

# Hazards Research Activities

2007-2008

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## Summary 2007-2008

- ✓ The Center for Natural Hazards Research was established in 2004 to serve as a focal point for ECU faculty interested in collaborative research on natural hazards with particular emphasis on coastal hazards. It has experienced progress and growth in nearly all assessment measures that were defined in the 2004 CNHR Strategic Plan. A committee of Kruse, Curtis, Landry and Mills revised the Strategic Plan in Spring 2008. Our revised plan with assessment measures can be found on page 23.
- ✓ The CNHR team consists of 9 Core faculty members, 16 ECU Faculty Associates and 24 CNHR Faculty Associates at other campuses. 8 students received hourly or graduate assistant support through CNHR. This report summarizes the activities reported by the 9 Core members.
- ✓ Welcome to David Mallinson, Associate Professor of Geology, who has joined our core faculty. David's expertise in Coastal Geological processes contributes to the balance between social and physical sciences within CNHR.
- ✓ Welcome to Kevin Mills, CNHR Administrative Support Associate, February 2008. Kevin's experience in community development in his previous position at FoR ENC is an asset to the Center. A short bio can be found on page 5.
- ✓ The CNHR Website: <http://www.ecu.edu/hazards/>
  - Contains content useful to the general public with information on evacuation and community readiness as well as links to state and federal government websites.
  - Disseminates the research findings of our faculty through a working paper series that now has 17 papers available for download.
- ✓ Grant Activity
  - 10 Proposals for externally funded research submitted for \$20.6 million.\*
  - Funded projects totaling \$2.79 million (includes \$1.7 mil RENC@ECU)
  - We have experienced another year of growth in return on ECU investment. The Ratio of Total Annualized External Funding to Total Internal Support = 9.36, in comparison 06/07 was 7.33. Investment ratios and charts start on page 30.
- ✓ Professional Activity of 9 Core Hazards Faculty
  - 29 Refereed Journal Articles
  - 9 Conference Proceedings and Book Chapters
  - 7 Abstracts
  - 35 presentations at conferences and departmental seminars.

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\* The proposal and publication activity is listed for 9 core faculty.

**CNHR PERSONNEL**

**2007-2008**

**Core Faculty** (*receive some support through CNHR*)

Jamie Brown Kruse, Economics, Director CNHR  
Scott Curtis, Atmospheric Science/Geography, Assistant Director CNHR  
Craig Landry, Economics, Assistant Director CNHR  
Okmyung Bin, Economics  
Tom Crawford, Geography  
Mohammad Jahan-Parvar, Economics  
Donna Kain, English  
David Mallinson, Marine Geology  
Kenneth Wilson, Sociology

**East Carolina University Faculty Associates** (*have participated in hazards research proposals in 2007-8*)

Tom Allen, Geography  
Derek Alderman, Geography  
Don Bradley, Sociology  
Mark Brinson, Biology  
Steve Culver, Geology  
Bob Edwards, Sociology  
Richard Ericson, Economics  
John Howard, Communication  
Jeffrey Johnson, Sociology and ICSP  
Joseph Luczkovich, Biology and ICSP  
Haiyong Liu, Economics  
Scott Lecce, Geography  
Gregory Meyer, Biology  
Ron Mitchelson, Geography  
Stan Riggs, Geology  
Catherine Smith, English  
Hans Vogel song, Recreation and Leisure Studies

**CNHR Collaborators**

Azlina Abd. Aziz, Universiti Malaysia Terengganu  
Robert F. Adler, University of Maryland, NASA Goddard Space Flight Center  
Phillip Berke, University of North Carolina at Chapel Hill  
Thomas Birkland, North Carolina State University  
Dakshina de Silva, Texas Tech University  
Jennifer Dorton, University of North Carolina at Wilmington  
Christopher Dumas, University of North Carolina at Wilmington  
Bradley Ewing, Texas Tech University  
Guojun Gu, University of Maryland-Baltimore County, NASA Goddard Space Flight Center  
Yang Hong, University of Oklahoma  
George J. Huffman, SSAI, NASA Goddard Space Flight Center

Rick Leuttich, University of North Carolina Institute for Marine Science  
George List, North Carolina State University  
Suriyani Muhamad, Universiti Malaysia Terengganu  
Nik Hashim Mustapha, Universiti Malaysia Terengganu  
Carla Prater, Texas A& M  
Ben Poulter, Potsdam Institute for Climate Impact Research, Germany  
Nur Azura Sanusi, Universiti Malaysia Terengganu  
Steve Sharf, Outreach, Dare County  
Gavin Smith, University of North Carolina at Chapel Hill  
Sharon Sullivan, Outreach, Dare County Schools  
Mark Thompson, Augusta State University  
Roberta Thuman, PIO, City of Nagshead, NC  
Al Wallace, Rensselaer Polytechnic Institute  
Yongsheng Wang, Washington and Jefferson College  
Heather Ward, NC Sea Grant  
John Whitehead, Appalachian State University

**Collaborating Institutions**

Appalachian State University  
Augusta State University  
North Carolina State University  
Potsdam Institute for Climate Impact Research, Germany  
Rensselaer Polytechnic Institute  
Universiti Malaysia Terengganu  
University of Maryland, NASA Goddard Space Flight Center  
University of North Carolina at Chapel Hill  
University of North Carolina at Wilmington  
University of North Carolina Institute for Marine Science  
University of Oklahoma  
Texas A& M  
Texas Tech University  
Washington and Jefferson College

**Students Supported or directed in natural hazards-related research**

James Brinkley, Coastal Resource Management Ph.D. (supported by RENC I)  
Caroline Brooks, Technical Discourse Ph.D. (Supported by Sea Grant and RENC I)  
April Evans, Coastal Resources Management Ph.D. (Supported by Sea Grant)  
Paul Hindsley, Coastal Resource Management Ph.D. (supported by CNHR)  
Kelly Jochim, Masters Public Administration (Supported by Sea Grant)  
Ryan Joye, undergraduate, Art (supported by CNHR)  
Stephen Siefert, Masters English (Supported by Sea Grant)  
Aimee White, Masters Sociology (supported by NSF SGER Grant)

**New CNHR Staff-Kevin Mills**

Kevin R. Mills was hired in February of 2008 to provide support for the day-to-day operations of CNHR. Prior to joining CNHR, Kevin worked as a Project Development Associate at the Foundation of Renewal for Eastern North Carolina where he assisted in the formation of several regional development projects. Kevin was a member of the US Air Force and served in Kuwait during Operation Desert Fox in 1998. During the spring of 2005 he served as an assistant to Senator William R. Purcell of the North Carolina General Assembly through a highly competitive internship program offered by NC State University. Kevin graduated *Summa Cum Laude* from East Carolina University with a B.S. in Political Science in May of 2006. He is currently enrolled in the Master of Arts in Adult Education program at East Carolina University and is also pursuing coursework in Public Administration.

***Courses Offered by Core Faculty that have Natural Hazards Content***

ECON 3323 Environmental Economics - Bin  
ECON 6000 Risk Management – Jahan-Parvar  
GEOG 1000 Introduction to Geography – Crawford  
GEOG 3430 Intermediate GIS - Crawford  
GEOG 4540 Coastal Storms - Curtis  
GEOG 6540 Advanced Coastal Storms – Curtis  
GEOL 1500 Dynamic Earth – Mallinson  
GEOL 5350 Marine Geology - Mallinson

## PROMOTIONAL AND PROFESSIONAL ACTIVITIES

### Public Outreach

- Paul Bin
  - Wiley-Blackwell Press Release, Journal of Risk and Insurance, March 27, 2008 “Proximity To A Flood Zone Lowers Property Values”
  - UNC-TV, North Carolina Now, September 28, 2007
  - CBS WNCT Channel 9 News, June 21, 2007 “Headline: New Study Paints Bleak Picture For Coast”
  - East Carolina University News Services, June 20, 2007 “New Study Finds Carolina Coastal Economy Vulnerable to Sea Level Rise”
  - North Carolina Press Conference held at North Carolina Museum of Natural Sciences, included Raleigh News & Observer, the Wilmington Star-News, WRAL-TV, WCTI-TV from New Bern, the North Carolina News Network (radio) and NC public radio, June 20, 2007 “New Study Finds Carolina Coastal Economy Vulnerable to Sea Level Rise”
- Scott Curtis
  - Quoted in *Coastwatch: International Climate Change Report Released*
  - Quoted in *Pieces of Eight: ECU Begins Water Conservation Efforts*
  - Quoted in *The East Carolinian: University Works to Conserve Water*
  - Quoted in *The East Carolinian: North Carolina Vulnerable for Active Hurricane Season*
  - Quoted in *The East Carolinian: Heating Up: Global Temperatures Sizzle, Global Warming Proves Deadly*
  - Visited the North Carolina Legislature on behalf of CNHR
- Craig Landry
  - Winterville Kiwanis Club, Center for Natural Hazards Research, 2007-2008
  - Visited the North Carolina Legislature on behalf of CNHR
- Donna Kain
  - Presentation, “Message Testing.” North Carolina City & County Communicators Conference. March 6, 2008, Greenville City Office Building, Greenville, NC.
  - Risk and Emergency Communication Workshop. December 11, 2007. Dare County Emergency Management Center.
  - Donna Kain, Catherine Smith and Menno de Jong. “Recommendations for the revision of the Hurricane Survival Guide.” Report to Dare County Emergency Management JIC. May 17, 2007.
- David Mallinson
  - Presentation, “Water and Landscapes” 5th grade classes at Wintergreen Intermediate School, Greenville, NC.

