

RETURNING FARMLAND TO FORESTLAND

UNC LEADS INTERDISCIPLINARY RESEARCH TEAM TO ASSESS IMPACTS OF CHINA'S AMBITIOUS REFORESTATION POLICY



Sloping land agriculture in Shanxi Province (top). Song and the household head with the property title for the forests created on household's sloping cropland (bottom).



In the late-1990s, China suffered back-to-back natural disasters: a major drought that caused the Yellow River to run dry for 267 days, followed by flooding that yielded record-high river levels – despite the fact that precipitation was in keeping with historical levels. It was clear that the land along these rivers had lost some of its water-holding capacity.

Faced with the impact of these disasters on industry and agriculture, the Chinese government made a bold move, launching an ambitious program to retire unproductive cropland on steep slopes and return it to forestland in an effort to conserve water and soil so that similar disasters can be avoided in the future. Participating households received compensation from the government based on the area of their cropland converted to forestland.

From 2001 through 2010, China invested more than \$33 billion (US dollars) in the Sloping Land Conversion Program (SLCP). SLCP was implemented in 25 provinces and autonomous regions, influencing the livelihoods of an estimated 124 million Chinese citizens.

UNC Associate Professor of Geography and Institute for the Environment Faculty Fellow Conghe Song is leading an international, interdisciplinary research team that has successfully secured a grant from the National Science Foundation (NSF) to study how the SLCP has affected the ecosystems and livelihoods of the households that participated in the reforestation program.

“We are looking at the fundamental connections between the human system and the natural system – viewing people and the land as a coupled system,” explained Song, who earned undergraduate and master’s degrees in forestry and forest ecology in China before coming to the U.S. for his Ph.D. in geography. “Our results will provide insights for the Chinese government on how to sustain these new forests, and also will be valuable to other developing countries

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PRESTIGIOUS LECTURESHIP TAKES IE DIRECTOR AROUND THE WORLD

IE Director Lawrence E. Band has been selected by the Geological Society of America to travel around the country – and the world – presenting more than thirty lectures at universities and research centers before 2014 winds down. He is about half way through, having given 16 lectures this spring. Among the stops: University of Virginia, Virginia Tech, Stanford, Appalachian State, University of Tennessee, Vanderbilt, University of Montana, University of Georgia, and Georgia Tech to name a few, with talks in China and Australia coming up this summer.

Band, a highly regarded expert in watershed ecohydrology, is basing his lectures on his research linking surface/subsurface water flow with ecosystem development in forested and urban sites, and on green infrastructure, groundwater and the sustainable city.

The Birdsall-Dreiss Lectureship has been awarded annually by the Geological Society of America’s Hydrology Division since 1978 to provide

travel funds for outstanding scientists working in the field of hydrogeology to visit other institutions and give talks on their research. The award is named in memory of John Manning Birdsall, a prominent geologist, and Dr. Shirley Dreiss, one of the most popular Birdsall Lecturers. Recipients are chosen for their research excellence and ability to communicate; past winners include many outstanding scientists from academia and government.

For Band, the lectureship is an opportunity to take his research to all corners of the nation and world, and create new partnerships to inspire collaboration. “It’s a great honor to be selected for this lecture – my predecessors are true leaders in our field. It’s also a terrific opportunity to get out our ideas on current and future grand challenges in water, and to get really valuable feedback from a large range of interdisciplinary scientists. It’s a great learning experience, and develops a number of important research and outreach collaborations that will benefit us here in North Carolina.” ■



Song interviews a household head in Anhui (left). Graduate student Qi Zhang measures a day's fuel use by a household (right).



that wish to address similar problems related to dwindling forest resources.”

The four-year, \$1.16 million grant that Song and his colleagues were awarded by the NSF is one of the largest grants ever received by the UNC Institute for the Environment. The project team includes four additional UNC faculty members – forest policy expert Pamela Jagger, watershed ecohydrologist (and IE Director) Lawrence Band, geographer Xiaodong Chen and biostatistician Richard Bilsborrow – as well as several other collaborators including U.S. Forest Service research hydrologist Ge Sun and Chinese researchers from Anhui Agricultural University (Xiaoniu Xu), Wuhan Botanical Garden (Quanfa Zhang) and Beijing Forestry University (Zhiqiang Zhang).

