

## RESEARCH

# Environmental research and applications group becomes part of CEP

## Move brings expertise in environmental computing and scientific modeling to bear on environmental issues facing North Carolina

In January, the Environmental Modeling Center, formerly at MCNC in Research Triangle Park, became part of the Carolina Environmental Program at The University of North Carolina at Chapel Hill. With the move, UNC-Chapel Hill gained 17 experienced scientists, mathematicians and engineers dedicated to expanding the frontiers of environmental computing and to linking advanced scientific modeling and environmental policy analysis.

Dr. David McNelis, deputy director and associate director of research programs for the CEP, will oversee the CEP Environmental Modeling Center. "The group was being dissolved at MCNC, and

we felt this would be a major loss to the state and the community if these researchers all accepted employment at different places," he explained. "Bringing the group to UNC keeps this capability together as a team and keeps it in North Carolina. This is a seasoned, production-oriented, self-supporting research and applications group that the state cannot afford to lose. These men and women will be an asset to the University and to the CEP."

Each of the Environmental Modeling Center investigators are now research associates at the CEP; as *The CEP Post* went to press, six also held adjunct faculty appointments at UNC and at

other institutions such as NC State University, where they will teach and do public service and outreach in addition to research. The group will move in stages from MCNC's Research Triangle Park headquarters to the CEP's Environmental Design Lab in the Bank of America building on Franklin Street in downtown Chapel Hill.

UNC-Chapel Hill has contracted or subcontracted the Center's research efforts from clients that include government, industrial and academic professionals who use the group's services to generate and understand environmental information. The nearly \$3 million per

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**"The CEP Environmental Modeling Center will also dramatically increase CEP's world-renowned capability in air quality research."**

*Dr. David McNelis, deputy director and associate director of research programs for the CEP*

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## FIELD SITES AND OUTREACH

# One North Carolina Naturally: CEP assists statewide conservation initiative

## Regional and statewide meetings begin to build consensus for comprehensive plan

The Carolina Environmental Program has been assisting the North Carolina Department of Environment and Natural Resources (DENR) with a new statewide land and water protection initiative established to guide North Carolina's future conservation efforts. DENR has established "One North Carolina Naturally" to lead the development and implementation of a comprehensive statewide conservation plan, with input from government agencies, private organizations, landowners and the public.

"[DENR Secretary] Bill Ross and I were discussing the CEP and our desire to be more engaged in statewide initiatives so that we become the central place to which North Carolina citizens and policy makers turn for advice on environmental

issues," CEP Director Doug Crawford-Brown explained. "We agreed that the One North Carolina Naturally project was a good match for our organizations: it fit with the CEP's goals and presented an opportunity to contribute to DENR's efforts. We anticipate that this will be the first of a number of projects on which we'll collaborate."

Last fall, the CEP helped organize eight regional meetings that brought local government officials, conservation, agricultural and forest interests in each region together to begin planning a coordinated, statewide conservation effort to meet North Carolina's conservation needs for the next 25 to 30 years. Using its connections through the North Carolina Alliance of Environmental Science and Studies Programs, which



Crawford-Brown developed, the CEP identified a university sponsor for each region, and UNC system campuses eagerly stepped up to host the meetings. Nearly 600 local officials, staffers from environmental nonprofits, private landowners and other stakeholders attended the meetings in Chapel Hill, Wilmington, Asheville, Boone, Charlotte, Fayetteville, Greensboro and Greenville to provide input.

"We believe that we need to plan for conservation just like you need to plan for development, and we've got to take into account the ecology and the biodiversity that we need to protect

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## FIELD SITES AND OUTREACH

# Students share research results at field site's grand finale

From atmospheric pollutants to migrating spotfin chubs, 'biodiversity' theme ties students' projects together

On December 13, five Carolina students who spent the fall 2002 semester at the CEP's Highlands Field Site got a chance to share what they learned with 60 local officials, community members, field site faculty members and staff. After an introduction by Site Director Robert Wyatt, the students took the floor, discussing the environmental research projects they each conducted during internships with local agencies and organizations.

Each of the projects addressed an aspect of this year's Highlands Field Site theme, "Land Use and Biodiversity on the Highlands Plateau." The group pulled together their work on topics as diverse as air quality, forest health, rivers and streams and land use planning through an interdisciplinary Capstone project

**"All of our projects go back to looking at the biodiversity of the area...without the hemlocks, you're going to see a change in the streams and water quality; development affects air and water quality. It's all connected."**

*Kate Whitley, junior biology major and Highlands Field Site participant*

that culminated in this presentation and a comprehensive written report.

