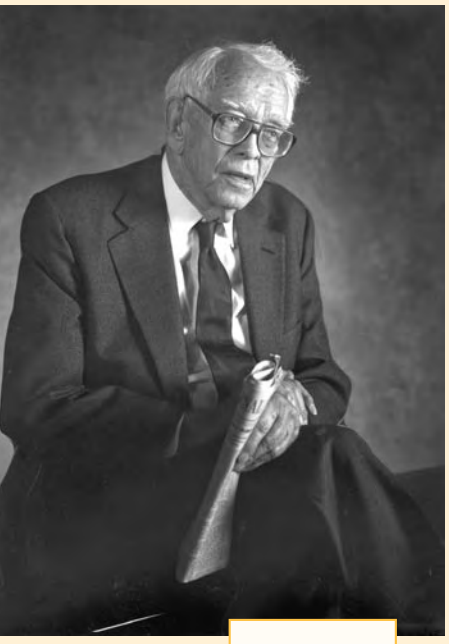
As of March 31, 2006, NC State is at 95 percent of its $1 billion goal, having raised $950,346,850, and the College of Engineering has raised $197,491,856, or 88 percent of our goal of $225 million. Support *Achieve! The Campaign for NC State*.

achieve!
The Campaign for NC State

New Professorship Established by Clancy & Theys

Family with close ties to NC State honors their father with the E.I. Clancy Professorship

One way to grow the faculty and attract nationally recognized professors is to pledge $1 million to create a professorship, which is exactly what brothers Tim and Tick Clancy did for the Department of Civil, Construction, and Environmental Engineering. The E.I. Clancy Professorship in Construction Management will be established using the $1 million gift from the company and matching funds of $500,000 to be provided by the Distinguished Professorship Endowment Trust Fund once the pledge is fulfilled, bringing the total value of the endowed professorship to $1.5 million.



E.I. Clancy

The Clancy family has a long history of philanthropy in many different areas, but because their father went to State, the family thought it was time to honor him by doing something in his name for the department. "As a boy during the 1920s, our father had seen an engineer looking through a transit and had decided right then and there that he wanted to become an engineer," said Tim Clancy, President. Tick Clancy, Executive Vice President, also noted his dad was intrigued by the blasting and tunneling through Beaucatcher Pass for the highway to Asheville, NC. He was convinced that he wanted to be an engineer. Clancy founded the company with his brother-in-law, J.C. Theys in 1948, so Tick said they would like to recognize him with this gift as well.

An Asheville native, Ernest I. Clancy (BS '38, Civil Engineering Construction Option) was one of the first to graduate from the construction program at NC State. He was also a Professional Engineer and a registered surveyor. Prior to founding the company, he worked during World War II in Alaska, supervising the construction of runways for the Civil Air Patrol.

A long history exists between Clancy & Theys and "State College" (as Ernest Clancy called it). The company has had numerous projects on the NC State campus, including Winston Hall and Engineering Building II, which was dedicated on Centennial Campus this April. Its employees have come to campus many times to give seminars and lecture in classes. Also, Ernest Clancy established a scholarship endowment in the department in 1999, to which the company has since contributed.

"Our goal with this professorship is to attract more students to the department, so if this endowment adds one faculty member, that would be great," said Tim Clancy. He noted that they employ more graduates from NC State than from any other university, and that construction in NC is so strong because of the education offered by the Department of Civil, Construction, and Environmental Engineering.

Giving to Make a Difference

Remember the challenges of financing higher education? You know the importance of having the very best resources to maximize achievement. You may be interested in helping students achieve their dreams. The NC State Engineering Foundation provides many options to assist in turning your vision into reality. You may support students, faculty or programs in the Department of Civil, Construction, and Environmental Engineering by simply writing a check for an annual fund gift, or consider a planned gift that can allow you to make a much bigger impact than you may have thought possible.

One attractive option for many donors is an endowment, where only the income produced is spent as the donor designates, so the principle is never used and excess earnings are returned to the fund for growth. This provides funds in perpetuity, creating long-term financial stability so the department is less dependent on unpredictable funding sources.

All planned gift vehicles provide donor tax savings, and some offer life income benefits. These include appreciated securities, real estate, annuities, trusts, wills, retirement accounts and life insurance. Matching gifts through employers can increase the impact of any cash gift.

There are many ways to match your interests with departmental needs. If you would like to explore the possibilities, our staff can assist you in choosing the best option for your tax or income situation and help make the most of your gift.

Contact Stacy Zearing at (919) 513-0983, or by e-mail at stacy_zearing@ncsu.edu to request information.

