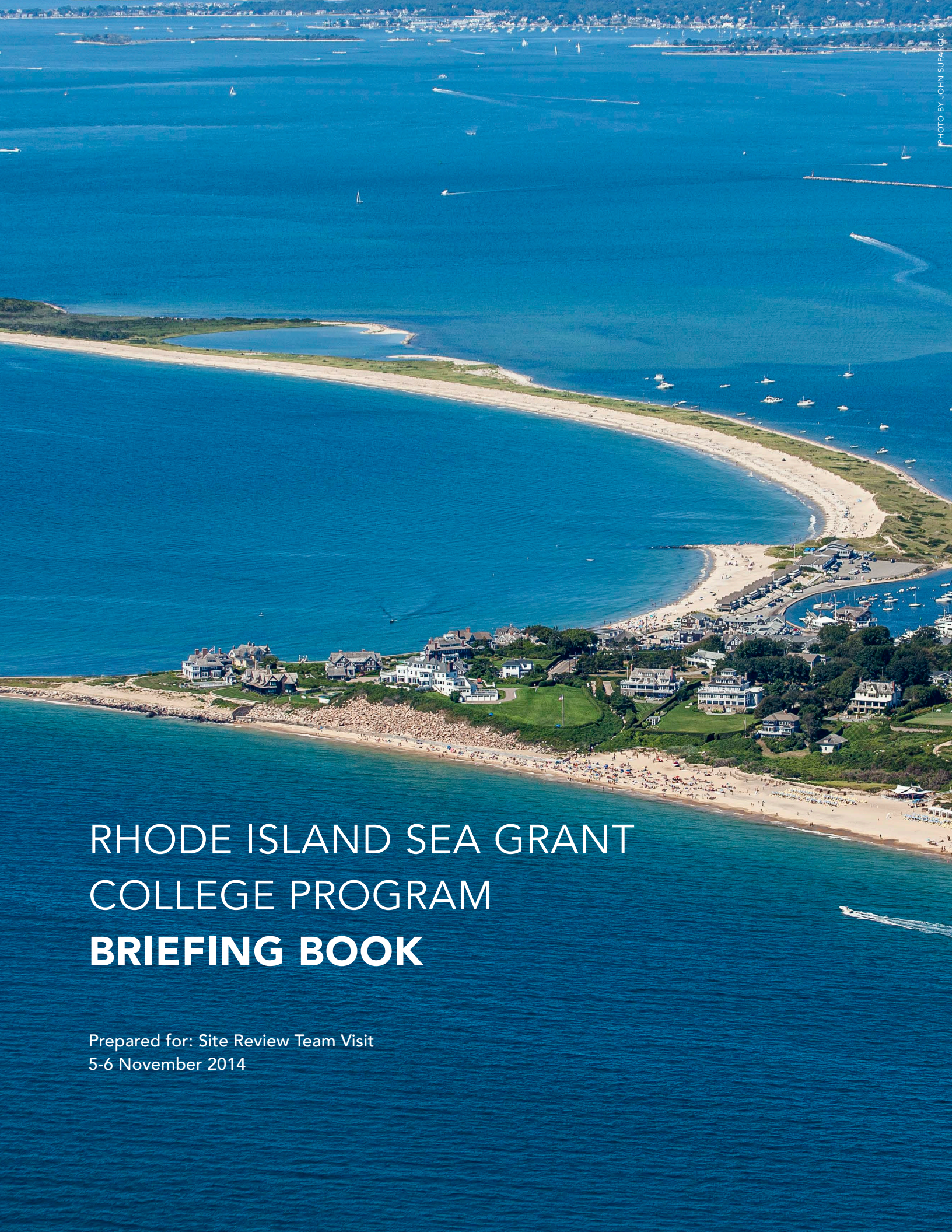

PHOTO BY JOHN SUPANCIC

RHODE ISLAND SEA GRANT COLLEGE PROGRAM **BRIEFING BOOK**

Prepared for: Site Review Team Visit
5-6 November 2014

Lilla Samson, Fire in a Drop of Sea installation

SUPPORTED BY VISUAL ARTS SEA GRANT PROGRAM

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Coastal Institute, GSO. PHOTO COURTESY METCALF INSTITUTE

Program Management and Organizational Leadership

Rhode Island Sea Grant is administratively located at the Graduate School of Oceanography, (GSO) one of seven degree-granting colleges at the University of Rhode Island (URI). In order to facilitate better communication with our extension staff and other outreach programs at the university, the Sea Grant Program * 8E8><D<EK Office was recently relocated to a suite of offices in the Coastal Institute building on the GSO campus.

Since the last review of the program in 2010, Program Management has undergone significant change, with the departures of the director and program manager/fiscal officer in 2012, and legal program director in 2014, who left to pursue other opportunities.

Alan Desbonnet, Assistant Director, served as Interim Director while an internal (to URI) search was conducted. In July 2013, Dennis Nixon, Professor of Marine Affairs, took the helm for Rhode Island Sea Grant. Administrative Assistant Tracy Kennedy took over fiscal officer duties, and was designated a Scientific Research Grant Assistant in May 2013. After assessment of program management functions and needs, it was decided that the position of program manager would not be refilled. These changes have resulted in a reduction of administrative costs such that only 2 percent of federal funding coming to the program is used in support of program management personnel [Figure 1], a 13 percent reduction from the previous omnibus/evaluation period. Staff attorney Julia Wyman has served as Interim Director of the Legal Program since July 2014. A search to fill the vacancy is currently underway, with the intent of filling that position in January 2015.

As part of Program Management restructuring, Monica Allard-Cox was appointed Director of Communications in 2013, and a separate communications budget was developed for the 2014-2018 omnibus period.

Further reorganization has taken place within the extension program since the previous SRT visit. In order to reduce duplication of administrative effort, in 2011, the coordination of extension programs was consolidated at the URI Coastal Resources Center (CRC) (www.crc.uri.edu), located on the GSO campus, under the leadership of Jennifer McCann, who was appointed Director of Extension Programs for Rhode Island Sea Grant.

Nixon provides overall leadership for the program, playing key roles in integration with the host institution through a faculty position in the Department of Marine Affairs, where he continues to teach each semester. He also serves as a member of the GSO Dean's Senior Staff, builds new partnerships, explores new opportunities, and keeps key constituents—elected officials

Rhode Island Sea Grant Director Dennis Nixon

Participants at a 2014 Coastweeks event learn about aquatic invasive species in local waters. PHOTO BY MEREDITH HAAS

at state and national levels, university deans, etc.—apprised of program activities. He stays abreast of the key issues and needs of the Rhode Island Sea Grant stakeholder community through interaction with the Rhode Island Sea Grant Senior Advisory CoLE:ℂ, and strategically positions the program to achieve best effectiveness and efficiency in addressing Rhode Island's most critical coastal issues and problems.

