RHODE ISLAND SEA GRANT

Program Guide 2006–2008

Emphasizing partnerships, cooperation, and collaboration

The Rhode Island Sea Grant College Program is a federal-state partnership, based at the University of Rhode Island, that works to promote the wise use and conservation of marine resources for the public benefit through research, outreach, and education. Funding comes from a variety of federal, state, and nonprofit sources, with matching funds provided by the state/private sources. For more information about Rhode Island Sea Grant's research, education, and outreach programs, publications, and news, please visit our website at: *seagrant.gso.uri.edu.*

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Facing page, background: URI students Tiffany Smythe and Sara Schroeder record Bay activity for the BayScape research project. *Photo courtesy Robert Thompson, URI.* Inset: Map illustrating the areas covered by the Metro Bay SAMP. *Map courtesy The Providence Plan.*

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Sea Grant
Rhode Island

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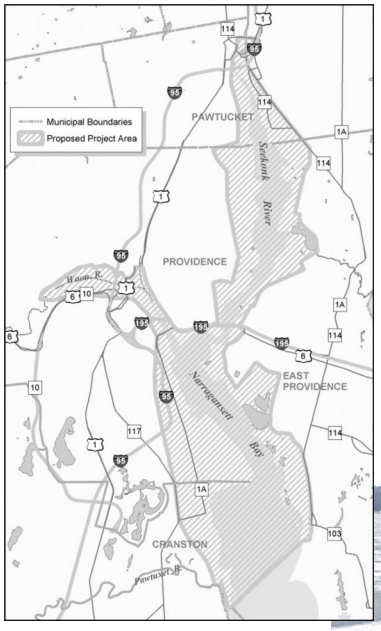
Rhode Island Sea Grant

Program Guide 2006-2008



Aerial photo courtesy Providence Water Supply Board; inset photo by Katherine Trapani, R.I. Division of Planning.

LETTER FROM THE DIRECTOR

America's shorelines are being loved to death. There are high demands for recreational, business, and residential developments near the water. Communities must balance economic and environmental values and manage the impacts of development while maintaining the integrity of coastal ecosystems.

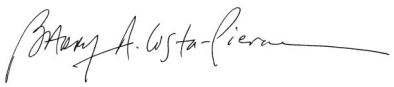
Sea Grant believes that investments in a knowledge-based coastal economy that incorporate wise stewardship of the environment will pay off handsomely. Opening closed beaches, restoring coastal parks with public access, improving water quality to reopen shellfish beds, restoring fisheries, and reclaiming marine ecosystems and habitats are just as important economically as attracting new pharmaceutical or insurance companies. Many people would be attracted to a place that promotes its marine assets and modern infrastructure, its unique place-based traditions, its sustainable development policies, and its high quality of life.

Rhode Island Sea Grant's program agenda for 2006–2008 emphasizes partnership, cooperation, and collaboration. The program's extensive array of constituents, many of whom are represented on the Rhode Island Sea Grant Senior Advisory Council, offers opportunities to work together in partnership to achieve common goals. Cooperating with academia, government agencies, and nongovernmental organizations, Rhode Island Sea Grant seeks to harness the collective strengths and resources of public and private partners to develop feasible, broadly supported solutions to salient coastal ocean issues. And through a strengthening of the program's partnerships, Rhode Island Sea Grant strives to make these relationships truly collaborative, creating win-win outcomes for all groups involved.

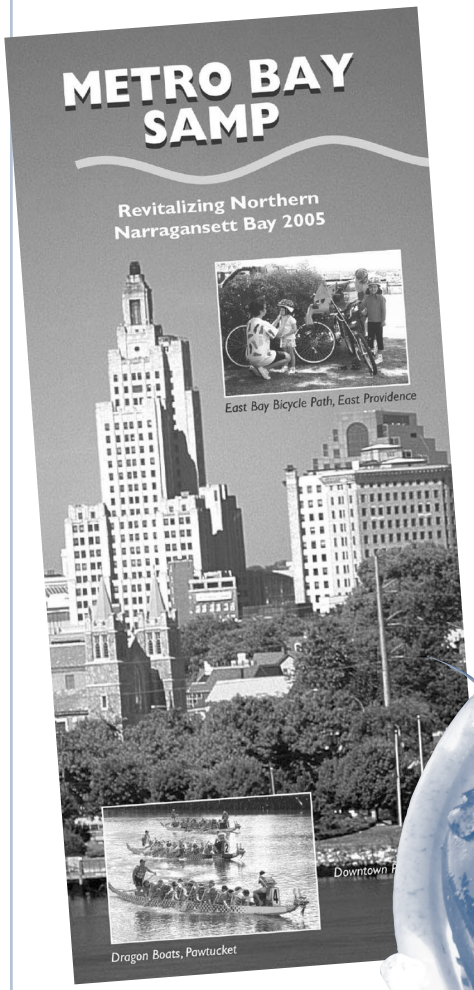
Recognizing that coastal issues of local concern reverberate nationally and even globally, Rhode Island Sea Grant engages at the state, regional, and local level with research, outreach, and education programming that can serve as national models for scientific advancement and enhanced management.

In 2006–08, Rhode Island Sea Grant funds over $3 million annually (federal and state/private match) in Rhode Island-based programs. Sea Grant continues to pursue partnerships with foundations, including successful new endeavors with the Sand County Foundation and the Packard Foundation.

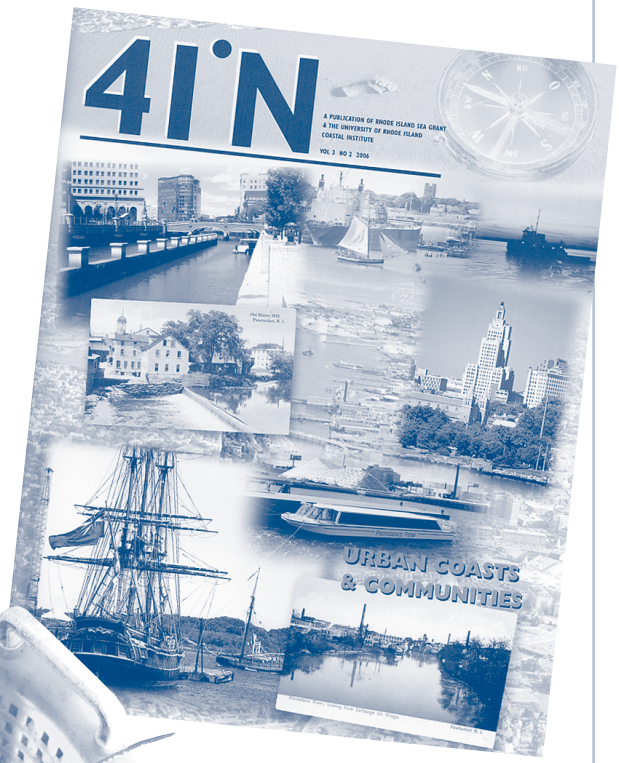
For 2006–08, Rhode Island Sea Grant builds on its strengths in two overarching thematic areas—Sustainable Fisheries and Sustainable Coastal Communities and Ecosystems. The program's efforts in these two themes and five functional areas of administration, law, research, education, and outreach are guided by its *Strategic and Organizational Development Plan, 2006–2010*—a plan developed through a 14-month collaborative process involving over 100 stakeholders. The plan was instrumental in articulating planning and evaluation frameworks, visions and missions, and goals and objectives to guide Rhode Island Sea Grant programming through 2010. Exciting plans are under way for 2006–08. We are committed to develop further our funding base and ideas about a Sea Grant Foundation, and we intend to examine seriously our roles in contributing to institutional diversity and internationalization of our programs. With a strong leadership team and programs, we are well on the path to becoming one of the top Sea Grant programs in the network. For more information about Rhode Island Sea Grant, visit us on-line at: *seagrant.gso.uri.edu.*



Barry A. Costa-Pierce



Our 2006-2008 program guide reflects programming and investments that promote the conservation and sustainable use of marine resources for the benefit of Rhode Island, the region, and beyond.



Lobster photo courtesy Rhode Island Sea Grant SFEP.

INTRODUCTION

The Rhode Island Sea Grant College Program is a federal-state university partnership, based at the University of Rhode Island (URI), that designs and supports research, outreach, and education programs that foster coastal and marine stewardship. It is one of over 30 programs that make up the National Sea Grant College Program, a part of the National Oceanic and Atmospheric Administration (NOAA). Rhode Island Sea Grant works with local, state, federal, and international partners to achieve its goals. Here is some of the programming we have planned for this 2006–08 period:

SUSTAINABLE FISHERIES

There are several new developments in Sea Grant fisheries research and outreach activities. Years of research by Rhode Island Sea Grant on lobster shell disease in southern New England waters led to a $3 million Congressional appropriation to manage a New England-wide research effort—the New England Lobster Research Initiative. These funds are being used to fund $2.3 million of new research and two large ventless trap surveys in Rhode Island and Maine to better understand and manage shell disease in New England waters.

