

Inside Sea Grant

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S.C. Sea Grant Consortium Program Impacts

Science Serving South Carolina's Coast

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Research Impacts

S.C. Beachfront Monitoring Program Informs Beach Management Decisions

Tourism is the largest industry in coastal South Carolina, and in large part, that industry is built on beaches. The Beach Erosion and Resource Monitoring (BERM) Program is a component of the Consortium's Coastal Erosion Study, which is funded by the U.S. Geological Survey (USGS) Coastal and Marine Geology Program. BERM measures beach "profiles" at 400 sites along the South



A tripod outfitted with computers that control acoustic instruments is lowered to the ocean floor to measure water flow and sediment processes. Photo: University of South Carolina

Carolina coast to determine the nature of and rate at which the shoreline is changing. BERM is the primary source of information used by the S.C. DHEC-Office of Ocean and Coastal Resource Management to generate its annual "State-of-the-Beaches" report to the citizens of South Carolina. In addition, Horry County and the City of North Myrtle Beach use BERM data to help with compliance and monitoring issues regarding nourishment projects.

BERM has also provided immediate surveys upon request from Hunting Island State Park to assist the S.C. Department of Parks, Recreation, and Tourism and the U.S. Army Corps of Engineers with their efforts to secure emergency funding for nourishment and repair of storm damage at the park.

Mapping Ocean Bottom Assists in Identifying Essential Fish Habitat

The S.C. Department of Natural Resource's (SCDNR) mandate in managing the state's marine fisheries habitat has been greatly aided by work of the Coastal Erosion Study Cooperative, which is funded by the USGS. The sea floor mapping coverage in the coastal ocean region off South Carolina is among the most comprehensive in the country.

Techniques developed for acoustically delineating nearshore reef habitats, in concert with the Study, expanded the massive regional sonar coverage of the inner continental shelf. These techniques and capabilities have also been used to aid SCDNR with monitoring of the Offshore Dredged Materials Disposal Site (ODMDS) for Charleston Harbor, as well as the reefs adjacent to the large Grand Strand Beach Nourishment Project. The information and products developed through this effort enhances the ability of resource agencies to identify and manage essential fisheries habitat important to the state's fisheries resources and economy.

(Research Impacts continued on page 2.)

Inside Sea Grant is published two times a year to inform interested constituents about goals, activities, and accomplishments of the S.C. Sea Grant Consortium.

S.C. Sea Grant Consortium is a university-based state agency supporting research, education, and outreach to conserve coastal resources and enhance economic opportunity for the people of South Carolina and the region.

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Research Impacts continued

Improving Flood Detection and Warning Capabilities—The CI-FLOW Project

Riverine and coastal flooding associated with hurricanes, tropical storms, and other forces of nature, cause significant loss of property and economic hardship each year. To help communities in South Carolina, North Carolina, and beyond, the S.C. Sea Grant Consortium and its partners—the National Sea Grant Office, North Carolina Sea Grant, and the NOAA National Severe Storms Laboratory and National Weather Service—are leading a regional project, CI-FLOW (Coastal/Inland Flood Observation and Warning), to pilot a new flood detection and monitoring system. Test results are being used in conjunction with National Weather Service flood tools to improve flash flood detection and warning capabilities. CI-FLOW is being integrated by N.C. State University researchers into a hurricane storm-surge model to provide more accurate inputs from riverine flooding. CI-FLOW is also being transferred to Sea Grant programs in the Gulf of Mexico for flood applications in that region.

Red Drum Stocking Program Helps Declining Population

S.C. Sea Grant researchers Ted Smith and Mike Denson with the SCDNR are succeeding in a stocking program that should help toward bringing back populations of red drum (also called red fish and spottail bass).

Their work involves stocking experiments in Murrells Inlet, S.C. The effort is important because the species was severely over fished in the 1980s. A number of issues are being examined in the studies including the effect of stocking size on return level, the utility of two different marking approaches, use of

stocked fish to estimate population size of legal size fish, community involvement to provide the sample data used to evaluate impacts, and ultimately



Juvenile red drum to be released into the estuary. Photo: S.C. Dept. of Natural Resources

the fate of the stocked fish in the angler's creel and the offshore adult population. The information obtained by this study will help to optimize stocking protocol.

The project has relied on community involvement to provide the biological samples used in the assessment of impacts. Results to date have been very satisfactory as anglers have been highly responsive in putting fish racks in project freezers. Also, the results clearly demonstrate that stocked fish are being recruited to the angler's creel. Similarly, efforts are underway to collect fin clips (genetic samples) from the adult population to demonstrate the contribution of stocked fish in the adult spawning population. Such information will be critical in addressing the question of sustainability of stocked populations.

