

FALL 2016

UNC environment

NEWS FROM THE INSTITUTE FOR THE ENVIRONMENT AT THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

VOLUME 15, ISSUE 2

EPA AWARDS MULTIMILLION-DOLLAR CONTRACT TO INSTITUTE TO PROTECT AIR QUALITY

AIR QUALITY ANALYSIS CENTER RECEIVES CONTRACT WORTH UP TO \$10.2 MILLION TO CONTINUE, EXPAND OPERATIONS



The CMAS center provides a major infrastructure for the development, discussion and dissemination of air quality tools. The center naturally fits the mission of the University as it spans both the environmental and health sciences, and provides a solid scientific basis for the creation of policy.

The University of North Carolina at Chapel Hill's Institute for the Environment has been awarded a seven-year contract worth up to \$10.2 million from the Environmental Protection Agency to continue and expand operations of its Center for Community Air Quality Modeling and Analysis.

Established in 2001, the EPA's center has been hosted at Carolina since 2003 and works with the agency to lead the international, open-source, community-based air quality modeling and analysis software used to evaluate and propose regulations. The extended funding allows the center to continue and expand the scope of its work in these vital environmental and human health areas.

"UNC is a national hub for studying and protecting air quality," said Terry Magnuson, vice chancellor for research. "This continued partnership with the EPA is a testament to the valuable role our research centers and institutes play at UNC—translating research into practical good for societal benefit."

Since its inception, the center's environmental and air quality models, have been used by regulatory offices at the EPA, as well as state governments, academics, businesses, industries, federal agencies and the international community. It has grown to serve more than 5,000 registered users in more than 90 countries.

"The growing and vibrant user community of these tools has not only helped promote scientific transparency regarding the models used in regulatory applications, but it is also helping evolve the modeling systems through contributions from the broader external environmental modeling community," said Jennifer Orme-Zavaleta, director of the EPA's National Exposure Research Laboratory.

Through the center, scientists at UNC-Chapel Hill's Institute for the Environment have developed a largely participant-funded training program covering air quality and emissions models. The center's trainings are conducted

continued on page 3

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ALUMNI PROFILE

TODD MILLER, '78, '81

PRESERVING AND PROTECTING
NORTH CAROLINA'S COAST



Having grown up in coastal North Carolina, Todd Miller's love for the coast blossomed during early childhood and continued throughout his life. However, his influence and impact on the region nearly didn't happen.

After leaving Carteret County in 1975 to attend college at UNC-Chapel Hill, Miller didn't think he would make it back to the rural community of Ocean that borders Bogue Sound.

"When I left here, I didn't think I was coming back," he said. "I wanted to go to somewhere with opportunity and work. I just wanted to do something different and didn't really think I'd be able to find employment here."

Growing up, Miller saw first-hand the steady changes as urbanization took hold of the beautiful and complex coastal landscape.

"Things we thought were super special were being destroyed without much care or planning or protection," he said.

After visiting other coastal communities throughout his college and graduate school career and almost taking a job in Tampa, Florida, Miller realized that nothing could compare to the beaches of North Carolina.

"I was spoiled by what we have here," he said. "Unlike a lot of coastal areas, the waters are still relatively clean. You can catch fish and eat them—if you catch them. Just the nature of the area—it's so diverse. It's just a pretty special place. The communities and economies are still pretty closely tied to the quality of the environment and we haven't separated ourselves, whereas a lot of urban areas have pretty much turned their back on the natural resources. They might be a pretty aesthetic part of the community, but they're not that connected anymore. But, that's not true here," he added.

So with a little help from his father and a background in environmental studies and city and regional planning, Miller returned to Carteret County with a mission to save his most favorite place on earth.

Within a few years, he managed to establish the largest nonprofit organization in North Carolina dedicated to preserving and protecting the state's coast that he, as well as hundreds of thousands of other individuals, calls home.

Miller's idea for the North Carolina Coastal Federation came from a project he worked on during graduate school where he traveled across the country looking at communities that had effective watershed management programs.

