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UNC environment

UPCOMING INSTITUTE EVENTS

IE Environmental Seminar

March 24, 2010

Featuring Dr. Linda Birnbaum,
Director of the National Institute of Environmental Health Sciences (NIEHS)

Spring Board of Visitors Dinner

April 8, 2010

Carolina Inn

Spring Board of Visitors Meeting

April 9, 2010

North Carolina Botanical Garden

RECENT INSTITUTE EVENTS

McDonough presents "Cradle to Cradle" design vision at Foard Lecture

On April 1, 2009, the UNC Gillings School of Global Public Health, with the Institute for the Environment and Greenbridge Developments LLC, presented the 41st Annual Fred T. Foard, Jr. Memorial Lecture. The lecture was given by world-renowned architect William McDonough, FAIA, who was recognized by *Time* magazine as a "Hero for the Planet" in 1999. McDonough's talk, "Cradle to Cradle Design," presented his vision that all design – be it for communities or buildings or products – be sustainable from the start. Unintelligent design creates waste and disparity, McDonough argued; intelligent design draws its inspiration from natural systems and thus is environmentally responsible, socially just and economically sound. McDonough spoke to an audience of almost 1,000 people at the Friday Center in Chapel Hill.



Top left, IE Board of Visitors Chair Tim Toben and Board Member Chip Hagan with McDonough. Top right, Architect Bill McDonough was this year's featured speaker at the Fred T. Foard, Jr. Memorial Lecture. Bottom right, IE Board of Visitors Vice Chair Olivia Holding and Young, Moore and Henderson P.A. Attorney Jody Darden. Bottom left, IE Director Larry Band spoke to the timeliness and importance of McDonough's message in his introductory remarks.



ADEL HANNA

Institute's CEMPD wins \$5.7 million EPA contract

The UNC Institute for the Environment (IE) has been awarded a \$5.7 million contract with the U.S. Environmental Protection Agency (EPA) to continue and expand the operation of the Community Modeling and Analysis System (CMAS) Center. CMAS is based in the IE's Center for Environmental Modeling for Policy Development (CEMPD).

CMAS's technology models air quality and pollution levels. Its advanced, open-source program is designed to allow national and international modeling experts to contribute to and refine tools for addressing air quality issues. The IE (formerly the Carolina Environmental Program, or CEP) has hosted CMAS since 2003, has continued to build the system's technical foundation, and operates a center to distribute services and train scientists from around the world to use the software.

The EPA award grants the CEMPD the leadership of the CMAS Center for another seven years. Dr. Adel Hanna, principal investigator of the grant, a research professor at the IE and director of the CEMPD, will continue to direct the CMAS Center.

IE Director and Voit Gilmore Distinguished Professor of Geography Lawrence Band said that in addition to funding research and jobs in the state, the EPA grant would bring dollars to North Carolina as scientists from around the world come to UNC to learn modeling and analysis skills in training ses-

sions and at an annual conference.

Band said the contract would also allow the University to promote sustainable growth in North Carolina and the nation through its ability to track and predict levels of air pollution relative to air quality standards, or measures of the level of air pollution that the EPA and state dictate cities must stay below. Serious human health impacts may result if these standards are not met, and cities can have development and economic activity curtailed.

"This contract provides valuable environmental technology to the state and nation and important high-end research and development jobs to UNC and the state," Band said. "This award is a good reflection of the vital role the CEMPD plays in the science and policy of air quality and human health."

"The EPA should be commended for recognizing the important work conducted at UNC and the Institute for the Environment," said U.S. Rep. David Price (D-NC), a member of the House Interior and Environment Appropriations Subcommittee, which funds the EPA. "This funding and the jobs it will support are certainly welcome in these trying economic times and our state's difficult fiscal situation. The impact of this announcement, however, reaches far beyond our local economy – it can help make our skies cleaner and our citizens healthier, and it represents a thoroughly deserving investment in our common future." ✦

DOYLE WINS PRESTIGIOUS GUGGENHEIM FELLOWSHIP



MARTIN DOYLE

Dr. Martin Doyle, a UNC associate professor of Geography and director of the Institute for the Environment's Center for Watershed Science and Management, is one of five Carolina faculty members awarded fellowships in 2009 from the John Simon Guggenheim Memorial Foundation to support research and artistic creation.

