

DEPARTMENT OF CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING

North Carolina State University

Annual Report 2008–2009

George F. List , Professor & Head
Vernon C. Matzen , Professor & Associate Head for Graduate Programs
James M. Nau , Professor & Associate Head for Undergraduate Programs
David W. Parish , Lecturer & Coordinator of Advising

The Department of Civil, Construction, and Environmental Engineering is pleased to publish its **2008-09** Annual report which summarizes the dedicated work of its faculty, staff and students. Our successes and accomplishments continued to move the Department forward to help prepare students for the 21st Century. Our commitment continues to integrate strong engineering education and research into all areas of the Department. These efforts are clearly recognized by our continued success in obtaining outside funding. This funding strengthens our traditional engineering programs while allowing us to invest in emerging fields which prepare our students for the workforce of the future. We thank our alumni and friends for their continued generous support.

I. Overview

A. Changes in Service Environment: The main changes to our service environment are 1) a 40% growth in undergraduate enrollment, 2) continuing growth in distance education graduate students, and 3) a major reduction in state funding.

- Fall 2008 undergraduate enrollment increased to **690** matriculated students and **1051** total students. BS degrees awarded in 2008-09 totaled **194** including **140** CE, **46** CEM, and **8** ENE degrees. Scholarship support continues to expand.
- Total graduate enrollment increased to **270** in Fall 2008. This breaks down into **184** in the Master's program and **86** in the PhD. The online MCE degree program continues to grow, with **85** students enrolled in Spring 2008. Eighty-nine graduate degrees were awarded this year and graduate enrollment in distance education courses continues to expand with students representing **31** states
- Our externally funded programs continue to prosper as faculty receive national recognition with grants, contracts, and other funding from federal, state, industry and private sources. The creative work of our faculty and students is being recognized by publication in some of the most respected scholarly journals in the profession as well as through leadership roles in professional societies. External funding generated by the faculty totaled **\$14,294,305** in active research, evaluation, and training contracts and grants with expenditures of **\$4,253,165** for the fiscal year 2008-09.

B. Compact Plan: The compact plan calls for:

- a. Hiring faculty and staff to support a sustainability theme: hired Joe DiCarolis (faculty) and Phil Lewis (extension specialist)
- b. Build on existing strengths: underway, more proposals and more awards
- c. New courses and undergraduate research immersion opportunities: new introduction to environmental engineering that can be taken by all students, revisions to the undergraduate civil engineering curriculum, plans to develop a computer-aided engineering subdiscipline
- d. Raise admission standards: enforcing the 2.9 GPA minimum requirement for matriculation
- e. Integrate ENE into a university-wide EnvSci program: underway, several faculty are active participants
- f. Create graduate degrees in ENE: Masters degrees are in the process of being approved.
- g. Re-invigorate the research component of CEM: inviting chaired professors for a symposium this summer
- h. Participate in the M&M graduate program: actively involved
- i. Increase international outreach and collaboration: Taught undergraduate classes in Nanjing, developing collaborations in Japan, South Korea, Italy, Argentina, Panama, and several other countries

C. Diversity

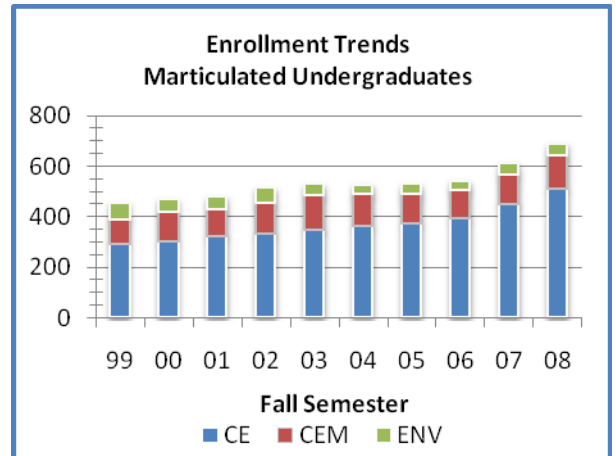
- a. Three of the 40 faculty members are female.
- b. All search committees were briefed about seeking out diversity hires and they sought to find them.
- c. We actively participated in the Building Future Faculty program.
- d. We hired a female Research Assistant Professor.
- e. A female was hired as a Research Associate from her post-doc position.
- f. Three of our six post-docs were women, and they represented three ethnic groups. Two have been rehired and one has been released due to budget constraints.
- g. We interviewed for an Extension Lecturer and the lead choice was a woman. Budgetary constraints and other extenuating circumstances precluded us from making an offer.
- h. All of our faculty and staff have completed the basic on-line Discrimination and Harassment Prevention and Response Training and all of the faculty and staff supervisors have attended the Discrimination and Harassment Prevention and Response Training for supervisors.

II. UNDERGRADUATE PROGRAM

Total matriculated enrollment increased from **617** in Fall 07 to **690** in Fall 08. The number of degrees awarded remained stable with **194** awarded during 2008-09.