"The common denominator for those communities that were actually doing something was usually engaged citizens. It wasn't just the government coming in and saying we're going to protect something. Usually, it was getting pushed by active citizen interest or public interest. So having the public involved was a critical ingredient for effective environmental management," Miller said.

After seeing the degradation from urbanization happening all across the North Carolina coast throughout his life, he realized the area needed an organization like the North Carolina Coastal Federation.

Starting such an entity from scratch was no easy matter, but Miller is not easily dissuaded.

He tackled the first obstacle—getting enough people to back the idea—by bringing together organizations from across the coast dedicated to working on environmental issues. Enough people realized the need for a comprehensive organization like the North Carolina Coastal Federation, and he was able to assemble a board and apply for operational support funds.

Two years of organizing, planning, and an incredible amount of work later, Miller received the break that his budding nonprofit needed. The Mary Reynolds Babcock Foundation in Winston-Salem realized the potential of

Miller's project and decided to financially support his cause.

"If that \$20,000 grant had not come through, the North Carolina Coastal Federation would probably be completely forgotten by now. It wouldn't have much of an impact. It was essential at the time for things to continue. It was wonderful of them to give us the opportunity. I mean, it was basically someone coming in with no track record, but somehow we sold the idea and their trustees invested in us," he said.

So it was in 1982 that Miller's dream finally materialized and the North Carolina Coastal Federation was born.

Since then, Miller has yet to see a boring day.

"It's been a whirlwind," he said.

From preventing strip mining of wetlands in Hyde and Dare counties to acquiring its first piece of land in North Carolina with half a million in Clean Water Management Trust Fund dollars, the North Carolina Coastal Federation has had an enormous impact along the state's coast.

"There are things we've done now that I never would have envisioned would be possible," Miller said.

While it started out with just Miller at the helm, the organization now includes more than a dozen staff members and hundreds of volunteers.

Miller attributes the success to the comprehensiveness of the federation's reach.

"We're not a single issue organization or a single strategy. We're working on things that are really long-term in terms of just basic education of people about the coast, starting with children all the way to design professionals and engineers. I think with the combination of things we've been able to do, we've earned the respect of folks to help to change attitudes in the long run. And that's sort of the secret."

The organization's success also comes from its ability to adapt.

After seeing the decline of environmental coverage by the media, members of the North Carolina Coastal Federation decided to take matters into their own hands and began the Coastal Review Online (CRO).

The CRO specifically targets environmental news occurring in North Carolina. However, by remaining separate from the North Carolina Coastal Federation, it has been able to establish itself as a credible news organization dedicated to providing extensive coverage and good news. So good, in fact, that the program was recently inducted into the North Carolina Press Association and won 23 press awards in 2015.

Miller's hope is that the North Carolina Coastal Federation will continue adapting to the rapidly changing times.

"Unfortunately, I don't think we're going to work ourselves out of jobs," he said. "The challenges and threats to the coast aren't going to go away, so I think we have to stay focused on those areas where we can make a difference and continue that work. We still need to continue to grow the number of people that are concerned and engaged—the people that help us."

In a time of environmental uncertainty and turmoil, the North Carolina Coastal Federation has played an enormous role in helping protect the diversity and beauty of the North Carolina coast. Without its influence and dogmatic determination to protect such a unique environment, these landscapes would not be the wonderful places locals revere and visitors fall in love with.