### Professional Activities

- Presentations-Bin
  - The Nature Conservancy Sea Level Rise Adaptation Briefing for Policymakers in North Carolina, April 10, 2008, Manteo, North Carolina. “Measuring the Impacts of Climate Change on North Carolina Coastal Resources,” with C. Dumas, B. Poulter, and J. Whitehead.

- The Current State of Knowledge of the Setiu Wetlands, December 2-3, 2007, Universiti Malaysia Terengganu, Terengganu, Malaysia. “The Economic Value of the Setiu Wetlands: A Choice Modeling Approach to Management Options.”
- Southern Economic Association Annual Meetings, November 18-20, 2007, New Orleans, Louisiana. “Riparian Buffers and Hedonic Prices: A Quasi-Experimental Analysis of Residential Property Values in the Neuse River Basin,” with C. Landry, and G. Meyer.
- North Carolina Beach, Inlet & Waterway Association Annual Conference, November 12-13, 2007, Carolina Beach, North Carolina. “Impacts of Global Warming on North Carolina’s Coastal Economy,” C. Dumas, B. Poulter, and J. Whitehead.
- Center for Natural Resource Economics & Policy, Louisiana State University, May 20-23, 2007, New Orleans, Louisiana. “Flood Prone with a View: Coastal Housing Market Response to Risk and Amenity,” with T. Crawford, J. Kruse, and C. Landry
- GIS Measuring the Impacts of Climate Change on North Carolina Coastal Resources, Ecosystem Sustainability & Health of Threatened Marine Environments, May 2-4, 2007, Universiti Malaysia Terengganu, Terengganu, Malaysia, with C. Dumas, B. Poulter, and J. Whitehead.
- Presentations-Crawford
  - Annual Meeting of the Association of American Geographers, April 2008, Boston, Massachusetts, “Mapping and modeling coastal flooding vulnerability from impervious runoff on the Outer Banks, NC,” with T. Allen, T. Crawford, Y. Wang, M. O’Driscoll, and R. McClendon.
  - Coastal Zone '07, 2007, Portland, Oregon, “Emergency communication and risk perception in the coastal zone of eastern North Carolina,” with H. Ward, C. Smith, D. Kain, and J. Howard.
  - Geographic Information Science Workshop, March 2008, Greenville, North Carolina, “Human dimensions of GIScience and technology.”
- Presentations-Curtis
  - 3<sup>rd</sup> NASA/JAXA International TRMM Science Conference, February 2008, Las Vegas, Nevada, “The Climate-Weather Connection: Examples from TRMM.”
  - NASA Energy and Water Cycle Study Science Team Meeting, September 2007, Huntsville, Alabama, “Northern Hemisphere Climate Modes and Extreme Precipitation Over the US.”
  - American Geophysical Union Spring Meeting, May 2007, Acapulco, Mexico
- Presentations-Kain
  - Georgetown University Round Table, March 15, 2008, Washington D.C., “Storm Stories as Everyday Risk Analysis,” with **C. Smith**.
  - RISK SYMPOSIUM 2008: Effective Risk Communication: Tools, Theory and Applications, March 12, 2008, Sante Fe, New Mexico, “Researching Risk and Emergency Communication for Multiple Publics,” with **C. Smith**.
  - 2007 International Professional Communication Conference (IEEE), October 1, 2007, Seattle, Washington, “Local Weather Risk Communication:



- Hurricanes, Municipal Public Information Officers, Diverse Communities,” with C. Smith, H. Ward, and R Thuman.
- Hazards and Disasters Researchers Meeting, July 14, 2007, Boulder Colorado, “Researching the Effectiveness of Storm-related Risk and Emergency Communication for the Public in the Coastal Zone,” with **C. Smith**.
  - Coastal Zone 07 Conference (NOAA), July 26, 2007, Portland Oregon, “Emergency Communications and Risk Perceptions in North Carolina’s Coastal Zone,” with H. Ward, **C. Smith**, **T. Crawford**, and J. Howard.
- Presentations-Kruse
    - Southern Economic Association Meeting, November 2007, New Orleans, LA. “Economic Effects of Hurricane Katrina.”
    - Texas Tech University, Wind Science and Engineering Seminar, November 2007, Lubbock, TX. “Beautiful but Risky: Housing Market Response to Coastal Hazards.”
    - National Science Foundation HSD PI’s meeting, October 2007, Arlington, VA. “The New New Orleans: Evaluating Preferences for Rebuilding Plans After Hurricane Katrina.”
    - Hazards and Disaster Researchers’ Meeting, July 2007, Boulder, CO. “Collection of Economic Impact Data: Implications for Disaster Areas and Receiving Regions.”
  - Presentations-Landry
    - University of Georgia Dept of Agricultural Econ Seminar Series, April 2008, Athens, Georgia. “Flood Insurance Coverage in the Coastal Zone.”
    - Southern Economic Association Annual Meeting, November 2007, New Orleans, Louisiana. “Amenity Valuation in Simultaneous Hedonic Property Markets.”
    - East Carolina University Dept. of Geography Seminar Series, April 2008, Greenville, North Carolina. “Optimal Beach Erosion Management.”
    - Mississippi State University Department of Agricultural Economics Seminar Series, November, 2007, “Amenity Valuation in Simultaneous Hedonic Property Markets.”
    - University of Tennessee Department of Economics Seminar Series, October 2007, Knoxville, Tennessee. “Anchors Away: Field Experiments on Anchoring of Consumer Valuations.”
    - National Science Foundation HSD PI's meeting, October 2007, Washington, District of Columbia. “Evaluating Preferences for Rebuilding New Orleans after Hurricane Katrina.”
    - Triangle Resource and Environmental Economics Seminar Series, September 2007, Raleigh, North Carolina. “Amenity Valuation in Simultaneous Hedonic Property Markets.”
    - American Agricultural Economics Association, July 2007, Portland, Oregon. “Optimal Beach Erosion Management.”
    - Center for Natural Resource Economics & Policy, Louisiana State University, May 2007, New Orleans, Louisiana. “Amenity Valuation in Simultaneous Hedonic Property Markets.”
  - Presentations-Mallinson

- American Geophysical Union, 2008, Orlando, Florida, “New Insights into Quaternary Sea-Level Fluctuations and Isostasy Based on OSL, Geophysical, and Sedimentological Investigations of Paleo-Shoreline Features on the Southeast U.S. Atlantic Coastal Plain,” with K. Burdette, J. Rink, S. Mahan, and R. Peltier.
- NC Beach and Inlet Waterway Association, 2007, Carolina Beach, North Carolina, “Quaternary sea-level change: Implications for the NC coast,” with **S. Riggs** and **S. Culver**.
- Presentations-Wilson
  - Southern Sociological Association Annual Meetings, April 2008, Richmond University, “Family Pets and Hurricane Evacuation Decisions,” with C. Reiser, S. Aube and L. Mooney.
- Panelist-
  - Louisiana State University, Expert Panelist on Restoration of Gulf Coast, 2007-2008, New Orleans, Louisiana. “Planning for Restoration and Sustainability.” (Landry)
  - PERC/Liberty Fund participant/panelist in colloquium, 2007-2008, Emigrant, Montana. “Markets, Freedom, & the Environment.” (Landry)
  - The Current State of Knowledge of the Setiu Wetlands, December 2-3, 2007, Universiti Malaysia Terengganu, Terengganu, Malaysia. “The Economic Value of the Setiu Wetlands: A Choice Modeling Approach to Management Options.” (Bin)
  - The Nature Conservancy Sea Level Rise Adaptation Briefing for Policymakers in North Carolina, April 10, 2008, Manteo, North Carolina. “Measuring the Impacts of Climate Change on North Carolina Coastal Resources.” (Bin)
  - Southern Economic Association Annual Meeting, New Orleans, Louisiana, 2007. (Jahan-Parvar)
  - NC Coastal Resources Commission Science Advisory Panel, Science Panel Member - responsible for advising on coastal management policy, Raleigh, North Carolina.(Mallinson)
  - NC Division of Water Quality - Beach and Inlet Management Plan (BIMP), Science Panel Member - responsible for advising on coastal policy, Raleigh, North Carolina. (Mallinson)
- Reviews by CNHR faculty-
  - Journals
    - American Journal of Agricultural Economics* (2)
    - Climate Research*
    - Ecological Economics*
    - Environmental and Resource Economics* (2)
    - International Journal of Intelligent Systems in Accounting, Finance and Management*
    - Journal of Agricultural & Applied Economics*
    - Journal of Agricultural & Resource Economics*

*Journal of Climate* (2)  
*Journal of American Water Resources Association* (2)  
*Journal of Environmental Economics & Mngt* (3)  
*Journal of Public Economics*  
*Journal of Risk & Insurance* (2)  
*Open Atmospheric Science Journal*  
*Sensors*

- Funding Agency Reviews
  - Site Visit Team, National Science Foundation, Engineering Directorate, Engineering Research Center of Excellence, 2008 (Kruse).
  - National Science Foundation, Decision, Risk and Management Sciences Program, Advisory Panel, 2007-2009 (Kruse).