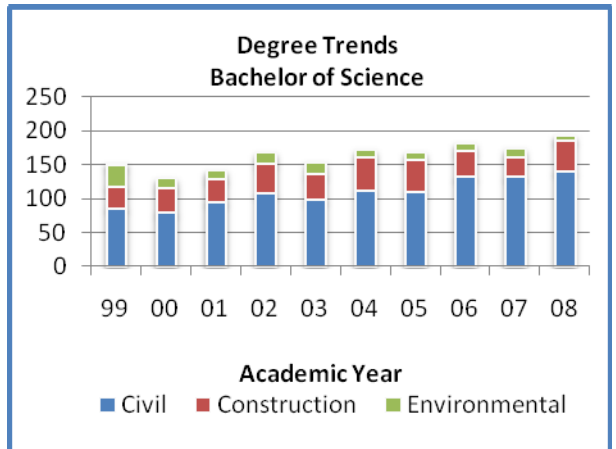
A. Enrollment & Degrees Awarded – 2008-09

Matriculated	F08	S08
Civil Engineering (CE)	511	524
Construction Engineering and Management (CEM)	131	122
Environmental Engineering (ENE)	48	64
	690	710
Undesignated		
Civil (CEU)	266	209
Construction (CMU)	54	35
Environmental (ENU)	41	28
	361	272
Total:	1051	982



Degrees Awarded – 2008-09

Bachelor of Science	
Civil Engineering (CE)	140
Construction Engineering and Management (CEM)	46
Environmental Engineering (ENG)	8
Total	194



B. Instructional Program Advances

The civil engineering program was updated. Some courses were removed from the required list. Others were repackaged. The introduction to environmental engineering class was changed so that students can take it without taking chemistry. Now it is accessible to all undergraduates. The multi-disciplinary content was increased in the senior design classes. We concluded a four-semester experiment in teaching programming in-house to the undergraduates. Arrangements are being made for Computer Science to revamp CS 112 so it better meets our needs. Ideas are being developed to create a computer-aided engineering sub-disciplinary concentration.

C. Highlighted student honors, measures of quality – too many to list given the page limit

D. Degree recipients list (optional) – omitted due to the page limit

E. Scholarships & Awards

In an effort to recognize the many outstanding undergraduate students in the CCEE Department, over 144 students were awarded scholarships for the 2008-09 academic year. We cannot list all of these students in this report, but below are the Senior Awards

2008 Senior Awards

- **Kaitlin H. Marley**, Scholarly Achievement
- **Nicholas J. Lutzweiler**, Leadership
- **Steven K. Dickens**, Citizenship
- **Samuel H. Lee**, CCEE Faculty Senior Scholarship

2009 Senior Awards

- **Lina K. Lawrence**, Scholarly Achievement
- **Matthew J. Poisel**, Leadership
- **Nicholas A. Schultz**, Citizenship
- **Brittany Boudreaux**, CCEE Faculty Senior Scholarship

F. Student Organizations and Activities

• Students Build Bridge at the NC Legislature

Ahmad Saffouri, **Lina Lawrence** and **Matthew Poisel**, seniors in the Department of Civil, Construction, and Environmental Engineering (CCEE), under the direction of faculty advisor Dr. Emmett Sumner, designed and built a fully functional temporary pedestrian bridge outside the Legislative Building in Raleigh. The students were presented the **2009 Future of Engineering Award** which is sponsored by the **American Council of Engineering Companies of North Carolina (ACEC/NC)**, at a ceremony at the bridge site on April 22. Eleven students from the departments of industrial and systems engineering, electrical and computer engineering, computer science and materials science and engineering were also part of the bridge team. The ceremony occurred as part of Engineering Days, an annual event held by the engineering companies of ACEC/NC to highlight the leadership role that engineering plays in the present and future prosperity of North Carolina.

Student Organizations

• American Society of Civil Engineering (ASCE)

The ASCE had a very active year serving student members and the CCEE Department. Highlights of activities and events include:

- Hosted a breakfast with National ASCE President Wayne Klotz
- Organized monthly chapter meetings featuring presentations from local CE companies
- Provided tours to prospective students and their families
- Met with students and parents during the Engineering Open House
- Supported Habitat activities and Shack-a-thon
- Nipped at the heels of the Clemson Tiger at the Carolinas Conference in Charlotte
- Awards were presented to the following students: **Bill Price & John Gorham** (NCSU Outstanding Senior ASCE members); **Aaron Rucker & Favio Intrigago** (ASCE Scholarship)

- **Alfred P. Norwood Chapter of Chi Epsilon Chapter Report**

The NCSU Chapter of Chi Epsilon, endowed by the first chapter president Alfred P. Norwood and directed by **John Baugh**, is pleased to have welcomed twenty-five new members this year. The following served as chapter officers: **Margaret Williams**, President; **Kip Gray**, Vice-president; **Adolfo Javier Obregon-Salinas**, Treasurer; **Dustin Tuttle**, Associate Editor; and **Taylor Auten**, Marshal.

On November 16, 2008, the following students were initiated into the Alfred P. Norwood Chapter: **Matthew Steven Boatwright, Brittany Angele Boudreaux, Frazier Mack Brame III, Neema Faryar, Randy Scott Freeman, Philip Daniel Gaston, Matthew Duane Hart, Daniel Jay Jacobson, Amanda Virginia Kerr, Brooks Person Moore, Tyler Ross Pendry, Jeremy Michael Potter, Taylor Andrew Rawlinson, Caroline Jennings Saul, Jason Scot Simon, Jason Edward Spain, and Joshua Lee Vaughan.**

The initiation held on April 19, 2009 welcomed the following students into membership: **Michael George Alston, Paul Ryan Barrett, Forrest Michael Dungan, Troy Edward Gilmore, Ross Charles Oliver, Stephen Tyree Rutledge, Ryan Christopher Schul, and Hannibal Godwin Warren III.** After the initiation ceremony, the following members were installed as chapter officers for the 2009-10 academic year: **Danielle Touma**, President; **Tyler Pendry**, Vice-president; **Hannibal Warren**, secretary; **Jason Spain**, treasurer; **Troy Gilmore**, Associate Editor; and **Michael Alston**, Marshal.

