PRP Narrative—INTRODUCTION
Rhode Island Sea Grant College Program

Sea Grant has deep roots in Rhode Island—the first national conference to use the term was hosted by Rhode Island Senator Claiborne Pell in 1965 at the University of Rhode Island. Rhode Island eagerly embraced the opportunities presented by the National Sea Grant College Act of 1966, and became one of the first four programs recognized under the law. Recognized as an important source of scientific information by our state government, Rhode Island Sea Grant has played a key role in the rational development and management of the state's abundant marine and coastal resources.

Rhode Island is known as the "Ocean State" for good reason. In addition to being the nation's smallest state, we are the second most densely populated, and have the third highest percentage of the state that is underwater (33.1%). Every Rhode Islander lives within 30 minutes of the shore, and most within 10 minutes. Our Colonial Charter preserved the "Privileges of the Shore" for all inhabitants in 1662, and that provision was carried over and strengthened in the 1842 State Constitution. Our history, geography, and population density combine to nurture a citizenry that is uniquely dependent on its coastal resources and their wise management.

Rhode Island Sea Grant has become a trusted partner of the two primary state agencies that have management responsibilities over our marine and coastal resources: the Coastal Resources Management Council and the Department of Environmental Management. Our research agenda is driven by the practical questions those resource managers face, and our outreach program is directed at implementing the scientific findings developed in the research program. The combination is a powerful tool to address our three themes: sustainable coastal development, healthy coastal ecosystems, and safe and sustainable seafood supply. Our unique legal program plays a key role in the implementation of the initiatives driven by those thematic areas, and our communications team moves information through various media to audiences that want or need the information. Sea Grant support of graduate and undergraduate students helps build the next generation of scientists, resource managers, and legal and policy professionals.

Working with us to achieve our goals are two key partners: the URI Coastal Resources Center and the Marine Affairs Institute at the Roger Williams University School of Law, the host of the Rhode Island Sea Grant Legal Program. The Coastal Resources Center provides technical assistance to state agencies, local communities, and citizen groups faced with marine resource problems. Rhode Island Sea Grant provides some staff funding for each of their projects related to our three themes, and they seek matching funds from other agencies or foundations to complete their mission. A more recent but similar partnership occurs with our Legal Program: Roger Williams University School of Law provides space, technical staff, and a Director who heads both the Marine Affairs Institute and the Sea Grant Legal Program. Rhode Island Sea Grant provides the funding for the Staff Attorney and the Sea Grant Law Fellows. The Program is unique in that legal impacts are addressed early on as part of any proposed management change.

Taken together, Rhode Island Sea Grant has accomplished much and is relied upon as a key player as the state faces new challenges in climate change and sea level rise. To celebrate the 50th Anniversary of the National Sea Grant College Act, Rhode Island Sea Grant will be pleased to host Sea Grant Week in October 2016 where it all began—Newport, Rhode Island!

PRP Narrative—SAFE AND SUSTAINABLE SEAFOOD SUPPLY
Rhode Island Sea Grant College Program

Over the span of the 2011–2014 Strategic Plan, the landscape for fisheries in Rhode Island changed significantly. The University of Rhode Island Sustainable Seafood Initiative, championed by Dr. Cathy Roheim, was left without a leader when she accepted a faculty position at another university. The URI faculty replacement did not have the same interests and no further building of URI fisheries-centric faculty has occurred. Efforts to build a university-wide initiative around sustainable seafood was therefore neither practical nor probable so efforts were reprogramed. Also during this strategic plan timeframe, Rhode Island Sea Grant Director Barry Costa-Pierce, the center point for multi-trophic, ecosystem-based aquaculture efforts, left the program. These departures have lead to a different suite of outcomes than those described in the 2011–2014 Strategic Plan.