Guggenheim Fellows are appointed "on the basis of stellar achievement and exceptional promise for continued accomplishment," according to the foundation's news release announcing the awards. Only 180 fellowships are awarded to artists, scientists and scholars from an applicant pool of almost 3,000.

Doyle plans to use the prestigious fellowship to write a history of American rivers. This academic year, with the support of the Guggenheim

and other funding, he is taking a research leave to work with the U.S. Army Corps of Engineers' Institute for Water Resources in Washington, D.C. on national river policy and river analysis, as well as taking time to research and write his book.

"They say that the Guggenheim 'buys you time to think,' which is a prized commodity in academia these days," Doyle said. "The Guggenheim, combined with the chance to be amongst the leaders of the Corps of Engineers and see river science and policy at the federal level, is an ideal opportunity."

Dr. John Pickles, chair of the Department of Geography, called Doyle "very deserving" of the Guggenheim Fellowship. "He is an incredibly dedicated and active researcher, and an outstand-

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CAROLINA ENVIRONMENTAL SYNTHESIS PROGRAM TACKLES N.C. WATER SUPPLY ISSUES

CROSS-DISCIPLINARY PROGRAM LAUNCHES FIRST MAJOR INITIATIVE

As highlighted in the last issue of *UNC Environment*, the IE has launched the Carolina Environmental Synthesis Program (CESP), a major initiative that unites UNC undergraduates, graduate students and faculty in cross-disciplinary efforts to tackle, and find solutions to, real and immediate environmental problems in North Carolina.

The first project, focused on finding innovative solutions to protect our water supplies, is underway in Triangle watersheds that drain into our major water supply reservoirs.

“Legislative proposals for the ‘Jordan Lake Rules,’ as well as for Falls Lake, have suggested significant new regulations on how new communities near the lake are designed and built and on how existing communities should be retrofitted to reduce the impact of stormwater run-off on our drinking water supply,” IE Director Larry Band explained. “These rules are aimed at controlling the nutrients that enter the water from run-off, so as to reduce water quality deterioration from problems such as algae blooms, discoloration and odors.”

Although the prospect of retrofitting existing communities has caused some controversy, some of the concern is based on incomplete information as to where the pollutants are actually coming from and how hard it would be to control them. “This CESP project will gather that information, so we can make more informed decisions about the best strategies for controlling that pollution. We will produce new watershed science, as well as important policy advice and educational strategies for our communities,” Band said.

The project includes collaboration with the Duke University Nicholas School of the Environment and NC State University. This summer, several UNC and Duke undergraduate and graduate students spent time in Triangle watersheds collecting water samples and conducting detailed geographic information systems analysis of watershed hydrology, landcover and nutrient loads.

Because there are several municipalities in the drainage area of Jordan Lake and Falls Lake, the CESP is also studying how land use and stormwater policies vary from town to town. A UNC student has been carrying out research on the range of policies and land use management plans in place.

This fall, the project ramps up with additional graduate student research and a new post-doctoral student. J. R. Rigby will join UNC to help integrate the work on stream water quality, pollution entering Jordan Lake and land use policy around the Triangle. Rigby recently completed his PhD at the Pratt School of Engineering at Duke University.

Faculty in the Institute’s Center for Watershed Science and Management and the Center for Sustainable Community Design are particularly involved with this project.

“There is a lot of interest from state and local leaders in what we’re doing,” Band noted. “As the CESP project moves forward, we’ll draw in more people from different departments, schools and agencies. We’ll work with Chapel Hill, Durham and other municipalities, as well as with state agencies such as the North Carolina Department of Water Quality. Work with the Department of Marine Science will link the headwaters of our large river basins in the Triangle with the coast, while collaboration with the IE’s Atmospheric Chemistry group will link watershed nitrogen cycling with atmospheric circulation and deposition.”