- **Associated General Contractors**

The NC State University Student Chapter was led during the 2008-2009 year by President **Kelly Kronenwetter**, Vice President **Andrew Parker**, Secretary **Aaron Jordan**, and Treasurer **Carey Blackmar**, and faculty advisor **Dr. David Johnston**. Membership totaled 55 students during year. The student chapter held monthly luncheon meetings with invited distinguished speakers from many segments of the construction industry. Joint with the NAHB Student Chapter, workshops were held with presentations on resume preparation and interviewing for construction positions. Chapter members participated in Habitat for Humanity, Shack-a-thon, and Engineers Week. The Chapter also sponsors the FE Exam Sign-up Night, facilitating engineering senior application for the Fundamentals of Engineering Exam by arranging for photos to be taken and for notarization of the applications.

The chapter is proud to have been the first student chapter chartered by AGC of America in April 1930. It also became the first endowed chapter thanks to the generosity of the Charles T. Wilson Construction Company of Durham. Funds from the endowment earnings help the chapter in its many activities. Four chapter members and new faculty member Dr. Phil Lewis attended the national AGC Convention in San Diego where they interacted with contractors, and attended convention presentations and exhibits.

- **American Concrete Institute: Carolinas Chapter**

The NCSU-ACI Student Chapter had another successful and productive year. New officers were elected. **Christopher Ford**, a senior in Construction Engineering and Management now leads this student organization. A membership drive was conducted and yielded increase in membership and wonderful student leadership. Under faculty advisor **Roberto Nunez**, the NCSU-ACI Chapter planned, organized, raised funds, and participated in a number of important domestic and international events.

In October 2008, 16 NCSU-ACI students and faculty traveled to Panama to visit the Panama Canal Expansion project and participated in a number of seminars, cultural visits, and were exposed to several technical and construction engineering events associated with the Panama Canal project and with the incredible construction growth in the country of Panama. This program was the result of a very efficient collaboration between NCSU, the Universidad Tecnica de Panama, and the ACI-Carolinas Chapter. In November 2008, and later in April 2009, a total of 30 NCSU-ACI Student Chapter members

traveled to St. Louis, MO and to San Antonio, TX to participate in student competitions and seminars that took place at Fall and Spring ACI International Conventions.

During the year, four NCSU-ACI student teams were also engaged in two concrete construction project competitions sponsored by the ACI. Once a month, NCSU-ACI Student Chapter members participated as supplemental examiners for a "Concrete School" jointly organized by NCSU and the NCDOT; this program trained approximately 150 concrete professionals in the State of North Carolina to obtain ACI Field I Concrete Technician Certifications. As part of this program, this year alone, 10 NCSU-ACI Student Chapter members were issued a scholarship (funded with student discounts and credits from ACI, NCDOT and NCSU) that allowed them to become certified and now enjoy the benefits of an important credential to jump start their careers.

- **NCSU National Association of Home Builders (NAHB)**

The 2008-09 academic year was very exciting for the NCSU NAHB Student Chapter. Under the leadership of its President, **Justin Miller**, chapter membership nearly doubled to 50 registered members. This made NCSU one of the largest and most active student chapters in the nation. The Chapter had monthly meetings with guest speakers from within the industry. At monthly meetings, invited speakers shared their experience in various aspects of residential construction. Land developers, home builders, bankers, and NC Home Builder's Association representatives were made presentations to students about their part of the construction process. Working with the NCSU AGC Student Chapter, both chapters also held workshops teaching students about resumes, interviews, and safety in the construction workplace. The Chapter also participated in many other industry and campus activities. The chapter held events during E-Week and Engineering Open House, assisted the Wake County HBA with their yearly convention, and participated in Service Raleigh.

Six chapter members, accompanied by faculty advisor **Dr. David Johnston**, traveled to Las Vegas to participate in the International Builder's Show, our national convention. These chapter members were able to network with and learn from industry leaders. The chapter is now well known to all CCEE students and faculty. They are confident that they will be able to lead the NCSU NAHB Student Chapter to even greater heights next year and continue the heritage and industry involvement that the organization has developed.

- **NCSU Institute of Transportation Engineers (ITE)**

The NCSU Institute of Transportation Engineers (ITE) student chapter has been busy during this past year. The chapter held monthly meetings with speakers from various aspects in the transportation industry. Along with the monthly meetings, the chapter took 19 members to TRB meetings in Washington, D.C. in January. As a fund raising activity for the trip, they conducted traffic counts with Martin/Alexiou/Bryson for the UNC-Chapel Hill stadium project. Members of the chapter also helped with the 3rd Annual NCSU TRB Reception which was another huge success. In March, the chapter hosted the 2009 student-led NCSITE Meeting at the McKimmon Center. At this meeting, students from NCSU and UNCC presented their research to members of NCSITE and fellow students. The newly appointed Deputy Secretary for Transit, Jim Westmoreland, served as the keynote speaker for the luncheon. This spring, the chapter also continued its 11 years of service for Adopt-A-Highway by picking up trash along the highways. In April, three members of our chapter traveled to Birmingham, AL to represent NCSITE in the annual Traffic Bowl held at the Southern District ITE Annual Meeting. The chapter ended the semester with a cookout and social outing to Frankie's Fun Park.