The research will be carried out in three different provinces in China that represent a range of climates. Song traveled to each site in December 2013 to lay the groundwork for a group of UNC faculty and graduate students to visit

this summer. They will conduct interviews with families who have participated in the program, as well as a control group of families who did not, to assess how the households’ livelihood options changed as a result of the implementation of SLCP, and their responses to the ensuing changes in ecosystem services. The team will use satellite images and ecological models to estimate the changes in ecosystem services caused by the newly planted forests.

Song, who has been on the UNC faculty since 2001, is grateful to UNC, and to IE in particular, for helping to make this research possible. “I received a seed grant from UNC’s Carolina Asian Center and a subsequent seed grant from Anhui Agricultural University that enabled me to start this work in China. The Institute for the Environment provided excellent logistic support in preparing the grant and is providing office space for the UNC graduate students and visiting Chinese scholars who are working with us on this project.”

A major challenge in doing interdisciplinary research in another country is logistics, Song noted, but things have been going smoothly thus far. “Unlike some other environmental issues we hear so much about in the media, the Sloping Land Conversion Program is a bright spot for the Chinese government, so we have easily gotten support from China’s State Forestry Administration for our work.” ■

STUDENTS OUT IN THE FIELD: TAYLOR PRICE

HOMETOWN: CARY, NC



Recent graduate Taylor Price was an Environmental Studies major; Geography minor and spent the Fall 2013 semester at IE’s Outer Banks Field Site (OBXFS). Taylor was the 2013 recipient of the Kealy Diversity Award, established by Bill and Ellen Kealy to help increase the diversity of the student body at the OBXFS.

Why Environment?

“When I first applied to UNC, I was leaning more toward biology and medical science. But my first semester I took Introduction to Environment & Society. That introduced me to the social science perspective, which I enjoyed, and as I learned more about myself, I realized that I really like interacting with people and that I didn’t want to work in a lab setting.”

Favorite Experience?

“Being at the Outer Banks Field Site and working at the Coastal Studies Institute was a great experience. We had only ten students and our four professors, and everything – the classes, internships, Capstone project – all fit together, so we got so much out of it. It was a chance to see the world in a different way.

“For my internship, I helped with the environmental education programs at Jennette’s Pier in Nags Head. I worked with summer camp groups, visiting school classes, field trips. We did

everything from teaching introductory fishing to dissecting a baby shark. It was an opportunity to work hands-on getting kids interested and excited about science.”

“For our group Capstone project, we looked at the Predator Management Program set up by the Cape Hatteras National Seashore to protect endangered sea turtles and birds. On the social science side, we assessed community perceptions about the program, which is highly debated there, so it was interesting to delve into that issue, and people were really interested to hear what we learned.”

Winning the Kealy Award

“Winning this award helped offset the cost of tuition and other expenses for me to go to OBXFS, which was wonderful. It really allowed me to make the most of my time on the Outer Banks.”

After graduation?

“I really enjoy getting kids excited about learning and especially science, so I’d like to work for a few years in environmental education. This semester I’m working with the environmental education programs at the NC Botanical Garden in Chapel Hill, so between that and OBXFS I’ll have a good handle on whether that’s something I really want to pursue. Then, in a few years, I’ll probably go to graduate school.” ■



INTERNSHIPS AT PRESTIGIOUS NATIONAL LAB GIVE UNC UNDERGRADS UNCOMMON RESEARCH AND LEARNING OPPORTUNITIES

UNC undergraduates who attend the IE's Highlands Field Site each fall already have an extraordinary opportunity to immerse themselves in the rich ecological systems and incredible biodiversity of this forest region. But several get to take the experience one step further as interns at one of the nation's top ecological research laboratories.