Desbonnet provides for all aspects of program management and functioning on a day-to-to day basis, including supervision of staff, budget, and facilities. He also acts as the Rhode Island Sea Grant Research Coordinator and is responsible for all aspects of Rhode Island Sea Grant's research program, and is the point of contact for omnibus development, annual reporting, and e*SG* administration. He provides oversight and management of the Education Program portfolio, which is largely comprised of graduate fellowships and undergraduate class studios supported in various colleges within the URI academic system, as well as public educational events, such as the Ronald C. Baird Sea Grant Science Symposium, Coastweeks, the Community Lecture Series, and the Coastal State Discussion Series.

Tracy Kennedy, Scientific Research Grant Assistant/Fiscal Officer, provides for all aspects of implementation of budgetary processes (e.g., student hires, payroll, purchasing, travel, etc.), and conformance with host institution policies and processes, and federal fiscal requirements.

Allard-Cox is responsible for all elements of Rhode Island Sea Grant communications, and is editor of Rhode Island Sea Grant's newly redesigned flagship publication, *41°N*, which is produced in partnership with the URI Coastal Institute (seagrant.gso.uri.edu/news/41n/). Working with Allard-Cox is Science Writer Meredith Haas, who is the main conduit for communications about Rhode Island Sea Grant funded research and serves as webmaster for the newly redesigned Rhode Island Sea Grant website (seagrant.gso.uri.edu). Haas also has the responsibility of oversight for annual reporting of impacts and accomplishments for the program.

McCann leads a team of five extension agents and three support staff at CRC, as well as two extension agents located in the URI Department of Nutrition and Food Sciences. Together, they cover the areas of coastal management, resiliency, hazards, climate change, fisheries,

HARVESTING THE CREATIVITY OF A CLASSROOM

IN 2012, RHODE ISLAND SEA GRANT was approached by the chair of the URI Landscape Architecture Program with a request for Program Development funds to engage a class of seniors in a design studio with Friends of the Waterfront, a non-profit located in Newport. The intent was for the class to present various landscape design alternatives for a shorefront park that would be resilient to sea level rise. Sea Grant funded the project and coordinated it with guidance from Teresa Crean, Rhode Island Sea Grant extension agent working in Newport on sea level rise issues, to help ensure that the outcomes would be effective and applicable for the city. The studio presented a variety of design alternatives, and was rated a success by students, professors, extension agents, and most importantly, by Friends of the Waterfront's president, the late Jim Perrier, who said, "The students presented ideas that we never would have considered or even thought of, and while no one individual design filled all our needs, elements of several could be stitched together to give us a road map forward."

Thanks to the success of this project, Rhode Island Sea Grant, in partnership with the URI LAR program, has developed this into an ongoing element of its education portfolio, funding junior and/or senior level studios as opportunity presents itself to merge with extension and/or research efforts. Through the studios, students get the opportunity to engage directly with stakeholders, hear their visions, and then attempt to capture that through landscape design. They also have the opportunity to work with extension agents so they better understand and can apply concepts that merge theory into action.

Storer Park in Newport, the focus of a design studio of URI landscape architecture students. PHOTO BY RIWXPHOTO

"Having the opportunity to work directly with those considering our designs, and getting feedback from them gives us an opportunity to learn that can't be gained in a classroom," said LAR senior Rob Barella. "It's easy to design as a purely academic exercise, but having the opportunity to work with real end users gives a look into the professional world that we'll soon be entering, and we will be better prepared for it because of this experience."

This best practice—engaging undergraduate classes in studios integrated with extension—is being piloted with the URI College of Ocean Engineering on concepts of redesign of marinas facing sea level rise.

marine spatial planning, and seafood health and safety. It is important to note that all of the extension staff are only partially supported by Sea Grant; they are also engaged in a wide array of funded research for government agencies and private foundations. Marine Affairs Fellows, Master of Environmental Science and Management (MESM) Fellows, and Landscape Architect and Ocean Engineering Studios interact with extension agents to expand program depth and breadth, while providing students with real-world experiential learning.

The Rhode Island Sea Grant Legal Program, established in 2003 and one of only four dedicated Sea Grant legal programs nationally, is housed at the Marine Affairs Institute at Roger Williams University School of Law (seagrant.gso.uri.edu/projects-2/topics/marine-law-and-policy/). A unique public-private university partnership offers students the opportunity to earn a Juris Doctor from Roger Williams School of Law and a Master's in Marine Affairs from the University of Rhode Island in three and a half years. Its marine law offerings have attracted well-qualified

students to the Roger Williams School of Law, and the Rhode Island Sea Grant Legal Program further offers them the opportunity to participate in its Law Fellows program, which integrates second- and third-year law students into extension and research efforts, as well as placing them with non-academic partners where they perform critical legal research for Rhode Island Sea Grant stakeholders, engaging in real world law and policy issues. Law Fellows serve as a major conduit for integration across the entire Rhode Island Sea Grant program portfolio.

LEGAL RESEARCH INTEGRATES ACROSS PROGRAMS

SHELLFISH TAKEN from closed waters in Rhode Island must undergo a one-year depuration in approved waters. This regulation squashes the potential for development of a mussel aquaculture industry in the highly productive waters of upper Narragansett Bay. As both a Law Fellow and Marine Affairs Fellow, Melissa Chalek joined forces with funded researcher Scott Lindell to explore the validity and utility of the growout policy relative to national guidance set by the Interstate Shellfish Sanitation Commission (ISSC) and how other U.S. states interpret and implement ISSC guidance. Chalek's research on the growout policy determined that Rhode Island policy did not correlate well with other states, and appeared to be an overly cautious and unwarranted approach to public safety. Based on the quality of the legal research she conducted, Chalek was invited to undertake a review of all of the state's regulations pertaining to shellfish as part of an effort to develop the Shellfish Management Plan being conducted for the DEM and CRMC by the Rhode Island Sea Grant coastal extension program. Chalek's initial research is being published in the *Sea Grant Law and Policy Journal* (Vol. 6, No. 2; in press) and her review of state regulations has been developed into a chapter of the Shellfish Management Plan (www.rismp.org/wp-content/uploads/2013/02/DRAFT_SMP_LegalFramework.pdf), where it likely will influence policy change. This is an excellent example of integration across Sea Grant programs—funded research, extension, education, and legal programs.

A pilot project to farm raise mussels in Narragansett Bay showed some promise, but challenges have hindered industry growth.

PHOTO BY MELISSA DEVINE

Funding Distribution

Figure 1. Allocation of federal funds.