This project is funded by private foundations and businesses and receives additional research grants from federal agencies. Restoration Systems, a leading environmental restoration and mitigation company based in Raleigh, is co-funding the post-doctoral position with the Park Foundation. Engagement for the project in Orange County that will work with the commercial sector on stormwater issues will be funded by the Wallace Genetic Foundation. Additionally, Band and Dr. Martin Doyle, director of the IE Center for Watershed Science and Management and associate professor of Geography, have secured NSF grants that will advance this year’s CESP.

“Restoration Systems is pleased to continue its support of the UNC Institute for the Environment and is encouraged by the leadership of Larry Band to develop innovative solutions to environmental problems like how to improve water quality in the Jordan Lake watershed,” said Chief Operating Officer John Preyer. “Several years ago, Restoration Systems helped fund another post-doctoral student, Adam Riggsbee, working with the Institute’s Martin Doyle, who helped confirm the positive attributes of dam removal as a form of stream mitigation. [Riggsbee worked for Restoration Systems for several years and is now a member of the IE’s Board of Visitors.] As a private company full of UNC alums, we look forward to more collaborative work with the Institute in the future.”

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Wind, solar and nuclear: IE schools audiences across the state on alternative energy options

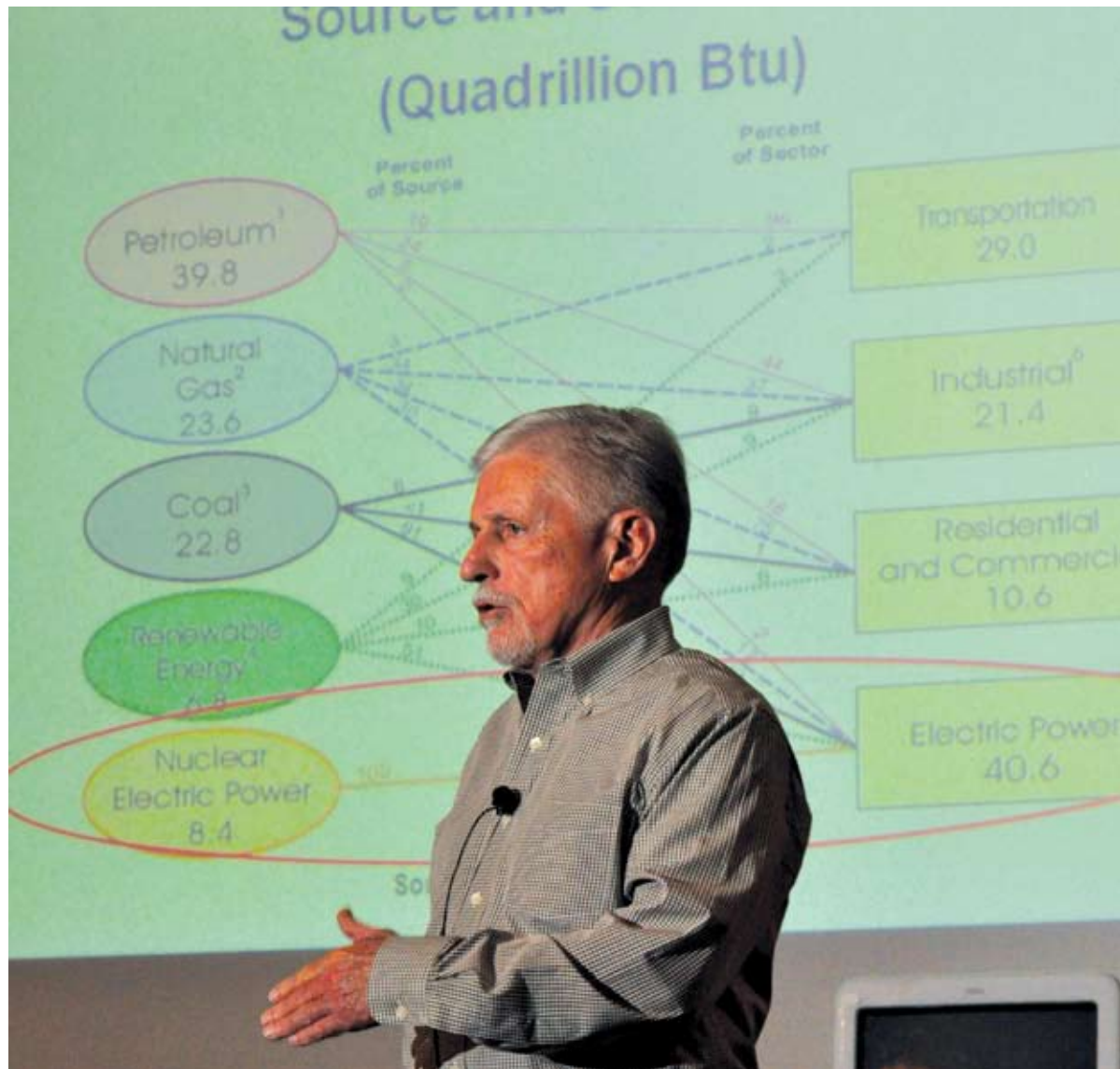
**NEW PROGRESS ENERGY GRANT
FUNDS TEACHER TRAINING WORKSHOPS
AS WELL AS PUBLIC LECTURES**