Each year, some UNC undergraduates at the field site intern at the nearby Coweeta Hydrologic Laboratory, a USDA Forest Service facility established back in the 1930s to study different approaches to forest management and their effects on forest ecosystems. As one of the National Science Foundation's Long-Term Ecological Research (LTER) program sites, Coweeta has collected continuous data on forest ecosystems for decades, and is the base for many important large-scale research projects that draw scientists from all over the world to western North Carolina.

Over the years, more than a dozen UNC students have interned at Coweeta, gaining hands-on experience working on a wide variety of research projects with mentors. Some have even published research in a peer-reviewed journal – an uncommon honor for an undergraduate and a testament to the high quality scientific research being undertaken, noted Highlands Field Site Director Jim Costa.

Associate Director Karen Kandl said, "The Coweeta internships are outstanding because our students get to do independent research working with ecosystems and instruments they're initially unfamiliar with, work with top-rate mentors, and learn how to do quality science."

IE has had a longtime connection to Coweeta Hydrologic Lab through IE Director Larry Band, who is a co-principal investigator for the LTER site. Coweeta Research Project Leader Chelcy Ford Miniati, Ph.D., has collaborated with Band and mentored UNC interns. "We are always thrilled to have Highlands Field Site students work with us," she said. "They are a sharp bunch, very dedicated and professional. The IE program has been a wonderful resource and represents a great relationship for us."

This fall, two Carolina undergraduates interned at Coweeta during their semester at the Highlands Field Site.

Isabel Hillman, a junior biology and environmental studies double major, studied soil efflux (the movement of CO₂ from the soil into the atmosphere) to determine what factors (e.g., soil temperature and moisture, vegetation, elevation) influence efflux variability within a forest.

Initially, Hillman was unfamiliar with the concept of soil efflux. "I was apprehensive about studying something that I had no experience with prior to the internship, but it turned out to be a great experience. It showed me that I can study whatever I want as long as

Left to right: Carolina students Isabel Hillman (left) and Ellen Quinlan work with Hillman's mentor Dr. Chris Oishi to clean out one of the weirs on the Coweeta Lab property.

I'm willing to put in the effort to understand it."

Hillman says the most valuable part of her Coweeta internship was the research experience she gained. "I had to go through the process of data collection and analysis, and then write a scientific paper. Working through a project from start to finish was priceless experience for research I will do in the future. Coweeta has high expectations for their interns, and they require a lot of work, but the trad-

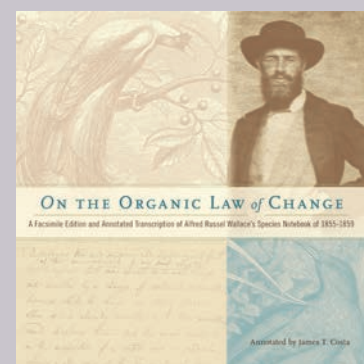
eff is well worth the effort."

Ellen Quinlan is a senior environmental science major concentrating in ecology, with a minor in physical geography. At Coweeta, she worked on developing equations that could help predict features of the mid-canopy layer of the forest such as biomass, leaf area and surface area. "This had previously been done with seedlings and large trees but never with the mid-canopy, which is important to study because it drives changes in the forest dynamics and ecosystem fluxes," she explained.

For Quinlan, who plans to attend graduate school in plant ecology, the greatest value was the time spent in the field and the lab with her mentor. "During my internship I was able to take many of the skills and key concepts I had learned in my field site classes and apply them to my project; conversely, I was able to take several skills I learned in my internship and apply them to my classes. The internship reinforced my desire to continue to do research post-graduation and obtain at least my master's degree." ■

IE Highlands Field Site Director Jim Costa's latest book provides a new window into the travels, personal trials and scientific genius of Alfred Russel Wallace, a world-famous naturalist, contemporary of Darwin and the co-discoverer of natural selection. In *On the Organic Law of Change: A Facsimile Edition and Annotated Transcription of Alfred Russel Wallace's Species Notebook of 1855–1859*,