UNC-Chapel Hill undergraduate Catherine Shields analyzed ozone and other atmospheric pollutants, based on

more than a decade of data collection at the Coweeta Hydrologic Lab, to help increase awareness of poor air quality in nearby areas. Kate Whitley worked with the U.S. Forest Service on a comprehensive survey of hemlock trees around Highlands to assess the level of infestation of the hemlock woolly adelgid, an Asian pest that has recently spread to North Carolina. Matt Curtin examined fish communities on the Chattooga River

as an indicator of water quality, while Deb McCown studied the fall migration habits of spotfin chubs and whitetail shiners. Eric Morris worked with the



Jason Kemp (center) with Brian Edwards of the Outer Banks History Center (left) and charter boat skipper Captain Omie Tillett (right).

Highlands zoning office to develop recommendations for undeveloped parcels of land in Highlands.

Whitley, a junior biology major, loved her internship and enjoyed working with her classmates on the Capstone. "All of our projects go back to looking at the biodiversity of the area, and we really tried to link it all together so everyone can see where it connects. For instance, without the hemlocks, you're

going to see a change in the streams and water quality; development affects air and water quality. It's all connected, and it's just a matter of defining those connections."

Mentors and the field site's Community Advisory Board (CAB) members received copies of the students' report; many others requested copies. Following the presentation, *The Highlander* newspaper—whose editor, Patrick Neal, is a

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Kevin Fitz Patrick



J. Aaron Trotman Photographs



J. Aaron Trotman Photographs

Fall 2002 CEP field site closings (clockwise from top): UNC student Kate Whitley with her family at the Highlands Field Site 2002 closing event; UNC student Jason Kemp (left) at the Albemarle Ecological Field Site 2002 closing event in Manteo, N.C.; UNC student Erin Musiol speaks at the Manteo event.

## Kate Whitley

- Junior, Biology major
- Highlands Field Site
- Studied hemlock woolly adelgids, an exotic pest that causes defoliation of hemlock trees, with the U.S. Forest Service



The Highlander

"I was looking at the impact of hemlock woolly adelgids on biodiversity, because if the hemlocks are destroyed by these exotic pests, there will be a change in the ecosystem. Since hemlocks help moderate temperatures, stream temperatures will increase where they go through the hemlock stands, so you're going to have some brook trout and other fish that won't be able to stay because the water won't be cold enough in some areas. And you're looking at a shift in what trees will take the place of hemlocks, if this pest cannot be controlled.

"I was pre-vet last year, and I have always been interested in insects. When I got up to Highlands and started my internship, I fell in love with fieldwork and the research aspects of biology. It pretty much has gotten me set on going into entomology or something in the ecological biological area, so this semester has been a big change for my future plans!"



## RESEARCH

# CEP hosts Symposium on Environmental Change and Human Health

## Community of scholars addresses emerging areas of social, medical and environmental concern.

On April 14-15, 2003, the Carolina Environmental Program hosted the *Symposium on Environmental Change and Human Health 2003*. About sixty medical, public health, ecological and social scientists, city and regional planners and economists converged on UNC's William and Ida Friday Center for Continuing Education in Chapel Hill to examine the links between ecosystem and human health, particularly infectious disease. The goal of the symposium was to build an ongoing multidisciplinary community of research and scholarship concerning the interactions between ecological integrity and human well being, at UNC-Chapel Hill and at other Research Triangle area organizations.

"It has become increasingly clear that the major health problems are ones that must be tackled by understanding human health, understanding the ecosystems in which humans live and understanding the effects of policy on those ecosystems," said CEP Director Doug Crawford-Brown. "UNC has wide



Duke University

**Dean Bill Schlesinger of the Nicholas School of the Environment and Earth Sciences at Duke University was a major speaker at the CEP Symposium on Environmental Change and Human Health 2003.**

expertise in each of these disciplines, and this symposium has created a community of scholars in those three areas who are now able to move forward and address some of the major health problems in the United States."

The two-day event was co-chaired by Hillel Koren of the CEP and U.S. Environmental Protection Agency and Fred Pfaender of the UNC School of Public Health.

"The CEP was honored to have several leading scientists from around the country engaged in the symposium," Koren acknowledged. "Not only are they leaders in their own fields of research, but they all share a commitment to better understand the interconnection between environmental changes and human health."