Thanks to a recent grant from Progress Energy, the Institute for the Environment is getting people around the state to think about where we get our energy, how it's used, and what alternative forms of energy are available to meet society's energy demands in the 21st century. IE Center for Sustainable Energy, Environment and Economic Development (C-SEED) Director David McNelis, the grant's principal investigator, is leading both teacher professional development workshops and public lectures across North Carolina this semester to share cutting edge information on energy types and options, consumption, fuel life-cycle issues, and distribution and waste management.

The teacher workshops have been developed by the IE's Environmental Resource Program Science Educator Dana Haine. The workshops are open to K-12 educators, and are unique in that teachers will be provided with lesson plans and hands-on activities and resources they can use to educate their students about the fundamentals of energy and alternative energy options. Teachers will also deepen their own content knowledge by hearing from McNelis, who will participate in these workshops. McNelis and Haine began conducting workshops in August and will conduct ten in the fall of 2009. They will serve teachers from across the state through either school district-sponsored workshops for schools located within Progress Energy's service area, or through annual statewide conferences such as the North Carolina Science Teachers Association.

According to the grant, the purpose of the teacher training is to create a more knowledgeable public in the future by "provid[ing] generations of students with a fundamental understanding of the benefits and issues associated with each of the energy generation options." The trickle-down effect is impressive: if 25 teachers attend each of the 10 workshops, those 250 teachers could share their new knowledge with 5,000 to 10,000 students annually.

The second component of the grant allows for the education of the general public through a series of lectures, also to be held across the state in Progress Energy service areas. The lecture location and audiences vary greatly, from a crowd of 30 at UNC-Chapel Hill's Morehead Planetarium and Science Center



C-SEED Director David McNelis gives a public lecture on nuclear energy at the UNC Morehead Planetarium and Science Center in June.

to a crowd of 100 at the Tir Na Nog pub in downtown Raleigh. McNelis's lectures focus either on a large sampling of alternative energy options or specifically on nuclear energy.

"For us to all become wise consumers of electricity, we must understand the changing energy landscape," said Bill Johnson, chairman, president and chief executive officer of Progress Energy. "We are proud to partner with the UNC Institute for the Environment to provide this learning opportunity for communities across the state." ❁

In memoriam, Sheila Nickerson

In April 19, 2009, the Institute for the Environment lost dear friend and colleague Sheila Nickerson. Sheila worked for the IE as an administrative assistant for two years and served the state of North Carolina at UNC for 11 years. She was known for her shining smile and demeanor, which never wavered, even as she battled illness. Sheila's faith and strength were an inspiration to all who had the privilege of knowing her. Her sense of humor, beautiful laugh, and happy and helpful presence were gifts to all who worked with her in Miller Hall. Sheila was a devoted and loving mother and wife, and an integral part of her church community. She is survived by husband Gene and daughters Amber, Nicole, Crystal and Jennifer.

"When we worked with the Shared Leave Coordinator here at UNC to recruit hours for Sheila to be able to take her chemo and radiation treatments, their entire office was amazed at the number of people and hours that Shelia received," Business Manager Myra Walters Burke said. "They checked their records, and nowhere in UNC history has one person received so many hours of time. That speaks mountains about Shelia and how many people she touched who were willing to donate their own vacation time for her."