Costa analyzes and contextualizes this never-before-published document – a notebook Wallace kept during his legendary expedition through Southeast Asia. Wallace's species notebook sheds new light on his evolutionary thinking, including a planned book on evolution that he abandoned once he became aware of Darwin's work. For Costa, who has long been interested in the history of evolutionary biology, the book is "my homage to Wallace on the centennial of his death." Costa's book, published by Harvard University Press, is available at online and local bookstores. ■



DOORS OPEN FOR NC'S WATERSHED STEWARDSHIP PROGRAMS

NEW NETWORK LINKS PROFESSIONALS, VOLUNTEERS THROUGHOUT THE STATE



There are more than 1,700 watersheds of varying sizes in North Carolina, and hundreds of organizations, agencies and individuals dedicated to protecting those watersheds. But until recently, there was no avenue for professionals and volunteers from these different groups to effectively communicate, collaborate or cross-train.

In 2012, the UNC Institute for the Environment joined forces with the NC Water Resources Research Institute (WRI), NC Department of Environment and Natural Resources, NC Cooperative Extension Watershed Education for Communities and Officials, and Triangle J Council of Governments to better understand the state's diverse watershed programs, their current staffing, resources and needs. After compiling North Carolina's first comprehensive, statewide database (550 programs and individuals were identified), the project team surveyed professionals and volunteers from many of these groups and issued a detailed assessment of statewide capacity and resource needs. (The report is available online at erp.unc.edu.)

"There are many people throughout North Carolina who are doing great work to protect our watersheds, which are critical to the economic, environmental and community health of our state," IE Project Coordinator Michele Drostin acknowledged. "In putting together this report, it became clear that there was a strong need to connect these people so they can network,

build and share skills and knowledge, and gain greater access to resources."

In May 2013, the project team convened a one-day workshop at the North Carolina Botanical Garden in Chapel Hill. Sixty participants representing local, state and federal government agencies and private and nonprofit organizations of all sizes met to review the needs assessment data and begin to flesh out plans for the North Carolina Watershed Stewardship Network (WSN). WSN's goal is to identify, include, connect and serve watershed stakeholders statewide.

From this meeting, a steering committee was charged with developing a strategic plan for WSN to engage a wide variety of stakeholders, create online and face-to-face opportunities for networking and training, engage government agencies and elected officials in management strategies, and foster public education about water quality impacts, storm water and watershed protection.

One of WSN's first priorities is to design an interactive website with tools that make it easy for watershed stewards to gather information about their watersheds, share information about their efforts, identify or publicize volunteer opportunities and seek technical support. Drostin and colleagues in the IE's Environmental Resource Program are providing leadership in developing that website as well as other WSN priorities.

The Wallace Genetic Foundation provided funding support for the database and assessment. ■

NC CLEAN TECH SUMMIT INSPIRES COLLABORATION



On February 26th, UNC-Chapel Hill hosted the first-annual N.C. Clean Tech Summit at the William and Ida Friday Center for Continuing Education in Chapel Hill. In partnership with Kenan-Flagler Business School's Center for Sustainable Enterprise, the Research Triangle Clean Tech Cluster (RTCC), and Strata Solar, the Institute for the Environment welcomed more than 300 people from industry, academia, and state government to discuss the clean tech industry in North Carolina. The Summit sought to ignite innovation and collaboration across the state and served as an extension of the Institute's mission to seek solutions to critical environmental issues.

An emerging industry representing trillions of investment dollars worldwide, clean tech includes technologies involving solar power, biofuels, alternative transportation, electric grid modernization, water conservation, improving energy efficiency, and more. These technologies represent a new way of tackling environmental challenges—a shift from regulatory models to

a market-driven approach. This approach has been spurred by price spikes, resource shortages, and security breaches that have become persistent threats to the global economy.

Here in the Triangle, top companies bring expertise in hardware, software, networking, and analytics that create an unparalleled base to shape the market for clean technology. The Triangle also hosts three top universities, with many more nearby. While the companies have recently launched the RTCC to galvanize our regional competitive advantage, the role of universities in supporting the advancement of the sector has not been clearly defined. UNC-Chapel Hill faculty are involved in an array of clean tech projects including advancing lithium ion batteries, developing new solar technology to convert the sun's energy into hydrogen fuels, and improving the efficient use of water. Dozens of other projects are underway at Duke University and N.C. State to support the growth of this industry—and more is happening at nearby UNC Charlotte and N.C. A&T.