Sea Grant's Sustainable Fisheries Extension Program (SFEP) continues to work with the Rhode Island Commercial Fisheries Center and the Commercial Fisheries Research Foundation at URI. The center has created unprecedented opportunities for the commercial fishing industry to interface closely and more successfully with scientists, educators, and outreach staff. With commercial fishermen, the SFEP conducted collaborative research on the development of new gear designs, including a haddock trawl net design that reduces bycatch of cod and other groundfish, and which has generated widespread interest throughout the New England trawl vessel fleet. In addition, the extension program coleader heads both the National Sea Grant and the Northeast Sea Grant Fisheries Extension networks, and led the organization of the first National Sea Grant Fisheries Extension meeting that brought together fisheries extension specialists from across the national network to share ideas and experiences. Greater cooperation with NOAA Fisheries led to Rhode Island Sea Grant fisheries extension staff being appointed to the Northeast Regional Bycatch Assessment Team. The team is the only forum of its kind that utilizes experts external to NOAA Fisheries to develop bycatch implementation plans and is serving as a national model for other NOAA Fisheries regions.

SUSTAINABLE COASTAL COMMUNITIES AND ECOSYSTEMS

In 2006–08, Sea Grant research in sustainable coastal communities and ecosystems focuses primarily on the effects of a changing Narragansett Bay. The research captures changing uses of the Bay as well as the physical, chemical, and biological responses to changing Bay conditions, including increasing temperature due to global climate change and reduction of nutrient inputs.

Most of Rhode Island Sea Grant's Sustainable Coastal Communities and Ecosystems (SUCCESS) Extension Program efforts address an "Urban Coasts" theme. The program worked with the R.I. Coastal Resources Management Council (CRMC) to develop for CRMC a Special Area Management Plan (SAMP) for Greenwich Bay. That plan has moved into the implementation phase, and the SUCCESS program is now creating a SAMP for the Metro Bay communities of Cranston, East Providence, Pawtucket, and Providence. The Metro Bay SAMP updates CRMC's earlier Providence Harbor SAMP. These plans will serve as the basis for major reforms in Rhode Island's Coastal Zone Management programs, and are important for coordinating multiple state and federal agencies with regard to placed-based management. Through the SAMP process, a new Urban Coastal Greenway Policy for the Metro Bay area was recently issued and will have a major impact on the redevelopment of Rhode Island's urban waterfronts.

The SUCCESS Extension Program is also undertaking a SAMP for Aquidneck Island in cooperation with the Aquidneck Island Planning Commission. Discussions have begun with leaders from the three municipalities on the island as well as with the Navy, a major landowner. Implementing the West Side Master Plan, which was developed by the planning commission with assistance from Rhode Island Sea Grant, is expected to be part of the SAMP. The West Side Master Plan addresses many issues regarding development of the island's west side, one of the last remaining undeveloped coastal areas in the Northeast.

SEA GRANT SCIENCE SYMPOSIUM

In 2006, Rhode Island Sea Grant designated its annual science symposium as the "Ronald C. Baird Sea Grant Science Symposium" in honor of Baird's contributions to Sea Grant during his 10-year tenure as National Sea Grant College Program director. The 2007 Baird Symposium will focus on "Creating Vibrant Urban Waterfronts." The long-awaited book, *Science for Ecosystem-Based Estuarine Management: Narragansett Bay in the 21st Century,* is being published by Springer in 2007. This book represents the findings, discussion, and synthesis of the work presented at the 2004 Sea Grant Science Symposium on the "State of Science Knowledge of Nutrients in Narragansett Bay."

SEA GRANT LEGAL PROGRAM

During 2006–08, the Rhode Island Sea Grant Legal Program will develop into a full-fledged program, with research, education, and outreach arms. Based at the Roger Williams University (RWU) Ralph R. Papitto School of Law, the legal program is becoming a key resource for the public and government officials in assessing and appreciating the legal dimensions of environmental and natural resource management decisions.

Our 2006–2008 program guide reflects programming and investments that promote the conservation and sustainable use of marine resources for the benefit of Rhode Island, the region, and beyond. Projects and programs funded by Sea Grant during this period are organized below according to the thematic/functional area to which they contribute.

Photo courtesy Puffin Enterprises.

SUSTAINABLE FISHERIES THEME

Rhode Island Sea Grant has a long history and great strength in the area of sustainable fisheries. For 2006–2008, research priorities in this thematic area include exploring the links between ecosystem-based management and fisheries management, delving into lobster shell disease, gear engineering to reduce bycatch, leadership development opportunities for the fishing industry, elucidating emerging industry and consumer priorities regarding seafood, and increasing our knowledge of the biology and ecology of commercial and recreational fish species and stocks.

In the areas of outreach and education, top program priorities include facilitating the evolution of comanagement processes and institutions locally, regionally, and nationally and educating the current and next generation of fisheries scientists, fishermen, and managers.

RESEARCH

Laboratory testbedding of transferable allowance policies and institutions: Tradable output and input allowances
Principal Investigator: Christopher Anderson, URI Environmental and Natural Resource Economics
Co-Principal Investigator: Jon Sutinen, URI Environmental and Natural Resource Economics

Recent reports by governmental and nongovernmental organizations are encouraging fisheries managers to more widely apply individual transferable quota and other tradable allowance systems. Usually, fishery managers set a cap on catch or an "input," allocate shares among eligible fishermen, and permit fishermen to trade their individual shares among one another. In Rhode Island, an industry group of lobstermen proposed, and the Atlantic States Marine Fisheries Commission approved, a tradable trap certificate program for the American lobster fishery in southern New England. This project will continue to examine tradable fishing allowance management in the Rhode Island lobster fishery using experimental economics tools. Using a simulation environment, researchers hope to develop a better understanding of how transferability of input allowances affects outcomes for the market, the industry, and the stocks. The results of this work will be presented to national and regional fisheries managers and fishing industry representatives.

Multispecies fisheries models for ecosystem decision support
Principal Investigator: Jeremy Collie, URI Graduate School of Oceanography

A broad mandate for ecosystem-based fisheries management has emerged from recent ocean commissions and advisory panels. One of the key components of this management strategy is to account for the trophic interactions among fish species. Previous studies of multispecies fisheries have shown that the amount of fish consumed by other fish is the same order of magnitude as the amount caught in fisheries. Predation mortality is therefore considered to be an important process in regulating marine fish communities. Trade-offs between the catch of prey and predator species need to be considered when formulating fishery management advice. This joint project of the Rhode Island and Alaska Sea Grant College programs will create a model that will help fishery decision makers incorporate multi-species considerations into management choices. The researchers will develop a graphical interface to help users visualize trade-offs in harvesting predator and prey populations. The Rhode Island component focuses on 10 fish species on Georges Bank.

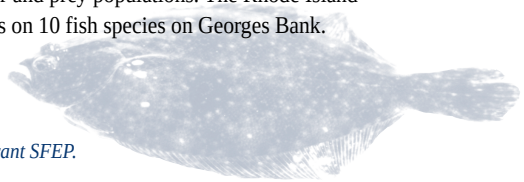


Photo courtesy Rhode Island Sea Grant SFEP.

OUTREACH

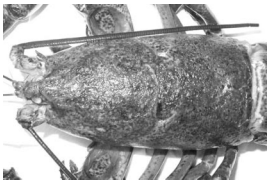
Sustainable Fisheries Extension Program
Principal Investigators: Kathleen Castro and Laura Skrobe, URI Fisheries, Animal and Veterinary Science

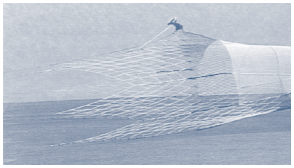
The Rhode Island seafood industry represents a complex mix of local, regional, and national issues. Rhode Island fisheries managers continue to struggle with meeting the demands of national and international seafood markets and the market-driven demands of the fishing industry, while seeking and maintaining sustainable levels of commercial and recreational fishing. Other contemporary issues of priority include proper reutilization of recovering stocks, reducing bycatch, and ecosystem-based management.

The SFEP works as an integrated extension, research, and education program with the harvest and processing industries, fisheries managers, scientists, the recreational fishing community, and seafood consumers to clarify fisheries issues and to help devise solutions to fisheries problems. Through projects in fisheries science and technology and seafood safety and marketing, the SFEP balances the complex ecological, social, and economic factors affecting the seafood industry and the natural resources dependent on it. One important goal for the SFEP is to help foster neutral discussion and problem-solving for development of new institutions such as the URI-based Commercial Fisheries Center of Rhode Island, the URI Fisheries Center, and the Commercial Fisheries Research Foundation.