"She was a true friend," Burke continued. "Her care and compassion for others remained with her even in her last days. Shelia's faith was so strong during her sickness that she amazed everyone by

attending church functions right up to the week she passed."

"Shelia lived with a magnetic force that drew so many to her," Grants Manager Sonya Watson said. "She had an unconditional love that was very rare. It was through her illnesses that we realized that Shelia was one of a kind – she was more concerned about how others were feeling than dwelling on her own pain and discomfort. Although she may have been afraid of the unknown, she never showed a lack of courage while battling this disease. Shelia is missed greatly by all who were drawn to her, even those who had a brief encounter with her."

We thank Sheila for her friendship and love, and we miss her dearly. ❁

IE's Center for Watershed Science and Management knee-deep in projects

Priority is on addressing water issues in North Carolina

The IE's Center for Watershed Science and Management (CWSM) weaves together basic and applied research on issues related to water, watersheds and the environment to help address water-related economic and policy issues faced by North Carolina, the U.S. and the world. Center Director Martin Doyle shared several current CWSM projects:

North Carolina's largest reservoirs serve a variety of uses in addition to flood control, the purpose for which they were originally built. Some are used for drinking water supply or recreation; others are used for hydropower. Kerr Lake, for example, was built for flood control, but it also provides hydropower. Falls Lake and Jordan Lake, also built for flood control, are primary sources of drinking water for the Triangle. Often, management of these different uses comes into direct conflict.

In partnership with the UNC School of Government, the CWSM has begun a hydrology, economic and policy analysis of how decisions regarding those mixed mandates are being balanced around North Carolina. The project is funded jointly through the state and the U.S. Army Corps of Engineers, which manages some of the largest reservoirs in the U.S.

Doyle, a geographer with training in engineering and hydrology, is working with Project Leader and Professor of Public Law and Government Richard Whisnant; Associate Professor of Environmental Sciences and Engineering Greg Characklis, who is one of just a handful of water economists in the country; and Victor Flatt, an environmental attorney and specialist on the Corps of Engineers who recently joined UNC's School of Law as the Thomas F. and Elizabeth Taft Distinguished Professor in Environmental Law. Together, this team has an unparalleled depth and breadth of expertise in water issues.



Then-graduate student and current IE Board member Adam Riggsbee collects samples with CWSM Director Martin Doyle.

The CWSM is deeply engaged in the Carolina Environmental Synthesis Program's interdisciplinary initiative to find innovative solutions to water supply protection (see page 2 for details on the CESP project). Doyle has received a grant from the National Science Foundation to work with several economists to evaluate the structure and impact of water quality trading programs ("cap-and-trade" nitrogen and phosphorous pollution) currently being used around North Carolina, and how well they meet the goals of the Clean Water Act.

"I'm focusing on the Neuse River, where there's a trading program between the different wastewater treatment plants that release water into the river," Doyle said. "The question is, could we start a smaller, regional trading program for Falls Lake or Jordan Lake to improve the water quality for those important sources of drinking water? The rigorous scientific approach taken by the Carolina Environmental Synthesis Program toward water issues really helped secure the grant from the NSF for this very high-end science."

The NSF grant is also helping to fund the development of an interactive, Sim City-like environmental trading game that will serve as an educational tool for students. "This is a cutting edge approach in economics, using these games to understand how environmental markets may or may not work," Doyle said. "Students take on roles as wastewater treatment plant managers and other stakeholders. As the group plays, we can observe the decisions they make and see how the markets react to behavioral realities."

The CWSM is also working with the Environmental Finance Center at the UNC School of Government, which mapped out North Carolina's complex inter-basin transfer infrastructure (the actual interconnections that allow water to be moved around the state). Doyle and graduate student Lauren Patterson are now overlaying that information with population growth estimates and various climate change scenarios to evaluate how well current infrastructure meets future demands to transfer water. Patterson is also using satellite imagery and census data to determine how many people have moved onto high-risk, 100-year flood plains in North Carolina over the past few decades, despite regulations. ♦

HARNESSING NORTH CAROLINA'S COASTAL WINDS

UNC STUDENTS AT IE FIELD SITE HELP WITH STUDY ON POTENTIAL OF WIND ENERGY

Students at the IE's Morehead City Field Site played a key role in a UNC-Chapel Hill study, commissioned by the North Carolina General Assembly, to assess the feasibility of installing wind turbines in the sounds and off the coast of North Carolina.