- **A&WMA Student Chapter**

The student chapter of A&WMA at NC State continues to play an active role in serving the student body on campus with their academic interests. From August 2008 to May 2009, the Chapter worked on the organization of activities and recruitment of new members. Last year at this time, there were 28 members; however after the summer, several members graduate leaving only 10 active member at the beginning of Fall 08. Successful recruitment efforts resulted in 18 members by the end of May 09.

- Officers and Advisors: **Yaosheng Chen**; Vice-President: **Joshua Hemperly**; Secretary: **Xiaoming Hu** and **Kristen Olsen**; Treasurer: **Kristen Olsen**; and Faculty Advisor: **H. Christopher Frey**.
- The chapter officers had meetings on a regular basis discussing issues related to the activities of this chapter. The chapter also updated its website (<http://clubs.ncsu.edu/awma/index.html>). The website includes important announcements, activity schedules, and information on recruiting of new member.
- The chapter activated an email address (ncstatewma@ncsu.edu) to be used for official news, announcements and posting of activities. This email will be the official email and replaces the President's email which changes from year to year.
- Field Trips: The chapter organized a very successful field trip to an air quality measurement site near Lake Wheeler Road. Dr. William Barnard presented members a fantastic introduction of the measurement program as well as details of instruments. He also shared with attendees insights on the field based on his several decades of experiences in the area.
- **Future Work:** The major focus in the future will include (1) encouragement of student participation in chapter activities; (2) becoming more active in other engineering school's activities; (3) collaboration with other student organizations from relevant fields.

G. Cooperative Education Program – no formal one exists

H. Career Placement – omitted due to the page limit

III. Graduate Program

A. Enrollment and Degrees

The Department offers the Master of Civil Engineering (MCE), Master of Science (MS), and Doctor of Philosophy (PhD) degrees in all specialty areas of Civil Engineering. Total enrollment in Fall 2008 was **270**. There were **89** graduate degrees awarded. The Distance Education Track of the MCE degree continues to see expanded enrollment. In Spring 2000, **85** CE distance students were enrolled. In the last four years the first **30** distance track MCE students graduated.

Enrollment by Degree		
	F08	S09
Masters (MCE/MS)	184	172
Doctoral (PhD)	86	88
Total:	270	260

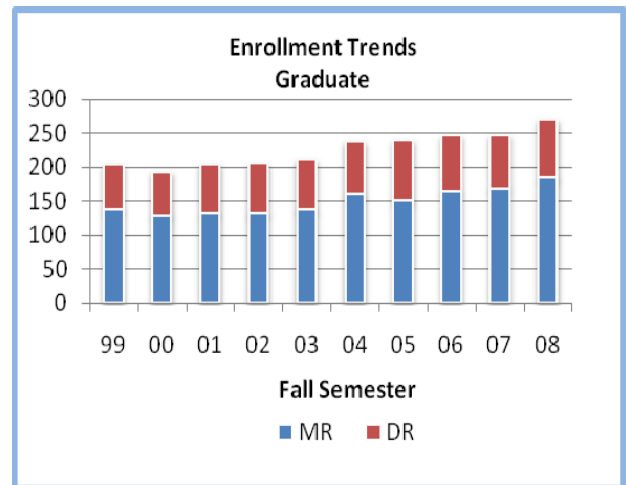
Enrollment by Area		
	F08	S09
Computer-Aided Engineering	3	2
Construction	47	42
Geotechnical	23	19
Structures & Mechanics	89	89
Trans. Systems & Materials	50	48
Water Resources & Env. Eng.	58	60
Total	270	260

Sources of Support		
	F08	S09
Teaching Assistants (TAs)	46	44
Research Assistants (RAs)	64	76
Dean's Fellows*	9	9
Other Fellows & Scholarships*	16	25

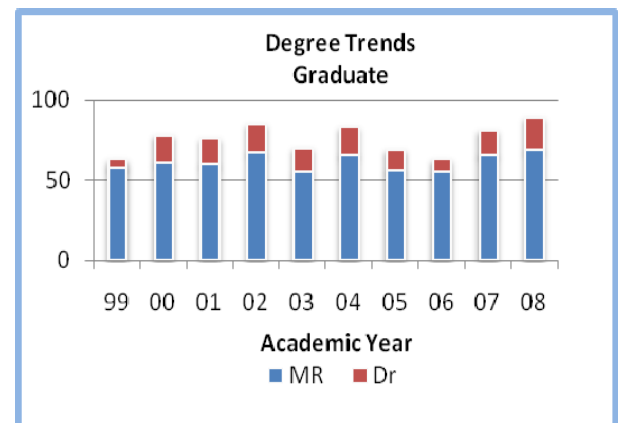
*Some Fellows are also TAs or RAs.

Degrees Awarded		
	F08	S09
Masters (Total)	43	26
MCE	33	21
MS (thesis required)	10	6
Doctoral (PhD)	12	8
Total:	55	34

Summer 2008 Degrees Conferred have been grouped with Fall 08 Degrees



Note: MR represents combined MS and MCE enrollment statistics.