As a liaison among the fisheries constituencies, as an educational resource offering workshops and academic courses, and as a scientific presence on committees, councils, and working groups, the SFEP seeks to advance the management of natural and human resources to ensure the long-term availability and quality of seafood. Projects for 2006–2008 include:

- Completion of an analysis of a new net design for a haddock trawl that eliminates cod and other groundfish bycatch
- Continue developing leadership skills and capacity in Rhode Island marine fisheries stakeholders
- Administer the New England Lobster Research Initiative to investigate the causes and consequences of shell disease ($2.3 million of applied research)
- Coordinate the R.I. Sea Turtle Disentanglement Network (RISTDN) under contract from NOAA Fisheries
- Work with New York Sea Grant seafood extension specialists to initiate an internet training program on sanitation, good manufacturing, and hygienic practices for food processors, wholesalers, and warehouses
- Work with Delaware Sea Grant researchers and seafood technology specialists to explore high-pressure inactivation of viruses in ready-to-eat food products





Top, left: Shell-diseased lobster. *Photo courtesy Rhode Island Sea Grant SFEP.* Bottom left: Experimental net designed to catch haddock while eliminating cod and other groundfish. *Photo courtesy Rhode Island Sea Grant SFEP.* Right: Brian Sharp, Provincetown Center for Coastal Studies (far left) demonstrates the use of the sea turtle disentanglement kit to RISTDN responders. *Photo by Malia Schwartz.*

Sea Grant Fisheries Extension Regional and National Coordination
Principal Investigator: Kathleen Castro, URI Fisheries, Animal and Veterinary Science

The Northeast Sea Grant regional fisheries network, led by Rhode Island Sea Grant's SFEP, has forged partnerships with local, state, regional, and national agencies involved in Northeast fisheries issues. We are broadening the visibility of Sea Grant as a regional network, which will likely garner future collaborative projects. SFEP staff coordinate the Northeast Sea Grant Fisheries Extension Program, maintaining responsibility for organizing meetings in the region for Sea Grant, NOAA Fisheries, fishery management councils, and commissions, as appropriate, providing education opportunities, and maintaining the Northeast Fisheries Extension website. As coordinator for the regional and national network, Rhode Island Sea Grant is a central link among the Sea Grant programs and the other regional stakeholders in fisheries. Activities include:

- Organizing the first National Sea Grant Fisheries Extension Meeting
- Developing a searchable database for all fisheries agents to aid in developing joint programs
- Compiling the results of Fisheries Extension Enhancement projects
- Developing a national website for fisheries extension activities
- Determining impacts from Fisheries Extension Enhancement projects and contributing towards future Fisheries Extension Enhancement programming
- Working towards developing partnerships with other government agencies with similar missions
- Creating a national network approach and identity for Sea Grant Fisheries Extension
- Providing a support structure and learning opportunities for fisheries extension agents

Rhode Island Aquaculture Initiative
Principal Investigators: David Alves, R.I. Coastal Resources Management Council; Barry Costa-Pierce, Rhode Island Sea Grant

As a consortium of CRMC, Rhode Island Sea Grant, URI, RWU, aquaculture industry representatives, and the R.I. Shellfishermen's Association, the Rhode Island Aquaculture Initiative (RIAI) funds and implements multiyear research grants and mini-grants in project development, extension, and education. Determining priorities for projects to be funded is the task of the RIAI Executive Committee composed of representatives of RIAI's partner institutions and the aquaculture industry. Rhode Island Sea Grant recently produced, for the RIAI, a strategic plan titled, *Rhode Island Aquaculture Initiative: A Shared Vision for the Future.* In addition, the RIAI website, created and maintained by Rhode Island Sea Grant, was handed off to CRMC to continue. Visit *www.crmc.state.ri.us/riai/* for a full listing of projects and mini-grants.

The RIAI is funding the following projects in 2006–08:

- Peter August, URI natural resources science professor, received $149,983 over three years to enhance the Rhode Island Aquaculture and Fisheries website and map server with up-to-date physical, chemical, and biological spatial data.
- Bradford Bourque, RWU marine laboratory manager, Harold Pomeroy, RWU biology professor, and Something Fishy, Inc. received $125,438 over three years to develop economically and environmentally sustainable land-based culture techniques for at least three species of marine ornamentals.
- Graham Forrester, URI natural resources science associate professor, and Robert Rheault, Spatco, Ltd. president, received $100,028 over two years to evaluate the effects of aquaculture facilities on natural habitats and to describe the habitat values of shellfish aquaculture gear.

Clownfish photo by Constance Brown Photographer.
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- Marta Gomez-Chiarri, URI fisheries, animal, and veterinary science assistant professor, Roxanna Smolowitz, Woods Hole Oceanographic Institution (WHOI) Marine Biological Laboratory researcher, and Tim Scott, RWU Center for Economic and Environmental Development director, received $49,136 over three years to evaluate the presence of a parasite found in wild and farmed northern quahogs in Rhode Island and the potential effect of the disease on Rhode Island's quahog industry.
- Perry Raso, shellfish aquaculturist, and Alicia Thayer, South Kingstown High School teacher, received $82,405 over three years to educate over 1,700 students from Grade 6 through college about shellfish aquaculture and to promote community acceptance of aquaculture. In addition, students will be involved in a cutting-edge model aquaculture facility.
- Tim Scott, RWU Center for Economic and Environmental Development director, received $100,000 over three years to determine whether producing young seed clams in a hatchery and replanting them on public grounds will result in a greater harvest of adult clams in the future or will inadvertently attract predators to a productive bed.

Photo by Malia Schwartz.

AQUACULTURE JOURNAL

Rhode Island Sea Grant manages the Husbandry and Management section of the journal *Aquaculture*—the top international scientific journal in the field—produced by Elsevier Science. With an international database of nearly 5,000 scientists, Rhode Island Sea Grant now maintains one of the largest scientific reviewer databases for aquaculture in the world. In addition, all reviews are carried out with a new Elsevier electronic editorial management system, which Rhode Island Sea Grant helped design. Over 500 peer-reviewed manuscripts were processed in 2006.

SUSTAINABLE COASTAL COMMUNITIES AND ECOSYSTEMS THEME

Rhode Island Sea Grant's studies of coastal ecosystems have changed the way we manage these critical environments. In taking a new management approach, Sea Grant has pioneered many of the concepts of ecosystem-based management and integrated coastal management. In 2006–2008, our research priorities in this thematic area include characterizing and quantifying change in coastal ecosystems, improving understanding of acute/cumulative effects of physical, chemical, and biological contaminants, and developing innovative techniques to characterize the sources, pathways, and effects of nutrients, toxins, and biocontaminants.

The focus for the outreach and education programs in this thematic area will be to improve ecosystem-based management of coastal communities and ecosystems, educate a new generation of coastal scientists, policy-makers, and managers to advance coastal stewardship, and nurture scholarly learning communities locally, regionally, nationally, and internationally to foster ecosystem-based and integrated coastal management.

RESEARCH

Shoreline development and the functioning of Narragansett Bay salt marsh ecosystems

Principal Investigator: Mark Bertness, Brown University Ecology and Evolutionary Biology

Co-Principal Investigator: Caitlin Mullan Crain, Brown University Ecology and Evolutionary Biology

Coastal marshes filter and protect coastal waters and serve as a primary defense to marine eutrophication, but at the same time can be severely impacted by nutrient inputs. Because coastal marshes are valued for the many ecosystem services they provide, the potential for eutrophication to degrade remaining marshes is of great concern. The investigators have found startling new evidence suggesting that nutrient enrichment may have impacts on marsh vegetation by enhancing grazing by insects on enriched marsh grass. This project is designed first to determine whether insects feeding on salt marsh plants degrade the salt marsh and second, whether increased salt marsh production due to eutrophication in turn attracts more insects to feed on salt marsh plants, thereby furthering degradation. This work is intended to improve the conservation and management of salt marshes.

Left to right: *Crab and marsh grass photos courtesy Mark Bertness, Brown University; fishing photo by Adam Zitello; surfer photo by Charlie Festa; boat photo by Adam Zitello.*

Narragansett BayScape: An examination of human interactions with the marine environment

Principal Investigator: Tracey Dalton, URI Marine Affairs

Co-Principal Investigator: Robert Thompson, URI Marine Affairs

Narragansett Bay hosts numerous economic activities: marine transportation, research and ocean technology development, military, commercial and recreational fisheries, aquaculture, boatbuilding, boat-related services, tourism and recreation, and shipbuilding. Efforts have been made to quantify human activities in the Bay, but few efforts have been made to spatially characterize human activities on the shoreline or on the water. Using a landscape ecology framework, this study builds on previous efforts by employing standardized observational methodology and by analyzing density gradients of uses throughout Narragansett Bay. Such information will be useful to understand how different parts of the Bay are being used and to what degree, to explore relationships among elements of the Bay's social and natural

marinescapes, and to examine how the marinescape might change in response to new policies. Researchers are working with Rhode Island Sea Grant outreach programs to develop a strategy for incorporating the results into decision-making processes that address management issues, such as conflicts between commercial and recreational activities, perceptions of quality of the recreational experience, and the potential consequences of policy and use changes.