Rhode Island Sea Grant focused attention on building the capacity of the Rhode Island Department of Environmental Management, Rhode Island Department of Health, Rhode Island Coastal Resources Management Council, and the shellfish aquaculture and wild harvest industries, to create a comprehensive statewide plan for shellfish management. Shellfish regulations were spread across the three agencies and were not coordinated, making for a confusing and often hostile environment for those being regulated. Considerable confusion also reigned regarding what is known about shellfish ecology and biology, and their management and regulation both in Rhode Island and throughout the region. In response Rhode Island Sea Grant convened the *2013 Ronald C. Baird Science Symposium*, pulling together shellfish biologists, managers, regulators, and industry members to discuss what is known and to define where critical gaps in the knowledge-base exist. Rhode Island Sea Grant, based on the needs identified by stakeholders to close critical knowledge gaps in order to develop coherent, ecosystem-based management, focused its 2014–2016 Research Request for Proposals (RFP) on the single theme of shellfish ecology and biology in support of ecosystem-based shellfish management.[1]

Another area of sustainable seafood work was by Jeremy Collie (University of Rhode Island) on the value of fisheries certification on fish stocks and fishermen. His work has shown that certification is a mixed bag regarding positive impact on the fishery itself, tends to vary species by species regarding positive impact on stocks, and that little if any impact is felt as far down the product chain as the actual fisherman catching the fish. Collie's research however, does show that when product branding affects consumer preference (e.g., Prince Edward Island mussels, Point Judith calamari, etc.), then fisheries certification is value added. These findings have made the fishing industry in Rhode Island proceed with caution regarding seeking certification for a fishery, which is expensive and time consuming. New effort however, is being placed on branding of Rhode Island-origin seafood products, an area that Rhode Island Sea Grant is exploring as a follow-on to its work on the Shellfish Management Plan. Much of the seafood landed in Rhode Island is shipped elsewhere, where demand is higher. The state is seeking to

[1] Seven research projects were funded to take place as the 2014–2016 Rhode Island Sea Grant research agenda, two that were social science oriented. The 2016–2018 research RFP requested further research on shellfish, but not as a sole focus area.

promote locally caught seafood to Rhode Islanders not only to support local fishermen but also to enhance local food systems to provide food that is fresher, and with a reduced carbon footprint.[2]

Rhode Island Sea Grant assisted the Rhode Island Department of Environmental Management in development of a pilot sector allocation program for the summer flounder (fluke) fishery. Despite initial findings of economic improvement for those engaged in the sector-managed fishery, the program was discontinued when the commercial fishing industry became fractured regarding the benefits and drawbacks of sectors, and could not support continuance.

Rhode Island Sea Grant continues its work with fisheries stakeholders in the Ocean Special Area Management Plan (SAMP) initiative[3]. The Ocean SAMP provides commercial and recreational fishermen, a major sector of Ocean SAMP stakeholders, a place at the decision-making table through the creation of the Ocean SAMP Fishermen's Advisory Board. For instance, Cox's Ledge, a prime fishing area for both recreational and commercial fishermen, was acknowledged as such by the Fishermen's Advisory Board and was demarcated as off-limits to development in the approved plan. Through the Fishermen's Advisory Board the fishing community regularly provides information regarding fisheries activities in the Ocean SAMP area to the Coastal Resources Management Council for management purposes. This is a very important relationship as it provides a mechanism for real time updates on changes in fish stocks that are occurring as a result of climate change.

Rhode Island Sea Grant participated in the USDA Trade Adjustment Assistance program—the first time this program was applied to non-land-based agriculture—with other Sea Grant programs in the Northeast, helping lobstermen put together sound business plans aimed at providing economic sustainability. Rhode Island Sea Grant engaged with the lobster industry beyond the trade adjustment program, working with lobstermen to capture their local ecological knowledge, and assess it for its potential value to, and incorporation into, lobster management. A further element of work with the lobster industry has been in regard to diversification of the industry to be more economically viable. One effort has been to work with lobstermen to modify gear so they can take advantage of the Jonah crab, which is growing in popularity in Rhode Island as table fare. A second effort has been through the Legal Program working in collaboration with Maine Sea Grant and the Maine lobster industry to diversify into tourism by using their vessels as tour boats. A Rhode Island Sea Grant Law Fellow researched the legal and liability issues related to lobster fishing boats doubling as tourism platforms, such as for taking tourists out to haul lobster pots, sightsee, and experience a day-in-the-life of a lobsterman.