Multi-Disciplinary Team's Findings Published in Book by Springer-Verlag

Understanding how coastal growth and development impacts natural resources helps decision makers

(continued on page 5)

Education Highlights

Statewide Cleanup Nets 33.5 Tons of Trash

The 18th annual Beach Sweep/River Sweep was held September 16, 2006, and nearly 5,000 volunteers across South Carolina joined forces to rid beaches, marshes, and waterways of unsightly, and sometimes dangerous, debris. The litter cleanup, supported primarily with donations from the private sector, is organized by the S.C. Sea Grant Consortium and the S.C. Department of Natural Resources, and is held in conjunction with the Ocean Conservancy's International Coastal Cleanup.

Covering over 1,050 miles in 38 of South Carolina's 46 counties, cleanup crews removed 33.5 tons of trash, recycling much of what was collected. On the coast, volunteers tackled over 100 sites—from North Myrtle Beach to Daufuskie Island—that were made safer, healthier, and more beautiful for all to enjoy.

Aside from the typical cans, bottles, and cigarette butts, some unusual items include car parts, tires, appliances, carbon dioxide container, large pieces of Styrofoam, construction material, many plastic beach chairs, tents, and umbrellas, charcoal grills, propane tanks, plastic toys, inflatable kiddie pools, bowling ball; firework debris, derelict crab traps, compressor pump; 55-gallon drums, port-a-potty, and plastic detonator cords from the demolition of the Cooper River Bridges.

Major sponsors of the 2006 Beach Sweep/River Sweep were Applied Technology and Management,



Cub Scout Webelos from Pack 11, Den 7 pull a cart up the beach path on Sullivan's Island during the 2006 Beach Sweep/River Sweep. Photo: Wade Spees

BP Cooper River Plant, Ben and Jerry's of Charleston, Charleston City Marina, Coastal Expeditions, Duke Energy Foundation, HDR Engineering, Hilex Poly Co., Magnolia Plantation and Gardens, Marine Terminals of S.C., Mount Pleasant Waterworks, Osprey Marina, Piggly Wiggly Carolina Co., South Carolina Ports—S.C. State Ports Authority, Ocean Conservancy, and Universal Data Solutions.

Visit www.scseagrant.org for more information and to participate next year.



Bringing Marine Science to the Upstate

A small grant of just \$1,500 from the Consortium in the mid-1980s led to the development of the Marine Lab and the Ecology Lab at the Roper Mountain Science Center in Greenville, S.C., according to the Center. At the time, the Consortium funded a "touch-tank" so that children could become more familiar with sea life. The Center is now in the process of developing education exhibits in the labs, and in the coming year 8,000 students and teachers will attend formal lessons in the Marine Lab.

Each lesson will focus on the South Carolina Science Curriculum Standards. Classes visit the Roper Center from 29 school districts in 14 counties, and 11,000 other children will see the Marine Lab at designated public times. The Consortium continues to support the Roper Mountain Science Center and assist with new exhibits to enhance teaching skills and experiences. Last year, the Consortium supported a grant for education presentation equipment needed for lessons in the new Marine Lab.

In 2006, Roper Mountain Science Center had over 90,000 students attend lessons and over 20,000 attended lessons in the Natural Science Building, which houses the two labs. The Roper Mountain Science Center is an opportunity for the Consortium to bring marine science to students in the Upstate. For more information about the Center, visit www.ropermountain.org.

Outreach to Coastal South Carolina

Conservation Plan Helps Jasper County Prepare for Growth

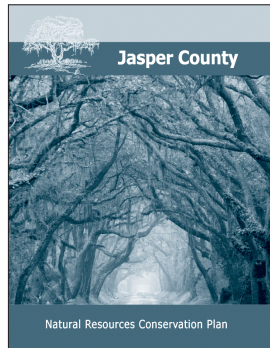
Jasper County, like many South Carolina communities, is growing at a rapid pace. Planning and managing that growth is important to support and conserve the natural resources that enhance economic development. In August of 2004, the S.C. Sea Grant Consortium, in conjunction with the Jasper Soil and Water Conservation District (JSWCD), the USDA-Natural Resources Conservation Service (NRCS), and the S.C. Department of Natural Resources, began a countywide conservation planning effort.

More than 100 stakeholders representing local and regional government, state and federal resource agencies, nonprofit conservation organizations, local businesses, private land owners, and concerned citizens were involved in developing the Jasper County Natural Resource Conservation Plan.