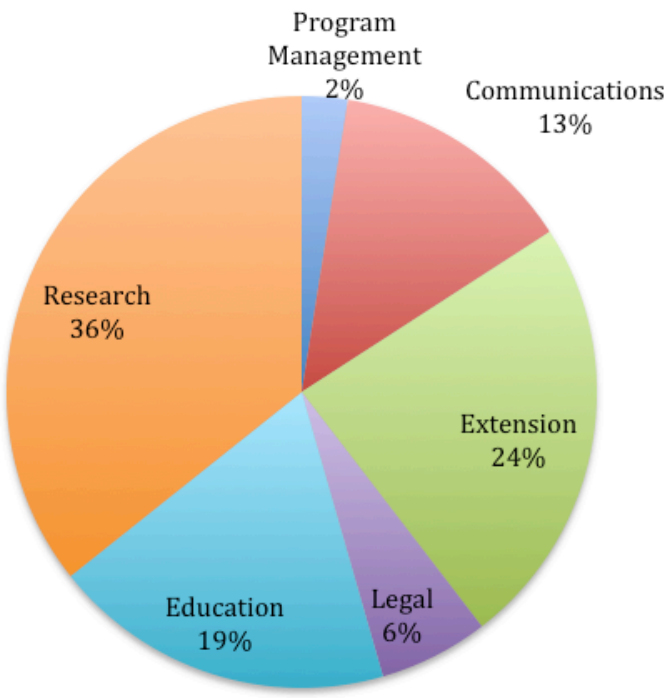
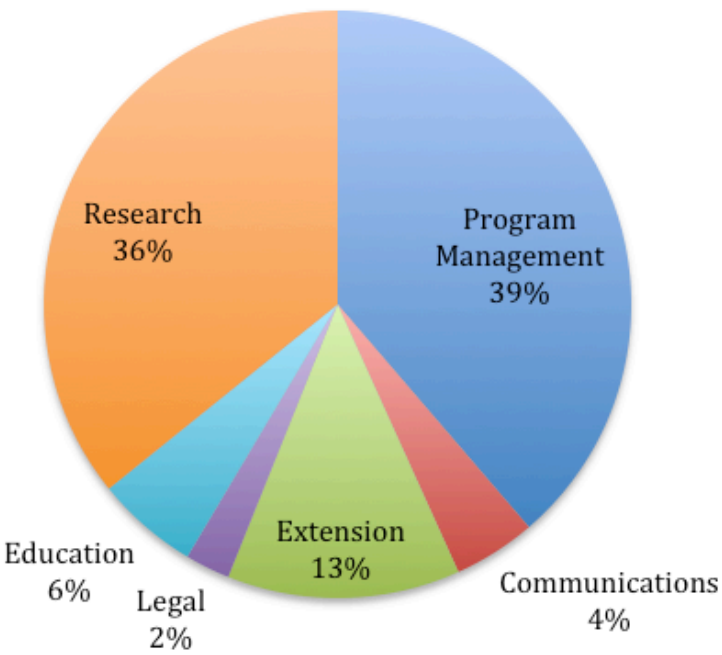


Figure 2. Provision of matching funds.



Distribution of federal funding provided to the program is shown in Figure 1. Extension and legal programs receive approximately 30 percent of federal funding, and communications programming about 13 percent. Federal funding going into research is approximately 50 percent, which is made up of research funded through a competitive RFP process, small-scale, non-competitive research funded through Program Development, and funds provided to students at the graduate and undergraduate levels for research outside of the RFP process, and funded through the Education Program budget. The bulk of Education Program funds are targeted at graduate research fellowships and undergraduate studios in ocean engineering and landscape architecture. The balance of educational funds are typically targeted at public events designed to communicate to larger audiences, such as through lectures, hikes and walks, gallery exhibitions, and similar activities meant to engage the public at large. As noted previously, Program Management utilizes only 2 percent of the federal funds provided to the program.

The provision of required 50 percent match funding to the program is shown in Figure 2. The majority of match for the program is provided by Program Management through state/university funding for administrative salaries (2.65 FTEs). This high level of support from the host institution allows the program to route nearly all federal funds to on-the-ground programs directly impacting stakeholders and constituents. Research PIs must provide full 50 percent match, and therefore make up the second largest proportion of match to the program. Sea Grant is provided a 30 percent indirect cost rate by the host institution for all non-research activities. The waived overhead—the difference between the 30 percent Sea Grant non-research rate and the current indirect rate of 53.5 percent—provides further host institution support through match to the program. The provision of host institution waived indirect allows extension and legal programs to utilize these savings in match in applying for other funds with match requirements, increasing the programs potential for leveraging outside dollars to support programs.

Rhode Island Sea Grant Senior Advisory Council

In early 2014, director Nixon reorganized the Rhode Island Sea Grant Senior Advisory Council (SAC) membership to better reflect the varied nature of the potential stakeholder community in the state. Current membership is: Ames Colt, R.I. Bays, Rivers, and Watersheds Coordination Team; Jared Rhodes, R.I. Statewide Planning; Judith Gray NOAA Research, ret.; Jon Stone, Save The Bay; Janet Coit, R.I. Department of Environmental Management; Grover Fugate, R.I. Coastal Resources Management Council; Fred Mattera, R.I. Commercial Fisheries Research Foundation; Bill Silkes, American Mussel Harvesters, Inc.; Wendy Mackie, R.I. Marine Trades Association; John Reindeau, R.I. Economic Development Corporation; Richard Hittinger, R.I. Saltwater Anglers Association.

The SAC meets twice per year, or more as deemed necessary, to advise the director and the program on current and emerging issues within the state and the possible role of Sea Grant in addressing those issues. The SAC also helps to define pressing research needs and help define a focus of upcoming research request for proposals (RFPs), and to provide advice and information on potential areas of Sea Grant investment through targeted Program Development funding for research. Perhaps more importantly, each of the members act as individual resources as issues arise related to their areas of expertise.

Ron Baird, former National Sea Grant College Program director, is a de facto member of the SAC, as well as serving the program as an in-house senior advisor, particularly with regard to federal partners and fisheries issues. Ron's work with the program in the areas of evaluation and assessment, particularly with regard to long-term tracking and validation of impacts for annual reporting, has aided Rhode Island Sea Grant tremendously. Ron serves the program in a volunteer capacity one day per week.

Research Program

Rhode Island Sea Grant conducts a rigorous peer review-based RFP process. During the year prior to RFP release, the SAC provides input to help define the critical questions that can be answered using Sea Grant research funds. Management, extension, and legal program staff further explore and refine SAC suggestions, meeting with the SAC again in the fall to discuss broader input, amend and refine research focus areas for the RFP, and agree upon research areas to be broadcast in the RFP.

Once the RFP process is in progress, preproposals are received, reviewed by the director and assistant director to ensure they meet RFP directives, and put out for review with up to three reviewers per preproposal; reviewers from within the state of Rhode Island are not used in the review process. Depending upon the nature of the reviews, a panel may be convened, or more typically, extension and legal program staff will meet to discuss proposals. In general, provided a preproposal meets the criteria posted in the RFP and reviewers find the science to be robust, they are invited to the full proposal phase; comments from reviewers and program staff are provided to applicants so they can improve their final proposal submissions.

Full proposals are put out for review with three out-of-state reviewers who are knowledgeable in the appropriate discipline of the proposed work. PIs are provided with anonymous comments and allowed to submit a rebuttal. A final review panel is convened once the review and rebuttal process is completed. The panel is typically made up of 5 to 7 technical experts, selected so as to give the broadest range of expertise such that all proposals are given due consideration based on their technical merits. Typically, two in-state resource management professionals are also requested to serve on the final review panel to comment upon the relevancy of the proposed work to solving problems at local, state, regional and/or national levels.