New Appointments

List Named Department Head

George List has been named Department Head effective July 1, 2005. He replaces Downey Brill who served as Head of the Department since 1988. List comes to NC State from Rensselaer Polytechnic Institute, where he served as Chairman of the Department of Civil Engineering. He was also Director of the Center for Infrastructure and Transportation Studies and Professor in the Department of Decision Sciences and Engineering Systems. His professional experience includes work in the private sector as a senior transportation engineer with Transportation and Distribution Associates in Philadelphia, PA, and in the military as an instructor and department head at the Nuclear Power School in Bainbridge, MD.

List received his PhD in Civil Engineering from the University of Pennsylvania in 1984 and is a specialist in instrumentation and control for large-scale networks. He was the recipient of the ITS-NY 2003 Project of the Year Award, the US Department of Energy 1999 Defense Programs Award of Excellence and Rensselaer's Darrin Counseling Award. List is a member of the Transportation Research Board, the Institute for Operations Research and Management Sciences, the American Society of Civil Engineers, the Institute of Transportation Engineers and the Institute for Electrical and Electronic Engineers.

Other New Faculty

It is a significant privilege to welcome these new faculty members to our department.

- **Sankar Arumugam** joined the Department as Assistant Professor in August 2006. Arumugam comes to NC State from Columbia University's International Research Institute for Climate Prediction. He received his PhD in water resources engineering from Tufts and his MS in water resources and environmental engineering from Indian Institute of Technology Madras. His primary research interest is towards understanding, modeling and forecasting hydrological fluxes at large spatial scales based on land surface and climatic indices. He is also interested in water resources planning and analysis, integrated water management and environmental assessment in developing countries.
- **Matt Evans** joined the department in January 2006 after completing his PhD at Georgia Tech, where he received numerous honors and awards. His research focuses on experimental and numerical micromechanics of granular soils, unsaturated soil mechanics and interfaces in geotechnical engineering. Prof. Evans received a BA in physics from UVA, a BSCE from the University of New Mexico and his MSCE and PhD from Georgia Tech.

Promotions

Promoted to Professor

- **Christopher Frey** (August 16, 2004)
- **Margery Overton** (August 16, 2005)
- **Shamimur Rahman** (July 1, 2004)

Promoted to Associate Professor

- **Abhinav Gupta** (August 16, 2004)
- **Mervyn Kowalsky** (August 16, 2004)
- **Joel Ducoste** (August 16, 2004)

Retirements

- **John Fisher** (November 1, 2005)
- **Ajaya Gupta** (July 1, 2006)
- **Malcom Rooney** (May 15, 2004)

- **Rudi Seracino** comes to us from the University of Adelaide, Australia, where he was Deputy Head of the School of Civil and Environmental Engineering. He has been on the faculty of the University of Adelaide since June 1999 when he completed his thesis working with Profs. D.J. Oelhers and M.F. Yeo. He received his bachelor's degree with Honors in 1993 and his master's in 1995, both from the University of Toronto. Rudi is recognized worldwide as an expert in the use of fiber-reinforced polymers to reinforce and rehabilitate concrete and masonry structures. He has developed a practical tiered approach for the assessment of composite bridges and has several papers on the topic of plated reinforced concrete structures. He is also interested in finite element analysis and has developed several specialized programs to analyze the non-linear behavior of both reinforced concrete and composite structures. He is also an accomplished teacher, having received a number of honors.

Pavement, *continued from page 4.*

measured from both the FHWA ALF pavement sections and the KHC test road.

This current research is significant in that the groundbreaking VEPCD-FEP++ model will be considered by the FHWA and the KHC as the next generation of asphalt pavement analysis and design modeling, thus furthering NC State's reputation both at home and abroad in the industry and field of pavement performance prediction. Recently, Kim and Guddati have been invited to submit proposals to the FHWA to calibrate and validate the VEPCD-FEP++ using pavements from New York Ohio and Texas as well as perpetual pavements in China.

Brill Steps Down as Head

Department Salutes Longtime Leader

After 17 years, the CCEE leadership torch has been passed on with a job very well done. Prof. Downey Brill Jr. has returned to regular faculty status and director of the Center for Transportation and the Environment (CTE) after serving as head of the department from 1988 to 2005. "Downey led the significant growth of the environmental program," said David Johnston, associate head and director of graduate programs. Under Brill's watch, the department added a BS program in Environmental Engineering and several faculty members were hired. A distance education Master's in Civil Engineering (MCE) was also added. "As head, Downey put the needs of the department above everything else," said Prof. Mort Barlaz, former associate head.