For the team-based Capstone course that is a core component of the IE's field site curriculum, the 11 Carolina undergraduates who took part in the fall 2008 program collected and analyzed wind data from gauges around eastern North Carolina to determine where wind speeds are great enough to capture energy using turbines.

Working with Institute of Marine Sciences faculty members Rachel Noble and Pete Peterson and Department of Marine Sciences faculty member Harvey Seim, the students also identified sites that would not be appropriate for placement of wind turbines, including military training areas, wildlife feeding and bird migration areas and other protected areas. In particular, they identified ecologically sensitive areas where wind energy fields would have an adverse impact on birds, bats and butterflies, as well as the ecological impact building off-shore platforms would have on populations of fish and other marine life.

This spring the faculty refined the analysis begun by the students; in June, they presented the report to the General Assembly. The study found that there is potential for utility-scale production of wind energy off the coast of North Carolina and possibly within eastern Pamlico Sound. Read the report at <http://www.climate.unc.edu/coastal-wind>.

"This was an exciting opportunity to involve our students in a very timely and important project for the state," said Noble, who directs the Morehead City Field Site. "They learned about many of the unique environmental features of North Carolina and about the important things to consider in designing a system that balances energy potential with protection of our environment." ♦



The students of the 2008 Morehead City Field Site

ENVIRONMENTAL SCIENCE STUDENT RECEIVES ESTEEMED UDALL AWARD

Boulicault's work at UNC combines passions of social justice and environmental change

By Megs Eichorn, IE communications intern



MARION BOULICAULT

Marion Boulicault, a rising senior Environmental Science and Philosophy double major at UNC-Chapel Hill, recently received the prominent Udall Award for her commitment to, and work with, environmental concerns.

Boulicault, who hails from London, England, was one of 80 students nationwide to receive the award; she was the only student chosen from UNC. She is the thirteenth UNC student ever to win the award.

The Morris K. Udall Scholarship and Excellence in National Environmental Policy Foundation of Tucson, Ariz. will award Boulicault with funds for tuition, books, and room and board up to \$5,000 for her senior year. Established by Congress in 1992, the Morris K. Udall Foundation honors Udall's 30 years of service in the House of Representatives by promoting environmental conflict resolution and educating Americans to preserve their national heritage through studies in the environment and Native American health and tribal public policy.

Though Boulicault has always been interested in the environment, it was not until she came to UNC that she "really began to appreciate how interconnected and far-reaching environmental issues are." She began to work for both environmental and social justice issues while serving as the Alternative Winter Break chair. She led the first winter break trip to Pembroke, N.C. to work with the Lumbee Tribe and participate in environmental education in Native American communities. She also co-founded the Native Health Initiative and the Native American Diversity Awareness Partnership (NADAP), an organization that brings together UNC-Chapel Hill teaching fellows and Native American communities to address issues such as environmental education in American

Indian communities.

Boulicault spent the second semester of her junior year studying abroad in Vietnam, focusing on the ecology and sustainability of the Mekong Delta. She conducted research on community-based conservation in an ethnic minority village.

Boulicault's future goals have further been shaped by her summer experiences. After her freshman year, she spent the summer in a small village along the banks of the Nile in Uganda, where she was exposed to environmental issues concerning natural resource management. She also interned at the D.C. Public Defender's Service the summer after her sophomore year. "[That position] gave me a glimpse of how the law can be used to advocate for others and inspired me to consider a career in environmental justice."

The Udall Award win was recent, but Boulicault already feels its impact on her life. She looks forward to meeting and sharing ideas and thoughts with other scholars. She is currently preparing for the upcoming Udall Conference, where she and another Udall winner will lead a session on "Conservation in the 21st Century." With the scholarship the Udall Award provides, Boulicault hopes to spend an additional semester at UNC to finish her double major. Additionally, as a Morehead-Cain Scholar, she is considering applying to the scholarship's Discovery Fund to pursue an environmental law-related internship next spring.