## RESEARCH PROJECTS

### Externally Funded Projects

- Appalachian State University Energy Research Council, \$39,000, 2008, "Evaluating Preferences for Wind Turbines: An Application of Visualization Wall Technology," T. Cherry, T. Allen, **C. Landry**, and J. Whitehead.
- NASA Energy and Water Cycle Study, \$15,000, 2007-2008 "Global Precipitation Analysis for Climate and Weather Studies," **S. Curtis**.
- National Science Foundation, \$36,383, 2007-2008 "Collaborative Research and RUI: Physical Mechanisms Behind the Caribbean Mid-Summer Drought," **S. Curtis**.
- National Science Foundation (NSF), \$1,000 honorarium, total grant \$251,012, 2008-2010, "Enabling the Next Generation of Hazards and Disasters Researchers," **J. Kruse**, PI T. Birkland, NCSU.
- National Science Foundation (NSF), \$172,596, 2006-2008, "The New New Orleans: Evaluating Preferences for Rebuilding Plans After Hurricane Katrina," Principal Investigator **J. Kruse, C. Landry, O. Bin, K. Wilson**, and J. Whitehead.
- National Science Foundation (NSF), \$172,440, 2008, "Refining the Quaternary Sequence Stratigraphic Framework of the Northeastern," **D. Mallinson** and **S. Culver**.
- NC-DENR, \$0, 2007, "Stratigraphic Evaluation of the Buckridge Coastal Preserve," **S. Riggs, S. Culver**, and **D. Mallinson**.
- North Carolina Sea Grant, \$38,000, 2007, "Linking Demographic Patterns to Landscape Indicators of Coastal Development," **T. Crawford** and D. Bradley.
- North Carolina Sea Grant, \$75,000, 2007, "Recreation Value and Economic Impacts of the North Carolina For-Hire Recreational Fishing Fleet," **C. Dumas**, T. Hatcher, J. Herstine, **C. Landry** and R. Whitaker.
- North Carolina Sea Grant, \$130,598, 2008, "Risk Perceptions and Emergency Communication Effectiveness in Coastal Zones," **Donna Kain, C. Smith** and **K. Wilson**.
- RENCI@East Carolina University, Coastal Systems Informatics and Modeling (C-SIM) Cooperative Agreement with Renaissance Computing Institute, Director, total support \$1.7 mil, 2006-2009, **J. Kruse**.
- University of North Carolina Research Competitiveness Fund, \$288,694, 2007-2008, "North Carolina Coastal Hazards: Economic Implications of Severe Storms and Sea Level Rise," **S. Culver, S. Riggs**, T. Allen, D. Ames, R. Corbett, **T. Crawford, C. Dumas, M. Jahan-**

**Parvar, C. Landry, D. Mallinson, M. O’Driscoll, H. Vogel song, J.P. Walsh, N. White, J. Whitehead,** and R. Young.

- U.S. Department of the Interior, \$121,955, 2007, “North Carolina Coastal Geology Cooperative Research Program,” **S. Culver, D. Corbett, D. Mallinson,** and J. P. Walsh.

**Total**

\$2,790,666

### **Internally Funded Projects**

- Coastal Maritime Council (ECU), \$20,000, "Hazard Management Scenarios for Coastal Communities," with P. Gares, **T. Allen**, and D. Marcucci - **C. Landry**.
- East Carolina University, Coastal Maritime Council, \$8,000, "Understanding Heterogeneous Preferences on Essential Fish Habitats: A Choice Modeling Approach," with J. Luczkovich - **O. Bin**.
- East Carolina University, Faculty Senate Research/Creative Activity Grant, \$22,500, "Assessing Coastal Risk Exposure using Extreme Value Theory," – **M. Jahan-Parvar** and **C. Landry**.
- East Carolina University, Research Development Award, \$19,705, "Evacuation Decisions: the role of Family Pets," – C. Reiser and **K. Wilson**.
- East Carolina University, Research Development Award, \$22,318, "Mesoscale Convective Systems in the Coastal Environment of Malaysia: A Collaborative Initiative Between ECU and KUSTEM," – **S. Curtis**.

**Total**  
\$92,523

## PUBLICATIONS AND REPORTS

### Refereed Journal

- “A comparison of TRMM to other basin-scale estimates of rainfall during the 1999 Hurricane Floyd flood,” **S. Curtis, T. Crawford,** and S. Lecce. Natural Hazards, 2007, 43: 187-198.
- “A Multidisciplinary Plan for Executive Education and Lifelong Learning Programs in Wind Science and Engineering,” forthcoming in International Journal of Continuing Education and Life-Long Learning, **J. Kruse** with B. Ewing and M. Thompson.
- “A public participation GIS application for citizen based watershed monitoring in the Pamlico-Tar River Basin, North Carolina,” J. Luchette and **T. Crawford**. Southeastern Geographer, 2008 (in press).
- "A Semi-Parametric Estimator for Revealed and Stated Preference Data: An Application to Recreational Beach Visitation," **C. Landry** and **H. Liu**. Journal of Environmental Economics and Management, accepted 2008.
- “Analysis of Time-Varying Turbulence in Geographically Dispersed Wind Energy Markets,” forthcoming in Energy Sources, Part B: Economics, Planning and Policy, **J. Kruse** with B. Ewing and M. Thompson.
- “Estimate gridded and time-variant runoff curve numbers using satellite remote sensing and geospatial data,” Y. Hong, R. Adler, F. Hossain, **S. Curtis,** and G. Huffman. Water Resources Research, 2007, 43, W08502, doi:10.1029/2006WR005739.
- “Flood Hazards, Insurance Rates, and Amenities: Evidence from the Coastal Housing Market,” **O. Bin, J. Kruse,** and **C. Landry**. The Journal of Risk and Insurance, 2008, 75(1): 63-82.
- “Flood prone with a view: coastal housing market response to risk and amenity,” **O. Bin, T. Crawford, J. Kruse,** and **C. Landry**. Land Economics, (in press).
- “Geospatial Analysis of Barrier Island Width of Two Segments of the Outer Banks, North Carolina, USA: anthropogenic curtailment of natural self-sustaining processes,” **C. Smith, S. Riggs, S. Culver,** D. Ames, and **D. Mallinson**. Journal of Coastal Research, 2008, 24 (1): 70-83.
- “Going Home: Evacuation-Migration Decisions of Hurricane Katrina Survivors,” **C. Landry, O. Bin, P. Hindsley, J. Whitehead,** and **K. Wilson**. Southern Economic Journal, 2007, 74(2): 326-343.
- Guest Editor, *Hurricane Katrina Symposium*, Southern Economic Journal, October 2007, **J. Kruse**.
- “Hedonic Onsite Cost Model of Recreation Demand,” **C. Landry** and K. McConnell. Land Economics, 2007, 83 (2): 253-267.
- “High resolution shallow geologic characterization of a late Pleistocene eolian environment using ground penetrating radar and optically stimulated luminescence techniques,” **D. Mallinson,** S. Mahan, and C. Moore. Southeastern Geology, (in press).
- “Hurricanes and Economic Research: an introduction to the Hurricane Katrina Symposium,” **J. Kruse,** B. Ewing, and D. Sutter Southern Economic Journal 74(2), October 2007 pp. 315-25.
- “Late Holocene Barrier Island Collapse: Outer Banks, North Carolina, U.S.A.,” **S. Culver,** C. Grand Pre, **D. Mallinson,** D. Corbett, J. Foley, M. Hale, J. Ricardo, J. Rosenberger, C.G.

Smith, C.W. Smith, S. Snyder, D. Twamley, K. Farrell, and B. Horton, The Sedimentary Record, 2007, 5(4): 4-8.