Topics addressed by these scholars included: environmental change scenarios for the future; linking human and environmental health; the ecology of infectious disease; Lyme disease as a model for eco/health interaction; emerging infectious disease of wildlife and its

threats to biodiversity and human health; the impacts and consequences of pathogens in urban runoff; and a conceptual model for integrating environmental change and human health. The symposium also featured a roundtable on research opportunities that invited representatives of the EPA, the National Institute of Environmental Health Sciences, and the National Aeronautics and Space Administration to speak. A second roundtable, following a morning of focus groups, shed light on Research Triangle Park institution initiatives with the help of research leaders from UNC-Chapel Hill, North Carolina State University, Duke University and the EPA.

"Our goal was to bring the many dimensions of human health and environmental change to the faculty and students of UNC and our sister institutions in the Research Triangle," Pfaender noted. "We were very fortunate to have world-class scientists and scholars come to Chapel Hill to help us focus on these emerging areas of social, medical and environmental concern." ■



Kevin Fitz Patrick



Kevin Fitz Patrick

**Highlands Field Site student Matt Curtin (left) celebrates at the event with Site Director Robert Wyatt.**

**Above: Highlands Field Site student Kate Whitley (left) with Site Director Robert Wyatt at the site's December 2002 closing event.**

## Jason Kemp

- Senior, Geography major
- Albemarle Ecological Field Site
- Collected oral histories about the Oregon Inlet Fishing Center and the development of sport fishing in Dare County, with the Outer Banks History Center

"The theme of our Capstone was ways in which water is valued here in the Albemarle region of the Outer Banks. My contribution was looking at the development of sport fishing and the value of water to the charter boat fishing community. I interviewed charter boat captains, former mates, wives of captains and boat builders who had been fishing from 1945 to 1980. We looked at the culture of this group—what made it special and different, what the lifestyle was like, how the community functioned—as well as the historical facts: when boats began to fish from different areas, where people signed on to get their charters, who the movers and shakers were in that community who helped spur the development.



J. Aaron Trotman Photographs

"This project has allowed me to really observe and, to some measure, participate in the community. It's a big business and a big part of the way of life and the economy here on Roanoke Island and in Dare County. Some of these guys have spent their entire lives on the water, fishing, building boats or somehow involved in a really unique way of living. I consider myself lucky because I got to go into people's homes, sit down with them over a cup of coffee and hear all these stories of charter boat fishing and of the Oregon Inlet Fishing Center."

## EDUCATION

## CEP/College of Arts and Sciences students awarded high honors



Liz Veazey



Collin Lee

Two Environmental Science and Studies students, Liz Veazey and Collin Lee, were recognized for their outstanding achievements in environmental science last semester.

Liz Veazey, a junior from Morganton, N.C., was awarded a 2002 Morris K. Udall Scholarship following a nationwide competition. The scholarship is given to students who demonstrate academic excellence and commitment to environmental preservation. It will pay for tuition, books, and room and board of up to \$5,000 for a year.

"It's helping me go to New Zealand this semester to study abroad," Veazey said. She said the scholarship is enhancing her environmental studies by giving her the opportunity to take classes in another country. "I am studying biodiversity and conservation with the School for International Training. I'm really excited about it and I feel that it ties in with my Environmental Sciences degree." Veazey said the scholarship has increased her commitment to the environment. "The Udall has motivated me to get even more involved in environmental activism."

Doug Crawford-Brown, director of the Carolina Environmental Program, said, "Liz is just a stunning student. The sense of UNC and the Udall Committee was that she is going to be a leader in the environment. She is one of our top students and she is going to do great things after she graduates."

Collin Lee, a senior from Winston-Salem, N.C., received a National Wildlife Federation Campus

Ecology Fellowship grant. Lee will use the \$1,000 award to encourage the use of green power at UNC.

"The grant will help to ensure the success of this project," Lee said. "This is a great opportunity to put what I've learned in the classroom into action on campus. It is a really rewarding experience. UNC has the potential to make history in the South as the first university in the area to take this step."

Greg Gangi, director of student affairs for the CEP, said, "Collin is a hardworking, motivated student. His most outstanding quality is his ability to bring people together. He has been instrumental in revitalizing the Student Environmental Action Coalition (SEAC) on campus."

Crawford-Brown said Lee and Veazey demonstrate the caliber of the students in the CEP. "When I speak to faculty members, they always say that our majors are among the top students in their classes." He said the CEP has an impressive record for attracting outstanding students. "The CEP has an unusually large number of Morehead Scholars, well above the campus average."

