

# Exploration & Discovery

News and Notes from the Division of Research and Graduate Studies

October 2007

Email story ideas to [editorxd@ecu.edu](mailto:editorxd@ecu.edu)

Volume III, Issue 1

## Research and Graduate Studies News

### Biologist Studies the Consequences of Declining Biodiversity

Biologists regard declining biodiversity as one of the greatest environmental challenges facing stewards of the planet; and the principle cause of declining biodiversity is human activity. Scientists have already shown through numerous studies that reduced biodiversity can significantly alter natural ecosystem processes. Most of this investigative work, however, has focused on the loss of plant biodiversity on dry land. There has been less work focusing on the loss of animal biodiversity. Furthermore, prior studies have assumed that all species face an equal likelihood of extinction, and earlier work has largely ignored how the extinction process affects the functioning of natural ecosystems even before any species are actually lost. For example, during the process of extinction a species becomes progressively rarer, but prior studies have not fully quantified how changes in the relative abundance of species (not just presence or absence) affect ecological systems. The result is a somewhat incomplete view, leaving scientists unclear as to exactly how more realistic patterns of biodiversity loss affect the structure, function, and stability of natural ecosystems. Gaining such an understanding is an important scientific objective because this information can significantly inform the natural-resource management policies that society chooses to adopt.

Dr. David Chalcraft, an assistant professor in ECU's Department of Biology, aims to sharpen our knowledge of the roles that biodiversity plays by studying how realistic changes in animal biodiversity affect the ecology of "temporary ponds," which are fairly common features of the landscape along the plains of the east coast.

Working with the assistance of a new grant from the National Science Foundation (expected to total \$625,000 over the next five years), Chalcraft is launching a thorough investigation of how changes in the diversity of aquatic predatory insects and amphibians affect the ecology of temporary ponds.

A prime reason for the splendid diversity of life found in temporary ponds, and for Chalcraft's specialized interest **(continued on page 2)**

### North Carolina Agromedicine Institute and ECU: Research to Improve the Lives of Our Ag Workers

North Carolina's high-tech industries have for years made headlines, so it might escape the notice of city dwellers that our state remains the farming, fishing, and forestry powerhouse it has always been. North Carolina ranks ninth in the nation for agricultural exports, with annual proceeds exceeding \$2 billion. We rank first in the production of sweet potatoes and tobacco, we are the second leading producer of hogs and pigs, cucumbers, turkeys, and Christmas trees, and we are third in terms of total farm income.

Much of North Carolina's produce is labor-intensive—this is especially true in the eastern part of the state—but still, our large numbers of farm and fishery workers operate mostly out of sight and out of mind to price-conscious grocery shoppers. Whether we consider the tens of thousands of migrant workers in our fields, the members of farm-owning families who must hold down second jobs to keep family farms going, or the thousands of full-time commercial fishermen plying our coastal waters, North Carolina's agricultural labor force is in need of greater study and protection than it has traditionally been afforded.

Many owners of small farms remain perpetually in debt and deprived of adequate health insurance. Agricultural workers suffer greater-than-average occupational risks for injury and death, and disproportionately poor health outcomes owing to their relative lack of access to health insurance and medical care. These risks are especially endemic among our rapidly growing population of migrant workers.

The **North Carolina Agromedicine Institute** exists to mitigate these and other risks to our farm, fishing, and forestry working populations. Established in 1999 and now headquartered in the old Voice of America building six miles west of Greenville on VOA Site C Road, the Institute is a partnership of ECU, NCA&T, and NCSU, as well as members of industry, state and federal government agencies, and local farmers, fishermen, and loggers and their organizations. The work conducted under the auspices of the Institute consists primarily of research and educational projects aimed at enhancing the wellbeing of our agricultural labor force. To date, the Institute has conducted projects researching the excessively high rate of skin cancer among farmers and fishermen, and findings have been incorporated into successful intervention and education programs. It has

**(continued on page 2)**



With new funding, David Chalcraft plans to fill the rest of this West Campus field with experimental ponds.



Dr. Kristen Borré began her tenure as Director of the NC Agromedicine Institute in March of this year.



# Research and Graduate Studies News

## Biodiversity (continued from page 1)

in them, owes to the very *fishlessness* of these wetlands. Fish, being the predatory creatures they are, tend to suppress not only the numbers but also the number of varieties among life forms sharing their waters. Recurring periods of desiccation peculiar to temporary ponds eliminate fish from the taxonomic inventory, permitting other species to flourish. Thus, these temporary ponds become an ideal natural laboratory for discovering how altered numbers within one animal species can affect the wellbeing of others. Chalcraft is in something of a hurry to visit and inventory as many of these ponds as he can, while he can, because every year human development further reduces the remaining number of such places.