The Summit worked to further clarify the role of academia and open up discussions between academia and the other major sector that can support clean tech's advancement: state and local leaders. Brad Ives, assistant secretary for natural resources at the North Carolina Department of Environment and Natural Resources, delivered a keynote address at the Summit in which he described the state's solar industry, which is now worth a billion dollars in annual revenue and 10% of all new solar in the U.S. and Canada. Lou D'Ambrosio, chairman of Sensus and speaking from the industry perspective, gave a lunchtime keynote address about the need to "transform, reinvent, and refocus" with the changing world and industry.

2014 Summit sponsors included Birdseye Renewables, Fifth Third Bank, Strata Solar, and WasteZero. The second annual N.C. Clean Tech Summit will be held on Thursday and Friday, February 19-20, 2015, at the William and Ida Friday Center for Continuing Education in Chapel Hill. Information can be found at ie.unc.edu/cleantech. ■



COUSTEAU BRINGS FAMILY LEGACY TO UNC'S CAMPUS EARTH WEEK

Alexandra Cousteau, filmmaker and granddaughter of Jacques-Yves Cousteau, delivered the campus earth week keynote address at 6 p.m. on Wednesday, April 16, at UNC-Chapel Hill's Sonja Haynes Stone Center. A reception was held prior to the talk for students to meet Cousteau.

The lecture was free and open to the public and was brought to campus by the UNC Institute for the Environment in partnership with "Water in our World" and the Center for Galapagos Studies, Sustainability Office, Department of Environmental Sciences and Engineering, and the Gillings School of Global Public Health.

Cousteau's keynote address, "This Blue Planet: Preserving and Sustaining our Healthy Earth," complemented Carolina's "Water in our World" campus-wide water theme by exploring Cousteau's work on water quality and availability, particularly on the Colorado River. During her visit, Cousteau made connections with faculty and students and plans to continue the lively, inspiring conversations that began at UNC.

Following the talk, questions for Cousteau centered on her advice for those who wish to inspire better management of water resources. She encouraged

students to take time to travel to see global challenges first-hand. In reference to her own experiences, she described a small group of Mexican citizens who have worked for decades to see the Colorado River, critically depleted due to over-allocation and increased drought, reconnect to the sea at the Gulf of California, which it soon will.

Cousteau is a National Geographic "Emerging Explorer" and a globally recognized advocate on water issues. Her global initiatives including her NGO, Blue Legacy, focus on telling the story of water issues to inspire citizens to protect water resources. Led by Cousteau, Blue Legacy spearheads educational expeditions to produce short films, blogs, photographs and interactive elements to allow media outlets to more effectively engage audiences. It pursues water's intersection with energy, food, communities and diplomacy as themes for its expeditions.

Cousteau was honored as an "Earth Trustee" by the United Nations and a "Principal Voice" by CNN International. The reach of her work extends to projects in Botswana, Cambodia, Canada, India and the Middle East. She resides in Berlin, Germany. ■

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STEVE WALL JOINS INSTITUTE TO CONNECT RESEARCH TO REAL-WORLD

Steve Wall joined IE this spring as part of its "translational initiative." He will work to expand the reach of IE's research to impact environmental policy and increase public understanding of IE's work on critical issues.

As a research associate and project manager, Steve will work with faculty to better connect their research with the media and the public, increase collaboration among environmental faculty across campus, and keep faculty and staff informed of ever-evolving environmental policy at all levels.

Before joining IE, Steve served as a policy analyst in the Secretary's office of the North Carolina Department of Environment and Natural Resources and worked for the Biofuels Center of North Carolina and the North Carolina League of Conservation Voters. Earlier in his career, he worked on federal environmental and agricultural legislation for U.S. Congressman Mel Watt.