Though uncertain of what she wants to study in graduate school, Boulicault is considering environmental law or natural resource management. "I hope to work on addressing the issues found at the intersection of environmental rights and indigenous rights, potentially by working as an environmental lawyer." 🌱

HAIL TO CAROLINA'S 2009 Environmental GRADUATES

Top left, Graduates Angela Wang and Brock Phillips with Wang's family. Right, Anslei Foster celebrates with her family. Bottom middle, IE Associate Director of Education Greg Gangi and Curriculum's for the Environment and Ecology Chair Dave Moreau have fun awarding diplomas. Bottom left, North Carolina Representative Lucy T. Allen was the honored guest speaker at the May 10 graduation event in the Fed-Ex Global Education Center.



IE receives gifts, grants to continue state-focused research

The Institute for the Environment is grateful for several gifts and grants that have allowed vital research to continue, despite budget cuts and the state's struggling economy.

As mentioned on page 2, Restoration Systems, LLC of Raleigh recently pledged a gift of \$30,000 to fund part of a post-doc research position. Thanks to this gift, J.R. Rigby will come to the IE from the Pratt School of Engineering at Duke University to work with Director Larry Band on projects within the Carolina Environmental Synthesis Program.

The Wallace Genetic Foundation recently funded two key initiatives that will use Institute expertise to serve the public. The first, run through the Center for Sustainable Community Design, is a project titled, "Examining the risks of environmental hazards to children attending public schools in North Carolina." Led by CSCD Deputy Director David Salvesen, this project serves as a follow-up to an initial study, also supported by Wallace Genetic Foundation, to determine the extent to which public schools in North Carolina are located in close proximity to environmental hazards such as industrial facilities, major roads, floodplains, railroads and Superfund sites. The original study identified 1,143 schools, roughly half of the schools in the state, in which at least one environmental hazard fell within a defined buffer zone. Within those 1,143 schools, more than 620,000 students are educated daily. This new grant awards Salvesen \$40,000 to follow up on those findings with a study designed to support efforts to develop better school siting guidelines for North Carolina. In addition to garnering more data about the level of risk North Carolina's school children face, the study will "bring together experts in risk assessment, public health, land use planning, school facility planning and other relevant fields to develop model guidelines for siting schools in North Carolina," Salvesen said. This work will mirror ongoing efforts to develop national legislation for school siting.

The Wallace Genetic Foundation also awarded a grant to Environmental Resource Program Director and IE Associate Director for Outreach and Public Service Kathleen Gray for a new project that will coordinate efforts between the IE, the Town of Chapel Hill, the North Carolina Department of Environment and Natural Resources (NC DENR) and local stormwater educators to create educational materials about stormwater runoff. The project, titled "Improving stormwater management in the commercial sector," will be a component of this year's Carolina Environmental Synthesis Program (see article about CESP on page 2). The groups will collaborate to develop materials that will provide hands-on training and information for employees in the commercial sector on how to better their business practices. The materials will focus on the restaurant and painting and concrete contractor sectors; additional, general materials will be developed for commercial property owners.

The World Bank, the IE and the UNC Department of Marine Sciences are teaming up to fund a project titled, "Mapping the vulnerability of coastal marine ecosystems to anthropogenic climate change." Ample research now exists to show the devastating effects climate change is having on marine ecosystems. With the warming of the world's oceans, water is becoming more acidic and species from

coral to kelp are dying en masse as the heat rises. A plethora of problems are created by warming temperatures, and they affect every aspect of marine life. In addition to threatening the species within the water, global warming's damage to marine life affects the coastal communities whose societies and economies rely on the abundance of the sea. Dr. John Bruno, a professor in Marine Sciences, will lead this project, which seeks to define the local marine changes that will evolve as a result of global warming in locations around the globe, in an effort to help the communities in those locales better prepare for climate change's consequences.