B. Instructional Program Advances

New graduate classes were offered. Approval was sought for masters degrees in environmental engineering. More classes were added to the on-line course offerings.

C. Graduate Students, current list – omitted because of the page limit

D. Degree Recipients – omitted because of the page limit

E. Fellowships and Awards

College of Engineering Dean's Fellowships were awarded to the Following Civil Engineering graduate students in 2008-2009:

- Colleen Bowker
- Elisabeth Brown
- Steven Fulmer
- Hartley Grimes
- Rebecca Haley
- Dillon Lunn
- Steven Marshall
- Matt Ranando
- Meade Willis

The following Civil Engineering graduate students received fellowships from the Southeastern Transportation Consortium:

- **Javon Adams**
- Ingrid Arocho
- Mahdi Bahador
- Brandon Graver
- Rebecca Haley
- Donna Hollar
- Hyeung Hu
- Aditya Ramachandran
- Soheil Sajjadi
- Maryam Sakhaeifar
- Gurdas Sandhu
- Yuze Zhang

Special recognition goes to the holders of these prestigious fellowship awards:

- Ingrid Arocho, Ed Vick Fellowship
- Tarek Aziz, Preparing the Professoriate
- Tarek Aziz, Smallwood Fellowship
- Colleen Bowker, National Science Foundation Fellowship
- Hartley Grimes, Daniel P. Jenny Research Fellowship
- Mahdi Khalilzad-Sharghi, Graduate Research Fellowship
- Shree Krishna, Mentored Teaching Assistantship
- Jitendra Kumar, Mentored Teaching Assistantship
- James Levis, Smallwood Fellowship
- Steven Kelly Marshall, Emol A. Fails Graduate Fellowship
- Michael McGurl, Emol A. Fails Graduate Fellowship
- Jennifer Padgett, Smallwood Fellowship
- Matt Ranando, Sean McGrath Memorial Fellowship
- Brent Robinson, Eisenhower Fellowship- US Dept. of Transportation
- Marianne Vazquez, Pineiro, Bridge to Doctorate Fellowship
- Bilgen Yuncu, Preparing the Professoriate

F. Career Placement – omitted because of the page limit

IV. Faculty and Staff

A. Administrative Achievements and Staff Changes

New Faculty Appointments

- **Christopher P. Bobko** joined the department in the Fall of 2008. He received a B.S.E. (2003) from Princeton University, Department of Civil and Environmental Engineering, the MS (2005) and PhD (2008) from the Massachusetts Institute of Technology, Department of Civil and Environmental Engineering. Bobko is an experimentalist, with specific interest in experimental micromechanics. In general, his research interests are in the complex porous materials encountered in civil engineering. The goal of his research program is to discover and apply a new fundamental understanding of the materials used in civil engineering for the improvement of engineering performance, including durability and sustainability, at structural scales.
- **Joseph F. DeCarolis** joined the department in the Fall of 2008. He received a BA (2000) in Physics and Environmental Science & Policy from Clark University and a PhD in Engineering and Public Policy from Carnegie Mellon University in 2004, where his dissertation focused on the economic feasibility and environmental impacts of large-scale wind power. Before joining the CCEE faculty, Dr. DeCarolis was an environmental scientist at the U.S. Environmental Protection Agency in the Office of Research and Development.
- **Alixandra Demers** joined the Department as a Research Assistant Professor, May 1, 2009. She received a BSCE (1993) from Rensselaer Polytechnic Institute, an MSE (1996) from UT-Austin, and her PhD (2008) from NC State. Dr. Demers also spent seven years as a traffic engineer and transportation planner, consulting in Texas, Massachusetts, and New York; her experience encompassed master planning, traffic signal system design and maintenance, neighborhood transportation planning including traffic calming, pedestrian, and bicycle treatments, and standard traffic impact analyses.

Promotions

- **Detlef Knappe** was promoted to the rank of Professor effective August 16, 2008. He received his doctoral degree in Environmental Engineering from the University of Illinois at Urbana in 1996 and joined the Department as an Associate Professor in 2002. His research interests include removal of emerging contaminants and organic micropollutants from drinking water, adsorption of organic micropollutants by activated carbon and alternative adsorbents, characterization of adsorbent materials, advanced oxidation processes, interactions between micropollutants and humic substances, bioavailability, coagulation, mitigating the effects of algae on drinking water quality and treatment process performance.
- **John Stone** was promoted to the rank of Professor effective August 16, 2008. He received his doctoral degree in Civil Engineering from the University of Virginia in 1981. His research interests are in transportation engineering and systems analysis, urban transportation, and land use. He is currently conducting research on truck traffic data requirements for pavement design. He teaches undergraduate and graduate courses in traffic engineering, airport planning and design, transportation systems analysis, and planning. He co-teaches multidisciplinary capstone design with CCEE colleagues. The course includes elements of multimodal transportation design, structural design, and construction engineering management.

- **Billy Williams, Jr.** was promoted to Associate Professor with tenure effective August 16, 2008. He received his doctoral degree in Civil Engineering in 1999 from the University of Virginia. His research interests include decision support and system integration for intelligent transportation systems; application of information technologies to transportation engineering and the analyses and modeling of traffic operations during evacuation situations, including lane-reversal plans.