The final review panel, as facilitated by the director and/or assistant director, ranks proposals first based on technical/scientific merit, and recommends alterations that will improve the scientific rigor of the proposed work. Invited resource professionals then provide input on relevancy and potential application of research results. The panel then reconsiders its initial rankings, amends those as appropriate, if at all, to make a final ranking so that the best science with the highest relevancy is selected for funding. PIs are notified, and final proposals and budgets are crafted according to changes suggested by the final review panel. Typically 4 to 6 different institutions are represented at each phase of proposal development, and typically 2 or 3 different institutions are involved in funded research projects. The number of new PIs varies widely depending upon how broad or narrow the focus of the RFP.

LEARNING FROM PARTNERS
A NEW BEST PRACTICE FOR RFP REVIEW

THE PRIVATE, NONPROFIT Rhode Island Commercial Fisheries Research Foundation (CFRF) obtained funding for collaborative fisheries research between scientists and fishermen. Knowing Rhode Island Sea Grant had a reputation for running a rigorous, transparent, and fair RFP process, the foundation sought the program's help in running its research RFP. As a collaborative venture, the CFRF wanted fishermen involved in the decision-making process, but still to ensure that robust science was selected for funding. It was agreed to bring into the review process two representatives of the fishing community who would be asked to comment on the relevancy of proposed research to improving the industry. The process worked so well that Rhode Island Sea Grant modified its own final review panel process for its research RFPs to include representatives of appropriate user communities. This has been found to be extremely useful to the scientists on the review panel, who have consistently said that engagement of users in the process leads to selection of not only the best science, but that which also has greatest benefit to user communities. Relevancy reviewers have voiced that being included in the process has given them a stronger understanding of how research is selected for funding, and they have passed this knowledge along to others in the user community, who now pay greater attention to Sea Grant-funded initiatives and are more willing to engage with extension agents around the research knowing that they had a voice in the process.

FOCUSING RESEARCH ON STAKEHOLDER NEEDS

For the first time, for the 2014-2016 time frame, the focus of the Rhode Island Sea Grant research RPF was set within a single, narrow niche—shellfish ecology, including the human dimension, as it relates to shellfish management. This precedent was set based upon requests from throughout the stakeholder community—shellfish resource managers, public health regulators, academics, commercial shellfishermen, and aquaculture business owners—for research that would help better inform a statewide shellfish management plan initiative underway. This request provided a unique opportunity to integrate research and extension from the very onset of the RFP process, and the concentration of effort in a single focus area, it is hoped, will allow for a greater impact on a pressing issue than a more diffuse RFP might have.

For the first time, a fisherman serves as a co-PI on a Rhode Island Sea Grant–funded research project. PHOTO BY MELISSA DEVINE

While end results are still a year away, the RFP has encouraged collaboration among researchers, extension agents, and legal program staff like never before. Most prospective PIs met with extension agents during development of their proposals to iron out a concrete plan of action for moving science into practice. PIs who were awarded research funding gave presentations to stakeholder audiences showing what research they would be conducting, what they hoped to find, and how they felt it would fit into management and practice. Participants asked questions and provided input to PIs, which in some cases resulted in refinement of field sites or timing of field activities. In a few instances, collaboration between shellfisherman and researchers was forged to complete field work more efficiently. With one field season completed, PIs are on task to present initial findings to stakeholders, and to work with Sea Grant staff to integrate findings, where appropriate, into the management process. While it is unclear to what extent narrowly focused RFPs might become a regular practice for Rhode Island Sea Grant, it is clear that under the right circumstances they can provide solid benefits. Program staff plan to evaluate outcomes and adopt applicable elements into future RPFs.

Program Development

Rhode Island Sea Grant is exploring several avenues of stakeholder engagement through targeted, generally small-scale research initiatives with new partners. A significant project that has seen early success is one targeted at cleaning up debris in Providence Harbor. Rhode Island Sea Grant was approached by Clean Bays, a local nonprofit, to explore opportunities to clean up abandoned shoreline timbers along that urban waterfront. Sen. Sheldon Whitehouse also requested help to move this long-stalled project forward. The intent is to recycle submerged timbers while cleaning up debris, making the harbor both more attractive as well as navigable to small craft. Rhode Island Sea Grant partnered with 11th Hour Racing (a program of the Schmidt Family Foundation), who provided funding for initial side-scan sonar survey work to determine the extent and type of debris that would need to be removed. Assessment of the site found five submerged shipwrecks in the harbor, and subsequent detailed underwater survey work located as many as 15 shipwrecks. A Sea Grant Law Fellow conducted legal research in the historical archives to make a first order estimate of legal status of possible ownership of wrecks and/or debris. Rhode Island Sea Grant will now provide, in partnership with the Rhode Island Historic Preservation Commission, funding to conduct a historical survey to determine historic value, if any, of the submerged vessels. 11th Hour Racing has committed further funding for cleanup and historic preservation, as appropriate, and a dialog is being opened with the NOAA Debris Program to see if a partnership would be fruitful. The ultimate end result would be to clean up the debris in Providence Harbor, and if applicable, develop underwater diver and/or canoe and kayak paddling "historic trails" through the urban harbor, modeled after those developed by Sea Grant programs in the Great Lakes, that would focus on the unique maritime history, and preserved ship wrecks, of the Providence waterfront.

Historic Providence Harbor is the site of a promising new project. PHOTO COURTESY CRC

The development of a machine to de-bone scup could prove beneficial for fishermen and consumers alike. PHOTO BY BEN HARWOOD

A second effort still in the pilot phase is being conducted in partnership with the R.I. Commercial Fisheries Research Foundation, the R.I. Economic Development Corporation, and a private consultant (James Griffin, previous President and CEO of Coolfish, a division of Slade Gorton & Co., and past Associate Provost of Johnson & Wales University). This partnership is exploring the opportunity to develop mechanization to fillet scup, an underutilized marine food fish found in R.I. waters and currently being fished well below its sustainable capacity. Scup is a tasty local fish limited in use because of the difficulty it poses to removing fillets from the fish frame. Mechanization would open new markets and provide fishermen with new options for remaining economically sustainable while providing a new food product. The R.I. Economic Development Corporation is committed to making low-interest loans available for fillet machine production, and Johnson and Wales University's culinary school is willing to conduct "in kitchen" research on the effects of freeze/thaw on scup fillets destined for consumption. Rhode Island Sea Grant will fund business plan development, should efforts with fillet machinery manufactures prove mechanization possible, then bring this to the industry through outreach efforts.

Still in exploratory development, in partnership with the R.I. Marine Trades Association (RIMTA), is an effort to create a program to recycle boat hulls. This is a significant problem in Rhode Island, and is one that extends across the

country, so any solution will have national impacts. Present methodology sees boat hulls crushed and transported to landfills where they, in essence, never degrade. The European Union has implemented programs to fund recycling programs where boats are stripped of valuable hardware then "melted down" into a petroleum-based distillate that can be used as fuel. There are many obstacles to success in the absence of a program such as that in Europe where boat owners "prepay" for salvage when they purchase the vessel. A business model must be developed that allows a company to invest in the burn chamber required to convert fiberglass to fuel, and turn a profit from hardware and distillate sales. Rhode Island Sea Grant is working with RIMTA to fund a study that would examine the feasibility of such a project. Sea Grant will also be supporting a Brown University senior engineering class that will examine potential uses for shredded fiberglass. Though challenges abound, there is potential given development of a solid business model, and the environmental rewards could be huge.