Steve received both a B.A. in political science and a J.D. at UNC-Chapel Hill. He resides in Carrboro with his wife, Aimee, and their three daughters. ■

GIFTS &
GRANTS

With a grant from the **National Science Foundation**, IE Director Larry Band will lead research to develop a crowd-sourced green infrastructure (GI) design framework. This will enable stakeholders to interactively create and evaluate GI designs that consider broad social, economic, and environmental criteria. The research will include creating urban watershed models to predict impacts of GI designs, developing interactive ways to crowd-source the design process, and implementing the model and design methods in a cyberinfrastructure framework. Through collaborative planning, this project will increase water quality and the greening of urban spaces to the benefit of human and ecosystem health and wellbeing. The project is in collaboration with faculty, students, and staff in the Renaissance Computing Institute (RENCI) and the Department of Computer Science at UNC-Chapel Hill, and at the University of Illinois.

With a grant from the **Eddie and Jo Allison Smith Family Foundation**, IE Environmental Resource Program staff will work with fifth grade teachers to incorporate current science about the Tar-Pamlico River Basin and Pamlico Sound. Kathleen Gray, Sarah Yelton and Michele Drostin will lead the project. Using hands-on activities and outdoor exploration, teachers will gain an in-depth understanding of these waterways with the goal of promoting stewardship among their students. A partnership with two regional education centers—Goose Creek State Park and A Time for Science—will enable field trips and ongoing education for teachers.

IE is collaborating with the Environmental Law Institute on a project to facilitate greater collaboration among emergency managers, floodplain managers, wildlife conservationists and others in Iowa's Cedar River Basin. As part of the project, which is funded by the **McKnight Foundation**, IE and ELI will convene a workshop this summer to identify opportunities for different groups and organizations to work together. Multiple stakeholders will be represented at the workshop, including conservation and agricultural interests as well as federal, state and local environmental regulatory agencies. This is the third collaborative project between IE and ELI. The project will be led by IE Research Associate David Salvesen.

With a contract with the **U.S. Forest Service**, IE Research Associate Uma Shankar will lead a project to model wildfire emissions driven by climate change. Shankar and colleagues will look at the next 50 years in the Southeastern U.S. to assess emission impacts on atmospheric composition over the region in selected current and future years. In this, the third year of the project, IE will process emissions data from non-fire sources for 2010 and compare them to observations from that year, providing insights into the skill of the modeling system in representing the wildfire emissions impacts on air quality.

IE Research Associate B.H. Baek will lead a project under a grant from the **Mid-Atlantic Regional Air Management Association (MARAMA)** to improve software and provide training. Using the U.S. Environmental Protection Agency's Emissions Modeling Framework (EMF), IE will install and implement current software, modify it to address the needs of each region, and provide training to the staff of MARAMA and member agencies.

With a contract with the **California Air Resources Board (CARB)**, IE Research Associate Zac Adelman will lead work to modify the Sparse Matrix Operator Kernel Emissions model (SMOKE) and develop new methods to improve CARB's State Implementation Plan modeling procedures. The work will include updating SMOKE to work with CARB's data and improving the efficiency of their emissions data processing procedures.

IE's Environmental Resource Program staff, led by Sarah Yelton, will offer a summer institute for teachers in the Albemarle-Pamlico Region under a grant from the **NC Department of Environment and Natural Resources**. Participants in the three-day institute will explore environmental science, health, and civics issues related to water quality in North Carolina. Through hands-on and real-world exploration, teachers will gain a greater understanding of the human health implications of environmental impacts to water resources and water quality.

With a grant from **North Carolina State University**, IE will develop climate change projections for Puerto Rico. Jared Bowden, a research assistant professor at IE, will lead the project. Using the Weather Research and Forecasting Model, Bowden will run simulations to seek variables that will most directly affect wildlife distribution and perseverance in the Commonwealth. This will provide information for decision making in preparation for impacts of climate change.