In November 2006, the plan was submitted to the County for incorporation into the Natural Resource Element of their Comprehensive Land Use Plan. A print version was published in June 2007. The plan also was available on CD-ROM and on the S.C. Sea Grant Consortium Web site.

The plan will serve as an informational guidebook for the residents of Jasper County and local developers, a resource and education tool for natural resource educators and planners,

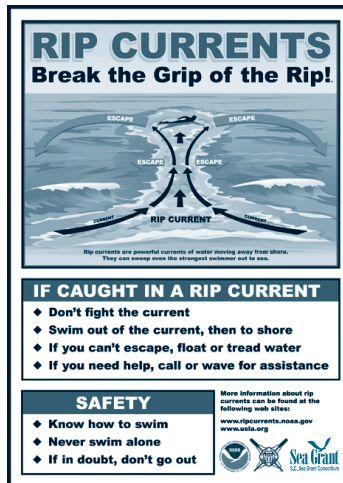
and, most importantly, an inventory of biological data and innovative solutions of how to protect the many fragile



ecosystems and species in the region. The plan will help direct future growth patterns, provide quality growth management tools that are designed to protect the County's natural resources, and preserve the rich heritage and quality of life in Jasper County, while minimizing or avoiding the problems associated with poorly planned development.

Break the Grip of the Rip® Campaign Debuts in South Carolina

Rip currents are fast-moving water flowing away from the shore—hazards that beachgoers often face along the South Carolina coast. The S.C. Sea Grant Extension Program (SCSGEP) recently held a Rip Currents Awareness Workshop for Horry and Georgetown



counties to promote life-saving rip current awareness programs for residents and tourists.

The SCSGEP will work with the City of Myrtle Beach to place rip current warning signs at walkways, distribute brochures and magnets, and place public service announcements on local television stations. For more information, visit www.ripcurrents.noaa.gov.

Workshop Extends Blue Crab Research to Public

The S.C. Sea Grant Extension Program, S.C. Department of Natural Resources, and Clemson University held a workshop on April 5, 2007 to present the Consortium-funded blue crab computer model to the public.

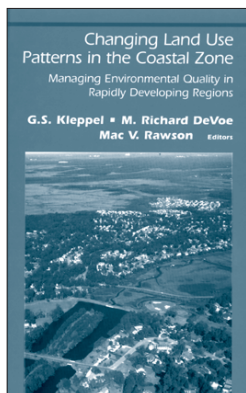
Participants received hands-on training on how to use the blue crab model to track crab movements, investigate trap efficiency, and how changes in water quality affect blue crab populations.

Dr. Michael Childress of Clemson University and Dr. Elizabeth Wenner of SCDNR created the computer model, called the South Carolina Blue Crab Regional Abundance Biotic Simulation (SCBCRABS), to study how water pollution, winter freezes, habitat destruction, tropical storms, and fishing pressure affects the blue crab fishery. For more information about the SCBCRABS project and to see the Ashley River model in action, visit www.clemson.edu/SCBCRABS.

Research Impacts *continued*

to guide development for both economic benefit and conservation of our natural resource heritage. The South Atlantic Bight Land Use-Coastal Ecosystem Study (LU-CES), a multidisciplinary research program initiated by the Consortium with funding from the NOAA Coastal Ocean Program, has generated information on direct cause-and-effect linkages between population and development trends and their impacts on the region's salt marsh-tidal creek ecosystems.

LU-CES research results have formed the basis for a recently published book by Springer-Verlag titled *Changing Land-Use Patterns in the Coastal Zone: Managing Environmental Quality in Rapidly Growing Regions*, edited by Gary S. Kleppel, M. Richard DeVoe, and Mac V. Rawson. Sea Grant extension and communications staff are listed as associate editors for their contributions in writing the chapter summaries.



The book is part of the Springer Series on Environmental Management, and up to two dozen investigators from all marine-related science disciplines

contributed to the text by writing chapters covering their areas of research. Due to the multi-disciplinary and collaborative nature of the study, the book should become a landmark in the area of understanding coastal estuarine ecosystem dynamics and the nature of anthropogenic inputs. To order the book, visit www.springer.com.

Fellowships

S.C. Sea Grant Students Awarded Knauss Fellowships

Martha McConnell and Kathleen Semon have been chosen as Dean John A. Knauss Marine Policy Fellows for 2007. The students were selected from a pool of 80 candidates submitted by Sea Grant College Programs nationwide.