Professional Leadership

Rhode Island Sea Grant staff engage with many stakeholder communities through service on various boards, commissions, and advisory groups. Below is a list of Rhode Island Sea Grant staff engagement in leadership roles.

PROGRAM MANAGEMENT

Dennis Nixon—The Point Club, Secretary (commercial fishing insurance group); Sailors for the Sea, Science Advisor; 11th Hour Racing, Ambassador; Clean the Bay, Advisor; National Sea Grant Biennial Report Committee; Friends of Jamestown Rights of Way to the Shore, Advisor; UNOLS, Legal Advisor (University National Oceanographic Laboratory System).

Alan Desbonnet—National Weather Service Taunton Office Marine Advisory Board; URI Coastal Institute, Senior Fellow; Sea Grant Association, Alternate Delegate; National Sea Grant Research Coordinator Network, Chair Elect, Chair, Past Chair 2008-2013; Northeast Regional Sea Grant Network, 2015 Regional Meeting Planning Committee; Coastal SEES Collaborative Research Hypoxia Program Science Advisory Committee; Wood-Pawcatuck Watershed Association Board of Trustees, past President, currently Vice President and Chair of Fund Development Committee; Stonington Shellfish Commission, Ad hoc Science Advisor, Secretary 1998-2012.

COMMUNICATIONS

Meredith Haas—Northeast Sea Grant Consortium, Communications Coordinator; National Sea Grant Strategic Communications Subcommittee.

LEGAL PROGRAM

Julia Wyman—American Bar Association Section of Environment, Energy, and Resources, Vice Chair Marine Resources Year-In-Review; American Bar Association Section of Environment, Energy, and Resources, Planning Committee for Fall 2014 Conference (Miami, FL Oct 8-11); Restore Americas Estuaries/ The Coastal Society Summit "Inspiring Action, Creating Resilience," Program Co-Chair.

EXTENSION

Jennifer McCann—Rhode Island Renewable Energy Coordinating Board Advisory Committee; URI Coastal Institute, Senior Fellow; Long Island Sound Coastal and Marine Spatial Planning Initiative; Coastal Marine Spatial Planning Advancement Training Steering Committee (initiative of the Gordon and Betty Moore Foundation); Rhode Island Renewable Energy Task Force (a BOEM initiative).

Michelle Carnevale—EPA New England Climate Summit: Integrating Adaptation into Municipal Decision Making.

Teresa Crean—Newport Hazard Mitigation Committee; Rhode Island Stormwater/Green Infrastructure Coalition; EPA Smart Growth Implementation Assistance Grant Economics and Climate Change in North Kingstown Steering Committee.

Azure Cygler—Rhode Island Seafood Marketing Collaborative; Rhode Island Marine Fisheries Institute; URI Coastal Institute, Senior Fellow.

Lori Pivarnik—Rhode Island Seafood Marketing Collaborative; National Seafood HACCP Alliance.

Pamela Rubinoff—Systems Approach to Geomorphic Engineering Advisory Committee (SAGE; a committee of the USACE and NOAA); URI Coastal Institute, Senior Fellow; Rhode Island Floodplain Manager Association; Town of South Kingstown Planning Board.

DEM Director Janet Coit and CRMC Aquaculture Coordinator David Beutel participate in a Shellfish Management Plan–sponsored clam dig. Rhode Island Sea Grant–funded researchers and staff are working together in an unprecedented way with stakeholders and these two state agencies to craft the plan. PHOTO BY MELISSA DEVINE

Engaging with Stakeholders

Engagement with stakeholders is the mainstay of Sea Grant work and is the mechanism by which research moves to extension and through which extension and legal program efforts effect change within stakeholder communities. As an example, Rhode Island Sea Grant has a long history of engagement with the R.I. Coastal Resources Management Council (CRMC), the lead state agency for coastal management. In fact, Sea Grant played the initial role of staff to CRMC upon its formation in the early 1970s, providing the intellectual horsepower to develop the states CZM policy book. Since that time, Rhode Island Sea Grant has served as research and process facilitation for policy development staff for CRMC, developing a series of ecosystem-based Special Area Management Plans (SAMPs; www.crmc.ri.gov/samps.html) ranging from urban Providence Harbor to the rural South Shore salt ponds and culminating in development of the Rhode Island Shoreline Change Special Area Management Plan (Beach SAMP). The Beach SAMP is a statewide effort to provide and improve resiliency for all Rhode Island coastal communities with practical planning policies and tools for adapting to climate change impacts such as the flooding associated with storms and sea level rise. Rhode Island Sea Grant is ensuring that the best available climate change science is shared with the CRMC and the local communities through an extensive education and outreach process. The CRMC is thus prepared to make public coastal policy decisions based on current data and community input, and is outfitted with practical tools to help municipalities move forward with effective and efficient resiliency planning. This long-term relationship with the state CZM agency provides for a partnership that is unique within the Sea Grant network, and has allowed Rhode Island Sea Grant to play a significant role in integrating science into policy development and decision-making at all levels within the state.

The respect garnered through the long-term relationship with CRMC has opened doors to other state agencies, such as Statewide Planning, a newly created Climate Commission, and R.I. Department of Environmental Management (DEM), who for the first time is working closely, and effectively, with CRMC on shellfish management through a process facilitated by Rhode Island Sea Grant. The trust developed through the long-term relationship has spilled over to local municipalities, who seek out Rhode Island Sea Grant to help bring the best available science, legal research, and policy innovations to local governance efforts. Rhode Island Sea Grant is a well-known, respected, and trusted ally in coastal resources management in Rhode Island, and this stature, developed over its 40-year history, allows Rhode Island Sea Grant to be involved in nearly all important governmental coastal management initiatives.

The following are further examples of ongoing work by Rhode Island Sea Grant to address stakeholder needs.

North Kingstown is a West Bay coastal community that bridges the urban core of the state and the rural characteristics of small-town Rhode Island. Community leaders grapple with the varied challenges and opportunities presented by such diverse land uses as the port at Quonset Point and the historic village of Wickford, and their vulnerability to accelerating sea level rise and the inundation that accompanies climate change. Rhode Island Sea Grant, in partnership with Statewide Planning and the Rhode Island Foundation, has worked with North Kingstown to develop maps, assess vulnerability, and identify recommendations to improve resiliency based on lessons learned from other places. Utilizing tools developed in this pilot application in North Kingstown, the maps, process, and strategies will be available to other municipalities, which soon will be required to incorporate climate change issues into their town Comprehensive Plan of Development.