IE will work in collaboration with Dr. Donald McKenzie at the Pacific Northwest Station, and Dr. Jeffrey Prestemon with the Southern Research station under a grant from the **U.S. Forest Service (USFS)** to improve understanding of how climate change will affect fire ecology and air quality in the Southeastern U.S. The research, led by IE Research Associate Uma Shankar, will benefit both research and regulatory communities. Through a cooperative agreement with the Bureau of Land Management under its Joint Fire Science Program, IE researchers will improve the modeling of fire weather in the Southeastern U.S. and develop methods to simulate the spatial-temporal distribution of fires and fuel loads in an evolving climate. The research will allow new accessibility to the results and data through the USFS Research and Development Data Archive. ■

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IE WELCOMES NEW BOARD MEMBERS



Rye Barcott is a managing partner at Double Time Capital and cofounder of Carolina for Kibera, an organization inspired by his trip to Kenya during his junior year at Carolina. Rye is the author of the acclaimed memoir *It Happened on the Way to War*, which juxtaposes his co-founding and leadership of Carolina for Kibera with his service in the Marine Corps overseas. He is a Carolina alumnus and previously led an investment team focused on disruptive innovation for the former CEO of Duke Energy.



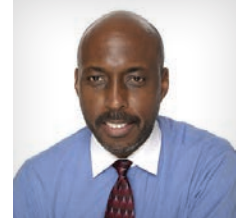
Ann Colley joined the Board this spring. She is the Director of Public Relations and Charitable Giving of Moore Capital Management, LP and serves as Executive Director and Vice President of The Moore Charitable Foundation and its affiliates. In this role, Ann advances the Foundation's mission of environmental conservation of land, water and wildlife protection and preservation. She serves on the Board of Trustees of Waterkeeper Alliance, as well as the Board of Directors of Riverkeeper, the Rainforest Foundation US, and the B. Robert Williamson, JR. Foundation. She is a member of The National Council of the Land Trust Alliance, Oceana's Ocean Council and Conservation International's Chairmen's Council. Ms. Colley graduated from the University of North Carolina at Chapel Hill with honors and a B.A. in Political Science.



Conor Farese, a strategic projects manager at Soligent Distribution, is a Carolina alumnus with a B.A. in environmental studies. Conor launched the UNC Global Gap Year Fellowship and a student organization, Gappl, to advocate and support gap years locally and nationally. Prior to his current work with Soligent, Conor led recruitment and growth at Global Citizen Year, the premier gap year organization for high school students interested in global issues and social entrepreneurship.



Doug Rader is the Chief Oceans Scientist at the Environmental Defense Fund, where he advises leadership on the scientific aspects of policies and programs affecting oceans. He has chaired or served on numerous state and regional advisory panels and committees, including legislative and gubernatorial commissions on offshore energy and the South Atlantic Fishery Management Council's Habitat and Marine Protected Areas Advisory Panels. He earned his BS and Ph.D. in biology at UNC-Chapel Hill.



Henry Lancaster II, president and principal lobbyist at Lancaster Craig & Associates, rotated off IE's Board of Visitors this spring. Previously, Henry served as director of intergovernmental affairs for the League of Municipalities and as director of legislative and intergovernmental affairs for the N.C. Department of Environment and Natural Resources. He served on IE's Board for three terms beginning in 2002. IE expresses its deep appreciation for his service and support.

PEOPLE NEWS

Post-doctoral researchers **Jon Duncan**, **Jordan Kern**, and **Yuri Kim** joined IE this spring. Yuri and Jon will work with IE director Larry Band, and Jordan will work with Greg Characklis, director of IE's Center for Watershed Science and Management.

Kat Bawden joins IE as a part-time research associate. Kat will coordinate the Environmental Resource Program's outreach to communities living near Superfund and other hazardous waste sites and contribute to various projects by translating educational materials to Spanish. She continues to work at Benevolence Farm in Carrboro, NC, where she serves on marketing and program development committees for the organization. Kat is a recent graduate of the Department of Health Behavior in the UNC Gillings School of Global Public Health.