Characterizing the dynamics of phytoplankton change in Narragansett Bay

Principal Investigator: Paul Hargraves, URI Graduate School of Oceanography

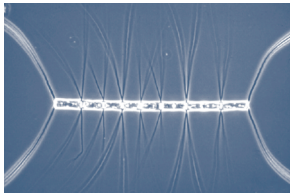


Photo by Paul Hargraves, URI.

Along with most coastal environments worldwide, Narragansett Bay is changing. While some primary production at the base of the food web is benthically (bottom) generated, the bulk of the annual primary production is planktonic. The winter-spring phytoplankton bloom provides a major portion of the annual primary production and jump-starts the subsequent annual secondary production in the plankton and benthos. The types of phytoplankton that comprise the winter-spring phytoplankton bloom in Narragansett Bay have changed over time, with previously unrecognized species appearing, while other formerly abundant species become ephemeral or disappear entirely. This project is designed to determine the extent of biodiversity changes in the phytoplankton of the Bay and whether perceived changes are more likely attributed to changes in water temperature (winter warming) or modifications to the nitrogen-to-silicate ratio over time. (Silicate is often a limiting nutrient for diatoms, which previously dominated winter-spring blooms in Narragansett Bay.)

Modeling and observations of circulation and biochemical processes in Narragansett Bay: The relationship between the upper Bay and its impacted sub-systems

Principal Investigator: Christopher Kincaid, URI Graduate School of Oceanography

Co-Principal Investigators: Deanna Bergondo, URI Graduate School of Oceanography; Changsheng Chen, University of Massachusetts-Dartmouth Marine Science and Technology; Candace Oviatt, URI Graduate School of Oceanography

Narragansett Bay and its sub-systems, including Greenwich Bay, the upper Bay, and the Providence River, suffer from episodic hypoxic (low oxygen) events. Warm water temperatures and stratification are the fundamental requirements for hypoxia; however, there are secondary processes (precipitation, solar irradiance, wind speed and direction, tidal range, and phytoplankton blooms) controlling hypoxia that are more complex and tend to vary among regions of the Bay. Analysis of buoy data from two sites in the upper Bay and the Providence River indicate that the occurrence of hypoxia is based on a balance between local vertical mixing and lateral exchange. Moreover, events like the Greenwich Bay fish kill in August 2003 underscore the importance of understanding and predicting hypoxia within the Bay in much greater spatial and temporal detail. This project continues the development and application of an existing Sea Grant–funded physical model that simulates key features of the Narrangansett Bay system and works to couple the 3-D prognostic physical model with a high-resolution chemical-biological model. In addition, the dramatic changes occurring in Narragansett Bay, including a projected 25 percent reduction in total nitrogen discharge and the documented warming of the Bay, are expected to modify the physical processes within sub-regions and flushing patterns between sections of Narragansett Bay. Having an accurate model of the physical-chemical-biological processes in the Bay under such changing conditions will allow the investigators to ultimately provide this scientific tool to inform coastal policy decisions.

BayMap: A proposal to image the seafloor, map and ground-truth the habitats, and document the cultural landscape of Narragansett Bay

Principal Investigator: John King, URI Graduate School of Oceanography

Co-Principal Investigators: Jon Boothroyd, URI Geosciences; Carol Thornber, URI Biological Sciences; Kathryn Ford, WHOI; Roderick Mather, URI History; Kathryn Moran, URI Ocean Engineering; Christopher Deacutis, Narragansett Bay Estuary Program; Sheldon Pratt, URI Graduate School of Oceanography; Christopher Damon, URI Natural Resources Science

Effective integrated management of marine resources, infra-structure development, and environmental protection requires a full knowledge of our bays and harbors, including habitat information. Using state-of-the-art technology, the BayMap project is addressing these problems by mapping all habitats in the Narragansett Bay system. This six-year project, continuing from 2004–06, will produce a comprehensive series of high-resolution seafloor maps and images of Narragansett Bay and adjacent Rhode Island and Connecticut coastal environments to create a complete picture of their geology, habitats, biological communities, and archaeology. This valuable information can then be used for habitat and cultural resource management in reviewing environmental assessments dealing with major projects such as coastal construction, dredging, location of aquaculture sites, and dredge disposal. It will also be used to develop mitigative measures and to advance a quantitative understanding of benthic ecosystems.

Point Judith Pond entrance from the ocean between Galilee and Snug Harbor. *Photo courtesy Scott Nixon, GSO.*

Integrated numerical modeling and field observations of groundwater flow in southern Rhode Island and implications for nutrient loading in coastal lagoons: Phase II

Principal Investigator: S. Bradley Moran, URI Graduate School of Oceanography

Co-Principal Investigators: John Masterson and John Colman, U.S. Geological Survey Water Science Center

The problem of eutrophication and bacterial contamination in southern Rhode Island salt ponds and nearshore freshwater ponds are connected with complex questions of water supply and waste disposal in a sole-source aquifer contained in a small area. Rhode Island has begun to address these questions by developing a regional numerical groundwater flow model from which the contributing lakes, streams, and salt ponds can be determined. It has proven difficult to quantify the influence of direct groundwater discharge into the coastal ocean, due to the nature of groundwater flow. This project builds on the first phase—sponsored by Rhode Island Sea Grant—of a collaboration between the URI Graduate School of Oceanography (GSO) and the U.S. Geological Survey (USGS) aimed at developing a regional characterization of groundwater flow to Point Judith, Potter, Ninigret, Green Hill, Quonochontaug, and Winnapaug ponds, using both numerical models and field measurements. Phase II of the project will now develop a detailed flow model of groundwater transport for a site-specific case—Ninigret and Green Hill ponds—coupled with geophysical sediment coring and groundwater flux measurements required to calibrate the model. Ultimately, the model will delineate contributing areas, estimate time-of-travel from recharge to discharge points, and calculate groundwater discharge patterns and fluxes. This research is directly relevant to establishing policy and guidelines for Rhode Island groundwater quality and usage and assessing risk-based environmental strategies for nutrients and bacteria within these coastal lagoons.

Experimental studies of benthic-pelagic coupling in a changing Narragansett Bay

Principal Investigator: Scott Nixon, URI Graduate School of Oceanography

Co-Principal Investigators: Stephen Granger and Betty Buckley, URI Graduate School of Oceanography

Narragansett Bay is poised to become the subject of a great but uncontrolled experiment in which both climate and nitrogen are changing. The impact of these changes in the water column on the biogeochemical cycling and productivity of the benthic communities in the Bay is virtually unknown, though 30 years of research have shown strong pelagic-benthic coupling in terms of oxygen uptake rates, nutrient regeneration rates, denitrification in the sediments, and plankton and benthos species composition and abundance. This project will measure the impact of changes in the timing and magnitude of phytoplankton blooms on the bottom community in Narragansett Bay. Researchers will assess the potential impact of nitrogen reduction in sewage effluent during summer on the growth rates and condition of important benthic animals and will provide measurements to improve numerical ecosystem models that predict responses of the Bay to climate change and nutrient reductions, such as those anticipated with upgrades to sewage treatment plants in Narragansett Bay.

Wally Fulweiler, URI oceanography doctoral student, analyzes Narragansett Bay water samples. *Photo by Malia Schwartz.*

OUTREACH

Sustainable Coastal Communities and Ecosystems Extension Program

Principal Investigators: Jennifer McCann, Rhode Island Sea Grant/URI Coastal Resources Center; Stephen Olsen, URI Coastal Resources Center

The SUCCESS Extension Program addresses coastal management and planning issues by providing decision makers with scientific and technical information to assist policy formation, implementation, and evaluation.

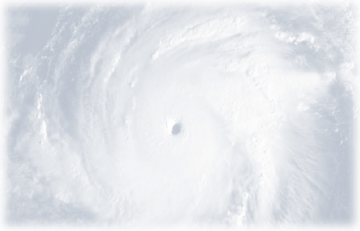
Projects for 2006–2008 include:

- Developing the Metro Bay SAMP in conjunction with the CRMC and the cities of Cranston, East Providence, Pawtucket, and Providence. The plan focuses on the highly developed waterfront along northern Narragansett Bay and promotes coastal access with the creation of an Urban Coastal Greenway Policy that incorporates not only protective vegetated buffers, but also public access to the shoreline and habitat protection. The SAMP also addresses hazard mitigation, economic redevelopment, and balancing recreational uses with working waterfronts.

- Helping Metro Bay municipalities work collaboratively to increase their resilience to natural hazards such as hurricanes by building regional capacity across government, business, and community sectors to engage in preparedness, responsiveness, and recovery activities. Tailored approaches are being carried out for each sector, with opportunities for sectors to join together for public presentations featuring experts, municipal forums, and Institute for Business & Home Safety “Open For Business” training programs for

social agencies. Within each activity, the best and most current scientific data and policies are interwoven with training techniques to help community stewards create the most effective and efficient tools toward establishing a disaster-resilient Metro Bay region.