The quality of the students in the CEP helps explain the growing demand for the Environmental Science and Studies Curriculum. Crawford-Brown said, "We get hundreds of inquiries every semester. The CEP's undergraduate programs have grown more than 200 percent over the past few years." ■

*Amy Graham*

**"Bringing the group to UNC keeps this capability together as a team and keeps it in North Carolina."**

*Dr. David McNelis, deputy director and associate director of research programs for the CEP*

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year in research and applications contracts and grants held by the CEP Environmental Modeling Center will also provide employment and research experience for UNC students. CEP clients include the U.S. Environmental Protection Agency, the U.S. Department of Energy, the National Science Foundation, the N.C. Department of Environment and Natural Resources and other state departments of the environment, the Electric Power Research Institute and the Western Governors' Association.

Projects conducted by the CEP Environmental Modeling Center include modeling of current and future air quality changes to help create solutions, and development of multimedia software to help envision environmental challenges and their solutions. The Center's work will help strengthen overall environmental research at Carolina, particularly in the areas of environmental policy, decision-making and planning.

"The CEP Environmental Modeling Center will also dramatically increase

UNC's world-renowned capability in air quality research," McNelis said. "Our goal is to build on the existing synergy between these new research associates and other investigators on the Carolina campus. We also want this group, which has traditionally focused on air quality modeling, to expand their interests and activities into other areas of modeling."

All of the group's projects are directly or indirectly related to understanding and improving North Carolina's environment. One such project is the multiyear N.C. Air Quality Modeling Project. Funded by the N.C. Department of Environment and Natural Resources, this project studies how weather and emissions from vehicles, power plants and other sources interact to affect air quality in the state. Project results have helped the department identify key sources contributing to air pollution and develop appropriate control measures to improve North Carolina's public health.

Researchers in the Environmental Modeling Center have been pleased with the opportunity to join the CEP.

Dr. Adel Hanna, now an adjunct associate professor at UNC, noted that "working with UNC faculty and staff will enhance our ability to address a broader range of environmental issues to better serve the communities in North Carolina, nationwide and beyond."

New adjunct associate professor Saravanan Arunachalam agrees. "This is an excellent opportunity for the Environmental Modeling Center. I am excited about this transition and look forward to establishing more collaboration between the two groups.

"The State of North Carolina has been proactive in addressing the air quality issues in the region, and one of our state-funded projects is studying the ozone problem in the Southeastern U.S., with special focus on helping the state achieve the federal air quality standards for ozone. We hope to interact with the other world-class researchers at UNC in studying and understanding issues related to air pollution that might subsequently improve public health." ■



## PHILANTHROPY

## Two gifts to CEP recognized

The Carolina Environmental Program is a participant in UNC's Carolina First campaign. This crucial fundraising effort, which focuses on providing support for UNC students, faculty, research, facilities and strategic initiatives, runs through June 2007. Environmental programs at Carolina are a campaign priority.

Tom and Gina Snell, of Morristown, N.J., made a generous commitment to the Carolina First campaign in October

2002. Their pledge benefits the Carolina Environmental Program Innovation Fund. The fund holds unrestricted contributions supporting the CEP, which are indispensable in allowing our staff to build the program and react to unexpected opportunities.

Bruce and Ann Colley, of New York, N.Y., made a contribution to the CEP in late 2002. Their support will provide stipends for two students studying

coastal or marine issues. These Colley Environmental Scholars will attend the fall 2003 session of the program's Albemarle Ecological Field Site (Manteo, N.C.) and Morehead City Field Site (Morehead City, N.C.).

Gifts from the Snells, the Colleys and many other donors help the CEP advance environmental study, research, outreach and public service at UNC. We thank them for their generous support. ■

*North Carolina Naturally*  
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across the state," said Richard Rogers, DENR's director, Office of Conservation and Community Affairs, who is heading the One North Carolina Naturally initiative. "In order to do that, we have to be more connected with conservation efforts taking place around our state, and coordinate these efforts better. The goal of these regional meetings was to educate folks on how we need to plan for the state's future with regard to conservation as well as economic development."