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[2] Rhode Island Sea Grant extension experts are working closely with state agency and industry representatives in 2015 to develop strategic avenues for increasing the consumption of local seafood species locally and regionally, through branding and marketing.

[3] The Ocean SAMP is a major initiative, facilitated by Rhode Island Sea Grant, to develop statewide guidance for the development of renewable energy in the offshore waters of Rhode Island. The Ocean SAMP has been formally adopted and implemented, with wind turbine placement—the first in the nation in offshore waters—taking place in August 2015 off Block Island. Fishermen remain engaged in management, oversight, and monitoring efforts of the Ocean SAMP process.

Finfish aquaculture has not been an area of investment by business entrepreneurs in Rhode Island because disease outbreaks have been a major limiting factor. Marta Gomez-Chiarri (University of Rhode Island) was funded to conduct research on fish feed that would improve disease resistance in closed culture systems without reducing growth rates, but that would still be affordable. Results are promising, though not conclusive, and require further research and testing, which the PI is pursuing with leveraged funding.

Mussel consumption is on the rise in the United States, and Narragansett Bay, which provides a good growing environment for the species, has a strong shellfishing industry that could capitalize on this trend. Scott Lindell (Marine Biological Laboratory) conducted site-specific research on mussel growth in the bay that has led to several new breakthroughs in hatchery procedures as well as in-water growing techniques that promote growth of the industry and the consumption of locally sourced foods. Applications for new aquaculture permits have increased as a result of project findings and outreach, suggesting that future economic impacts may accrue as farm expansion occurs, and mussels become "Rhode Island Grown."

Disease is a continuing threat to aquaculture operations even in non-hatchery settings, and the identification of a new threat is particularly concerning. Several oyster aquaculture operators noticed reduced growth and increased mortality at some sites, and submitted samples for pathological examination, which found the presence of Seaside Organism (*Haplosporidium costale*), previously unknown in Rhode Island waters. Rhode Island Sea Grant, through Program Development funds, sponsored Roxanna Smolowitz (Roger Williams University) to assess the prevalence of Seaside Organism in Rhode Island waters, and the possible threat it poses to the shellfish aquaculture industry. The study posed more questions than it answered, but it clearly shows that a new threat has emerged, and is having negative impact on cultured oysters at specific sites. Management implications are being considered, and currently there is a restriction of oyster transfer from infected sites until further understanding of the threat is developed.

David Rowley (University of Rhode Island) contributed significantly to the goals of improved technology research and ecosystem-based approaches to aquaculture. Rowley's efforts in identifying, isolating, and producing probiotic materials that help juvenile oysters resist *Vibrio* in hatchery settings has proven viable in both theory and pilot operational procedures. Given the economic impact to a grower when an entire year's crop of juvenile oysters is lost, and the environmental impacts of pharmaceuticals used in treating aquatic diseases being released to coastal waters, Rowley's contribution in reducing both risks by using native micro flora is significant. The final hurdle, to be conducted with leveraged funding post-Sea Grant project funding, is to evaluate applicability during full-scale commercial hatchery operations. Rowley has several patents pending from his Rhode Island Sea Grant funded research.

Knowledge gaps exist at broader regional scales as well as locally. Sea Grant programs located in the Northeast share many of the same issues, and addressing these issues through research will be more effective and efficient when implemented at a regional scale. The Northeast Sea Grant Consortium, a collaboration between NY, CT, RI, WHOI, MIT, NH and ME Sea Grant programs, aids in the support of all strategic goals for Safe and Sustainable Seafood Supply. Each member program of the consortium allocates funding for research that is issued through a regional RFP. To date, several research projects have been funded to address issues of importance to regional fisheries,

and issues regarding the economic and social impacts of climate change on coastal municipalities. Regional efforts have focused on social science-oriented research, which has helped Rhode Island Sea Grant work on one of its strategic priorities.[4] Regional research has developed a new AUV visual mapping technology to chart the abundance and distribution of *Didemnum spp*., a highly invasive colonial tunicate creating havoc in the commercially important George's Bank fishery area. The new technology allows resources managers to document the spread of this invasive species, and allows fishermen in turn to avoid areas indicating high tunicate abundance.[5]