- “Micropaleontologic record of late Pliocene and Quaternary paleoenvironments in the northern Albemarle embayment, North Carolina, USA,” **S. Culver**, K. Farrell, **D. Mallinson**, B. Horton, D. Willard, E. Theiler, **S. Riggs**, S. Snyder, J. Wehmiller, C. Bernhardt, and C. Hillier, Palaeogeography, Palaeoclimatology, Palaeoecology, (in press).
- “Optically Stimulated Luminescence Age Controls on late Pleistocene and Holocene Coastal Lithosomes, North Carolina, USA,” **D. Mallinson**, K. Burdette, S. Mahan, and G. Brook. Quaternary Research, 2008, 69: 97-109.
- “Precipitation extremes estimated by GPCP and TRMM: ENSO relationships,” **S. Curtis**, A. Salahuddin, R. Adler, G. Huffman, G. Gu, and Y. Hong. Journal of Hydrometeor (GEWEX Special Issue), 2007, 8: 678-689.
- “Simulated and Real Buyers in Posted Offer Markets,” **J. Kruse**, Handbook of Experimental Results, Vernon L. Smith and Charles Plott, eds, North Holland/Elsevier Press.
- “Spatial Dependencies in Wind-Related Housing Damage,” forthcoming in Natural Hazards, **J. Kruse** with D. De-Silva and Y. Wang.
- “The Atlantic multidecadal oscillation and extreme daily precipitation over the US and Mexico during the hurricane season,” **S. Curtis**. Climate Dynamics, 2008, 30: 343-351.
- “The effects of Hurricanes Katrina and Rita on the seabed of the Louisiana shelf,” M. Goni, Y. Alleau, R. Corbett, J.P. Walsh, **D. Mallinson**, M. Allison, E. Gordon, S. Petsch, and T. Dellapenna. The Sedimentary Record, 2007, 5: 4-9.
- “Transmission of Shocks Among Health Care Sector Index Returns,” forthcoming in Applied Financial Economics Letters, **J. Kruse** with B. Ewing and M. Thompson.
- “Tropical rainfall variability on interannual-to-interdecadal/longer-time scales derived from the GPCP monthly product,” G. Gu, R. Adler, G. Huffman, and **S. Curtis**. Journal of Climate, 2007, 20: 4033-4046.
- “Twister! Employment Responses to the May 3, 1999 Oklahoma City Tornado,” forthcoming in Applied Economics, **J. Kruse** with B. Ewing and M. Thompson.
- “Using Ex Ante Approaches to Obtain Credible Signals of Value in Contingent Markets: Evidence from the Field,” **C. Landry** and J. List. American Journal of Agricultural Economics, 2007, 89 (2): 420-432.
- “Valuing Human Organs: an application of contingent valuation,” **J. Kruse**, A. Altinanahtar and S. Crooker International Journal of Social Economics 35(1/2), 2008 pp. 5-14.
- “Viewscapes and Flood Hazard: Coastal Housing Market Response to Amenities and Risk,” **O. Bin**, **T. Crawford**, **J. Kruse**, and **C. Landry**. Land Economics, 2008, 84(3): 434-448.
- “Wind Hazard Risk Perception: an experimental test,” **J. Kruse**, B. Ewing and M. A. Thompson Experimental Methods, Environmental Economics Vol. 8, 2008, T. Cherry, S. Kroll and J. Shogren, eds., Routledge, pp. 395-406.

### Proceedings and Book Chapters

- “A GIS Approach to Measure the Impacts of Sea Level Rise on Coastal Real Estate in North Carolina,” **O. Bin**, **C. Dumas**, C. Poulter, and **J. Whitehead**, The 21st International Conference of The Coastal Society, 2008.
- “The Economic Value of the Setiu Wetlands: A Choice Modeling Approach to Management Options,” **O. Bin**, The Current State of Knowledge of the Setiu Wetlands, 2007.



- “Emergency Communications and Risk Perceptions in North Carolina’s Coastal Zone,” H. Ward, **C. Smith, D. Kain, T. Crawford**, and J. Howard, Coastal Zone 07 Conference, July 22-26, 2007.
- “Emergency Communication: Case Study of Problematics in Public Discourse Regarding Hurricane Risks and Hazards,” **C. Smith, D. Kain**, H. Ward, and R. Thuman, International Professional Communication Conference (IEEE), 2007.
- G. Huffman, R. Adler, **S. Curtis**, D. Bolvin, and E. Nelkin, 2007: Global Rainfall Analyses at Monthly and 3-h Time Scales. Section 4, Chapter 23, pp. 291-305 of *Measuring Precipitation from Space: EURAINSTAT and the Future*, V. Levizzani, P. Bauer, and F. Turk, Eds., Springer, 722p.
- **J. Kruse**, B. Ewing, 2007: The Prime Rate-Deposit Rate Spread and Macroeconomic Shocks, vol. 5 of *Advances in Quantitative Analysis of Finance and Accounting*, Cheng-Few Lee, ed. World Scientific Publishing, Hackensack, New Jersey, USA.
- R. Adler, G. Huffman, and **S. Curtis**, 2007: World of Rain, pp. 30-35 in *Our Changing Planet: The View from Space*, M. King, C. Parkinon, K. Partington, and R. Williams, Eds., Cambridge University Press, 391p.
- Researching the Effectiveness of Storm-related Risk and Emergency Communication for the Public in the Coastal Zone, **D. Kain** and **C. Smith**, Hazards and Disasters Researchers Meeting. Boulder Colorado, July 2007.
- “Willingness to Pay for Risk Reduction and Amenities: Applications of the Hedonic Price Method in Coastal Areas,” **C. Landry** and **P. Hindsley**, Living Shorelines Summit, 2007.

### Abstracts

- “Characteristics of Storm Deposits on the Louisiana Continental Shelf: Insights from Sedimentological and Radiochemical Examinations,” D. Corbett, J.P. Walsh, L. Seaver, **D. Mallinson**, *AGU-ASLO Ocean Sciences Meeting - Orlando*, Eos, 2008.
- “Geoarchaeological Investigations Of Stratified Holocene Aeolian Deposits Along The Tar River In North Carolina,” C. Moore, R. Daniel, K. Seramur, **D. Mallinson**, and M. O’Driscoll, *Geological Society of America, SE Regional Meeting*, GSA, 2008.
- “Geomorphology And Preliminary Optical Dating On Paleoshoreline Features In Northern Florida, USA,” K. Burdette, J. Rink, and **D. Mallinson**, *GSA, Denver, Co, 39 (6)*, 2007.
- “Holocene Paleoenvironmental Change In Southern Pamlico Sound, North Carolina,” L. Metger, **S. Culver, D. Mallinson**, and **S. Riggs**, *Geological Society of America, SE Sectional Meeting*, Geological Society of America, 2008.
- “In The Eye Of A Human Hurricane: Pea Island And The Northern Outer Banks Of North Carolina,” **S. Riggs**, D. Ames, **S. Culver, D. Mallinson**, D. Corbett, and J.P. Walsh, *GSA, Denver, Co, 39 (6)*, 2007
- “New Insights into Quaternary Sea-Level Fluctuations and Isostasy Based on OSL, Geophysical, and Sedimentological Investigations of Paleo-Shoreline Features on the Southeast U.S. Atlantic Coastal Plain,” **D. Mallinson**, K. Burdette, J. Rink, S. Mahan, and R. Peltier, *American Geophysical Union*, Eos, 2008.
- “Stratigraphy And Late Quaternary Geologic History Of Buckridge Coastal Reserve, Tyrrell County, North Carolina,” P. Parham, **S. Riggs, S. Culver**, and **D. Mallinson**, *Geological Society of America, SE Regional Meeting*, GSA, 2008.

### **Reports**

- Weather and Society Watch: A Publication of NCAR's Societal Impacts Program, "Evaluating the Effectiveness of Storm-related Risk and Emergency Communication," **D. Kain**, 2007.

## PROPOSAL ACTIVITY

### Participation in ECU and UNC Initiatives:

- East Carolina University RENCI Engagement Center Proposal \$1.7million, 2006-2009. *funded.*

### *External Funding Requests*

- Department of Homeland Security, “Center of Excellence in Natural Disasters, Coastal Hazards and Emergency Management.” ECU Share \$1.9 mil total \$18 mil UNC-Chapel Hill (Lead) Status: Invited for Full Proposal, Invited for Site Visit, funded but reconfigured without ECU contribution, **J. Kruse.**
- University of North Carolina Research Competitiveness Fund, \$288,694, 2007-2008, “North Carolina Coastal Hazards: Economic Implications of Severe Storms and Sea Level Rise,” **S. Culver, S. Riggs,** T. Allen, D. Ames, R. Corbett, **T. Crawford, C. Dumas, M. Jahan-Parvar, C. Landry, D. Mallinson,** M. O’Driscoll, H. Vogelsong, J.P. Walsh, N. White, **J. Whitehead,** and R. Young. Funded.
- Economy and Environment Program for Southeast Asia, \$45,467, “Recreation Demand and Economic Value of Tropical Island Beaches in Malaysia,” **O. Bin** et. al. pending.
- Faculty Senate 2008-2009 Research/Creative Activity Grant, “Choice Experiments, Environmental Values, and Resource Management: An Application to Setiu Wetlands, Malaysia,” **O. Bin** not funded.
- NASA Earth and Space Science Fellowship, graduate stipend for Sol Wuensch, \$9,147, **S. Curtis.** Pending.
- National Science Foundation, “Enabling the Next Generation of Hazards and Disasters Researchers,” Mentoring Panel Member, \$1,000 honorarium, total grant \$251,012, 2008-2010. (This proposal was submitted by Tom Birkland, NCSU. **J. Kruse** is a faculty mentor.) funded.
- National Science Foundation (NSF), \$719,694, “Migration dynamics in a coastal frontier: later-life and working age migrant impacts,” **D. Bradley, T. Crawford,** and **R. Edwards.** Pending.
- North Carolina Floodplain Mapping Program Assessment of the Potential Consequences of Climate Change on Flooding In North Carolina, \$175,000, “Assessment of the Impacts of Coastal Flooding on Real Estate and Insurance Markets,” **O. Bin & J. Kruse** pending.
- Universiti Malaysia Terengganu Top-Down Research Proposal, \$495,129, “Valuing and Reporting Biodiversity Assets and Carrying Capacity of the Malaysian Marine Parks to Achieve Sustainability,” **O. Bin** et. al pending.