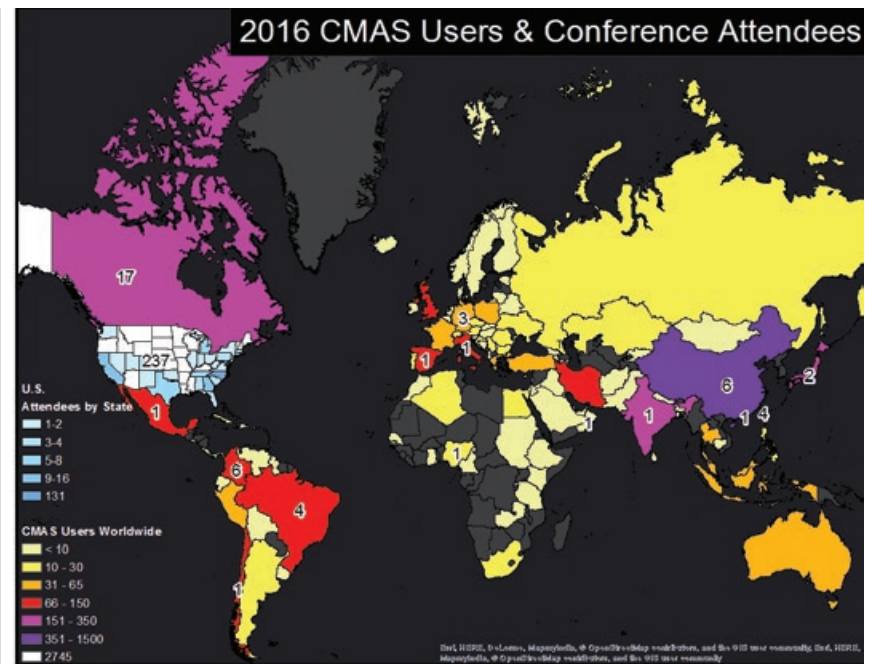
And it all started with a man who saw a need, and rose to meet it.

continued from page 1

on campus, online and at national and international sites.

“Protecting air quality for human health and the environment is paramount,” said Adel Hanna, a research professor at the UNC-Chapel Hill institute who leads the center. “We will continue to enhance existing capabilities while, as required by the contract, we continue to develop new ones.”

The center also hosts an annual conference that brings together leading air quality scientists from all over the world. The 15th annual conference was held Oct. 24-26, 2016 at the William and Ida Friday Center for Continuing Education. This year, nearly 300 air quality modelers, policymakers and representatives from academia, government and nonprofit agencies came together to share leading edge research and ideas. The conference also explores policies relevant to air quality analyses and their impact on communities. For more information on the center and the annual conference, visit cmascenter.org. See images from the 15th anniversary celebration on page 8.



Map of 2016 CMAS users and conference attendees. CMAS serves more than 5,000 registered users in more than 90 countries.

UNC-CHAPEL HILL-LED TEAM WINS \$3 MILLION TO STUDY INNOVATIONS, SOLUTIONS TO INTERDEPENDENCE OF FOOD, WATER AND ENERGY



The National Science Foundation (NSF) awarded nearly \$3 million to an interdisciplinary team led by UNC-Chapel Hill's Greg Characklis to examine the interdependence of the systems that supply food, energy and water.

Characklis, director of the UNC Institute for the Environment's Center for Watershed Science and Management and professor of environmental sciences and engineering at UNC's Gillings

School of Global Public Health, is conducting the study in California, a state which despite widespread droughts continues to lead the nation in agricultural production. The grant will span three years.

“While the focus is on California,” Characklis said, “the data that will be collected and the modeling systems that our team will develop should ultimately bring benefits to many states and regions that suffer from drought.”

Crop production, energy generation and water supply are clearly linked, particularly in times of scarcity. During droughts, farmers must irrigate their fields using pumped ground water, which can cause electrical demands to increase as much as 33 percent in the summer when urban electricity demands also rise. Less rain and snow also mean less hydroelectric power causing electric utilities to use more expensive means, such as natural gas, which raises electricity prices.

The use of more, higher priced, electricity could translate to economic distress for the farmer and higher food prices for the consumer. These scenarios pose important decision-making challenges from statewide infrastructure planning to choices made by local irrigation districts and individual farmers.

The goal of this study is to build a decision-making tool for stakeholders that models California's massive water and power infrastructure and its links to agricultural production in the state's Central Valley.

“We want to examine the vulnerabilities of this interconnected system to outside forces like climate change, technological innovation and economic uncertainty,” said Jordan Kern, a co-principal investigator (PI) of the study and a research assistant professor with the Institute for the Environment. “We'll explore tradeoffs among these sectors, and then identify ways to make the system as a whole more resilient and sustainable.”

Characklis's team includes scientists from multiple disciplines and institutions including UNC, University of California-Davis (UC-Davis) and Cornell University (Cornell).