B. Activities – omitted due to page limit

C. Awards and Honors

- **Mort Barlaz** received the Distinguished Service Award from the Associate of Environmental Engineers and Scientists, 2009.
- **Francis de los Reyes** was awarded the 2008 Distinguished Alumnus Award, College of Engineering and Agro-Industrial Technology from the University of the Phillipines
- **Francis de los Reyes** received the Philippine Government Balik-Scientist Award, 2008.
- **Joel Ducoste** was selected by the National Academy of Engineers at one of 30 engineers in the USA to participate in the Frontier of Engineering Japan Symposium, 2008.
- **Joseph F. DeCarolis** received the U.S. EPA National Risk Management Research Laboratory Award for Collaboration, 2008.
- **H. Christopher Frey** was named Fellow, Air & Water Management Association, 2008.
- **Mo Gabr** received the NCSU Alumni Distinguished Undergraduate Professor Award, 2009.
- **Abhinav Gupta** received a Visiting Faculty Fellowship from the US Nuclear Regulatory Commission, September 2008.
- **Joseph Hummer** was elected Fellow of the American Society of Civil Engineers (ASCE), 2008.
- **David W. Johnston**, received the 2008 Edward I. Weisiger Distinguished Professorship in Construction Engineering and Management.
- **Roberto Nunez**, received the American Concrete Institute (ACI) Certification Award, 2008.
- **Sami H. Rizkalla**, received the 2008 Distinguished Educator Award from the Precast/Prestressed Concrete Institute
- **Sami H. Rizkalla** received the 2008 Golden Mirko Ros Medal, Swiss Federal Laboratories for Materials Testing and Research (EMPA)
- **Sami H. Rizkalla** received the Joe W. Kelly Award from the American Concrete Institute, 2008.
- **Rudolf Seracino** received the Best Paper Award at the 4th International Conference on FRP Composites in Civil Engineering which was held in July 2008 in Zurich.
- **John Stone** was name Honorary Professor, Universidad Catolica Andres Bello, Caracas, Venezuela, 2008.

D. Courses Taught – omitted due to page limit

E. Seminars and Visitors

- **38th Henry M. Shaw Lecture**

“What’s the Matter with Concrete? A multiscale approach to the development of Sustainable Materials and Structures” (February 5, 2009)

The **38th Henry M. Shaw Lecture** was presented on February 5, 2009 by **Dr. Franz-Josef Ulm** , Professor of Civil and Environment Engineering, Massachusetts Institute of Technology. Dr. Ulm

received his engineering degree from the Technical University Munich, Germany, in 1990, his Ph.D. from the Ecole nationale des ponts et chaussées, France, in 1994; and his Habilitation Degree from the Ecole Normale Supérieure de Cachan, France in 1998. His current research focuses on experimental and theoretical nanomechanics of natural composites, microporomechanics, and biochemomechanics. Dr. Ulm has published over 80 scientific papers in peer-reviewed mechanics, materials science, and biomechanics journals, and four books; most recently “Microporomechanics” (co-authored with L. Dormieux and D. Kondo).

- **5th Annual Paul Zia Distinguished Lecture Series in Civil and Engineering and Construction**

“The Hunt for the Illusive Concept: A Unified Reinforced Concrete Model” (September 16, 2008)

The 5th Annual Paul Zia Distinguished Lecture was presented on September 16, 2008 by **Dr. Deric Oehlers**, Professor of Structural Engineering at the University of Adelaide, Australia. Oehlers received a higher doctorate (DEng.) from the University of Adelaide for his research into partial-interaction theory in composite steel and concrete structures, in reinforced concrete structures, and in steel and FRP plated structures. He has published over 100 international journal papers, 4 books and has contributed to 6 national and international codes of practice.

F. Staff

- Awards

Lara Shields, 2009 College of Engineering Awards for Excellence. Lara is the pre-award research specialist for the Department of Civil, Construction and Environmental Engineering. She implemented new procedures and created new resources that have provided great assistance to faculty. On top of existing responsibilities, she is an active member of the university research group and represents the department campus-wide.

- Retirements

Bill Dunleavy, Electronic Supervisor, retired from the Department, January 1, 2009, after over 28 years of service with the department.

V. Research Programs

External funding generated by the faculty totaled **\$14,294,305** in active research, evaluation, and training contracts and grants with expenditures of **\$4,253,165** for FY 2008-2009. At the end of March 2009, 76 proposals had been submitted, totaling \$22,381,716; 38 awards had been received totaling \$5,219,575. Expenditures were at \$3,349,279 (which should result in \$4.46M for the fiscal year). As of March 2009, the department had 58 active projects, not counting commercial testing contracts (3-accounts).