- Continuing to assist implementation of the West Side Master Plan, which is designed to guide development of the western side of Aquidneck Island and includes strategies for reducing congestion on West Main Road, setting aside land for public access to Narragansett Bay, supporting marine-related business and development, creating safe bicycle paths and walking trails, and developing an alternate travel route.
- Continuing to build the capacity of coastal decision makers, especially volunteer boards and commissions, by providing professional development training on a one-on-one basis to serve each person's specific needs in terms of learning coastal management policies and how they relate to government and community planning processes.



Coastal Community Development Program

Principal Investigators: Pamela Rubinoff and Jennifer McCann, Rhode Island Sea Grant/URI Coastal Resources Center

The SUCCESS Extension Program has promoted and facilitated planning for sustainable coastal communities through pilot projects in the Metro Bay and Aquidneck Island regions. Funded by the National Sea Grant College Program, Rhode Island Sea Grant's Coastal Community Development (CCD) Program works to enhance local decision making regarding coastal community development and land use. The CCD program also provides an avenue to link Rhode Island Sea Grant staff working in these areas with other Sea Grant program extension specialists and professionals. Ongoing efforts advance these concepts nationally and integrate them locally to foster coastal community resilience in Rhode Island.

Additionally, with funding from the U.S. Environmental Protection Agency (EPA), the CCD program and partners on Aquidneck Island are developing coastal Smart Growth principles to assist with land-use planning, as well as building the capacity of decision makers to create disaster-resilient communities that can prepare for, endure, and efficiently recover from natural hazards such as hurricanes. Rhode Island Sea Grant's CCD program, in collaboration with EPA and the Sea Grant Network, plan to share their results with a national audience of planners, developers, and outreach professionals. This sharing will help create buy-in that can influence the application of Smart Growth principles in development projects, technical assistance to communities, and practitioner training on a national scale.

The West Side Master Plan proposes developing Burma Road into a scenic alternate to West Main Road. *Photo courtesy URI Coastal Resources Center; hurricane photo courtesy NOAA.*

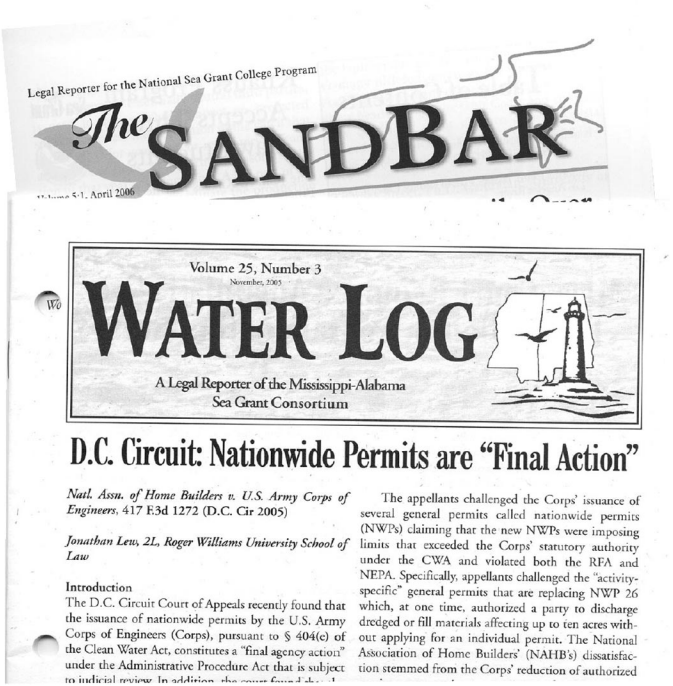
RHODE ISLAND SEA GRANT LEGAL PROGRAM

Principal Investigator: Kristen Fletcher, RWU Ralph R. Papitto School of Law

The complexity of coastal and marine issues and the social and environmental impacts of management activities add a legal dimension to ocean and coastal policy.

The Sea Grant Legal Program, established in January 2004, provides objective legal analysis for state agencies and other constituents as well as for Sea Grant's extension programs. A partnership among Rhode Island Sea Grant, URI marine affairs, and the RWU Law School, the program represents an interdisciplinary approach to legal and policy issues. The outreach element provides legal analysis for constituents requesting information on matters related to coastal zone management, fisheries, ports and harbors, and other areas of marine law. The educational component supports a joint-degree program through which students participate in related course work at both RWU and URI to earn juris doctor and master of marine affairs degrees in a concentrated program of study.

Grounded in marine law, coastal zone law, environmental regulation, fisheries management, international topics, and other aspects of marine law, students have the opportunity to apply their training to real-world ocean and coastal issues through internships in Sea Grant's outreach programs and participation in various learning forums, such as the annual National Environmental Moot Court competition. The Sea Grant Legal Program Law Fellows tackle difficult on-the-ground issues related to fishing regulation conflicts, rights-of-way to the shore, and state authority under the Coastal Zone Management Act. In conjunction with the RWU Marine Affairs Institute, the program also cosponsors symposia and speaker events focusing on interdisciplinary aspects of current marine policies. And staff and students regularly contribute to law and policy journals, including the *Ocean and Coastal Law Journal*, *Duke Environmental Law and Policy Forum*, and *Environmental Law Reporter*, and reporters, including the *Water Log Legal Reporter* and *SandBar Legal Reporter*.



Legal Reporter for the National Sea Grant College Program

The SANDBAR

Volume 25, Number 3

November, 2005

WATER LOG

A Legal Reporter of the Mississippi-Alabama Sea Grant Consortium

D.C. Circuit: Nationwide Permits are "Final Action"

Natl. Assn. of Home Builders v. U.S. Army Corps of Engineers, 417 F3d 1272 (D.C. Cir 2005)

Jonathan Leu, 2L, Roger Williams University School of Law

Introduction

The D.C. Circuit Court of Appeals recently found that the issuance of nationwide permits by the U.S. Army Corps of Engineers (Corps), pursuant to § 404(e) of the Clean Water Act, constitutes a "final agency action" under the Administrative Procedure Act that is subject

The appellants challenged the Corps' issuance of several general permits called nationwide permits (NWPs) claiming that the new NWPs were imposing limits that exceeded the Corps' statutory authority under the CWA and violated both the RFA and NEPA. Specifically, appellants challenged the "activity-specific" general permits that are replacing NWP 26 which, at one time, authorized a party to discharge dredged or fill materials affecting up to ten acres without applying for an individual permit. The National Association of Home Builders' (NAHB's) dissatisfaction stemmed from the Corps' reduction of authorized

PROGRAM ADMINISTRATION

Principal Investigator: Barry Costa-Pierce, Rhode Island Sea Grant

Rhode Island Sea Grant Program Administration is composed of Program Management—including Program Development and Education Program activities—and the Communications Program. The Program Management arm oversees all Rhode Island Sea Grant programming. It performs a wide variety of functions, including planning, grant administration, proposal review and selection, fund-raising, program evaluation, human resource management, proposal development, mentoring, and advising. The Communications Program disseminates useful information on marine and coastal topics in response to accelerating demands for accurate monitoring, interpretation, and synthesis of scientific and technical knowledge, insight, and data by diverse government, business, and public audiences. As a single Program Administration unit, led by the Sea Grant director, the two parts achieve a greater level of engagement and are better able to simultaneously serve and administer Rhode Island Sea Grant's thematic and functional areas. In addition to overseeing Rhode Island Sea Grant and representing the program locally, the director also plays a role in regional, national, and international arenas. Several of those initiatives for 2006–08 are detailed below.

Northeast Regional Ocean Science Advisory Council

Rhode Island Sea Grant along with the six other Northeast Sea Grant programs were awarded $350,000 over four years to develop regional research, information planning, and coordination to address important questions about the Northeast ecosystem—New York to Canada—and determine its value to stakeholders. The new Northeast Regional Ocean Science Advisory Council plans to develop an ecosystem-based management plan based on priority management concerns identified during discussions by a variety of stakeholders, including state and local government, industry, nongovernmental organizations, academia, federal agencies, and other interested parties. The discussions with stakeholders, workshops, and plan development will be completed by the end of the second year of funding. The remaining years' funding will identify issues to address, continue efforts to secure long-term funding for regional projects, and focus on technology transfer and training for managers and other users.

Northeast Regional Ocean Council

The Northeast Regional Ocean Council (NROC), composed of the New England governors and Eastern Canadian premiers and headed by Rhode Island's Gov. Donald Carcieri, is working to coordinate regional policy programs for the Northeast and Atlantic Canada. To date, NROC discussions have focused largely on ocean issues relating to education, exploration, observation, and economic development—and the best way to engage our Canadian counterparts. When called upon, Rhode Island Sea Grant's role in NROC is advisory in providing unbiased scientific information to inform these discussions.