“This proposal was truly a team effort from conception to submission, and while many were involved, co-PIs Jordan Kern (UNC Institute for the Environment), Jon Herman (UC-Davis) and Pat Reed (Cornell) all played critical roles in its success,” Characklis said.

Tamlin Pavelsky, an associate professor of geology at UNC, also is part of the research team.

“Solutions to our most pressing environmental challenges are invariably interdisciplinary, and this is particularly true of water,” Characklis said. “NSF continues to encourage large-scale efforts to explore new problem-solving approaches that cross disciplinary boundaries, and UNC should be well positioned to take advantage of these.”

The grant is part of NSF's “Innovations at the Nexus of Food-Energy-Water” and is the second NSF award to Characklis in the last two years. In 2014, a team led by Characklis received a \$2.2 million grant from the joint NSF and U.S. Department of Agriculture (USDA) program, “Water Sustainability and Climate,” designed to develop innovative strategies for sustainably meeting future water demands in North Carolina and across the Southeastern United States.

Adapted from an announcement by the UNC Gillings School of Global Public Health.

CAROLINA PROFESSOR WORKING TO MAKE “WATER IN OUR WORLD” SAFER FOR ALL

Recently Carolina celebrated the many ground-breaking water research projects and educational activities underway across campus. “Water in Our World” was Carolina’s first thematic approach to exploring a specific issue through a series of programs and special events to highlight Carolina’s work and impact on water-related projects.

The “Water in Our World” theme showcased dozens of Carolina faculty, staff and students working in the water field—from finance experts helping local governments plan for new water projects to researchers partnering with NASA to use satellites to estimate the amount of water on the planet—as a means of strengthening collaboration on campus and increasing the visibility of the university’s work and engagement on this critical topic.

One such example of a Carolina professor that is a leader in the water field is Jill Stewart, an associate professor of environmental sciences and engineering at the Gillings School of Global Public Health. Stewart, whose research is at the intersection of water quality and human health, develops tools and methods to study water quality and evaluate public health threats and to identify ways to mitigate those threats.

Stewart, a microbiologist, uses novel technologies to detect and track pathogens—disease causing organisms—in waterbodies. Remarking on the advantages of conducting cutting edge research at Carolina, Stewart says, “the collaborative nature of faculty colleagues here along with being integrated in a public health school allows for my research to be solution-oriented.”

One of the interesting aspects of Stewart’s work is that she is applying her solution-oriented methods and techniques at the local level right here in the Triangle area and at the global level in the Galapagos Islands.

The Jordan Lake Reservoir is a major source of drinking water for the Triangle region, serving as a critical drinking water supply for Apex, Cary and Durham. As such, gaining a better understanding of the health and quality of water in the reservoir is of vital importance—an issue local and state water agencies have been working on for decades. One of Stewart’s research projects looked at contamination sources in the watershed and identified the breakdown of contamination in the lake. The project also evaluated how contaminants were transported and how that process can change due to a variety of factors, such as weather or seasonal conditions.

Efforts to improve the water quality in Jordan Lake continue. Just this year the North Carolina General Assembly directed UNC-Chapel Hill to lead a multi-year study to recommend management solutions to improve the water quality of Jordan Lake. Stewart’s work has produced data and conclusions that can inform the work of water resource managers as they strive to ensure



Jill Stewart

protection of this critical drinking water source. Stewart has been able to apply the same techniques she uses here in North Carolina and utilize them in one of the world’s most treasured places—the Galapagos Islands. She is the associate director of UNC’s Center for Galapagos Studies, a partnership with the Universidad San Francisco de Quito, in Ecuador. Carolina has a strong presence in the Galapagos, including an international field site administered by the Institute for the Environment, which allows Carolina undergraduates to conduct research in this environmentally significant region.

Free of humans for almost all of their history, the Islands—made famous by a visit from Charles Darwin in 1835—have developed some of the most unique animal and plant life in the world. Consequently, the Islands offer tremendous research opportunities, a fact noted by Stewart as she says, “the region is the embodiment of a living laboratory with a full spectrum of environmental ecosystems.”

