

Exploration & Discovery

News and Notes from the Division of Research and Graduate Studies

January/ February 2009

Volume IV, Issue 3

Research and Graduate Studies News

ECU Scientists Work to Protect the Coast



Photo provided by the cover of "Coasts in Crisis"

The Institute for Coastal Science and Policy (ICSP) has released two pivotal reports on the subject of global warming and its effect on the state of North Carolina. In October of 2008, "North Carolina's Coasts in Crisis: A Vision for the Future" was published, discussing the detrimental effects climate change has on the coast, as well as alternatives to solve this growing problem. Similarly, ECU Board of Trustees approved the ICSP's response to Senator Marc Basnight's request to compile information on the ever-growing problem of global warming.

On July 23, 2008, Senator Basnight, President Pro Tempore of the North Carolina General Assembly, solicited the aid of researchers from ECU by asking them to compile a report of the causes and expected results of global warming and how the state of North Carolina can contribute to the preventing the effects of global warming from spreading. ECU responded with a 32-page document, similar to the "Coasts in Crisis" publication, outlining specifically how global warming effects the coast of Eastern North Carolina, as well as a timeline of how global warming will affect children, grandchildren and great grandchildren in the years to come.

Specifically, ECU researchers pointed out three key findings to Senator Basnight. The first is that global warming is a reality and is driven by the burning of fossil fuels and emission of greenhouse gases. The evidence that supports this is derived from the scientific observations of the increase in global average air, ocean temperatures, rising global sea levels and widespread melting of glacial ice. The second and third key findings deal specifically with the state of North Carolina and its citizens. The threats to North Carolina include the rising of the sea level, as well as extremes in precipitation ranging from drought to deluges and flooding, changes in the availability of water, frequency of tropical storms, accelerated coastal erosion, threat of barrier island collapse on the Outer Banks and other islands. Coastal North Carolina's low-lying agricultural land and wetlands tend to be vulnerable to highly variable precipitation and sea-level rise. The third finding considers the economic and social impact of climate change to the state of North Carolina and its citizens, which show that migration, tourism, population increases, development and growing wealth on the coast can

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Research and Graduate Studies News

Beth Velde Pilots ECU's New Service Learning Endeavor

ECU's motto "To Serve" has been exemplified by the development of the new Engagement and Outreach Scholars Academy with Dr. Beth Velde,



professor of occupational therapy and assistant dean in the College of Allied Health Sciences, holding the reins.

The academy was developed in response to the university's application to the Carnegie Foundation for the Foundation's Engaged University Classification, as well as to UNC's Tomorrow Com-

mission. The purpose is to cultivate engaged scholars who can be leaders within the university, while also working with communities in Eastern North Carolina to improve the quality of life and foster prosperity economically. With the development of this academy, the image of ECU as a doctoral institution, working with and for external grants, will raise the university's profile on a national level.

Having already been actively engaged within the community of Tillery on research, health services, grants, and publication for the past 11 years, Velde was the ideal candidate to spearhead this new endeavor. Deirdre Mageean, vice chancellor for research and graduate studies believes the appointment of Velde was ideal considering she can "walk the walk, as well as talk the talk." With a chance to put ECU on the forefront of active service learning with both faculty and studies Velde sees her new role as an evolution of her time at ECU, one that is meaningful, both personally and professionally. For more information about the academy, contact Beth Velde at 737-1377 or email, veldeb@ecu.edu.

Jeff McKinnon Appointed as the New Department of Biology Chair

Dr. Jeff McKinnon was recently appointed as the new chair in the Department of Biology. His main objective in this new position is to "bring my department's resources, including our building, and reputation up to the same high level as our performance." His specific research goals for the Department of Biology entail building on the already strong research areas of developmental biology and biotechnology, biodiversity, in both evolutionary and ecological contexts, and coastal ecology.

McKinnon believes the strengthening of the Department's Masters and Doctoral programs will contribute to the growth within these research areas. To achieve this he is working with the Department of Biology's graduate director and other faculty to "develop a truly vibrant graduate program with frequent seminars and workshops and a high level of intellectual exchange with other Southeastern and mid-Atlantic research programs." McKinnon would also like to see the undergraduate research programs grow within the department. "Undergraduate research is also close to my heart and I think there are synergies to be found between the training of graduate and undergraduate researchers. We are vigorously seeking external support for both our graduate and undergraduate programs."

McKinnon's own personal area of research centers on the sexual selection, speciation and evolution in fish. His paper, Evidence for Ecology's Role in Speciation, within the publication "Nature" has been cited 107 times.

"Every morning when I come into the office I feel fortunate to be working alongside the collegial, capable colleagues I have in my department and college." Although he has many goals for the Department of Biology, McKinnon is aware that a critical component of achieving these goals is teamwork and camaraderie within the department.