PROGRAM DEVELOPMENT

The Rhode Island Sea Grant director retains a small Program Development Fund that enables the program to respond quickly in a coastal crisis, to take advantage of a new research idea, to support technology, or to help start and nourish ideas with good future potential. For example, Program Development funds supported Gabriele Kass-Simon, URI biological sciences professor, and Stuart Cromarty, URI biological sciences adjunct associate professor, to investigate the effects of lobster shell disease on behavior, specifically the disease's impact on the lobster's sense of smell, which can affect mating behavior.

2006 Moot Court Team (left to right): Joseph Farside, Weayonnah Nelson, and Lance Young. *Photo courtesy Rhode Island Sea Grant Legal Program.*

Other Program Development funds were provided in support of the following:

- Marine Biology Endowment Fund kickoff event at URI
- Northeast Aquaculture Conference and Expo held in Mystic, Conn.
- Land and Water Summit held at URI
- The URI undergraduate research internship program
- The Coastal Society conference held in St. Petersburg, Fla.
- Moot Court competition by the RWU School of Law
- Rhode Island Sea Grant/RIAI booth at the Boston Seafood Show
- Historic Preservation Conference held at Rhodes on the Pawtuxet, Cranston, R.I.
- EPA Smart Growth Conference held in Providence, R.I.
- Sustainable Offshore Aquaculture Conference in partnership with the Baltimore Aquarium
- URI Bahamas Initiative, a partnership among the state of Rhode Island, URI, and the U.S. National Guard
- Sustainable Seafood Forum Scientific Advisory Board convened at the Aquarium of the Pacific
- Sea Grant National Fisheries Extension Meeting held in Jacksonville, Fla.

International Sea Grant Initiative

Rhode Island Sea Grant has been able to allocate some Program Development funding to cultivate an International Sea Grant Initiative. The initiative seeks to partner with organizations in developing nations that share common missions and goals with Rhode Island Sea Grant, and who could work with and exchange knowledge about innovative approaches to creating sustainable coastal communities and environments through research, outreach, and public education programs. To date, collaborations in Latin America are yielding promising results.

COMMUNICATIONS PROGRAM

Principal Investigator: Malia Schwartz, Rhode Island Sea Grant
Co-Principal Investigator: Monica Allard Cox, Rhode Island Sea Grant

Rhode Island Sea Grant Communications provides information on marine and coastal topics as well as on the outcomes of Sea Grant extension, research, and education. Communications efforts include the program website and its many topical offshoots, including sites for SAMP planning and lobster shell disease and regional sites for coastal community development and fisheries management. The Rhode Island Sea Grant Program website and its sub-pages now exceed 44,000 visitors per month. The program also issues press releases, produces a variety of print products, and coordinates public events. Communications has established a partnership with the URI Coastal Institute to produce *41 °N* magazine, which investigates a number of coastal issues. Communications coordinates Rhode Island's annual Coastweeks celebration of the coast with funding from CRMC and has established other partnerships to further provide the program's constituents with the information and resources they need to promote the wise governance of coastal resources.

EDUCATION PROGRAM

Principal Investigator: Barry Costa-Pierce, Rhode Island Sea Grant
Co-Principal Investigator: Alan Desbonnet, Rhode Island Sea Grant

Rhode Island Sea Grant recognizes that public knowledge and understanding of the scientific processes and issues related to oceans and marine and coastal areas is critical to the sustainability of our nation's marine ecosystems. Sea Grant's education program takes an integrated approach to providing lifelong learning opportunities.

During 2006–08, Rhode Island Sea Grant will focus its efforts on the following education activities:

- Provide professional development opportunities for graduate students supported via Sea Grant–funded research and outreach projects
- Commit funding to URI undergraduates in critically needed environmental sciences through the URI Coastal Fellows Program and the URI Provost's Undergraduate Research Program
- Participate in the Sea Grant Knauss Marine Policy Fellowship Program, the National Sea Grant Industry Fellowship Program, and the NOAA Fisheries-National Sea Grant Fisheries Science Graduate Fellowship Program

Photo courtesy Narragansett Bay National Estuarine Research Reserve.

- Implement the "Narragansett Bay Plankton Time Series,"—a Web-accessible database engine that will allow educators and researchers access to a unique 40-year data set
- Expand the Rhode Island Sea Grant Legal Fellows Program in collaboration with the RWU Law School and URI's marine affairs department
- Continue the Rhode Island Sea Grant Visual Arts Program
- Continue Rhode Island Sea Grant's public education efforts, especially the annual Coastweeks celebration and Summer Community Lecture Series

Top photo courtesy Rhode Island Sea Grant SFEP. Left photo courtesy Save The Bay.

FELLOWSHIPS/SCHOLARSHIPS

GRADUATE FELLOWSHIPS

A top priority for Rhode Island Sea Grant is supporting graduate education and engaging graduate students with Sea Grant–sponsored researchers. The opportunities for such engagement are listed below. Unless otherwise noted, information about the fellowship/scholarship programs is available on the Rhode Island Sea Grant website: *seagrant.gso.uri.edu*.

Rhode Island Sea Grant Research Fellowships

Sea Grant is currently supporting 10 graduate students and one post-doctoral student working with investigators on projects at URI and other Rhode Island institutions of higher education, including Brown University and RWU.

Dean John A. Knauss Marine Policy Fellowship

The Knauss Fellowship matches highly qualified graduate students to mentoring hosts in the legislative or executive branches of federal government or with federal agencies in Washington, D.C. Through this one-year fellowship, students gain a unique opportunity to participate in national ocean policy. For nearly every year of the program's existence, Rhode Island Sea Grant has sponsored at least one Knauss fellow, and for 2006–08, the program has five placements.

From left to right:

1. Jingjie Chu, Ph.D. candidate, URI Environmental and Natural Resource Economics
2. Michael Conathan, M.A. candidate, URI Marine Affairs
3. Yong Jiang, Ph.D. candidate, URI Environmental and Natural Resource Economics
4. Rebecca Asch, M.S. candidate, URI Graduate School of Oceanography
5. Elizabeth Etrie, J.D. candidate, RWU School of Law

National Sea Grant Industry Fellowship Program

A cooperative arrangement between the National Sea Grant College Program and specific companies, the fellowship supports graduate research and development projects. Students pursuing research of interest to a particular industry or company enjoy financial, technical, and facilities support from the sponsoring company as well as from Sea Grant.

For the 2006–08 period, Rhode Island Sea Grant has one Industry Fellow:

- Peter Egli, Ph.D. candidate, URI Environmental and Natural Resource Economics

NOAA Fisheries-Sea Grant Fellowship Program

This joint effort between NOAA Fisheries and the National Sea Grant Program encourages qualified Ph.D. candidates to pursue careers in either population dynamics and stock assessment or in marine resource economics. Students interested in population dynamics can receive up to three years of funding, and students pursuing marine resource economics are eligible for two years of funding. Through this fellowship, the program strives to increase available expertise in these fields, develop closer relationships between academic scientists and NOAA Fisheries, and to provide real-world experience to graduate students to accelerate their career development.

For the 2006–08 period, Rhode Island Sea Grant has two NOAA Fisheries fellows:

- Matthew Freeman, Ph.D. candidate, URI Environmental and Natural Resource Economics
- Joshua Wiersma, Ph.D. candidate, URI Environmental and Natural Resource Economics

NOAA Coastal Services Center Coastal Management Fellowship

This program provides an opportunity for graduate students to work with state coastal zone programs to gain on-the-job education and training in coastal resource management and policy. Rhode Island Sea Grant is not currently supporting any Coastal Services Center Fellows, but invites interested students to apply. For more information, visit: *www.csc.noaa.gov/cms/fellows.html.*

RHODE ISLAND SEA GRANT LEGAL FELLOWS PROGRAM

Rhode Island Sea Grant sponsors law students as Sea Grant Law Fellows to research and write legal briefs, opinions, and articles on ocean and coastal law issues, including the resolution of marine resource management and conservation issues. For 2006–08, Rhode Island Sea Grant is sponsoring nine Sea Grant Law Fellows:

Amanda Argentieri
Brian Eisenhower
Lisa LaBelle
Jonathan Lew
Jennifer Mehaffey
Tory Randall
Benjamin Spruill
Kevin Vendituoli
Lance Young

Tory Randall, Sea Grant Law Fellow. *Photo courtesy Rhode Island Sea Grant Legal Program.*

Published Articles

Lew, J. (2007) First Circuit interprets Rapanos to determine which test to apply. *The SandBar* **5**:4.

Lew, J. (2006) Florida court limits rule to red grouper. *Water Log* **25**:4.

Lew, J. (2006) When is a weland not a wetland? *The Coastal Society Bulletin* **28**(2).

Lew, J. (2006) Ninth Court upholds the Corps' adjacency jurisdiction over wetlands. *The SandBar* **4**:4.