Despite the isolation of the island for centuries, increased residential growth as well as an influx of approximately 200,000 tourists each year are putting the fragile ecosystems at risk. Stewart and her colleagues are seeking to understand the impacts of a larger human footprint. Stephen Walsh, director of the Center for Galapagos Studies, says that Stewart’s research is having a significant impact as she “works diligently with the local community to create a water quality monitoring program in homes, community beaches and throughout water systems in the Galapagos Islands.”

Stewart’s research study and water quality monitoring program provides a critical baseline for water quality in the Galapagos Islands where population growth and increased tourism are impacting human health and the environment in one of the planet’s ecological gems.

Whether close to home taking water samples at Jordan Lake or working in tandem with researchers from around the globe in the Galapagos Islands, Stewart’s research contributions are leading to a better understanding of the “Water in Our World.”

ERP SPENDS SUMMER CONNECTING WITH COMMUNITIES

HIGHLIGHTS FROM SEVERAL COMMUNITY ENGAGEMENT PROGRAMS THIS SUMMER

The UNC Institute for the Environment’s Environmental Resource Program (ERP) had a busy summer sharing research and science with communities throughout the state of North Carolina. Here are some highlights. Get the full stories on ie.unc.edu/news.



Local high school students spend week at UNC-Chapel Hill immersed in energy, climate science
Twenty-eight high school students from Durham and Orange counties spent a week learning about the connections between climate and energy at the Climate Leadership and Energy Awareness Program (Climate LEAP) summer institute as part of a yearlong student science enrichment program.

Throughout the week, students interacted with scientists, graduate students and educators and participated in discussions, field trips and hands-on lab activities to increase their knowledge of climate change, energy science and sustainability.

This year, students had the opportunity to learn about climate change science from professionals such as Chip Konrad, the director of the Southeast Regional Climate Center and associate professor in Geography at UNC-Chapel Hill; Greg Fishel, a WRAL TV meteorologist; and Sierra Woodruff, a Ph.D. candidate in the UNC Curriculum for the Environment and Ecology.

Students were also exposed to people working to find solutions to address climate change and in the process learned about careers in science and engineering.

ERP, partners develop guide to help Triangle fishermen safely eat their catch

Families enjoying North Carolina’s Free Fishing Day at Triangle-area lakes or rivers over the Fourth of July holiday had new resources to help them



The new Web site and brochure help anglers learn about harmful chemicals that may be present in fish caught in local waterways and how they can reduce their exposure.

Mercury and polychlorinated biphenyls (PCBs), chemicals found in some Triangle-area lakes and streams, can accumulate in fish that live long lives and eat other fish, especially largemouth bass, catfish and carp, making them unsafe to eat. High levels of PCBs have been found in fish in Lake Crabtree County Park and its tributaries, which are near the Ward Transformer Superfund site and south of Raleigh–Durham International Airport.

‘Tools of Watershed Management’ trains leaders to protect North Carolina’s watersheds



Following a comprehensive, statewide study of North Carolina’s diverse watershed programs, ERP, in partnership with the NC Watershed Stewardship Network, designed and conducted a series of workshops to build capacity in the state to protect our waterways. Participants have included professionals and volunteers associated with watershed programs in local and state

government agencies as well as private and nonprofit organizations.

This year’s workshop, the Tools of Watershed Management, was a free two-day session for volunteers and staff who work to protect and improve local watersheds. The workshop gave participants the tools they needed to engage a broad cross-section of their communities in watershed management—and the value of this engagement is significant. In a statewide survey conducted by ERP, the primary reason people gave for being involved in water protection efforts was that they felt a personal connection to their local natural resources. For this reason, participants in the workshop received instruction not only on the effective development of plans to protect local watersheds, but also on how to put such plans into action.

Participants are also given the opportunity to practice the skills taught during the workshops and network with others involved in watershed protection.

Exploring the Future of Electricity workshops continue to teach NC teachers



Forty-six science and technology teachers from Central and Eastern North Carolina recently participated in the professional development program Exploring the Future of Electricity, offered by ERP. The program is designed to foster learning about the alternative energy sources and emerging technologies that will be needed to meet electricity demand in the 21st century.