Downey Brill

Brill is a highly respected member of the College of Engineering faculty whose 30-year history of research expertise in developing optimization models for civil and environmental engineering systems has attracted funding from the National Science Foundation, the US Environmental Protection Agency, the US Department of Interior and the US Geological Survey. His research focuses on air and water quality management, solid waste, floodplain land use planning and water distribution systems. He is also a member of the Operations Research faculty at NC State.

Brill is a member of the American Society of Civil Engineers, the American Geophysical Union, the Institute for Operations Research and Management Sciences and the American Society for Engineering Education. He has served on the editorial boards of Water Resources Research and Engineering Optimization. He is the recipient of a number of research and teaching awards, including the ASCE Huber Prize and the Croes Medal.

Prior to joining the NC State faculty, Brill was professor of civil engineering at the University of Illinois at Urbana-Champaign. He has also served as a visiting scholar at the University of Texas at Austin and as a distinguished professor in the Fulbright Program with Yugoslavia at the University of Nis and Institut za Vodeprirredu "Jaroslav Cerni." He was a member of the US Army Science Board from 1985 to 1991.

Brill received his bachelor's degree in civil engineering from Cornell University in 1969 and his PhD in environmental engineering from The Johns Hopkins University in 1972.

Awards

- **Morton Barlaz**, Professor and Associate Department Head, received the 2004 Distinguished Individual Achievement Award from the Solid Waste Association of North America (SWANA).
- **Downey Brill**, Professor and Department Head, received the 2004 Award from the NC Section, Institute of Transportation Engineers, for his Outstanding Contribution to the Transportation Profession.
- **Leonhard Bernold**, Associate Professor, received a 2006 Fulbright Senior Specialists grant to the University College Dublin, Ireland, where he will work with the faculty there to develop innovative education tools.
- **Paul Cribbins**, Professor Emeritus of Civil, Construction, and Environmental Engineering, was inducted last November into the NC Transportation Hall of Fame. Cribbins was one of seven people selected for the honor.
- **Joe Ducoste**, Associate Professor, received a Fulbright research scholar award to Belgium during 2006. He will work with researchers at the Department for Applied Mathematics, Biometrics and Process Control at Ghent University on developing and evaluating numerical models of the internal bioreactor environment.
- **Christopher Frey**, Professor, was elected to serve as President of the Society for Risk Analysis in 2005 and to serve on the US EPA Federal Insecticide, Fungicide and Rodenticide Act scientific advisory panel.
- **Joseph Hummer**, Professor, received recognition in December 2004 from the NC Section of the Institute of Transportation Engineers for outstanding service from 1992 to 2003 as advisor to the NC State Student Chapter.
- **Mohammed Gabr**, Professor, received a Certificate of Appreciation by the Geo-Institute of the American Society of Civil Engineers for service on its editorial board for the past nine years.
- **Joseph Hummer**, **Nagui Rouphail** and **Jae-Joon Lee** received the 2005 Outstanding Paper Award from the Transportation Research Board Operational Effects of Geometrics Committee.
- **James Nau**, Professor, received the 2006 George K. Wadlin Distinguished Service Award presented by the Civil Engineering Division of the American Society for Engineering Education.
- **Roberto Nunez**, Lecturer and Senior Construction Extension Specialist, was inducted into NC State University's Academy of Outstanding Faculty Engaged in Extension. He also received an Outstanding Extension Service Award from the College of Engineering.

Legend Leaves Legacy 'in Stone' — Zia Honored by ACI

Paul Zia

A giant in the profession of civil engineering – Paul Zia, Distinguished University Professor Emeritus – was honored by 160 attendees at the American Concrete Institute's spring convention in Charlotte in March 2006. The ACI hosted Zia's symposium, "A Celebration of Achievement and a Life Devoted to Engineering," which included invited talks by prominent professionals from industry, government, consulting and academia.

"All I had to do was pick up the phone and mention this was for Paul Zia and these folks agreed immediately to speak," said Roberto Nunez, Lecturer and Senior Extension Specialist, who helped organize the event. Larry Monteith, NC State University Chancellor Emeritus, was among 12 who spoke to honor Zia.

"As one of his many graduate students, I have had the privilege to work with Prof. Zia since 1971. I have been treated, like most of his graduate students, as a member of his family," said Sami Rizkalla, Distinguished Professor and Director of the CFL, who co-organized the event.