Rhode Island Sea Grant is working with Newport's waterfront businesses to understand risks, develop strategies, and identify adaptation actions to improve their resilience so that they can bounce back quickly from extreme tides and weather. Rhode Island Sea Grant, with technical expertise in map development from the URI Environmental Data Center, is working in collaboration with Newport through meetings with government officials and the public to develop maps that illustrate areas vulnerable to sea level rise and extreme storm events. This project builds upon the city's momentum to understand and communicate sea level rise risks and identify innovative solutions. Project partners are the City of Newport, Newport County Chamber of Commerce, Newport Maritime Alliance, Newport County Convention and Visitors Bureau, Friends of the Waterfront, Seamen's Church Institute, Green Infrastructure/Stormwater Coalition, and the Aquidneck Island Planning Commission. Project Funders are Prince Charitable Trusts, Van Beuren Charitable Foundation, Rhode Island Foundation, Hour Racing, RICRMC, U.S. Dept. of the Interior, and R.I. Statewide Planning.

Community land trusts are key to preserving Rhode Island's open space, critical habitats, agriculture, and water quality. Climate change impacts these areas through habitat changes, including habitat loss, invasive species, threatened water supplies, and diminished agricultural productivity. Rhode Island Sea Grant Marine Affairs graduate fellow Clara Rubin worked with the South Kingstown Land Trust to identify tools for use in Rhode Island and beyond to assess vulnerability and identify strategies to begin to implement adaptation actions through conservation, management, and investment. Rubin developed an approach using Ecological Land Units (ELUs) which was applied to land trust holdings to provide new insight into habitat value and the threat to parcels from sea level rise inundation (seagrant.gso.uri.edu/wp-content/uploads/2014/03/climate_Conservation_Sector_Summary_final.pdf). The land trust is rethinking its approach to conservation easements, and is drafting language changes to its easement policies that will allow for uses that promote resiliency, such as siting of small scale wind or solar energy, or hunting to control deer. Other land trusts in the state are looking at this model using ELUs as a mechanism for better managing their holdings, and by which to plan for resiliency against change climate as well as to optimize biological diversity. The Town of Richmond's Conservation Commission is using an ELU model to help direct its efforts, and other municipalities are showing interest in its application.

As previously mentioned, Rhode Island Sea Grant is facilitating two requesting state agencies—RIDEM and CRMC—in the creation of the state's first comprehensive regulatory plan for the oversight of shellfish resources and activities in marine waters. For the Rhode Island Shellfish Management Plan (SMP) process, Rhode Island Sea Grant is bringing the best shellfish science, partially supported by the Rhode Island Sea Grant 2014-2016 Research RFP (seagrant.gso.uri.edu/research/2014-2016/), which was issued specifically in the areas of shellfish biology, the ecology of the resources that support shellfish, and shellfish management. RIDEM and CRMC are now working collaboratively to develop joint policies and regulations,

based on best available science, for the use and long-term management and protection of valuable wild harvest and aquaculture resources. Rhode Island Sea Grant supports this process with an in-depth public education program that provides citizens with opportunities to learn about local shellfish as the plan is prepared, engaging community members in practical dialogues with shellfishermen, aquaculturists, other industry members, scientists and the regulators themselves. Project funders (leveraged funds) are the Prospect Hill Foundation, the Rhode Island Foundation, van Beuren Charitable Foundation, and the Sharpe Family Foundation/Henry and Peggy Sharpe. Project partners are DEM, CRMC, Roger Williams University, and the URI Coastal Institute.

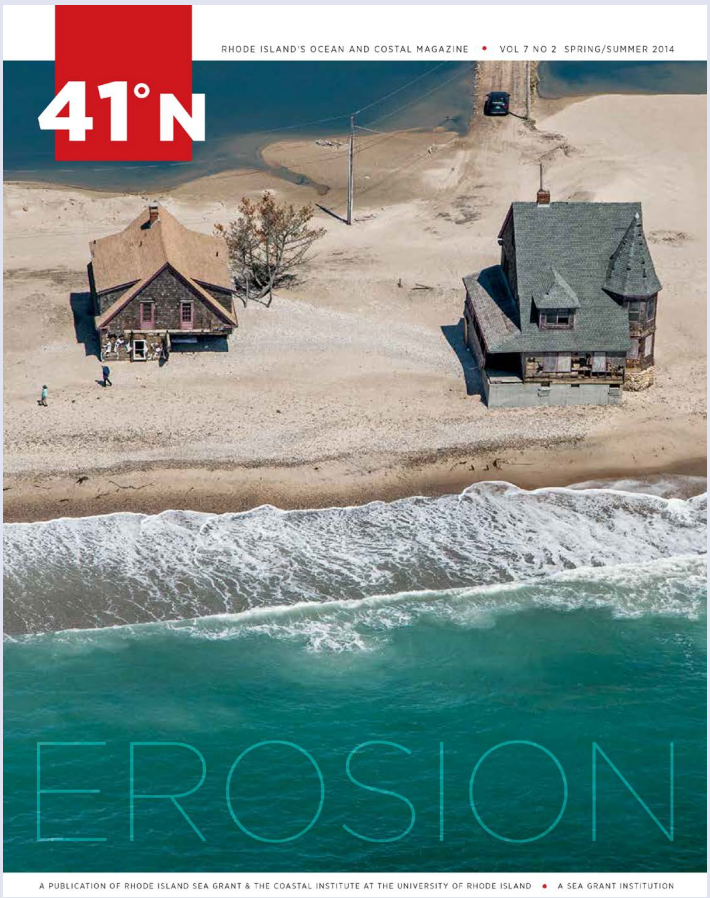
NEW EVALUATION METHODS GUIDE OUTREACH IMPROVEMENTS

PREVIOUSLY, RHODE ISLAND SEA GRANT communications and public education efforts were evaluated often informally, internally, and anecdotally, based on verbal feedback, email correspondence, and attendance/subscriber numbers. Advisory group feedback was generally positive about Sea Grant programming and publications.

However, internal dissatisfaction, initially with certain aspects of *41°N* that were thought to be "too academic," led to ad hoc efforts at changes. The leadership of the magazine quickly realized that improvements should be based on unbiased reader (and nonreader) feedback. An experienced communications consultant was hired three years ago to undertake a series of focus groups examining the magazine. This consultant was perceived by the focus group participants to be impartial, and the feedback from the groups was open and enlightening. While the groups had many good things to say about the magazine, they pointed out that too often the stories were written by the same people, which they thought limited the viewpoints expressed, and they perceived the magazine to be promotional for the university and Sea Grant.

The magazine's editors discussed the findings and agreed that the primary purpose of the magazine was to educate readers about ocean and coastal issues, rather than to directly promote the entities involved. Changes were made, including hiring more freelance writers to vary the "voices," focusing more articles on the work of others in the ocean and coastal realm, and adding a greater variety of pieces that would appeal to a broader set of readers—from book reviews to seafood recipes to explorations of coastal history, art, and music. The magazine also underwent a complete redesign to update and improve the layout and photography.

Subsequent focus groups were conducted this summer under the guidance of Jim Blair, a marketing Ph.D. candidate from the URI College of Business Administration, to determine the success of the changes. The editors are now assessing the feedback, most of which was positive, to determine future directions for the magazine.