Teachers gained ideas for enhancing the energy literacy of students and received inquiry-based instructional materials aligned with the NC Essential Standards along with classroom supplies. For example, workshop participants played the US EPA’s Generate! game, an interactive board game that promotes critical thinking about the electric grid by enabling players to explore energy choices, corresponding capital and operating costs, CO₂ emissions, and water use. (Pictured above.)

To date, more than 800 teachers have participated in energy-related teacher professional development workshops facilitated by ERP.

To learn about all of ERP’s community engagement endeavors, please visit ie.unc.edu/erp. The programs described above were funded by: Burroughs Wellcome Fund, Duke Energy Foundation, the National Institute for Environmental Health Sciences and the Wallace Genetic Foundation.

understand health advisories about eating the fish they catch, thanks to researchers at the University of North Carolina at Chapel Hill.

Over the holiday weekend, the Superfund Research Program in Carolina’s Gillings School of Global Public Health, along with the UNC Institute for the Environment’s Environmental Resource Program, released “Eat Fish, Choose Wisely.”

FORMER IE DIRECTOR FINDS NEW FOCUS, NOT SLOWING DOWN IN RETIREMENT



Former IE Director Doug Crawford-Brown took an unconventional route to his academic career in environmental sciences. Having grown up in New York and Richmond, VA, among a family of engineers, Crawford-Brown started college following in his family’s familiar path.

After trying out aerospace engineering, Doug Crawford-Brown electrical engineering and mechanical engineering at Georgia Tech, he finally settled on theoretical physics as his calling—much to the chagrin of his family.

“My grandfather and all of my uncles were engineers,” said Crawford-Brown, “so they were surprised when I went into physics. And they were surprised when it led to a career,” he quipped.

Crawford-Brown earned his undergraduate, master’s and Ph.D. from Georgia Tech in theoretical physics and nuclear science.

While working on his dissertation, he visited Oak Ridge National Laboratory, where he became interested in a group that was investigating radiation’s effects on human health. After completing his studies, he stayed on the project for a couple of years until the School of Public Health at UNC-Chapel Hill began recruiting him for an academic position in environmental science and engineering.

“I had to go and look at what environmental science was, because I’d never heard of it before,” he said.

Crawford-Brown found the opportunity to study radiation health effects and environmental sciences intriguing and took the offer. As his research and career developed, he began getting inquiries from the EPA and World Health Organization on protecting human health from environmental risks such as exposure to radiation, microbes and chemicals.

“I became interested in the policy process. How in the world did my research ever end up driving any sort of policy? That led me into what was called environmental management and policy.”

In 1997, Crawford-Brown was asked to spearhead the education arm for the Carolina Environmental Program (CEP), which he gladly did for several years. During this time, he received a Fulbright and was living in Salzburg, Austria with his wife and son. Later, Bill Glaze, the CEP’s director, stepped down leaving an opening that UNC asked Crawford-Brown to fill.

As director, Crawford-Brown championed the formation of the Institute for the Environment, which would retain the undergraduate majors and minors, the graduate program, increase research centers, engage with business and advise policy in the state as well as give students opportunities to have real-world experiences at field sites around the globe. His term lasted until 2008 when he retired to Cambridge, England.

“I’d like to be remembered as someone who stood with others in bringing the hundreds of faculty and thousands of students together to work on environmental problems,” he said.

Although he retired as director, Crawford-Brown continued to lead the Institute’s field site in Cambridge through the spring semester of 2016.

“I really loved working with the UNC students. They are wildly popular here in Cambridge. They have been instrumental over the years in moving the city of Cambridge forward in sustainability and climate policy,” he said.

After a long and productive career at UNC, Crawford-Brown is not slowing down. Also retiring from his position at the University of Cambridge, his focus has shifted to using his academic background to bring together citizens, governments and businesses to make the world a better place for everyone.

“All of my time now will be spent on moving projects forward on the ground in various countries around the world,” he said. “I no longer want to write papers about things, I want to work on low-carbon sustainable projects. My passion now is all about delivering on the kind of world I know we need if we are going to avoid catastrophic climate change.”