Zia joined the NC State faculty in 1961. His career spans more than 50 years of research, education and applied engineering. He has served as President of ACI, was the Founding Chair of the Carolinas Chapter and continues to be actively involved with ACI committees. Zia is a fellow of ACI, ASCE and the Prestressed Concrete Institute. He served as head of the civil engineering department at NC State for nine years. He has supervised 45 MS students and 22 PhD students, garnered more than 30 honors and awards, received funding for more than 30 sponsored research projects, and coauthored numerous publications, including approximately 100 journal and proceedings papers, two edited books, two engineering bulletins and chapters in three major structural engineering reference books and 24 research reports.

"It was really nice to see nearly 60 of my former students there."

A member of the National Academy of Engineering, Zia said that he was honored to be recognized and that he enjoys the ACI so much because it is purely a technical organization. "Also, it was really nice to see nearly 60 of my former students there," Zia remarked, smiling.

- **Sami Rizkalla**, Distinguished Professor and Director of the Constructed Facilities Lab (CFL), received the Delmar L. Bloem Award for Distinguished Service by the American Concrete Institute (ACI) in recognition of his leadership of the ACI technical committee on fiber-reinforced polymers. He also was named Fellow of the International Institute for Fiber-Reinforced Polymer in Construction (IIFC). Rizkalla is also Director of the National Science Foundation Center on "Repair of Building and Bridges with Composite."
- **Paul Zia**, Distinguished University Professor Emeritus, received the PCI Distinguished Educator Award for 2004. This award recognizes Zia as a distinguished educator with many years of outstanding service to the precast prestressed concrete industry. He was also appointed by Governor Michael Easley in February 2006 to serve on the NC State Licensing Board for General Contractors through 2010.

Did You Know . . .

- Four CCEE doctoral students were selected to participate in the NC State "Preparing for the Professoriate" program among only 10 chosen university-wide: Alixandra Demers, Phil Lewis, Bryan Staley and Ana Carolina Baeza.
- According to a *US News & World Report* article, Congress earmarked $286.5 billion for highway expenditures last year because of the nation's demand for bypasses, streets, tunnels and levees. These will require civil engineers to build and eventually rebuild them because of the growing population and deteriorating infrastructure in the United States. Consequently, the civil engineering field can expect up to 17 percent employment growth in both private and public sectors at the local, state and national levels.
- Sewer and water-treatment systems in our country also desperately need upgrading, and the US Environmental Protection Agency estimates that wastewater management expenditures alone will cost $390 billion in the next 20 years. The environmental engineering job market is likely to increase by at least 27 percent by 2014 according to the US Department of Labor.

Nicholson Retires

Barbara Nicholson

On June 1, 2005, after more than 33 years of service, Barbara Nicholson retired from the university. She began her career at NC State University in the Department of Engineering Science and Mechanics before joining the Department of Civil, Construction, and Environmental Engineering as an office assistant. During her employment, she efficiently and selflessly supported faculty, staff, visitors and students. We will miss Barbara and wish her a wonderful retirement.

Zearing Joins Department as Director of Development

Stacy Zearing

After nearly five years in development and college relations at NC State in the College of Physical and Mathematical Sciences and Special Projects, Stacy Zearing joined the Department of Civil, Construction, and Environmental Engineering in March 2006. He has 12 years of combined private and public sector business development and management experience.

He and his wife, Kim, have a daughter, Kelsey (7), and a son, Caden (1). Zearing got his start in development working at the Indiana University Foundation while he earned his BS in Public Affairs Management at IU-Bloomington.

He plans to improve the connection between the department and its alumni through personal visits and correspondence. Another goal will be to identify and steward symbiotic relationships with corporations and organizations who share a mutual interest with the department. Please welcome him and feel free to share with him your feedback and questions.

Staff Join the Department

Jeffery Cable (April 2006), university administrative manager. Originally from Greencastle, Indiana, Jeffery relocated to NC from Florida. He attended Indiana State University pursuing a degree in Marketing/Management; he received his Public Manager Certification in 2005. Jeff had been employed in the Department of Chemistry for six years.

Christina Cooper (May 2005), secretary for the Undergraduate Office. Christina graduated from Georgia State University in 2002 in Ancient Philosophy/Political Science. When away from work, Christina enjoys playing the piano and spending time with her Border Collie.

Christine Franek (January 2006), accounting technician. Originally from Manhattan then Long Island, NY, Christine and her husband, Joe, relocated to NC from Howell, NJ. She attended Long Island University where she pursued a degree in History.

Rachael Limberg (May 2005), office assistant. A native of Arlington, VA, she graduated in 2002 from Guilford College in Greensboro, NC, with a double major in Sociology and Peace and Conflict Studies. She returned to Arlington but moved back to NC because "it just felt like home."