In his five-year project plan, Chalcraft proposes to document how the abundance and biodiversity of herbivores (tadpoles of frogs and toads) are affected by changes in the biodiversity of predators (aquatic insects), and how the abundance and biodiversity of herbivores alter the functioning of temporary pond ecosystems. For example, Chalcraft will chart the effects on rates of decomposition and ecosystem metabolism (energy production and consumption) caused by changes in animal biodiversity, and he seeks to discover how much energy is transferred from pond food webs to land-based food webs when tadpoles metamorphose into adult frogs that live on dry land. Beyond recording field observations in natural settings, Chalcraft is also conducting experimental reductions of animal biodiversity in artificial ponds at ECU's West Research Campus, and developing models describing how biodiversity loss affects ecological processes operating in natural ponds.

To ECU and to eastern North Carolina, Chalcraft's project will bring benefits that go beyond an improved scientific understanding of how biodiversity loss affects ecological systems. The research will provide land managers with a better idea of the structure and function of a type of natural habitat that is common in eastern NC, and a number of graduate and undergraduate students will find opportunities to earn money and gain research experience while working on this project. Furthermore, middle and high school students and their teachers from a number of schools in eastern North Carolina will be invited to participate in research on Chalcraft's project. The experience these students gain will be similar to the activities of scientists at the National Center for Ecological Analysis and Synthesis. Specifically, the students will meet, identify a common research theme, and then conduct various independent projects based on the chosen theme. After completing their independent projects, the students will meet again to synthesize results and evaluate implications for the research theme. Such experiences will provide students from eastern North Carolina a collaborative background to help them become scientific leaders of the future.

Land development is bringing changes to the coastal plains faster than we have been able to track its effects on the natural world. David Chalcraft's research promises not only a novel set of tools and metrics for properly managing the land, but also a new generation of young citizens equipped to guide development in ecologically friendly directions. That adds up to research for which we can all be grateful.

## Agromedicine Institute (continued from page 1)

funded research to develop DNA markers that link prostate cancer to pesticide exposure. Recently, the Institute has supported research led by African-American medical students and cooperative extension agents in developing culturally appropriate surveys to monitor health problems among minority agricultural and rural populations living in the poorest regions of the South. Other recent achievements by the Institute and its academic and governmental partners include these initiatives:

- studies aimed at the reduction of tractor deaths, which are found to be completely preventable when proper safety equipment is used
- research of Latino migrant farm and poultry workers and their families in the areas of mental health and child abuse prevention, food security and obesity, and the prevention of pesticide exposure
- studies and outreach programs to reduce the risk of exposure to heat stress resulting in cardiac arrest
- support for the development of a respiratory health program to document the prevalence of upper and lower respiratory diseases among farm workers
- health disparities research targeting NC farmers, foresters, fishermen, and hired and migrant agricultural workers and their families who live and work on farms.

This year the Institute is headed by a new director, Kristen Borré, PhD, MPH, who brings a background in community-based and rural-health program management. Joining Borré is Robin Tutor, MPH, OT/L, who now serves as the Institute's Education and Outreach Program director.

Borré and Tutor are now working with colleagues conducting agromedicine research at the Brody School of Medicine and in the Schools of Allied Health, Nursing, and Human Performance, as well as in the College of Arts and Sciences; and the Institute is soliciting new partnerships. Persons seeking research funding or engagement in prevention or intervention activities, or who wish to develop outreach and education projects, may contact Borré or Tutor at the Institute, whose web site can be found at the following URL: <http://www.ecu.edu/ncagromedicine/>



Photo by Jack Dykinga, USDA



Photo by Dr. Heather Vance-Chalcraft

**Temporary ponds offer not only unique study settings, but often quite stunning beauty.**

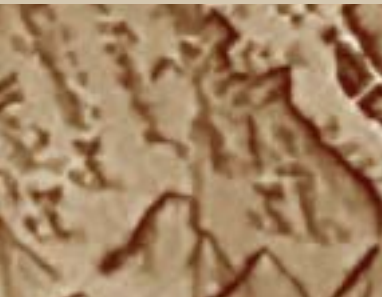


Photo courtesy of NC Agromedicine Institute



**The offices of the North Carolina Agromedicine Institute are located just west of Greenville on VOA Site C Road.**

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Please contact us with your  
comments and story ideas.