For the goal of increasing capacity of the seafood industry to ensure that safe seafood product gets to consumers, a significant accomplishment was made in the partnership with the East Coast Shellfish Grower's Association. With Rhode Island Sea Grant Program Development funding, the association produced and distributed safe shellfish handling instructional materials, then followed up by convening workshops with handlers. The result of this outreach and education effort was that it stopped the implementation of new Food and Drug Administration handling procedures for shellfish handlers. While the economic savings to seafood handlers by not having new rules to comply with cannot be readily calculated, it can be assumed that savings, perhaps considerable, accrued from this activity. Other efforts to revise existing Hazard Analysis & Critical Control Points (HACCP) training materials and curriculum to reflect best available knowledge will achieve progress on goals to increase the capacity of the seafood industry to ensure the safety of seafood products.

All strategic goals for Safe and Sustainable Seafood Supply are augmented by the Rhode Island Sea Grant communications team, which has developed several mechanisms for bringing research and extension results to the public. In a postcard-style publication, *Notes from Rhode Island Sea Grant* focuses on a single, significant research or extension outcome, with a brief highlight of an upcoming Sea Grant public event. Rhode Island Sea Grant's flagship publication, *41°N*, provides detailed coverage of research and extension activities in a highly readable, story-based format targeted at an informed public. *Notes* and *41°N* are provided in print and web-based versions to reach the largest audience.

The *Ronald C. Baird Sea Grant Science Symposium*, named in honor of former National Sea Grant director Ronald Baird, provides a major venue for moving research and extension findings and results to the target audience of resource managers. Baird Symposium topics have ranged from nutrient dynamics of Narragansett Bay and marine spatial planning to shellfish ecology and impacts of sea level rise on coastal economies. During this strategic planning time frame, one symposium focused, as noted earlier, on defining knowledge gaps related to shellfish ecology and management. Another focused on local seafood and under utilized species in partnership with Johnson & Wales University Culinary School. The symposium brought together local chefs, culinary

[4] The experience gained in promoting social science research at the regional scale has been applied to subsequent Rhode Island Sea Grant specific research requests for proposals. In response, social science proposals submitted for consideration has been 30% or more of the total, resulting in 20-25% of funded proposals being social science-oriented.

[5] The 2016–2018 Northeast Sea Grant Consortium regional research request for proposals is focusing on the regionally important issues of ocean acidification and how it relates to impacts on economically important fin fish and shellfish stocks in New England waters.

students, fisheries scientists, and commercial fishermen, who defined sustainability, and identified local, underutilized species that are being sustainably harvested. Fishermen delivered fresh samples of scup, a fish stock considered sustainable and under utilized, that was then prepared in various ways by teams of professional chefs and culinary students. Several local chefs followed up the symposium by buying scup from local fishermen and placing it on their menus. A few even planned events around introducing scup to consumers, having a fisherman and scientist team give a talk about sustainable fisheries prior to having a gourmet dinner featuring scup and other under utilized Rhode Island species. Another symposium, convened as a "think tank" activity by the Rhode Island Sea Grant Legal Program, focused on how the Magnusson-Stevens Act may hold up in light of climate change impacts to fisheries.

For the general public, *Coastweeks* offers activities for participants to learn and explore Rhode Island coastal environments and communities, taking place throughout the summer and fall seasons. Seafood-related activities have included lectures, clam-digging classes, and seafood cooking demonstrations.

Rhode Island Sea Grant Law Fellows, managed through the Rhode Island Sea Grant Legal Program located at Rogers Williams University School of Law, provide a unique contribution to research and outreach efforts by undertaking law and policy analyses that complement and/or add value to ongoing efforts. For instance, Law Fellow Melissa Chalek worked with research scientist Scott Lindell, researching law, policy, and regulations related to shellfish deputation. Her research found that Rhode Island depuration regulations were excessively restrictive in light of interstate, national and international regulations, and were standing in the way of development of an economically viable business model for mussel aquaculture in Rhode Island. Her research was used as guidance by state regulators to alter depuration regulations to be less restrictive to shellfish aquaculture development. Law Fellows gain a unique experience in developing their professional skills by working directly with researchers, Sea Grant clients, and Sea Grant extension specialists on issues of direct importance to the management of coastal and marine resources. Law Fellows are available to provide valuable law and policy research to other Sea Grant programs that do not have a dedicated legal program. This also provides more opportunities for partnering the Rhode Island Sea Grant program with other Sea Grant programs, including those in the Northeast Sea Grant Consortium. This experience grooms them to be several steps ahead in their professional maturation upon graduation.