### **Other activity relevant to the mission of the Center for Natural Hazards Research**

- Albemarle-Pamlico National Estuarine Program (APNEP) Science and Technical Advisory Committee (STAC), Science Panel Member, Raleigh, North Carolina (Mallinson).
- American Agricultural Economics Association, Reviewer for Selected Papers, Portland, Oregon (Landry).
- American Agricultural Economics Association, Symposium Organizer, Portland, Oregon (Landry).
- “An Analysis of the Cost of Hazard Mitigation Planning Policy in Local and Regional Government.” Dissertation Committee for Andrea Gamret, PhD Wind Science and Engineering, Texas Tech University, Final Defense planned for August 2008 (Kruse).
- Chair Search Committee, Human Dimensions of Coastal Sustainability Program Head, UNC Coastal Studies Institute/East Carolina University joint position. 2007-8 (Kruse).
- Chair Search Committee, Policy Position in the Institute for Interdisciplinary Coastal Science and Policy, East Carolina University, 2006-7 (Kruse).
- Coastal-Maritime Council, East Carolina University, 2005-present (Kruse).
- “Discrete Choices in Coastal Environments: Addressing Confounding Factors in Random Utility Models.” Dissertation Committee for Paul Hindsley, PhD Coastal Resource Management, East Carolina University, Defended April 2008 (Kruse, Bin, and Landry, Chair).
- Dissertation Committee for Maribel Martinez, PhD Wind Science and Engineering, Texas Tech University, Final Defense planned for August 2008 (Kruse).
- Doctoral Planning Committee, PhD in Risk Economics, East Carolina University, Department of Economics, 2006-present (Kruse).
- ECU Delegation to visit Universiti of Malaysia Terengganu (Bin).
- Geological Sciences - UNC Coastal Studies Institute Faculty Search Committee, Chair (Mallinson).
- Journal of Sedimentology, Associate Editor for scientific journal (Mallinson).
- “Making Decisions in Coastal Ecosystems: Understanding Knowledge, Attitudes and Access to Knowledge to Enhance Local Environmental Decision-making,” Dissertation Committee for Susan Lovelace, PhD Coastal Resources Management, East Carolina University, Defended April 2008 (Wilson).
- McMaster University, Hamilton, Ontario, Presented an invited seminar on the Quaternary evolution of the NC continental margin, Hamilton, Canada (Mallinson).
- Research Associate, Texas Tech University, Wind Engineering Research Center, 1996-present (Kruse).
- Search Committee, Director of Institute for Interdisciplinary Coastal Science and Policy, East Carolina University, 2006-7 (Kruse).
- Southern Economic Association Annual Meeting, Session Organizer, New Orleans, Louisiana (Landry).
- Steering Committee, Hazards and Disasters Researchers Meeting, Boulder, CO, 2006-present (Kruse).
- Visiting Professor, China Agricultural University, Beijing, China (Bin).

## **GOALS AND ESTIMATED RESOURCE NEEDS**

### **Short-term Goals (1-3 year time horizon)**

- Produce high quality research and outreach products.
  - Initiate Newsletter
  - Create video for website and as instructional resource.
  - Update Brochure
    - Target Audiences-
    - Counties & Communities
    - Students/educational outreach
    - Researchers/Potential Collaborators
  - Kevin Mills can provide expertise to the Newsletter and Brochure. This is also a viable project for a PTC Masters or PhD student. Resources Needed: \$8,000 support for PTC student
- Maintain active external grant proposal activity.
- Enhance the interdisciplinary aspect of graduate education.
  - Resources Needed: Graduate stipend for creation of competitive Hazards Center Fellowship - total \$18,000 plus tuition.
- Initiate Hazards Seminar Series with at least four outside speakers.
  - Resources Needed: \$2,500 per speaker to cover travel and small honorarium- total \$10,000.
- Foster International Collaborations
  - Resources Needed: Support for visiting professorship and additional travel money.
- Hurricane Floyd Symposium to mark ten year anniversary, September 2009.
  - Two day event will consist of one day of public speakers that will be open to the public and a second day devoted to scholarly research presentations targeted at an academic audience.
  - CNHR has initiated the planning process by developing seven planning committees. Committee meetings are scheduled to begin in summer of 2008.
  - Resources Needed: The planning committees are expected to develop a budget and contribute to raising funds. We expect to solicit funds from several different sources, such as National Science Foundation, and other federal funding agencies, RENCI, foundations and private industry. We do request funds for an undergraduate student assistant to help with planning and preparation. \$4,000.
- Create platform for databases available to researchers.
- Create Hazards Atlas.
- Other Resources needed.
  - Facilities. Conference room for project meetings, survey focus groups, and laboratory experiments. This has been partially fulfilled with joint priority access to Brewster B104.
  - Brewster B104 is need of renovation with replacement of existing tables and chairs, addition of a projector and wall prepared projection. Estimated cost \$20,000.

Center for Natural Hazards Research  
 Proposed  
 Support and 2008-2009 Budget

Operating Budget

Student Wages	60521	\$ 1,000	
Supplies	72000	\$ 3,000	
Prop/Plant/Equip	72400	\$ 2,000	
Honoraria	73064	\$ 2,500	
Travel	73200	\$ 10,000	
Current Services	73400	\$ 500	
Fixed Charges	73600	\$ -	
Participant Fees/ subject payments	73074	\$ 1,000	
total			\$ 20,000

Course Buyouts (\$4500 each)

Hazards Faculty Fellowship	2	
Assistant Director(s)	2	
Research support	2	
Total	6	\$ 27,000

Director Stipend (Kruse)	\$ 4,000
Administrative Assoc. (75%) (Mills)	\$ 18,000

**Discussion of new items included in budget**

Hazards Faculty Fellow Award

Two course release for Academic Year  
 Plus \$1000 travel grant to pursue or present Hazards Research

Outstanding Hazards Research Article

\$500 honorarium

Hazards Seminar Series-

Two outside speakers planned for 2007-2008 AY  
 Cost Per Speaker  
 \$1000 honorarium  
 \$1,500 travel expenses

### **Long-term Goals**

Continue to expand the influence of CNHR through research and outreach consistent with our strategic plan (page 23) and mission: *To promote research and analysis that ultimately reduces the harm caused by natural forces to life, communities, and the environment.*

- Resources needed. Long term vision for the CNHR includes the following:
  - Personnel-Staff-the current administrative assistant position split into two:***
    - Associate Director/Office Manager-Manage day-to-day operations of research center including accounting and outreach.
    - Secretary/Receptionist-Provide initial point of contact, organize meetings and calendars, work with AD to produce newsletter and maintain website.
    - Graduate Students***-two 9 month Graduate Assistant salary plus benefits
  - Faculty***
    - Visiting faculty position-one full time position for outside visitor. Can be split to support two visitors on sabbatical/development leave from other institutions or from within ECU.
    - Assistant Director- 51% departmental/49% hazards center
    - Four Split faculty positions- 51% departmental/49% hazards center positions
  - Possibilities:
    - Geography- GIS data management capabilities
      - Spatial statistics
      - Simulation
    - Sociology-hazards related research
      - Survey research and statistical analysis skills
    - Professional and Technical Communication-
      - Risk communication research focus
    - Atmospheric Science/Geography-
      - Hurricane/severe wind storm related research
    - Economics-
      - 1) Resource/Environmental
      - 2) Regional or Public Economics
    - Psychology/Decision Theory/Economics-
      - Risk and decision making
    - Planning- Land use planning and hazards
  - Quantitative Assets not necessarily linked to a single department.
    - Spatial Econometrics
    - Game Theory
    - Dynamic Stochastic Optimization
    - Network Analysis
    - Computational Fluid Dynamics
    - Visualization
  - Facilities
    - Sufficient Office space to house all personnel plus conference room.
    - Experiment and survey lab

**STRATEGIC PLAN**  
**and**  
**Report of Assessment Measures**  
*revised April 2008*

**Mission:**

*To promote research and analysis that ultimately reduces the harm caused by natural forces to life, communities, and the environment.*

**Vision Statement:**

The Center for Natural Hazards Research will foster a multidisciplinary research community that seeks to understand and thereby improve our ability to predict, respond to and recover from adverse events caused by the natural processes.

**Goals**

1. Create a community of researchers that publishes in high quality disciplinary journals as well as interdisciplinary outlets.
2. Communicate research findings and other important hazards information to the governments and citizens of North Carolina and beyond.
3. Attract external funding to increase the impact of the Center.

**Goal 1. Create a community of researchers that publishes in high quality disciplinary journals as well as interdisciplinary outlets.**

Objective 1.1 Create a community of researchers involved in high quality academic research. (Hazards Faculty)

- Strategy: Create a natural hazards research infrastructure.