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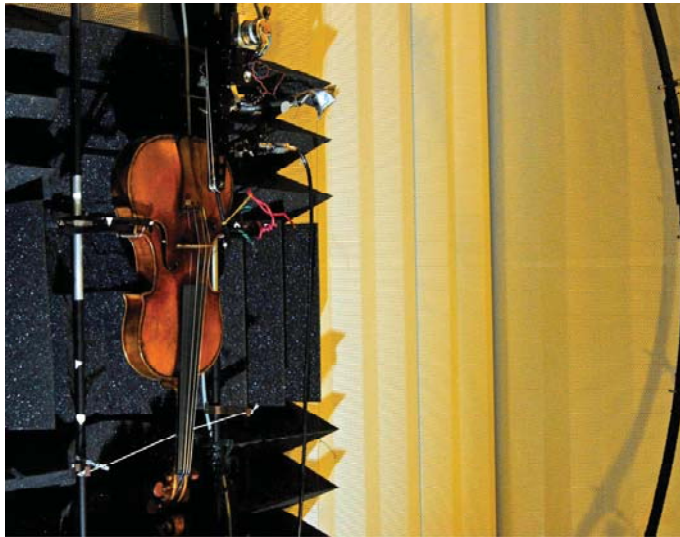
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Please contact us with your comments and story ideas.

Research and Graduate Studies News

Innovative New Research Could Lead to Violin Sounds of Old

Physics Central, a web site run by the American Institute of Physics (AIP), is currently featuring ECU Professor of Physics emeritus, Dr. George Bissinger's research on the physics of violins. Bissinger uses modern technology to analyze both old and modern violins. He uses a laser sys-



tem composed of three independent beams that scan the surface of the violin and within the three dimensions measures the motion of each point. Bissinger then suspends the violin and induces

it to vibrate by a small hammer that thumps the corner of the bridge. 266 microphones in an echo free chamber record the variations in pressure from sound output. Through these measurements a picture of the sound field can be produced. Finally, Bissinger is able to calculate how the damping of the violin's vibration and the radiation efficiency depend on frequency.

Through his studies, Bissinger has been able to show that top plates of good instruments, old and new, produce more sound than bottom plates. He has also been able to isolate out-of-plane vibrations from in-plane vibrations, and has found that features such as the f-holes and bass bar are able to convert in-plane motion to out-of-plane motion increasing the sound production of the instrument.

The study of violins is a fragile and sensitive one and studying the physics behind it requires much care and fluidity. The increasingly innovative methods researchers such as Bissinger are using to gain insight into the motion and sound production of

such an extraordinary instrument are leading them on a path to discovering how violins of old can become the violins of new.

From the Office of the University and Medical Center Institutional Review Board

As of February 19, 2009 the UMCIRB office has relocated to the Old Laupus Library. Look for the new IRB templates coming soon.

News & Notes

Dr. P. Darrell Neuffer, recently featured in The Daily Reflector, was awarded a grant in the amount of \$311,660 for his project titled, Linking Mitochondrial Bioenergetics to Muscle Insulin Sensitivity.

Research and Graduate Studies News

John Rummel Arrives at ECU as the New Head of the ICSP

Dr. John D. Rummel arrived at ECU in August of 2008 as the new head of the Institute for Coastal Science and Policy. Prior to ECU, Rummel worked at both NASA and the Marine Biological Laboratory. Upon receiving his Doctorate from Stanford University in 1985 he first joined NASA as a National Research Council Research Associate. From there he also worked as the Deputy Chief of The

Mission From Planet Earth Study Office, led the Exobiology Program and served as Branch Chief for the Gravitational Biology, Life Support, and Biospheric Research Programs. After initially leaving NASA Rummel then became the Director of Research Administration and Education at the Marine Biological Laboratory. Rejoining NASA in 1998 he served as NASA's Planetary Protection Officer.

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increase the consequences of severe events such as hurricanes or rising sea levels. The citizens directly affected by this tend to be from lower economic areas.

In response to the three key findings from ECU, there were several recommendations made to Senator Basnight that would be beneficial to North Carolina. The creation of a commission to review initiatives of other coastal states, along with a second commission of a panel of experts to conduct a review and assessment of the state government to determine whether or not the state is capable to respond to the challenges of adaptation, climate change, and mitigation. ECU researchers also proposed to initiate a study to analyze the socio-economic impact of sea level rise breaks in the Outer Banks and other vulnerable islands, the creation of a Coastal Adaptation

Fund to provide research on climate change and the coast, the increase of support to the North Carolina Sea Grant Program and other university outreach programs, design incentives for UNC faculty to conduct research that advances knowledge and contributes to the need of information by citizens and decision-makers, and lastly the establishment of a network of university research centers to address issues connected with climate change.

Senator Basnight's request of information and recommendations correlates directly with the "Coasts in Crisis" publication, as both seek out the reasons behind global warming and alternatives to solving this ever-growing problem. Both aim to bring about greater awareness of climate change and the effects it has on the state of North Carolina, as well as its citizens.

Looking Forward to the Next Issue...

- The RENCI Center's new 1.5 million dollar award
- The Currituck Bridge Project
- An overview of the Research and Creative Achievement Week
- University IRB, What is Your Subject?
- Graduate Education in a Challenging Economy