VI. Extension Activities

Roberto Nunez had a busy year conducting and managing Civil Construction and Environmental Engineering Extension (CCEE) activities while teaching Construction Engineering and Management courses, advising students, and managing the concrete and construction systems laboratories in Mann Hall. During the past year, Nunez organized, taught and/or managed the following activities:

- First, and most notably, the extension group now has a powerful human resource element with the addition of **Diane Gilmore** and **Dr. Phil Lewis**. Diane joined the extension group as a part time employee in August 2008, and immediately made an impact on both the quality and efficiency of CCEE extension programs. In May 2009, Dr. Phil Lewis, PE was hired to join Nunez as part of the Construction Management Faculty Group and with Senior Construction Extension Specialist responsibilities.
- Nunez and Gilmore organized, and managed 42 CCEE extension educational events, reaching approximately 1,300 civil engineering and construction professionals. CCEE education and professional development events consisted of short courses leading to credentials such as concrete technology certification, construction engineering diplomas, and OSHA construction safety cards. **Dr. Michael Leming**, a member of the CCEE faculty, was again a strong extension resource in delivering many of these programs.
- In an effort to help designers stay up-to-date on technology and best practices, several other short courses were taught with the help of other CCEE faculty as well as many leading industry-recognized experts. The CCEE group recognizes the effort of the following CCEE faculty for their commitment to extension work: Drs. **David Johnston**, **Detlef Knappe**, **Richard Kim**, **Sami Rizkalla**, **Rudy Seracino**, **Billy Williams**, and **Mervin Kowalsky**.
- The contribution of distinguished industry professionals continued to be a strong foundation of CCEE extension efforts. CCEE recognizes **Lionel Todd** (Fidelity Bank), **Vic O'Janpa**, (Brasfield and Gorrie), **Stuart Phoenix** (FMI Corporation), **Henry Stewart** (Strategic Benefit Solutions), **Harold Wilkerson** (Willis), **Jeffrey Parsons** (PARSONS), **Richard Rohrbaugh** (Kimley-Horn and Associates), **Everette Knight** (Hazen and Sawyer), and **Joseph Angell** (KCI). A partnership established this year between CCEE extension and the NCDOT allowed 14 minority-owned and disadvantage business construction entrepreneurs to obtain Construction Management Diplomas.
- As in the previous 7 years, CCEE Extension hosted its annual golf tournament during the month of May. Approximately 105 alumni and construction friends of the CCEE Department gathered for an afternoon of fun and camaraderie at the Crooked Creek Golf Course. This year, a team sponsored by National Rebar Fabrication, Inc. walked away with the top honors.
- Nunez maintained a CCEE tradition of involving CE students in extension activities. This year, 10 NCSU-CE students gained credentials and became "ACI Grade I Concrete Technicians"; other, previously accredited students, supported concrete extension courses as supplemental examiners or instructors. A special recognition is given to two PhD graduate students, Dr. **Luis Mata** and Mr. **Juan Jose Recalde**, for their outstanding leadership and contributions to the success of various extension programs.
- CCEE extension activities included actions designed to immerse students in special field projects. As part of this effort, 12 CCEE students were able to visit Northrop Grumman's Virginia Advanced Shipbuilding and Carrier Integration Center with valuable coordination and assistance from NC State alumni **Suzanne Beckstoffer** and **Scott Stabler**. In addition, 30 CCEE students led by Nunez participated in ACI Conventions held in San Antonio, TX and San Louis, MO.
- CCEE extension activities also included international outreach efforts. This year, Nunez continued the establish and necessary ACI certification programs in Panama and Guatemala, which were established following the successful NCSU-ACI model. As a result of this relationship, a very enthusiastic group of 16 students and faculty were able to visit the Panama Canal in Central America. CCEE extension also helped fund a student recruiting trip by **Dr. Matt Evans** and graduate student **Ingrid Arocho** to Puerto Rico.
- CCEE continued a promotional effort to help NC construction and design firms access opportunities in an upcoming multi-million dollar military design-build construction plan. North Carolina companies and individuals continue to appreciate the direct one-on-one support they receive from

CCEE faculty who answer inquires and provide help on a recurring basis. This friendly approach to industry is reflected by the consistent support of corporations to CCEE faculty and students.

VII. Financial Summary

VIII. Departmental Sponsors

The 2008-09 fiscal year was challenging for the Department of Civil, Construction and Environmental Engineering (CCEE). The state of the economy, budget cuts and the search for a new Director of Development got us off to a slow start but did not discourage the support of CCEE alumni. Our alumni understand that it is imperative that we have the funds available to spend on faculty support, financial aid, academic programs, student activities and research and our giving totals reflect this generous commitment from CCEE alumni, parents, and friends.

Our alumni are a distinguished group, and their ties to the Department remain strong long after graduation. There are more than 9000 departmental alumni, and many have shown their generosity and support this past year. We apologize for not naming all of those who have helped this year but felt the real focus should be on what we were able to accomplish and some of the successes that have come from their generous support. As of the end of May, 2009, the department had received \$382,219 in donations for the fiscal year (since July 1, 2008). We have extended the financial aid program to students who need it and helped meet the emerging needs and challenges of the Department. These funds allowed us the flexibility to undertake critical new initiatives which have a tremendous impact in helping us take CCEE to a new level of excellence. With their help, we have better educated and prepared students entering the workforce, and have raised the visibility of the Department and the stature and prestige of CCEE.

Our funded endowments have now surpassed **\$10 Million**. These restricted funds provide scholarships, fellowships and professorships for the department. These gifts directly and immediately benefit each student and faculty member as well as every program on campus. Currently, we provide scholarships for many of our students. The department now has funding for another Distinguished Professor and many graduate students are aided through these funds.