Assessment:

- Quality up-to-date website
  - Number of pages  
**21 Pages/5 more currently under development**
  - The quality control cycle: Number of days between updates and live-link checks  
**Updates are performed on an as needed, regular basis**
- Working paper series
  - Number of papers  
**17 working papers**
- Work environment
  - Physical space inventory  
**3 offices being utilized by staff and students**
  - Office usage statistics-assessment to be reported for 08-09 AY



- Annual review/survey of staff-assessment to be reported for 08-09 AY
  - Technology
    - Inventory of computers, software, and office equipment
      - 5 desktops**
      - 3 laptops**
      - Software:**
        - OpRisk VAR-Reduced cost through SAS memorandum of understanding.**
        - PC Miler**
        - Crystal Ball**
        - Adobe Suite**
- Strategy: Attract ECU researchers from many disciplines, promote interdisciplinary interaction and provide recognition for outstanding contributions.  
Assessment:
  - Number of faculty actively involved
    - Number of departments represented
      - 9 Departments**
  - Number of graduate and undergraduate students
    - Supported
      - 8 supported**
  - Hazard Fellowship e.g., Course release for outstanding research
    - Number of applications (this assessment measure to be reported in AY 2008-2009)
  - Number of projects with participants from two or more disciplines
    - Total number of projects
      - 11**
    - Total number of disciplines
      - 9**
- Strategy: Identify and engage hazards researchers internationally.  
Assessment:
  - Recognize number of universities
    - Total number of research associates
      - 24 representing 14 institutions**
    - Total number of people subscribed to LISTSERV
      - 12 subscribers**
- Strategy: Stimulate discussion and exchange of new ideas through regular seminar series with both internal and external speakers.  
Assessment:
  - Number of internal speakers (to be initiated in AY 2008-09)
  - Number of external speakers
    - Provided cooperating support for
      - Susan Cutter, University of South Carolina, Institute for Hazards Research
      - Kristin Csik, National Ocean Economics Program, UC Santa Barbara.

- Strategy: Encourage faculty to present in, organize and chair natural hazards-related sessions in regional and national conferences.

Assessment:

- List of conferences.
  - International Professional Communication Conference (IEEE)**
  - NASA/JAXA International TRMM Science Conference**
  - American Agricultural Economics Association**
  - American Geophysical Union Spring Meeting**
  - Annual Meeting of the Association of American Geographers**
  - Center for Natural Resource Economics & Policy**
  - Coastal Zone '07**
  - East Carolina University Dept. of Geography Seminar Series**
  - Geographic Information Science Workshop**
  - Georgetown University Round Table**
  - GIS Measuring the Impacts of Climate Change on North Carolina Coastal Resources**
  - Hazards and Disaster Researchers' Meeting**
  - Mississippi State University Department of Agricultural Economics Seminar Series**
  - NASA Energy and Water Cycle Study Science Team Meeting**
  - National Science Foundation HSD PI's meeting**
  - NC Beach, Inlet & Waterway Association Annual Conference**
  - NC Coastal Resources Commission Science Advisory Panel**
  - NC Division of Water Quality - Beach and Inlet Management Plan (BIMP)**
  - RISK SYMPOSIUM 2008: Effective Risk Communication: Tools, Theory and Applications**
  - Southern Economic Association Annual Meeting**
  - Southern Sociological Association Annual Meetings**
  - Texas Tech University, Wind Science and Engineering Seminar**
  - The Current State of Knowledge of the Setiu Wetlands**
  - The Nature Conservancy Sea Level Rise Adaptation Briefing**
  - Triangle Resource and Environmental Economics Seminar Series**
  - University of Georgia Dept of Agricultural Econ Seminar Series**
  - University of Tennessee Department of Economics Seminar Series**
- Number of papers presented.
  - 35 presentations**

Objective 1.2 Produce and disseminate high quality scholarly research.

- Strategy: Identify projects that take advantage of the expertise of hazards faculty.
- Assessment:

- Number of projects identified-3
  - **DHS Center of Excellence**
  - **UNC Competitiveness Grants**
  - **NSF Communicating Hurricane Information**
- Strategy: Garner support for faculty involved in a hazards research project in the form of summer stipend, release time, conference travel, software, and submission fees.

Assessment:

- Number of faculty supported by type of support
  - Bin-travel**
  - Curtis-release Assistant Director**
  - Landry-release Assistant Director**
  - Jahan-Parvar-Summer Salary and software**
  - Kain-travel**
  - Smith-grant accounting support**
  - Mallinson-course release**
- Strategy: Identify journal outlets for research that are valued within researchers' home departments or work to elevate recognition of the journal for promotion and tenure purposes.

Assessment:

- Journal and departmental rank category
  - No measureable progress here.
- Strategy: Publish research in refereed journals and other scholarly outlets.

Assessment:

- Number of publications in refereed journals  
**29 articles**
- Number of conference proceedings  
**9 proceedings and book chapters**
- Award for outstanding hazards article.
  - Number of applications (2008-09 AY)

## **Goal 2. Communicate research findings and other important hazards information to the governments and citizens of North Carolina and beyond.**

Objective 2.1 Produce and disseminate research findings through local and regional media.

- Strategy: Produce and disseminate press releases.

Assessment:

- Number of press releases distributed
  - Wiley-Blackwell Press Release, Journal of Risk and Insurance, March 27, 2008 "Proximity To A Flood Zone Lowers Property Values"**
  - East Carolina University News Services, June 20, 2007 "New Study Finds Carolina Coastal Economy Vulnerable to Sea Level Rise"**

**North Carolina Press Conference held at North Carolina Museum of Natural Sciences, included Raleigh News & Observer, the Wilmington Star-News, WRAL-TV, WCTI-TV from New Bern, the North Carolina News Network (radio) and NC public radio, June 20, 2007  
“New Study Finds Carolina Coastal Economy Vulnerable to Sea Level Rise”**

**Quoted in *Coastwatch*: International Climate Change Report Released**

**Quoted in *Pieces of Eight*: ECU Begins Water Conservation Efforts**

**Quoted in *The East Carolinian*: University Works to Conserve Water**

**Quoted in *The East Carolinian*: North Carolina Vulnerable for Active Hurricane Season**

**Quoted in *The East Carolinian*: Heating Up: Global Temperatures Sizzle, Global Warming Proves Deadly**

**ECU Researchers Want to Know What Makes People Flee (or Face) Impending Coastal Storms (April/May Issue of Exploration & Discovery Newsletter)**

- Strategy: Produce and disseminate “Policy Briefings” based on research results.

Assessment:

- Number of policy briefings produced-No measureable progress here.

- Strategy: Provide radio and television interviews

Assessment:

Number of interviews

**UNC-TV, North Carolina Now, September 28, 2007**

**CBS WNCT Channel 9 News, June 21, 2007 “Headline: New Study Paints Bleak Picture For Coast”**

- Strategy: Produce brochures and newsletters for dissemination.

Assessment:

- Number of brochures produced-one
  - Promotional portfolio is in production
  - Rate of update
    - annually

- Number of newsletters produced

**Currently under production**

Objective 2.2 Provide information that can be accessed through the internet.

- Strategy: Create and maintain a user-friendly website.

Assessment:

- Number of hits and downloads

**Newly designed website has recently been published**

- Strategy: Seek to make the website a “first-page” result of a “Google search”

Assessment:

- Rank of result from a list of key words

**CNHR Homepage ranked 1<sup>st</sup>**

**CNHR listing on Wikipedia ranked 7th**

Objective 2.3 Establish communication channel to government agencies, legislative committees, etc.

- Strategy: Set up meetings with government officials.  
Assessment:
  - Number of meetings and list of participants  
**State Treasurer Richard Moore (via telephone)-Mills**  
**North Carolina Legislature-Curtis, Landry**  
**North Carolina Public Information Officers-Kain**  
**Dare County Emergency Management Center-Kain**

### **Goal 3. Attract external funding to increase the impact of the Center.**

Objective 3.1 Identify funding sources.

- Strategy: Establish working relationship with Contracts and Grants so that the Center is notified when funding opportunities come to their attention.  
Assessment:
  - Number of research associates registered with Community of Science-Unknown TBA
- Strategy: Establish working relationship with university development office to create opportunities for private donation for specific purposes.  
Assessment:
  - List of meetings and contacts  
**Scott Wells, ECU Major Gifts Director-Mills**

Objective 3.2 Establish liaisons and cooperation with other research centers and institutes.

- Strategy: Interact with Coastal Studies Institute (CSI), Institute for Coastal Science and Policy (ICSP), Center for Sustainable Tourism (NCCST), RENCI and other ECU Research Centers and Institutes.
- Strategy: Interact with other members of the North Carolina Institute of Disaster Studies. (NCIDS)
- Strategy: Interact with other regional and national research centers dedicated to natural disaster research.  
Assessment for all three strategies:
  - List of contacts and affiliations  
**ICSP Director Search Committee**  
**ICSP Policy Position Search Committee Chair**  
**NCCST Research Associate Search Committee**  
**CSI Program Head Human Dimensions of Sustainability Search Committee Chair**  
**NCIDS Collaboration on DHS Center of Excellence Proposal**

Objective 3.2 Bring faculty together to write proposals.

- Strategy: Facilitate faculty interaction to identify projects that respond to specific RFP's  
Assessment:

- List of recurring events  
**Semi Annual CNHR Meeting**

Objective 3.3 Support grant writing and administration activities.