Amy Bradfield joined IE last fall as a human resources consultant. She supports both IE and other research units at UNC. Amy brings over twenty years of experience from her work with the Washington Post where she worked in employee relations, risk management, and recruitment, among other duties. She is a certified Senior Human Resources Professional and holds a B.A. from Miami University in Oxford, Ohio.

Jo Ellen Brandmeyer joins IE as a research associate in the Center for Environmental Modeling for Policy Development. She is an environmental modeling software engineer. She received her Ph.D. at Carolina where she studied urban and regional air quality modeling, and has environmental and chemical engineering degrees from University of Tennessee at Knoxville and University of Missouri at Rolla, respectively.

Carlie Coats joins IE as a research associate and senior software engineer in the Center for Environmental Modeling for Policy Development. His work focus is software engineering for environmental models, high performance and parallel computing, and computational algorithms and optimization. He received a B.S. in Mathematics from Duke University and a Ph.D. in the same discipline from the Massachusetts Institute of Technology.

Megan Hoert Hughes joins IE as a research associate with the Environmental Resource Program. Her work includes outreach on asthma and other environmental health issues. She also manages IDEA, a summer science enrichment program aimed at increasing diversity in the geosciences. She earned a Master of Environmental Management from Duke University where she studied resource ecology. Megan has extensive experience as an environmental educator, including work at Bowling Green State University's Center for Environmental Programs and the Environmental Finance Center at University of Maryland.

Michelle Snyder joins the Institute as an environmental modeler in the Center for Environmental Modeling for Policy Development. She studied physics and mathematics at Elon University, then earned a Ph.D. in physics from North Carolina State University. Before joining IE, she worked as a post-doc at the U.S. Environmental Protection Agency. She specializes in urban-scale air-quality modeling and computer programming.

Steve Wall (see sidebar, page 5) ■

INSTITUTE for the ENVIRONMENT
The University of North Carolina at Chapel Hill
Campus Box 1105
Chapel Hill, NC 27599-1105

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UNC environment

RECENT EVENTS

NC Clean Tech Summit

On February 26th, 300 industry leaders, entrepreneurs, faculty, students, and state and local government officials met at the William and Ida Friday Center in Chapel Hill to discuss the state of clean tech industry in North Carolina. Jobs, collaboration, growth, and goals for the industry were discussed. The Summit, organized by the Institute in partnership with Kenan-Flagler Business School's Center for Sustainable Enterprise and the Research Triangle Clean Tech Cluster, was sponsored by Birdseye Solar, Fifth Third Bank, Strata Solar and WasteZero. Keynote speakers were SENSUS Chairman Lou D'Ambrosio, N.C. Department of Environment and Natural Resources Assistant Secretary Brad Ives, and Strata Solar President Markus Wilhelm. The second annual NC Clean Tech Summit will be held on Thursday and Friday February 19-20, 2015 at the William and Ida Friday Center in Chapel Hill. (See details, page 4)

Spring Environmental Seminar

Dr. Berrien Moore III gave the Institute's 2014 Spring Environmental Seminar on March 19th at Tate-Turner-Kuralt Auditorium. Students, faculty, and members of the community attended the talk, "Understanding the human inflation of the global carbon cycle." Moore, a renowned climatologist at the University of Oklahoma and UNC graduate, explored evidence of direct human impact on global carbon amounts since the Industrial Revolution. He also explored the current state of climate science including the extent to which reduction in the burning of fossil fuels is necessary to substantially reduce atmospheric carbon concentration. The next Environmental Seminar will be held this fall.

Campus Earth Week Keynote Address with Alexandra Cousteau

A pan-campus partnership brought Alexandra Cousteau, filmmaker, explorer, advocate, and granddaughter of Jacques-Yves Cousteau to Carolina to speak to students during Campus Earth Week. Her keynote address, "This Blue Planet: Preserving and Sustaining a Healthy Earth" drew over 250 attendees from across the Triangle. Using stories and video, Cousteau highlighted her work documenting the concerns and efforts behind restoring the Colorado River in the American Southwest. She spoke of her extensive travels and called upon students to see the world and engage in issues beyond their doorsteps (see related article, page 5).