Lee Nelson (July 2004), research engineer and laboratory manager for the Constructed Facilities Laboratory. He received a BS in civil engineering from VMI in 2000. After six months hiking the Appalachian Trail, he came to State to begin work on a master's in structural engineering. He coordinates the general activities of the CFL and all commercial testing activities.

Toni Pascucci (August 2005), undergraduate student services assistant. Originally from Phillipsburg, NJ, she received a BS degree in Business Administration/Education from Long Island University and worked for IBM in NJ. After she and her husband moved to NC in 1994, Toni worked at Apex Elementary and Embrex Inc. Her two sons are enrolled at NC State and UNC Wilmington.

Lorenzo Watson, research associate and coordinator. Coming from Fayetteville, NC, he graduated from NC State in 2004 with a BS in computer engineering. He began working in the department as a work/study student and in April 2005 began coordinating the information technology services. Lorenzo and his wife, Natarsha Sanders, were married in March 2004.

Resignations

Tish Attayek, administrative manager for contracts and grants (February 2006), **Yolanda Douthit**, bookkeeper (November 2005) and **Jane Smith**, administrative officer (June 30, 2006).

Recent Alumni News

Laura Harrell (PhD '98) received an NSF Career award in 2003 entitled "Career: Toward Efficient Evolutionary Algorithm Methodologies for Surface Water Systems Management." She is an Assistant Professor of Civil and Environmental Engineering at Old Dominion University.

Jo Daniels (PhD '01) received an NSF Career award in 2004 entitled "Career: Relating Fundamental Viscoelastic Material Properties and Strengths Measured Using Various Testing Geometries." She is an Assistant Professor of Civil Engineering at the University of New Hampshire.

Barbara Mulkey (BS '77; MS '83), President and CEO of Mulkey Engineers & Consultants, has been appointed to the NC State University Board of Visitors.

Widi Pratikto (PhD '92), Director General of Coasts and Small Islands for Indonesia, presented a seminar on Indonesia's Tsunami Recovery on May 31, 2005, in the Monteith Engineering Research Building.

Byron Brady (BS '85) was named Manager of Wake County's Sedimentation and Erosion Control Section of the Division of Water Quality.

Bill Hunt (BS '94) completed his PhD from Penn State. He is currently Assistant Professor and Extension Specialist of Biological and Agricultural Engineering at NC State.

Anthony Reevy (BS '83) is employed as Associate Director for Advancement, Carolina Environmental Program, UNC-Chapel Hill. He has one son, Ian Robert, who was born in December 2003.

John Mathew (BS '95) is Enterprise Project Management (EPM) Project Manager for BST Global, a technology and consultancy vendor based in Tampa, FL.

Arthur McMillan (BS '86) was recently promoted to the position of State Highway Design Engineer for the NC Department of Transportation.

Wayne Atkinson (BS '61) recently retired as Manager of the FAA Airports District Office, Jackson, MS, after 41 years of service.

David Robertson (BS '74; MCE '75) was installed as President of the Hugh Hammond Bennet Chapter (NC) of the International Soil & Water Conservation Society on June 3, 2004. He received the Distinguished Service Award from the Central Carolina Chapter of Professional Engineers of NC on May 27, 2004.

Vardouniotis Kostas (MS '82) is co-owner of EXAS Ltd., a construction company in Makrygianni, Greece. He is married with three children, ages 15, 14 and 12.

Larry Goldstein (BS '62) is CEO of Best Construction and Supply, Inc. of Panama. A son, Mark, is General Manager of the company.

David McIntyre (BS '96) and **Jessica McIntyre** (BS '96) are proud to announce the birth of their daughter, Keenan Claire, in August 2004, in Tampa, FL. David is an investment banker at Atlantic American Advisors, and Jessica is an engineer at Moffatt & Nichols.

Tom Koning, PE (MS '90) joined Zapata Engineering as Vice President of Corporate Development.

Alex Hekimian (MSCE '69) has retired after 32 years as a transportation planner with the Maryland-National Capital Park and Planning Commission and is looking forward to more travel, tennis and time with family.

Civil Engineering students competed in the Engineers' Career Fair float contest with a model they constructed, 1931, NC State College.

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Have a professional or personal update? We'd like to hear from you!

Please send us an update so we may include you in future issues. Send your contact information and news to **stacy_zearing@ncsu.edu** or mail this form to the CCEE Department, Campus Box 7908, NC State University, Raleigh, NC 27695-7908.

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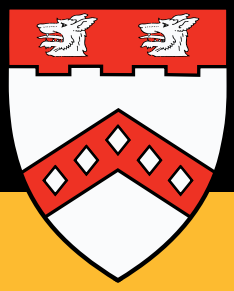

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