- Strategy: Provide staff time to support PI and Co-PI's in the process of producing the proposals including budgets, supporting materials and acquiring signatures in a timely manner.

Assessment:

- Number of proposals submitted  
**10**
- Total dollars of proposed research  
**\$20,616,583**

- Strategy: Provide staff time to support faculty in grant administration. (eg. Setting up summer salary, purchase of equipment or software, etc.)

Assessment:

- Number of grants administered  
**9 external grant funds**  
**1 internal award**
- Total dollars of funded research  
**External = \$387,397**  
**Internal = \$4,000**

**Research Investment Ratios  
 AY 07-08**

**Harriot College of Arts and Sciences Commitment**

CNHR Operating Budget	\$ 10,000
Course buyouts 4@\$4,000	\$ 16,000
Director stipend	\$ 4,000
Administrative Assoc. 75%	
Prorated 07-08	\$ 7,500
<b>Total</b>	<b>\$ 37,500</b>

**Additional Support from Internal Grants**

Competitive Research and Creativity Awards and Seed Grants

Faculty Senate	\$ 22,500
Coastal Maritime Council	\$ 28,000
Research Development	\$ 42,023
<b>Total</b>	<b>\$ 92,523</b>

External Grants

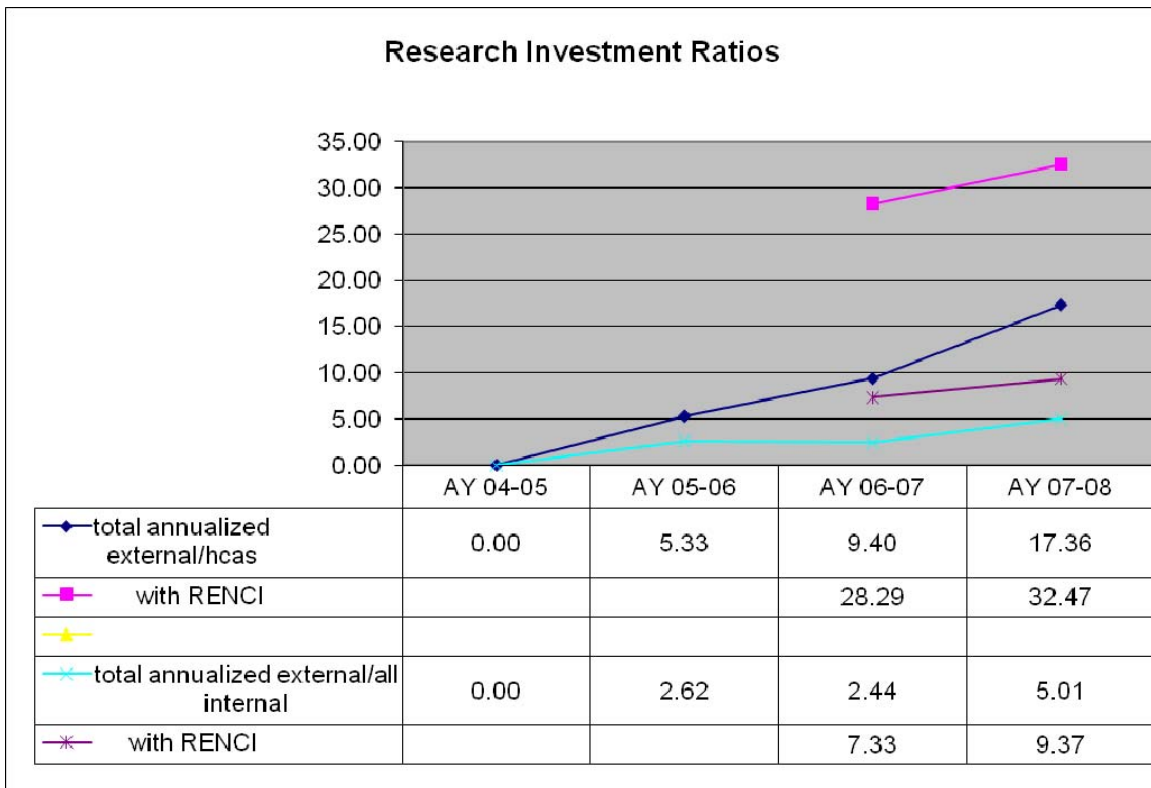
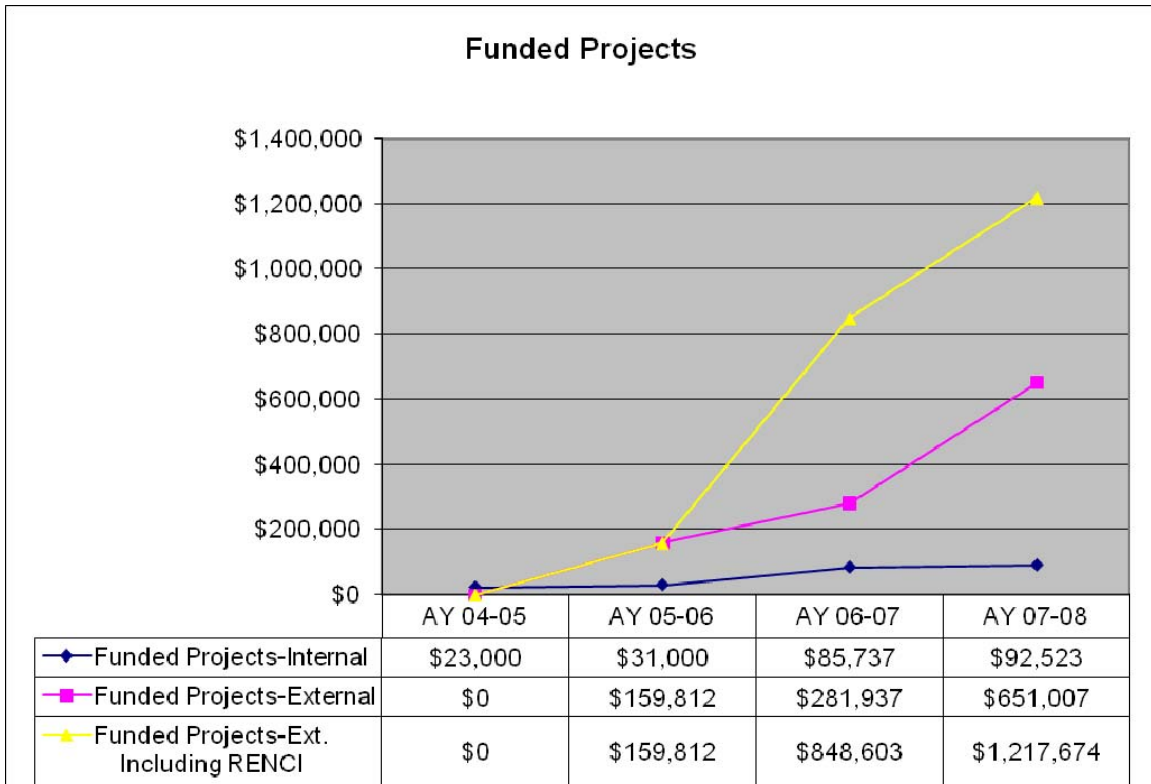
Active Grants	Total	Annualized
NSF	\$ 382,419	\$ 133,536
NC Sea Grant	\$ 243,598	\$ 140,799
NASA	\$ 15,000	\$ 15,000
DOI	\$ 121,955	\$ 53,125
App State	\$ 39,000	\$ 19,500
UNC Competitiveness	\$ 288,694	\$ 288,694
<b>Total</b>	<b>\$ 1,090,666</b>	<b>\$ 651,007</b>

RENCI	\$1,700,000	\$ 566,667
<b>Total w/RENCI</b>	<b>\$2,790,666</b>	<b>\$ 1,217,674</b>

Ratios		w/o RENC I	with RENC I
<u>Total Annualized External</u>	=	17.36	32.47
HCAS Commitment			

<u>Total Annualized External</u>	=	5.01	9.36
All Internal Funding			

Charts of Annual Comparisons in Grant Activity and Investment Ratios





## Articles

### **ECU Researchers Want to Know What Makes People Flee (or Face) Impending Coastal Storms (from the April/May Issue of Exploration & Discovery Newsletter)**

Along North Carolina's storm-beaten shores, emergency-preparedness officials have long worried about beach dwellers for whom storm warnings seldom motivate a safe response. Officials want to know more about when, why, and how people who hear storm warnings or evacuation notices decide to flee, or—too often—to stand their sandy ground. Such insights can help inform the crafting of public-warning messages.