Randall, T. (2006) Sea Grant Law Fellow marks International Maritime Court "first." *41˚N* **3**(2).

Spruill, B. (2006) Alabama court allows taxpayer to challenge ruling. *Water Log* **25**:4.

Young, L. (2006) RWU law students address cutting-edge water pollution issues in national competition. *41˚N* **3**(1).

UNDERGRADUATE FELLOWSHIPS

URI Coastal Fellows Program

The URI Coastal Fellows Program gives URI undergraduate students an unparalleled opportunity for hands-on experience with active research and outreach projects. Working with faculty or staff mentors, Coastal Fellows spend eight months working on issues related to environmental sciences and management. Fellows earn a stipend for the summer as well as academic credit for their school-year participation, and share the results of their work through a formal poster presentation. The Coastal Fellows Program is Rhode Island Sea Grant's principal undergraduate educational investment. Sea Grant collaborates with the program by specifying research and outreach opportunities for prospective fellows on Sea Grant–sponsored projects.

Coastal Fellow	Area of Study	Project	Mentor
David Conover	Marine Affairs	Documenting and describing shoreline access in South County, Rhode Island	Robert Thompson, URI Marine Affairs
Lauren Killea	Biology	Benthic survey of mud shrimp and mantis shrimp populations in the west end of Ninigret Pond	John King, URI Graduate School of Oceanography
Sean Moreschi	Fisheries and Aquaculture	Mapping progression of American lobster (*Homarus americanus*) shell disease over time in semi-field conditions	Barbara Somers, URI Fisheries, Animal & Veterinary Science
Amie Parris	Civil Engineering	Potential impacts of future reductions in the density of phytoplankton blooms on the benthic environment in Narragansett Bay	Scott Nixon, URI Graduate School of Oceanography
Sara Schroeder	Marine Affairs	Understanding human uses in Narragansett Bay	Tracey Dalton, URI Marine Affairs
Andrew Yberg	Environmental Science	Eastern oyster spat collection and quahog growth rates in Potter's Pond, Rhode Island	Perry Raso, Matunuck Oyster Farm

Cormorant photo courtesy Puffin Enterprises. Top image from photo by Malia Schwartz.

URI Undergraduate Research Grant Program

The Office of the Provost, Rhode Island Sea Grant, and the URI Honors Program provide grant support for undergraduate research, creative, or artistic projects. Proposals are evaluated by a multidisciplinary committee composed of faculty and students whose goal is to make awards to the best projects representing a wide variety of departments and interests. Typically, two to three awards are made per year.

URI "University Year-For-Action" Intern Program

The URI undergraduate internship program—University Year-For-Action—provides opportunities for students to engage in a variety of professional activities. Students gain academic credits for their semester-long internship experience. Rhode Island Sea Grant mentors students through this program on several writing and editorial projects. During the 2006–08 period, Rhode Island Sea Grant is engaging four student interns:

- Jennifer Riley, URI Journalism, as assistant managing editor for the journal *Aquaculture* and assistant copy editor for the upcoming book *Science for Ecosystem-Based Estuarine Management: Narragansett Bay in the 21st Century*
- Kendall Gomenski, URI Fisheries, Animal and Veterinary Science, as assistant managing editor for the journal *Aquaculture*
- Dana Arel, URI English, as editor of the Rhode Island Sea Grant newsletter
- Meredith Hass, URI Journalism-Marine Biology, as a science writer for *41°N* and other publications

Ocean Engineering Robotics Fellows

The Robotics Fellows program brings together the resources and technology of GSO and the URI ocean engineering department to engage undergraduate students in the design and development of autonomous underwater vehicles (AUVs). The program is intended to increase recruitment and retention of undergraduate students in oceanography disciplines through their involvement in ocean robotics. Fellows take design courses and enter, as a team, the Association for Unmanned Vehicles Systems International competition that challenges students to create and deploy unmanned AUVs. Rhode Island Sea Grant sponsors the team's travel to the competition.

Partners for Ocean Instrumentation Internship Program

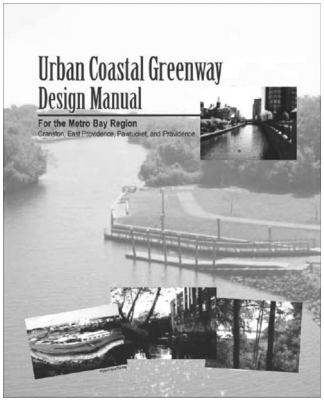
The Partners for Ocean Instrumentation (POI) provides an innovative internship experience for students. The POI nurtures URI marine science and engineering faculty and students by fostering research partnerships and student participation in instrument development projects and by promoting experiential learning between URI faculty and industry collaborators. The Rhode Island Sea Grant director serves on the POI board of directors, and Sea Grant program administration provides technical expertise for maintenance of the POI website. For more information, visit: *seagrantadm.gso.uri.edu/POI_Web/poi_home.htm.*

OTHER EDUCATION AND TRAINING PROGRAMS

Manager Training

SUCCESS implements training programs that feature SAMP development and implementation as well as other coastal governance strategies. One of the key benefits of SUCCESS's educational efforts is its ability to link earlier generations of coastal management to emerging issues to ensure that the challenges of ecosystem stewardship are met by professionals with a grounding in the basic principles of integrated coastal management.

Low-Impact Development Certification Program



This program is required for developers seeking state approval for building applications in the Metro Bay SAMP region. Through the program, participants learn how to apply low-impact development techniques to urban coastal settings. The certification program is part of the Urban Coastal Greenway Policy, which provides a more flexible and streamlined approach to coastal vegetative buffer regulations in an effort to balance development with environmental protection, restoration, and public access.

URI Marine Science Society

The Marine Science Society enhances classroom learning with opportunities for hands-on experience and interaction with professionals involved in marine science and industry. Expanding learning opportunities for motivated students, the society gives expression to skills and themes learned in class. SFEP staff mentor the group and coordinate activities that range from inviting fishermen to talk about their trade to bottom trawling aboard the URI Fisheries vessel *Cap'n Bert.*

HACCP Training

The Hazard Analysis at Critical Control Points (HACCP) system identifies points during the processing of seafood products where quality standards can be applied and measured as mandated by the federal government. Rhode Island Sea Grant has been a leader in facilitating and ensuring compliance with HACCP guidelines and requirements by developing and distributing training programs and materials. Because course offerings nationally are sporadic, Rhode Island Sea Grant and the SFEP extend their training offerings beyond the region through the Segment II Internet HACCP course, offered through Cornell University. All of these HACCP offerings serve health agencies, professional organizations, and other trainers as well as processors, vendors, and stakeholders in the seafood industry.

Photo courtesy Charles Yarish, University of Connecticut.

USEFUL WEBSITES

Rhode Island Sea Grant College Program
seagrant.gso.uri.edu

The Rhode Island Sea Grant College Program website offers information on the program's priority areas and research and extension efforts as well as downloadable publications and a staff directory.

Ronald C. Baird Sea Grant Science Symposium
seagrant.gso.uri.edu/research/science_symposium.html

The annual Baird Symposium provides a forum for researchers, resource managers, and stakeholders to discuss the state of the science in various areas important to Rhode Island coastal communities, ecosystems, fisheries, and beyond. This site offers information about and resources from past and future symposia (see page 26).

41°N
seagrant.gso.uri.edu/41N

The on-line version of *41°N*, a publication of Rhode Island Sea Grant and the URI Coastal Institute that highlights the programs' research, outreach, and education activities on a particular theme, contains all issues of the magazine, as well as links for further reading (see page 27).

A Daytripper's Guide to Rhode Island
seagrant.gso.uri.edu/daytrip

A Daytripper's Guide to Rhode Island includes listings for coastal areas and natural places throughout the state from the full text of Rhode Island Sea Grant's *Public Access to the Rhode Island Coast* and portions of *A Guide to Rhode Island's Natural Places.* Pdf maps will help you locate over 350 sites, and a variety of articles cover such topics as coastal birding, surfing, Providence's riverfront revival, and fall fishing in South County.

Metro Bay Special Area Management Plan
seagrant.gso.uri.edu/metrosamp

Created in support of the Metro Bay SAMP effort, this website offers information about and ways to get involved in the SAMP process, a database of documents related to SAMP issues, and a link to an interactive map server that allows users to build, view, and print SAMP maps that meet their particular needs.

The New England Lobster Research Initiative
seagrant.gso.uri.edu/fisheries/lobster_initiative

This website offers information on the New England Lobster Research Initiative, a Congressionally funded effort to study the causes and consequences of lobster shell disease. The site offers a description of shell disease, references, and a detailed list of projects funded, as well as photos of healthy and shell-diseased lobsters.