CEMPD Research Assistant Professor Sarav Arunachalam, CEMPD Director Adel Hanna and Research Professor Frank Binkowski were recently awarded a grant by the FAA Air Transportation Center of Excellence for Aircraft Noise and Aviation Emissions Mitigation to work on a project that will study the link between aviation emissions and regional air quality impacts and health effects. The study, which will begin this fall, is a continuation of their work on the Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) project; this new grant seeks to obtain enhanced understanding of air quality impacts in the immediate vicinity of aircrafts and airports. One of the project's many aspects involves work with the Los Angeles International (LAX) airport; the team will use datasets provided by the Los Angeles World Airport (LAWA) Authority to evaluate air quality measurement using new hybrid modeling techniques. The CEMPD team will partner with researchers at Aerodyne Research, Inc. and Carnegie Mellon University to develop enhanced characterization of aerosol formation from aircraft exhaust in multiscale air quality models, and with the Harvard School of Public Health for assessing health impacts from aircraft emissions.

Finally, IE Director Larry Band recently received a grant from the Division of Environmental Biology at the National Science Foundation as part of the Long Term Ecological Research (LTER) network to perform research on the Little Tennessee River Basin near Franklin, N.C. The grant will last seven years and supports research that "is geared toward understanding the combined influence of population growth, development and climate change on the ecology, stream flow and water quality of the southern Appalachians," Band said.

LTER networks are research initiatives that study how a region's ecological and societal processes interact to form "ecosystem services," including the quantity and quality of freshwater, biodiversity and vegetation cover, along with carbon and nutrient sequestration. Nationally, more than 1,800 scientists and students are involved in LTER projects across the nation.

The Coweeta LTER network has been operating since 1980, and the U.S. Forest Service has operated the Coweeta Hydrologic Lab since 1935, Band explained. "We have a good partnership developing between the LTER and the IE's Highland Biological Station Field Site. This year our UNC students at the field site will be working with a long-term database focused on fish populations, diversity and distributions in the Little Tennessee River Basin." The project is a collaborative effort with the University of Georgia, Duke University and a set of additional universities.

Band is also a co-principal investigator on the Baltimore Ecosystem Study, another one of the LTER sites located in Baltimore City and County. 🌱

Doyle, continued from page 1

ing teacher and colleague in the department and across the field of environmental studies. Besides the Guggenheim, this year his research has been recognized by the Institute for Emerging Issues (N.C. State University) and the prestigious Leopold Leadership Program, where he spent the summer at their annual workshop. Dr. Doyle's research is both rigorous and directly relevant to crucial contemporary environmental concerns. He has received recognition at national and regional levels, and he has been involved in rewriting water policy at both."

IE Director Larry Band added: "Martin Doyle has quickly established himself as a leader in river basin science, with significant recognition from academic scientific and management communities. His science has both depth and breadth, and is carefully chosen to be both intellectually demanding and of immediate relevance in the need to solve major environmental issues. The Guggenheim is very well deserved and will benefit his students, the state of North Carolina and the nation." 🌱

New face at the IE

Richard Ross has joined the Center for Environmental Modeling for Policy Development as a research associate. Originally from St. Louis, Missouri, Ross comes to UNC from the commercial software sector where he specialized in data processing and statistical analysis. He has worked in firms in Austin, Texas, New York City and North Carolina. Ross has bachelor's degrees in mathematics and computer science from the University of Texas at Austin. He also served as a Peace Corps volunteer teaching secondary school in Malawi. 🌱

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IE WELCOMES NEW BOARD MEMBER



JOHN COOPER

Dr. John Cooper, the newest member of the IE's Board of Visitors, is a program director and research associate at MDC Inc., where he directs a FEMA-supported effort to understand barriers to increased emergency awareness and preparedness in marginalized communities. He has written about the extent to which local disaster planning programs account for the conditions, concerns and capacities of disadvantaged people and the key elements of high quality plans. Prior to joining MDC, he worked at the North Carolina Division of Emergency Management (NCDEM) as a planning specialist and grant coordinator, advising local governments on the preparation of plans for compliance with state and federal mitigation planning requirements.

Cooper is currently a member of the advisory board for the Department of Homeland Security Center of Excellence: Natural Disasters, Coastal Infrastructure and Emergency Management (DIEM). He also serves on the board of the Orange Community Housing Trust. Cooper has training in economics and planning (Texas A & M University) and earned his PhD in city and regional planning at UNC-Chapel Hill. ✪