The most recent issue of 41N has been completely redesigned.

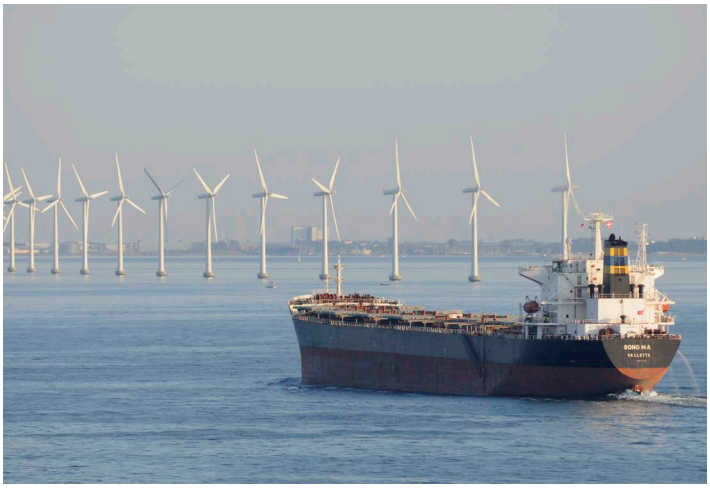
PHOTO BY JOHN SUPANCIC; GRAPHIC DESIGN BY ERNESTO APARICIO

This evaluative approach is also being applied to public events. Blair developed an e-mail survey for Sea Grant public events that is sent to all participants after every event to determine satisfaction. These surveys have already resulted in changes to programming, and will continue to be especially invaluable in assessing all of Sea Grant's major annual educational programs.

Engaging with Partners

Rhode Island Sea Grant partners with an array of private funders in order to target leveraged funds toward specific coastal and ocean management issues identified as impacting coastal or ocean resources or the well-being of shoreline communities. For example, Rhode Island Sea Grant partners with the Gordon and Betty Moore Foundation on the issue of strengthening the national and international network of coastal and ocean practitioners dedicated to exploring the application of marine spatial planning (MSP). MSP promotes the development of wise and balanced use and protection plans for a growing assortment of marine-based resources and activities, from fishing, to the siting of offshore renewable energy facilities, to the management of increasing port-based ship traffic. Rhode Island Sea Grant has established critical relationships with MSP experts and practitioners the world over, and is creating an innovative program to help the network share lessons learned, instruct a new generation of coastal and ocean leaders, and develop collaborative tools and techniques to aid in the management and protection of marine-based resources.

Rhode Island Sea Grant partners with the URI College of the Environment and Life Sciences (CELS) to engage students in professional development during their academic careers. Rhode Island Sea Grant provides funding for graduate fellowships in Marine Affairs, and Environmental Management, as well as undergraduate studios in Landscape Architecture. CELS provides match to Sea Grant funds, and provides the academic structure for fellows and studios. As a Rhode Island Sea Grant best practice, Marine Affairs fellows work directly with Rhode Island Sea Grant extension staff, becoming integrated into ongoing projects and acting as professional extension staff. Marine Affairs fellows are within a formal graduate degree-seeking program, and in most cases their thesis research is integrated into the Sea Grant project they are working on. Rhode Island Sea Grant supports up to two Marine Affairs fellows at any given time, one in pursuit of a Master's degree, the other a PhD. Rhode Island Sea Grant also supports Master's of Environmental Science and Management (MESM) fellows, who are students already having earned a bachelor's degree and that have returned to academia to take part in an accelerated program that leads to a Master's degree in three semesters. Each MESM fellow engages in a two semester practicum, on a part time basis, and Rhode Island Sea Grant supports up to three MESM fellows per year who engage directly with either an extension agent on a specific project or with an Rhode Island Sea Grant funded research PI. Rhode Island Sea Grant also supports undergraduate studios for junior and senior Landscape Architecture (LAR) degree seeking students. In partnership with LAR professors and a specific stakeholder group—a town planning body, non-governmental organization, or business entity, for instance—Rhode Island Sea Grant extension agents facilitate a process that engages students in designing landscape development options, that incorporate sea level rise projections, for instance, for stakeholders attempting to improve resiliency measures. The outcome is that students get real world practice engaging with "clients," interpreting their desires and putting them to practice using academic knowledge. Stakeholders receive various scenarios that will help them envision possible solutions to real problems. The LAR studios have proven to be so successful that Rhode Island Sea Grant is exploring a similar partnership with the URI College of Ocean Engineering. A pilot studio will occur in 2014-2015 engaging Ocean Engineering undergraduates with the Rhode Island marina industry to explore how to effectively adapt facilities to be resilient to rising sea level.



Rhode Island Sea Grant's marine spatial planning work has helped develop and train a worldwide network of practitioners. ISTOCK PHOTO

Rhode Island Sea Grant partners with the Coastal Institute at URI on a variety of outreach and education efforts, notably the twice-yearly publication *41°N*, whose mission is to be "Rhode Island's Ocean and Coastal Magazine." The magazine is funded by Sea Grant and the Coastal Institute, which provide editorial direction as well. Thanks to the robust commitment of both programs, the magazine has been developed over the last several years to appeal to a broader range of readers outside the realms of academia and state agencies. Following a series of focus groups and a reader survey, the magazine was redesigned in 2014, and

follow-up focus groups have been hosted to evaluate the new look and approach. Together the programs are participating in a new marketing effort through an undergraduate Marketing Principles class this fall in the URI College of Business Administration, in which a team of students is developing a marketing plan for the magazine to further expand readership.

Rhode Island Sea Grant partners with the URI Department of Art and Art History in a unique program titled Visual Arts Sea Grant (www.uri.edu/artsci/art/sea_grant_awards.html). This partnership seeks to engage artists, through the provision of small grant awards, who address the issues of the environment of the ocean and its coastal communities, and in doing so, stimulate conversation and lead people to think about the coast and ocean in new ways. Conceived in 1988 by then-Sea Grant director Scott Nixon and art professor Robert Rohm, Visual Arts Sea Grant celebrated it's 25th anniversary in 2013 with a month long gallery on the URI Kingston campus. Originally open only to professional artists, in 2012 the program was expanded to include a competition for students at the undergraduate level, which has proved popular, and opens another door to student engagement with Sea Grant.

Rhode Island Sea Grant joined with an array of partners—CRMC, the Narragansett Bay National Estuarine Research Reserve, The Nature Conservancy, the Roger Williams University School of Law, Save the Bay, and the town of North Kingstown—to test a process for mapping sea level rise inundation. The team accessed numerous Light Detection and Ranging (LiDAR) data sets from throughout the state to collect the information necessary for a sea level rise viewer for 21 coastal communities. The viewer is capable of demonstrating the approximate potential impact of one, three and five feet of sea level rise upon the communities. In North Kingstown, the information supported the development of Geographic Information Systems–based overlays and impacts to real property and infrastructure, as well as a natural hazards component for the local community comprehensive plan. The North Kingstown work is now providing the basis for a statewide model that other coastal communities can examine as they form their own adaptation plans and polices. Also, the information has proved useful to a number of new or updated planning tools, such as the Sea Level Affecting Marsh Model application, which is used to demonstrate how rising seas are potentially impacting salt marshes.