Northeast Coastal Community Development
seagrant.gso.uri.edu/ccd

Many Sea Grant Extension programs are helping communities address coastal development issues through the CCD program, established by NOAA in 2001. In the Northeast, the Maine, New Hampshire, and Rhode Island Sea Grant programs are participating. This website is an effort to share information to help make Northeast coastal communities more sustainable.

Photo by Adam Zitello.

Northeast Sea Grant Fisheries
seagrant.gso.uri.edu/reg_fish

Because a regional approach is important when addressing a regional resource, the Northeast Sea Grant Fisheries Extension programs work cooperatively as well as independently on fisheries management issues, including bycatch reduction, licensing, habitat, and stock assessment. This website provides information about those efforts, a special section on gear conservation engineering, and the contact information of regional fisheries experts.

Effects of Bottom Fishing on Georges Bank
seagrant.gso.uri.edu/research/georges_bank

In order to gain a better understanding of how bottom fishing impacts benthic organisms, a team of researchers from GSO and the USGS surveyed the benthic megafaunal community of Georges Bank. The results of this Sea Grant–funded work are available at this site.

Photo courtesy Rhode Island Sea Grant SFEP.

SPECIAL PROGRAM RESOURCES

Ronald C. Baird Sea Grant Science Symposium

The Rhode Island Sea Grant Annual Science Symposium brings current, pertinent marine research—much of it Sea Grant–sponsored— into the public realm. The content of the symposia is targeted at local, state, and federal resource managers, taking pertinent research findings and making them available to managers via presentations by researchers. In 2006, the symposium was renamed the "Ronald C. Baird Sea Grant Science Symposium" to honor Baird's accomplishments as director of the National Sea Grant College Program. The announcement was made at this year's symposium, which focused on regional ocean governance, "Marine Law Symposium—The Evolution of Ecosystem-Based Management: From Theory to Practice."

Program Development Fund

The Rhode Island Sea Grant director retains a small Program Development Fund that enables Rhode Island Sea Grant to respond quickly to an urgent management situation, such as a major coastal oil spill, or to exploit emerging research or other programming opportunities. Thus, the Program Development Fund strengthens Rhode Island Sea Grant's constituent support services and expands its capacity to seed-fund projects of clear local or regional interest.

Visual Arts Sea Grant

Each year, Rhode Island Sea Grant underwrites a $2,500 fine arts competition via URI's art department. The Rhode Island Sea Grant Visual Arts Sea Grant program was established in 1988 to encourage New England professional visual artists to engage in the ocean environment and coastal communities. The competitively awarded grants support a wide range of visual arts reflecting or influenced by the marine environment.

41ºN

Rhode Island Sea Grant and the URI Coastal Institute have joined forces in a new partnership to bring readers *41ºN: A Publication of Rhode Island Sea Grant and the URI Coastal Institute.* Published twice per year, the magazine highlights Sea Grant and Coastal Institute research, outreach, and education activities on a particular theme, as well as delivers the latest information on the innovative and exciting connections we are making in the state and beyond. *41ºN* is free to Rhode Island residents, $10 per year for out-of-state and foreign addresses. The magazine is also available on-line at: *seagrant.gso.uri.edu/41N*. Themes for 2006 include "Monitoring Narragansett Bay," with a special section dedicated to the cooperative Bay Window Program, and "Urban Coasts and Communities." Issues in 2007 focus on "Mapping the Coastal Environment" and "Aquaculture in the Ocean State."

Coastweeks

An annual, nationwide celebration held each fall, Coastweeks is dedicated to fostering awareness, understanding, and improved management of the coast. Coastweeks in Rhode Island is coordinated by Rhode Island Sea Grant and sponsored by CRMC. Each year, we produce a calendar of events that includes activities for every taste and pace—from book discussions, film showings, and painting workshops to kayaking and canoeing trips, tidepool explorations, a shoreline biathlon, and trips on a commercial fishing trawler. Calendars are available through Rhode Island Sea Grant or on-line at: *seagrant.gso.uri.edu/Coastweeks/*.

Summer Community Lecture Series

Sea Grant Communications works with the SFEP and the URI Cooperative Extension/Nutrition and Food Sciences Program to offer a monthly public lecture series during the summer that has delved into underwater photography, shipwrecks, hurricanes, natural history, the health benefits of seafood, bizarre sea creatures, and an annual seafood cooking demonstration. Lectures are free, but seating is limited. For more information, contact Sea Grant Communications at (401) 874-6842.

Sea Grant Bookstore

Rhode Island Sea Grant produces and disseminates the results of its research, outreach, and education activities in the form of books, posters, guides, a magazine, technical reports, videos, and other media. Many of our offerings are of great general interest, while some are geared to more specific audiences. To request a free publications catalog, call (401) 874-6842 or visit our bookstore on-line at: *seagrant.gso.uri.edu/bookstore/index.html*.

Photo by Monica Allard Cox.

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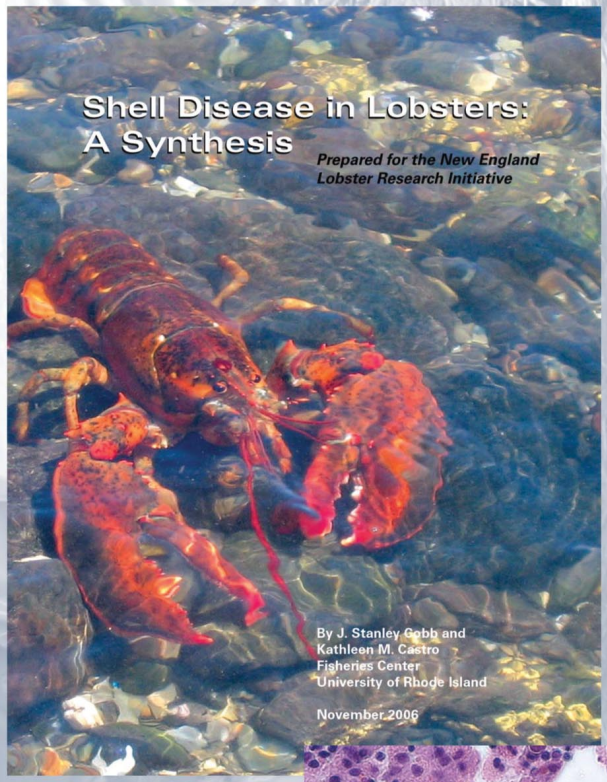

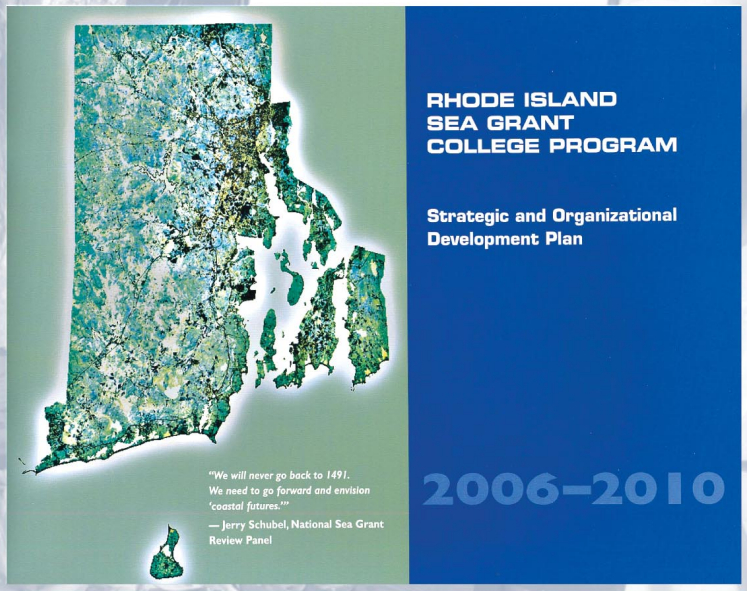

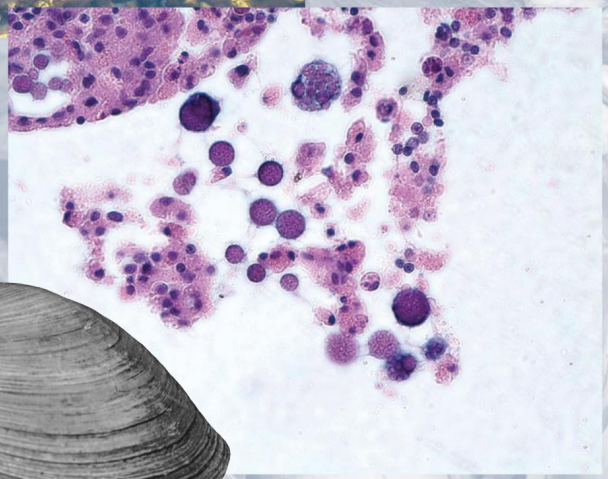

For 2006–08, Rhode Island Sea Grant builds on its strengths in two overarching thematic areas—Sustainable Fisheries and Sustainable Coastal Communities and Ecosystems.

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