Faculty members have benefitted from the generosity of our alumni in their research efforts by receiving the funding needed for new research projects as well as the ability to travel and participate in conferences and seminars both domestically and internationally. We have invited leaders of academia and industry to lecture in our classrooms and have been able to send some of our professors to lecture at other institutions. Our student groups continued to benefit from the generous support of our alumni and friends through many supported activities including:

- Opportunity to participate and travel to conferences and workshops
- Visits to corporate offices and worksites to observe innovation in practice
- Travel to competitions in San Antonio, Atlanta, and Newport News Ship Building
- Spearheading the building of the “Smart Bridge” which was erected on the Legislative Mall in Raleigh during “E-Day at the Legislature.”
- Renovation of the Student Lounge in Mann 415A which provides a gathering place for student meetings and small conferences as well as a place to study and rest between classes. The area also houses a working office which is used by our Student Advisory Board.

In the past few years, we formed a departmental Advisory Board which is a group of leading professionals committed to academic excellence in undergraduate and graduate education. It is a volunteer board and its members provide critical advice, guidance and support on matters relating to the Department's goals. The Advisory Board meets twice a year and this past year took the initiative to visit the Civil Engineering Department at Georgia Tech in order to better their mission as a volunteer board. In April, the board met with the Student Advisory Board in order to form a closer bond with current CCEE students. They hoped to mentor the students in their academic pursuits as well provides them with leadership and employment skills. Most recently, the board organized subcommittees including the Development Committee and the Nominating Committee and is in the process of forming a Construction Engineering Program Committee.

CCEE Advisory Board Members

- **Suzanne M. Beckstoffer** ('82) – Northrop Grumman Corporation
- **Thomas W. Bradshaw, Jr.**
- **John C. Brantley III** ('64) - Raleigh Durham Airport
- **Thomas C. Church, Jr.** ('64) - Ashland Construction Company
- **David T. (Tim) Clancy** (Clancy Theys)
- **Michael W. Creed** ('73) - McKim & Creed)
- **Philip G. Freelon** ('75) - The Freelon Group
- **Barry W. Gardner** ('75) - Shelco Construction Company
- **Michael B. Gwyn** ('80) - Benham Constructors, LLC)
- **Samuel G. McCachern** ('85) - Thomas & Hutton)
- **John M. McDonald** (McDonald-York, Inc.)
- Elizabeth A. Sall ('03) - San Francisco County Transportation Authority
- **Dr. G. Michael Walton** (MS'69; PHD'71) - University of Texas, Austin
- **Eliza Jane Whitman** (BS'89 MS '91) - Parsons
- **Robert G. Wright** ('68)
- **G. Smedes York** ('63) - York Properties Inc.

The mission of the Development Committee is to act as a liaison between the Alumni and the CCEE Development Office. They provide leadership and are the ambassadors in the NCSU community, building relationships with others who share our values and vision and with those who understand the importance of our mission.

CCEE Development Committee Members

- **Thomas C. Church, Jr.** ('64) - Ashland Construction
- **Thomas G. Coffey** ('63)
- **Glenn E. Futrell** (BS'63 MS'65) - Pirate's Cove
- **John T. Jenkins II** ('90) - Stewart Engineering
- **Ramey F. Kemp, Jr.** ('65) - Ramey Kemp & Associates
- **Nathan H. McLamb** ('61) - Carmel Contractors, Inc.)
- **Daniel Perry** ('77) - Shelco Construction Company)
- **James M. Robinson, Jr.** (BS'74; MCE'76) - Leadership Management Institute
- **Hans Warren, Jr.** ('84) - Warco Construction, Inc.
- **Edward G. Wetherill** ('78) - Wetherill Engineering Inc.
- **Charles T. Wilson, Jr.** ('64) - CT Wilson Construction Company

In January, Lora Bremer joined our staff as Director of Development. Her number one priority is to reach out and connect/reconnect more of our alumni with the department which will enable us to increase support and more effectively support the needs of our students and professors. In order to achieve our development goals, we must depend on the support of our alumni and friends. This support includes not

only financial contributions, but volunteer work as well. If you would like to get involved or learn more about the Department, please contact **Lora F. Bremer**, Director of Development (**Telephone:** 919-513-0983; **Email:** lora_bremer@ncsu.edu).

IX. Recommendations and Concerns for the Future

NC State has an exceptional Department of Civil, Construction, and Environmental Engineering that ranks in the top 25 nationwide. It graduates 2% or one out of every 50 civil engineering bachelor's degree recipients nationwide. The undergraduate program has mushroomed from 750 to 1050 students in the past few years without a corresponding increase in departmental funding.

Recommendations are:

- Continue the sustainability theme.
- Continue emphasizing engineering for the coastal environment when it makes sense in the research and educational programs.
- Build research strength in the area of construction engineering and management.
- Rebuild research strength in water resources, partnering with the existing strengths in BAE.
- Continue to grow and expand the extension activities.
- Grow the number of faculty in the department from 40 to 50+.
- Scale back the undergraduate program to 500-600 students and a graduation rate of about 120-140 so it fits with the resources being provided by the university. This will lengthen the time to graduation for students who meet the 2.9 GPA minimum and reduce the graduation rate from 180-200 to 120-140, but in the absence of additional resources, this is necessary.

Concerns are:

- The significant gap between needed and provided state funds will significantly increase the time-to-graduation for the undergraduates and limit the throughput capacity of the undergraduate program.
- The dire decline in state supported graduate students will also affect the size of the graduate program and its ability to grow quickly.
- Faculty time diverted to the undergraduate program because of a lack of TA support will inhibit the department's ability to grow the graduate program and make it world renowned.