Collaboration with NOAA Partners

Rhode Island Sea Grant engages with the Connecticut and Delaware Sea Grant programs to provide critical seafood safety education to a targeted audience of nurse practitioners and student nurses. Sea Grant has played an integral role in helping assess the food safety education needs for nurses, and is continuing to assist the partnership effort as work gets underway to develop a program to serve these needs. The collaboration includes an advisory group with representatives from the nursing colleges and dietetic programs at the institutions.

The Rhode Island Sea Grant Legal Program has worked with several NOAA partners, including other Sea Grant programs. In 2011, the Legal Program worked with Maine Sea Grant to research the legal barriers faced by fishermen and aquaculturists considering engaging in the tourism industry. Using funding received by Maine Sea Grant from the National Sea Grant Law Center, a Rhode Island Sea Grant Law Fellow was engaged to research barriers and potential solutions for the fishermen and aquaculturists, producing a report titled *Legal barriers and opportunities to developing business partnerships between fisheries and tourism*. Ultimately, there were fact sheets created for the fishermen on some of the key research findings, and there were workshops open to fishermen and aqauculturists, where the Law Fellow presented his work.

In 2011, the Gulf of Maine Council on the Marine Environment received funding from NOAA's Climate and Societal Interaction Program to collaborate with the Northeast Regional Ocean Council to examine innovative municipal approaches to climate change adaptation in the coastal zone of the Northeast and Bay of Fundy. The two-year project, *Stimulate innovation and increase municipal responses to a changing climate in the coastal zone of the Northeast and Bay of Fundy*, was completed in 2013. The research and outreach for the project was conducted by the following partners: Marine Affairs Institute, Blue Urchin, StormSmart Coasts Network, and Clean Air—Cool Planet. Through this funding, the Rhode Island Sea Grant Legal Program was able to support the research of six Law Fellows who researched and documented seventeen case studies of municipal approaches to climate change adaptation in the Northeast (necca.stormsmart.org/home/about/).

Rhode Island Sea Grant partners with six other Sea Grant programs (ME, NH, MIT, Woods Hole, CT, and

NY) through the Northeast Sea Grant Consortium. A Memorandum of Understanding has been signed by the seven host institutions that limits the amount of indirect costs on collaborative projects to that of the lead institution. For instance, if Rhode Island Sea Grant leads on a collaborative research project, only URI charges indirect costs. Each consortium member allocates an agreed-upon amount of funding into a shared pool to be used for regional projects. To date, the NESGC has funded nine research projects of mutual interest, six of them focused on social science questions related to assessing resiliency and the impacts of changing climate on the northeast region. Further collaborative efforts may engage extension programs as well as continuing to fund research of mutual interest.

SCIENCE SERVING RHODE ISLAND'S COASTS

RHODE ISLAND SEA GRANT has several mechanisms by which the latest science is made accessible to the public. Its foremost effort is the Ronald C. Baird Sea Grant Science Symposium (seagrant.gso.uri.edu/special-programs/baird/), which annually focuses on a topic of critical importance to the state or region. The intent of the Baird Symposium is to bring to light the best available knowledge on a topic to improve understanding of complex issues. Presenters are experts in the field, and audiences typically have a vested interest in the topic. Efforts are made to open a dialog among presenters and participants to better explore and understand the topic in light of the information presented.

In some instances, the Baird Symposium takes on the format of a "think tank" that is laser focused on a particular issue or problem with the intent of not only improving understanding, but defining an agenda for further efforts. For instance, there was great concern voiced by the scientific community regarding nutrient reduction programs slated for implementation in Narragansett Bay and how that might change the bay's ecology. In response, in 2005, the Baird Symposium convened 25 experts who presented the latest knowledge for Narragansett Bay with regard to its eutrophication, then debated and defined likely possible outcomes of nutrient reduction. The result was the 2008 publication a Springer Series on Environmental Management volume titled Science for Ecosystem-based Management: Narragansett Bay in the 21st Century. The book set a pre-nutrient baseline for Narragansett Bay that has been used by scientists and resource managers to frame up research and monitoring efforts targeted at capturing the processes of ecological change that ensues as nutrients input to Narragansett Bay are reduced. A similar "think tank" Baird Symposium was convened in 2008 that focused on compiling the best available scientific understanding of Rhode Island Sound and Block Island Sound. Outputs of that symposium went on to inform development of a research agenda for the R.I. Ocean Special Area Management Plan (seagrant.gso.uri.edu/projects-2/ocean-samp/), as well providing significant information that informed development of the actual regulatory document produced in the Rhode Island Sea Grant-facilitated process.

The 2012 Baird Symposium brought together marine spatial planners from around the world to share experiences.

PHOTO BY MELISSA DEVINE

In addition to the Baird Symposium, under the leadership of science writer Meredith Haas, the annual Coastal State discussion series was developed with a focus on scientific research. Investigators present findings, sometimes preliminary, in a small audience setting of resource managers and other researchers. The format fosters discussion of research findings and their application into practical resources management. Haas, based on feedback from participants, continues to adapt the program to best respond to user needs.

Program Changes Resulting from the Previous Site Review

The previous site review was conducted in July 2010, resulting in 1 recommendation and 5 suggestions.

Recommendation—Write an abbreviated strategic plan to cover the span of 2011–2014 so that it would then be aligned with the national strategic plan. Response—Rhode Island Sea Grant developed and implemented a 2011–2014 strategic plan as recommended.

Suggestion (1)—Appoint one extension representative to be the Rhode Island Sea Grant point for extension at the national level. Response—Jennifer McCann was appointed director for extension for Rhode Island Sea Grant and appointed as the Rhode Island Sea Grant representative to National Sea Grant Extension Assembly.

Suggestion (2)—Senior Advisory Council (SAC) program reviews should include interview or other stakeholder input. Response—The SAC has been reconfigured to better represent the Rhode Island Sea Grant stakeholder community (rather than project partners), and efforts refocused on defining critical emerging issues and possible roles for Rhode Island Sea Grant.

Suggestion (3)—Better integrate extension efforts across the program between fisheries, coastal communities, and legal programs. Response—Fisheries and coastal communities extension programs relocated to Coastal Resources Center, and Law Fellows integrated into extension efforts to ensure integration of legal issues throughout extension efforts.

Suggestion (4)—Consider an annual meeting of Rhode Island Sea Grant extension people to foster communications, cooperation, and coordination. Response—Weekly extension program meetings are convened at CRC to promote collaboration, coordination, and awareness across the program.

Suggestion (5)—Better define the Rhode Island Sea Grant role in regional management efforts so that projects best support NOAA and Sea Grant regional priorities. Response—Rhode Island Sea Grant engages regionally through the Northeast Sea Grant Consortium so that critical mass can be achieved with greatest effectiveness and efficiency with NOAA partners while ensuring integration with sister Sea Grant programs in the Northeast.