## Research Highlights

### The Future of Health Disparities Research at ECU — Part 2

*Cynda Johnson, MD, MBA, Senior Associate Vice Chancellor for Clinical and Translational Research*

In the last issue of *Exploration and Discovery*, I defined health disparities—a differential in health outcomes or in access to health care between two different populations—and pointed out the shocking prevalence of health disparities in our region. In order for investigators at ECU to focus on health disparities research in a coordinated fashion, a Center for Health Disparities Research (C-HDR) is being formed within the Division of Research and Graduate Studies, under the direction of Vice Chancellor Mageean.

In the UNC system, the purpose of a center is to focus a body of work, whether the center's primary mission is in research, public service, or instruction. Although a center can fall within a single department, most centers are interdisciplinary. The UNC system makes no technical distinction between centers and institutes, although in practical terms, institutes frequently engage in activities of a broader scope than do centers. In addition, more than one center can exist under the aegis of a single institute. Centers and institutes may be institutional or interinstitutional. An example of an interinstitutional institute is the Agromedicine Institute. Although housed at ECU, the Agromedicine Institute is a cooperative effort of East Carolina University, North Carolina State, and North Carolina Agricultural and Technical State University. A center is also considered interinstitutional if it is designated as a UNC Center by the Board of Governors, thereby receiving fiscal and/or administrative oversight from UNC's General Administration.

Thus, the health disparities effort at ECU will be an institutional center organized around its research mission. The vision of the C-HDR is "to improve the quality of life and eliminate health disparities in eastern North Carolina through the application of research findings"—a tall order, but one that must be filled.

As we indicated in our Center Proposal, interdisciplinary, collaborative research focused on eliminating health disparities in eastern North Carolina is entirely consistent with ECU's mission, and long tradition, of public service to this region. As the major university in the eastern part of the state—a research campus featuring a strong Division of Health Sciences comprising medicine, nursing, allied health, and public health—ECU bears a clear responsibility to conduct health disparities research on behalf of those who fall victim to such disparities. No health problem in our region is more compelling than the profound health disparities found here; no avenue of coordinated research promises to benefit our population more universally.

Next issue, the research agenda of C-HDR.

### Division of Research and Graduate Studies Invites New Faculty Participation in 2008 NSF CAREER Grant Competition

ECU's Division of Research and Graduate Studies invites new tenure-track faculty members to apply for the NSF Faculty Early Career Development (CAREER) award program. Since 1994, NSF's CAREER program has directed support to new faculty members at institutions like ECU, where research and teaching constitute co-equal imperatives. NSF CAREER grants are five-year awards bringing a minimum total of \$400,000. Applications for 2008 are open to new, *tenure-track* faculty members who are **a**) working in fields supported by the NSF, and **b**) employed (or will be employed) by ECU, by 1 October 2008. It is believed that NSF will award 300 to 400 new and continuing CAREER grants next year. Each applicant may apply for a CAREER award up to a maximum of three times.

Three ECU faculty members, in biology, computer science, and geography, have received past CAREER awards.

The Division can arrange assistance for interested parties in preparing CAREER applications for the next due date, anticipated in July of 2008. Among those services, the Division can offer mentoring by faculty members who have successfully received CAREER grants, professional assistance in preparing an application and budget, and introductions to appropriate NSF program officers. For more information on the NSF CAREER grant program, please visit the following web site: <http://www.nsf.gov/pubs/2005/nsf05579/nsf05579.htm>

For local help, contact Alan A. Schreier ([schreiera@ecu.edu](mailto:schreiera@ecu.edu)) or Ernie Marshburn ([marshburne@ecu.edu](mailto:marshburne@ecu.edu)).

### Funding Opportunities for Studies Abroad: Tell Your Grad Students

- Graduate students in science and engineering who wish to study abroad for eight summer weeks with foreign researchers—in Australia, China, Japan, Korea, New Zealand, Singapore, or Taiwan—may seek funding through the NSF's East Asia and Pacific Office of International Science and Engineering (EAPSI). The 2008 EAPSI Awards will include a stipend of \$5,000, an allowance for international travel, and support to attend a pre-departure orientation in Washington, DC. Foreign co-sponsoring organizations will provide additional support to cover EAPSI students' living expenses abroad. More information is available at the following URL: <http://www.nsf.gov/eapsi>
- The 2008-2009 National Security Education Program (NSEP) David L. Boren Scholarship and Fellowship competitions are now open. NSEP awards undergraduate scholarships and graduate fellowships to American students for study of world regions critical to U.S. interests (including Africa, Asia, Central and Eastern Europe, Eurasia, Latin America and the Caribbean, and the Middle East). Boren Scholarships provide up to \$20,000 for an academic year's study abroad. Boren Fellowships provide up to \$30,000 for language study and international research. The application deadline for the Boren Fellowship is January 30, and the deadline for the Boren Scholarship is February 12. Additional information and the online applications for the scholarships and fellowships are available on the web site of the Institute of International Education: [www.iie.org/nsep](http://www.iie.org/nsep)