Now a team of faculty and student researchers, led by **Dr. Catherine Smith** of ECU's Department of English, has been granted nearly \$38,000 in funding through a two-year NOAA-NC Sea Grant to explore just that issue. In the study, titled "Risk Perceptions and Emergency Communication Effectiveness in Coastal Zones," Smith, along with co-PIs **Drs. Donna Kain** (English) and **Ken Wilson** (Sociology), and with the help of graduate students, will spend this year conducting interviews and surveys of

coastal residents, asking people where they get their emergency information, probing the various demographic and communication factors that influence the behavior of residents, assessing people's trust in and ability to use the information they receive, and formulating recommendations for the improvement of public-warning language and dissemination. Next year the team will interview and survey coastal business owners and employees. Smith says, "Focusing on communication, we look at information flows and decision processes within and across public agencies and communities. We pinpoint disconnections between information and action, then look closer at varied interpretations and uses of information." Too often, officials and media view communication as a straightforward and unidirectional transmission of information from the sender to receivers. However, preliminary analysis of data collected in a recent pilot study the team conducted in Dare County indicates that coastal residents seek, process, and use risk and emergency information in complicated ways, synthesizing expert assessments, past personal experience with storms, family wishes, and practical concerns that may include pet ownership, medical conditions, or congested evacuation routes.

Emergency officials, wishing to better understand the behavior of citizens they seek to protect, need good data. ECU researchers are providing data and analysis that seem destined only to keep growing in value as our state's coastal population grows. As Smith puts it, "When responsible public agencies inform people about hurricane risks and hazards, and when informed people resist complying with public safety warnings, why do they resist? This already-important question will become more urgent if, because of global warming, hurricanes increase in number, intensity, or scope."

## **Wind, Water, & Wealth: ECU Economist Explores Crucial Connections (from the 2007/2008 Issue of Cornerstone Magazine)**

The saying goes that “everyone talks about the weather, but no one does anything about it.”

Harriot College’s Center for Natural Hazards Research (CNHR)—directed by economist Jamie



Kruse and assisted by Scott Curtis (a geographer whose specialty is atmospheric science) and Craig Landry (an economist whose specialty is resource economics)—addresses the real-world ramifications of events that shape our earth and our lives.

Under Kruse’s direction, the center contributes in two important ways to the vital conversation on hazards. First, CNHR studies hazards related losses and how those losses are measured. Eastern North Carolina has a potent reminder of the importance of this in the devastation caused by 1999’s Hurricane Floyd. This large geographical area—about the size of the state of Maryland—suffered from the weather event itself and then from the aftermath flooding, vestiges of which are still visible on the region’s landscape.

And CNHR calculates more than the damages or the dollars: the center looks at human economic behaviors related to catastrophic events. A region’s economy is also a kind of living organism, and studying economic impacts is really taking the pulse of a dynamic organism. Kruse and her colleagues look at federal and state funding in aftermath situations, but equally—or perhaps more importantly—they look at the value of loss reduction. If people can build and live in a region in a way that leads to significantly lower costs in catastrophe aftermaths, the economic and emotional savings are enormous.

But CNHR is not focused only on East Carolina University’s traditional service region. The center is establishing a national reputation as Kruse and collaborators from biology, chemistry, English, geology, geography, sociology, and the Brody School of Medicine at East Carolina University will be part of the University of North Carolina system’s Renaissance Computing Institute.

RENCI@East Carolina University is a state-funded regional engagement center that emphasizes high-tech solutions and outreach to benefit North Carolina’s environment and the state’s citizens. The RENCI center, called the Center for Coastal System Informatics and Modeling, has projects that range from characterization of storm surge to the support of at-risk populations in times of disaster.

As complex as the scope and mission of the Center for Natural Hazards Research, Jamie Kruse is herself a consortium of varied experiences. A nontraditional student when she began her undergraduate and graduate studies, Kruse received her undergraduate degree in animal science, her MS in agricultural economics, and her PhD in economics. The latter was fortuitous—her

family had relocated to Arizona, where she became a student of Nobel economics laureate Vernon Smith. His experimental economics lab studied the behaviors of human beings in controlled decision-making environments. Fascinated by the scope of this kind of research, Kruse is using this foundation and constructing new models here at ECU to serve the public good.

“After Hurricane Katrina on the Gulf Coast, we have to say to ourselves ‘surely we can do better than that,’ ” she says. “In any situation, people make decisions based on existing incentives. Without understanding the factors that motivate human action before, during, and after a natural disaster, we have no way to make policy decisions that will improve the overall environment.

“How people and government institutions perceive risks is the heart of good policy formulation. As CNHR helps institutions and people—especially the more vulnerable segments of our population—understand hazards-loss prevention and hazards responses, the more options we all will have. This is the crucial ‘public good’ connection among wind, water, and wealth.”

Although one of Harriot College’s newest collaborative research centers, the Center for Natural Hazards Research is already establishing itself as a resource that provides critical information services. The center has experienced progress and growth in virtually every one of its assessment measures that were developed concurrent with the center’s inception, and the activities of its core faculty members are supported and augmented by faculty across disciplines at ECU and faculty associates drawn from other university campuses. These campuses include many of the UNC system universities and Duke University here in North Carolina as well as institutions such as Augusta State University, Mississippi State University, the University of Southern Mississippi, Texas Tech University, the University of Texas Pan American, the University of Colorado–Boulder, and the University of Maryland.

Funding—both internal and external—is another success story for the CNHR. ECU-based initiatives total thirty million dollars and include *North Carolina Coastal Hazards–Economic Implications of Severe Storms and Sea Level Rise* (a detailed report submitted to the UNC General Administration), the RENCI@East Carolina University Regional Engagement Center, and participation as a Department of Homeland Security Center of Excellence. External funding exceeds two million dollars and comes to ECU from agencies such as the National Science Foundation, the National Aeronautics and Space Administration, the National Commission on Energy Policy, the US Department of Education, and the Federal Deposit Insurance Corporation. With an enviable national funding record, the CNHR is certainly making a name for itself and for ECU.

CNHR core faculty member Okmyung Bin collaborated with colleagues at the University of North Carolina at Wilmington, Duke University, and Appalachian State University to prepare *Measuring the Impacts of Climate Change on North Carolina Coastal Resources*, a report to the Bipartisan Policy Center Inc., of Washington, D.C. This seminal document examines the impacts of climate change on North Carolina coastal resources and focuses on three subject areas: the impacts of sea-level rise on the coastal real estate market, the impacts of sea-level rise on coastal recreation and tourism, and the impacts of increased numbers of tropical storms and hurricanes on business activity. A report on any one of these topics would be of critical interest to ECU’s

service region—all three mark the document as one that will powerfully influence bipartisan political decision-making at the national level.

All of these CNHR activities play an important part in undergraduate and graduate education, as center activities are incorporated into course work and as student assistantships with the center engage learners in active, ongoing research contributing to the region and the world and help to develop tomorrow's scholars in this vital field.

## News Releases



Sea Level Rise Adaptation Briefing  
Roanoke Island Festival Park, Manteo, NC  
Thursday, April 10  
9 a.m. until 3p.m.  
Lunch will be provided  
Business casual dress

Please join conservation, government and legislative leaders for a science and policy discussion on sea level rise in the Albemarle-Pamlico region. The morning session will consist of speakers describing the science behind the problem. We are pleased to feature:

- Margaret Davidson, National Oceanic and Atmospheric Administration
- **Stan Riggs**, East Carolina University
- **Okmyung Bin**, East Carolina University
- Sam Pearsall, The Nature Conservancy

The afternoon will be a moderated session to discuss adaptation options for our coast. Bill Holman from Duke University will lead that session to produce a short list of very high priority actions that can be taken to reduce the impacts of sea level rise on the region.

Following the discussion, participants are encouraged to join us at 4 p.m. for a visit to a local site impacted by sea level rise. More information regarding the field trip will be distributed in a later email. Please RSVP by April 4 to Carla Hudy at 919-403-8558, x1012 or [chudy@tnc.org](mailto:chudy@tnc.org) along with any dietary restrictions you may have. For directions to Roanoke Festival Park, please click [here](#).

Sincerely,

Katherine D. Skinner, The Nature Conservancy  
Bill Crowell, Albemarle-Pamlico National Estuary Program

*Purpose*

This briefing will highlight the region's vulnerability to climate change and stimulate discussion on formulating and implementing adaptation plans for the Albemarle region. Our goal is to produce a short list of very high priority actions that can be taken to reduce the impacts of sea level rise on the region.

*Background*

Among landscapes vulnerable to the effects of climate change, few are in as precarious a position as North Carolina's Albemarle region. Rising seas threaten to change this complex ecosystem of estuaries, swamp forests, marshes, and meandering rivers. The effects of climate change are already visible in the region: the region's peat soils are degrading quickly and natural communities are in retreat from saltwater intrusion. Unless something is done soon to protect the landscape and manage the inevitable ecological changes, we could well lose as much as a million acres to rising seas within the next 100 years, eliminating habitat for a wide range of wildlife, from black bears to red wolves to migratory songbirds.

More than 540,000 acres in the region are currently under conservation protection as Department of Defense lands, National Wildlife Refuges, North Carolina Wildlife Resources Commission Game Lands, North Carolina Coastal Reserves, and other preserves established by The Nature Conservancy, the Conservation Fund, the North Carolina Coastal Land Trust, and other private and public agencies. The area also includes many culturally significant sites such as Fort Raleigh (site of the first European settlement in the Americas), the historic Cape Hatteras Lighthouse, and the site of the Wright Brothers' first flight. Albemarle and Pamlico Sounds are part of the largest semi-lagoonal system in the world and the healthiest and second largest estuary in the eastern United States.

**Katherine D. Skinner**

Executive Director

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