Knauss Fellows Kathleen Semon (left) and Martha McConnell (right) with Vice-Admiral Conrad Lautenbacher, NOAA administrator. Photo: NOAA-Department of Commerce

Selection criteria include academic performance, letters of recommendation, career interests, and work and volunteer experience. Forty-four students from across the nation will participate as Knauss Fellows during 2007.

McConnell, an M.S. graduate in geological sciences from the University of South Carolina, has been placed as a legislative fellow in Sen. Frank Lautenberg's (D-NJ) office, working on coastal, ocean, and climate legislation.

Semon, an M.S. graduate in earth and environmental resources management at the University of South Carolina, has been placed as an executive fellow in the Partnerships and Communications Division of the Sustainable Fisheries Office of NOAA Fisheries Service in Silver Spring, Maryland. Semon will develop and launch a Web site called FishWatch and other promotional materials to educate the general public about the status of U.S. seafood stocks and NOAA Fisheries Service's efforts to manage fisheries sustainably.

The Knauss fellowship brings a select group of graduate students to the nation's capital where they work in the federal government's legislative and executive branches. Students learn about federal policy regarding marine and Great Lakes natural resources, and lend their scientific and policy expertise to federal agencies and congressional staff offices.

The fellowship is named after Dr. John A. Knauss, one of Sea Grant's founders, former NOAA administrator, and former Dean of the Graduate School of Oceanography at the University of Rhode Island.

Staff Appointments

Executive Director **Rick DeVoe** was elected chair of the Southeast Coastal Ocean Observing Regional Association (SECOORA) Board of Directors. SECOORA is one of 11 regional associations established to organize efforts in support of the U.S. Integrated Ocean Observing System (IOOS). Through a network of observations, IOOS systematically acquires and disseminates data and information on the past, present, and future status of the oceans and U.S. coastal waters. For more information, visit www.secoora.org and www.ocean.us.

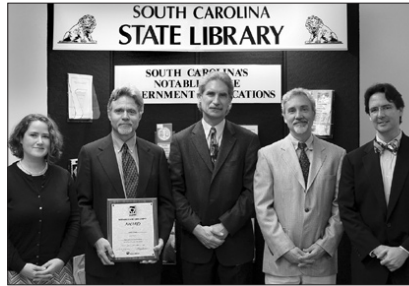
Communications Director **Susan Ferris Hill** and COSEE-SE Director **Lundie Spence** were named members of the National Marine Debris Advisory Panel. The panel will be assisting the NOAA Marine Debris Program to provide educational material to increase awareness of the litter problem, harmful effects of marine debris, and how people can take action. Ferris Hill is the coastal coordinator of South Carolina's annual statewide litter cleanup, Beach Sweep/River Sweep.

Program and Staff Awards

Coastal Heritage, a quarterly publication of the S.C. Sea Grant Consortium, recently won several awards.

The publication won a 2006 Notable State Document Award from the South Carolina State Library. Only 10 of these awards are given each year, and they “recognize state governmental publications of outstanding merit and usefulness to the citizens of South Carolina.”

Coastal Heritage won two prestigious awards from the Society for Technical Communication (STC) Carolina Chapter for 2006-2007: Best of Show and Distinguished awards. According to the STC judges, “*Coastal Heritage* is well-written, well-designed, and of considerable interest. The quality is very high overall and it was obvious that care was taken with the conception and follow-through for all the articles.”



Susan Ferris Hill, John H. Tibbetts, Rick DeVoe, and Carl Turner accept the S.C. State Library 2006 Notable State Document Award from the library's Interim Director Curtis Rogers.
Photo: S.C. State Library

The publication also won two awards in the 2006-2007 Council for the Advancement and Support of Education (CASE) District III competition: an Award of Merit in the Low Budget Publication category; and Award of Merit in the Other Magazines category.

Coastal Heritage covers issues of coastal and marine policy, science, and history. For a free subscription, contact Annette. Dunmeyer@scseagrant.org or call (843) 953-2078.

The Center for Ocean Sciences Education Excellence–Southeast Director **Lundie Spence** was awarded the National Marine Educators Association 2006 Honorary Member Award. Spence was recognized for a career of leadership and outstanding performance as a marine educator in the classroom and in the community.

S.C. Sea Grant Extension Program Leader **Robert Bacon** was presented with a 2006 Award of Excellence in Service/Outreach from the Clemson University Board of Trustees. Bacon was recognized for his outstanding contributions to students, the college, and its mission.

Marine Aquaculture Specialist **Jack Whetstone** received the 2006 Distinguished Service Award for Excellence in Extension Education from the S.C. Association of County Agricultural Agents.