UNC INSTITUTE FOR THE ENVIRONMENT HONOR ROLL 2015/2016

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MEET REGINA HILL, IE'S NEW DIRECTOR OF DEVELOPMENT

During a field trip in elementary school to the Newark Watershed in New Jersey, Regina Hill was struck by the beauty and wonder of nature and instantly developed a love and appreciation for the environment. For Hill, the group's zealous tour guide instilled in her an understanding that day—that every organism plays an important role in nature.

When the group came upon vultures scavenging a deer carcass, the tour guide explained that the vultures helped prevent contamination to the water system by eating the remains of dead animals. Without the vultures, animals infected with diseases could decompose and pollute the water system.

"It was just a great experience that I never forgot," Hill said. "It gave me a newfound appreciation for the environment in terms of how everything flows together and our role in keeping this place in good shape for generations to come."

Now as IE's new director of development, she can combine her two passions: the environment and raising money for a cause she feels connected to.

Hill has big plans for the Institute. In addition to raising money, she plans to build cross campus collaborations with the Institute and other departments at UNC. She will work closely with central development to fundraise for the Institute and Carolina's environment community as a whole.

"We're stronger if we join together," she said.

"We are thrilled to have Regina join the Institute to lead our fundraising efforts," said IE's Director Larry Band. "She brings a wealth of experience from the hospital and an extensive career in fundraising. She is a vital addition for both the Institute and University as we ramp up our fundraising efforts."

Hill is not new to UNC. Before coming to IE, she worked with UNC Children's as the director of annual giving for more than five years and later as the assistant director of development. While her positions centered on fundraising, Hill explained that she "fell" into this career direction.

After earning a bachelor's degree in radio/television at Shaw University and a master's degree in media studies at New School University, she landed her first fundraising job as the director of development and public relations at Shaw University.

Hill was only interested in the public relations aspect of the position, but she also was required to manage a fundraising program. As time went on, Hill excelled in the fundraising portion of her job.

"I actually fell in love with fundraising and I appreciated the industry," she said.

Her next post was the director of the annual fund at Cheyney University and since then, she's never looked back.

Outside of work, Hill enjoys spending time with her two children, Sage and Michael, and her husband, Cleo, as well as with their extended family in New Jersey. As a self-proclaimed "news junkie," she also spends her time listening to WUNC and CNN

on the radio. "I listen to pretty much anything involving news topics during my commute. Also, there's this trade show that I listen to on Sundays on WPTF and it's pretty old school. It's just people calling in to sell things. I don't know why, but I can't stop listening to it," she quipped.

When it comes to music, if she likes the song she'll listen to it. Her tastes range from mellow rhythm and blues and Prince to Elton John. "I'm more of a song person—it doesn't matter who sings it," she said.

Hill's position is co-funded by UNC's central development office.



"We are thrilled to have Regina join the Institute to lead our fundraising efforts. She brings a wealth of experience from the hospital and an extensive career in fundraising. She is a vital addition for both the Institute and University as we ramp up our fundraising efforts."

—Larry Band

Director, Institute for the Environment

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UNC 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

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LETTER FROM THE EDITOR
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Dear UNC Environment readers,

As an Institute, we are committed to solving environmental, energy and development challenges through research, education and outreach. For years, IE has printed this newsletter with the impact on the environment at heart. We are taking our commitment a step further by going completely digital.

You will now get our latest news + updates delivered directly to your inbox on the first Monday of each month and a mailed copy of our Year-in-Review, beginning in 2017. If we don't have your current e-mail address, **please subscribe to our monthly e-news by following the directions in the box below.**

In our last issue, we announced the Mar. 2016 launch of our new Web site and social media accounts. Please follow us on your favorite social media platform and visit IE's new Web site for more news + events at ie.unc.edu.

We deeply value our readers and would love to stay connected with you. Please follow the directions below to continue to receive news + updates from the UNC Institute for the Environment.

Sincerely,

Emily Williams
Director of Communications | UNC Institute for the Environment

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Registration is now open for the 2017 UNC Clean Tech Summit!
To register, visit ie.unc.edu/cleantech.
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Photos from IE's 15th anniversary of CMAS conference and celebration on Oct. 25.