## In Brief

### Patrick Long Assumes Directorship of the North Carolina Center for Sustainable Tourism

Dr. Patrick Long, a recognized scholar and tourism development specialist, is just settling into his new job as director of ECU's North Carolina Center for Sustainable Tourism, a position he assumed October 1. The Center, a unit of the Division of Research and Graduate Studies, will promote the development of tourism that balances environmental, socio-cultural, and economic needs. Long brings to the Center extensive experience in grappling with the competing requirements of regional development and resource conservation. He comes to ECU from the Leeds School of Business, University of Colorado at Boulder, where he established the nation's first sustainable tourism center. Long will hold tenure in ECU's College of Business and apply a much-practiced interdisciplinary approach in guiding the development of a new MS degree offering in Tourism Management, as well as directing the Center's plans for multi-campus partnerships in sustainable tourism.

Long says, "The economic health of the region and state can be enhanced by responsible tourism planning and management, but such development cannot come at the expense of precious natural and human resources." He added, "The Center will draw from the wealth of faculty, staff, and students currently engaged in tourism research, teaching, and outreach. It will place particular emphasis on sustainable practices that support responsible traveler behaviors, effective business initiatives, and enlightened public policy."

Two immediate initiatives on which the Center will focus include a joint project on Renewable Energy and Tourism with the University of Colorado at Boulder and the National Renewable Energy Lab, and an in-depth analysis of the social and economic impacts of second-home development. "Although there are similarities between Colorado and North Carolina in the need to protect precious environmental and community resources," Long noted, "the commitment here at ECU is unprecedented among universities across the country. The addition of an interdisciplinary graduate program means that the Center will be positioned to effect real change in business operations and in public policy through the work of its researchers and future graduates."

Long's office is located in RW 208A Rivers Building. He may be reached by email at [longp@ecu.edu](mailto:longp@ecu.edu), or by phone at 328-9469.

### Kenny Flowers Named ECU's Director, Community and Regional Development

Mr. Kenny Flowers assumed the position of Director of Community and Regional Development on October 15. Flowers comes to ECU from the North Carolina Department of Commerce where he served as executive director of the NC Rural Development Council supporting comprehensive and sustainable economic development in the state's 85 rural counties and provided coordination for federal, state, and local rural development initiatives. He is recognized by legislative, nonprofit, state, and community leaders for his 17 years of innovative programs and strong partnerships throughout North Carolina. Flowers' office is located in the Willis Building, Rm. 302. He may be reached by email at [flowersk@ecu.edu](mailto:flowersk@ecu.edu), or by phone at 737-1380.

### John Chinn Appointed Incoming Director, Office of Research Compliance

On November 1, Mr. John W. Chinn will assume the directorship of ECU's Office of Research Compliance. Reporting directly to Vice Chancellor of Research Dierdre Mageean, Chinn will work closely with the BSOM Compliance Office and the university groups responsible for human subjects protection, animal welfare, biological safety, laboratory safety, research misconduct investigations, and export control regulations. Chinn's office will be located in ECU's Greenville Centre building at 2200 S. Charles Blvd., rm. 2204. His email address is [chinnj@ecu.edu](mailto:chinnj@ecu.edu).

### Cold-war Relic, Unusual Resource



This vault-like room at ECU's West Research Campus, measuring 10' x 10' x 7.5' and lined completely with copper, is a large Faraday cage which ECU inherited when the university acquired the VOA site just west of Greenville. This installation, saved from demolition in the name of historic preservation, may be of practical interest to researchers whose work requires electromagnetic isolation.

## Undergraduate Research and Creative Symposium

Saturday, November 17, to be held in Greensboro

The third annual Undergraduate Research and Creative Activity Symposium, sponsored by the UNC Undergraduate Research Consortium, is scheduled to take place this year on Saturday, November 17, on the campus of UNC-Greensboro. Students may submit abstracts for posters or oral presentations at the following URL:

<http://www.uncg.edu/our/sncurcs07.htm>

East Carolina University will provide free bus transportation to and from the symposium. For time and place of departure, interested parties may contact the Honors office at 328-6373.