To further assist the DENR Office of Conservation and Community Affairs' small staff, the CEP also formed a team of Carolina undergraduate students to attend each meeting and analyze participant surveys and

feedback. The students prepared a series of summary reports for DENR and those who attended each meeting. The reports share how participants in each region value land that is home to endangered species, for example, or land that has a water quality protection function or

historical value. They also summarize participants' comments about the One North Carolina Naturally planning process. In addition, the students prepared a master report for DENR that summarizes the results of the eight

regional meetings, highlights trends and provides examples of other large-scale conservation projects taking place around the country, including what

values other organizations use in terms of land conservation.

The goal is to create a statewide geographic information system (GIS) database that identifies conservation opportunities across the state. The GIS maps will show where land is currently being conserved, and identify land that is not being conserved, but that might serve some of the values identified in the surveys. GIS layers will highlight endangered species, natural heritage areas and other important information, so overlays can help identify prime conservation areas to make sure they are protected.

On April 16 and 17, DENR held a statewide One North Carolina Naturally conference in Raleigh, N.C., that brought together local and state officials, legislators, business leaders and environmental interest groups

to share the results of the regional meetings and introduce a proposed statewide plan, including a glimpse of the early stage development of the GIS system that will support

the plan. The goal of this meeting was to help participants understand where conservation needs exist across the state, why there is an urgency to get an effective plan into action, and to discuss the implications of this plan and strategies for moving forward.

"This plan will not only benefit the preservation and stewardship of North Carolina's natural resources, but also look to enhance our economic development in our rural communities by

utilizing their natural assets," Rogers noted. "That means involving a lot of different areas of state government—including transportation, commerce and cultural resources—as well as agricultural, forest, business and conservation interests."

The CEP partnered with DENR to create the statewide plan and organize the statewide conference, and is seeking funding to develop the GIS system from sources like the Z. Smith Reynolds Foundation, which also provided a grant to fund the regional meetings. If local governments, environmental groups and economic development leaders around the state strongly support the One North Carolina Naturally plan, it will enhance DENR's efforts to secure increased funds from the General Assembly to reach these conservation

goals for the state.

"We can't do it alone," said Rogers. "The Carolina Environmental Program offers a great asset because it has connections to colleges and universities across the state,

which gives us a value-added piece for this project."

Bill Ross, secretary of DENR, agreed. "We have embarked on an extremely ambitious program, and without this key partnership with the Carolina Environmental Program, the Z. Smith Reynolds Foundation and others, the great progress we have made thus far would not have been possible. Our future accomplishments, too, will rely greatly on these partners." ■

**"We believe that we need to plan for conservation just like you need to plan for development..."**

*Richard Rogers,  
Director, DENR Office of Conservation  
and Community Affairs*

### Lars Perlmutt

- UNC senior, Environmental Studies major
- Worked on the One North Carolina Naturally research project as part of a Capstone course for the Environmental Studies degree program



"It has been interesting for us to learn what different organizations around the state want in terms of land conservation. Going to these meetings has been something new for me, and I've learned to work in a team to find out what we need to do for the State of North Carolina. At the same time, I've learned a lot about how challenging state government can be. I've found that a lot of people think we should be working more from local organizations on up, instead of the state department coordinating these efforts and trying to work their way down to local aspects. So that's been a neat process for me. I've really enjoyed it—it has been one of the great experiences in the Carolina Environmental Program for me."



N.C. DENR

2002/2003 Environmental Seminar Series speaker Bill Ross.



Barry Slohin

2002/2003 Environmental Seminar Series speaker Paul Gilman.

## Upcoming 2003 CEP events

### CEP Annual Commencement Reception:

May 18, 1:30 pm, Miller Hall Lawn.  
Speaker: The Honorable Eleanor Kinnaird.

### 2003/2004 CEP Environmental Seminar Series:

September 25-26. Appearance by Dr. Bill Cronon of the University of Wisconsin-Madison.

### Morehead City Field Site Opening:

October 11, UNC Institute of Marine Sciences, Morehead City, N.C. Speaker: Dr. Thomas Malone of the University of Maryland.

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member of the CAB—sponsored a reception that was organized by fellow CAB member Frances Oakley.

“The students did a great job with the presentations, drawing a lot of questions from the audience and much attention during the reception,” Wyatt reported. “This event gave the students a clear endpoint to their hard work for the semester, and required them to explain to the public the importance of what they had done. Local citizens have used the presence of the CEP in the Highlands community as a rallying point for concerns with conservation and land preservation.”

Students at the Albemarle Ecological Field Site in Manteo held a similar presentation, on ways in which water is valued in the region, on February 7, 2003 at the North Carolina Aquarium on Roanoke Island. ■

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