PIER PRP Program Focus Area Report

Rhode Island Sea Grant

Safe and Sustainable Seafood Supply

Program Focus Area: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Program Goals

1. A sustainable supply of safe seafood to meet public demand.
2. A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently.
3. Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption, and who understand how to evaluate the safety of the seafood products they buy.

JUMP TO REPORT SECTION

Impacts and Accomplishments toward Program Goals

1. **Program Goal: A sustainable supply of safe seafood to meet public demand.**
   Accomplishment(s)
   - 19552 - Rhode Island Sea Grant Baird Science Symposium focuses the current and the potential future value of shellfish to Rhode Island
   - 19345 - Catch share pilot program for Rhode Island summer flounder increased fleetwide revenues by over $800K
   - 19203 - Emerging oyster disease in Rhode Island waters could impact local aquaculture industry
   - 19168 - Rhode Island researcher finds scallop waste an attractive fish feed that improves weight gain while reducing waste stream and costs
   - 18772 - Rhode Island mussel industry may benefit from alterations in existing longline materials to collect seed
   - 17492 - Building mussel aquaculture in Rhode Island
   - 17008 - Soybean Fishmeal Alternatives Enhance Summer Flounder Aquaculture
   - 15211 - Graduate students engage as Fellows with the Rhode Island Sea Grant College Program.
   - 15137 - Roger Williams University Law Review dedicates an entire issue to the 2010 Marine Law Symposium, 2011 Deepwater Horizon Conference, and other marine affairs topics.
   - 15109 - A new Intellectual Property Patent application was submitted for approval.
   - 15045 - Adoption fo the Ocean Special Area Management Plan (SAMP) adoption spins off new implementation initiatives.
   - 15030 - Commercial fishermen engage in cooperative research of bycatch gear technologies.
   - 15029 - 110 Rhode Island lobstermen have enrolled in the USDA Trade Adjustment Assistance Program.
   - 14169 - Rhode Island Sea Grant Provides Research Support for New Collaborative Fisheries Research
   - 13865 - Algae for Food:Turning a Pest into a Product

2. **Program Goal: A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently.**
   Accomplishment(s)
   - 19345 - Catch share pilot program for Rhode Island summer flounder increased fleetwide revenues by over $800K
   - 19203 - Emerging oyster disease in Rhode Island waters could impact local aquaculture industry
   - 19168 - Rhode Island researcher finds scallop waste an attractive fish feed that improves weight gain while reducing waste stream and costs
   - 18772 - Rhode Island mussel industry may benefit from alterations in existing longline materials to collect seed
   - 17492 - Building mussel aquaculture in Rhode Island
   - 17008 - Soybean Fishmeal Alternatives Enhance Summer Flounder Aquaculture
   - 15211 - Graduate students engage as Fellows with the Rhode Island Sea Grant College Program.
   - 15138 - Law Fellow projects inject legal research findings into the decision-making processes for a broad stakeholder community.
   - 15109 - A new Intellectual Property Patent application was submitted for approval.

- 15082 - The 2011 Ronald C. Baird Sea Grant Science Symposium--"Developing the Rhode Island Seafood Knowledge Economy: Perspectives on Seafood Sustainability"was hosted in June 2011 at Johnson & Wales University.
- 15030 - Commercial fishermen engage in cooperative research of bycatch gear technologies.
- 15029 - 110 Rhode Island lobstermen have enrolled in the USDA Trade Adjustment Assistance Program.
- 13866 - Shellfish Handling Workshops Stopped New FDA Post-Harvest Regulations
- 13865 - Algae for Food:Turning a Pest into a Product
- 7016 - The National Seafood HACCP Alliance Training Curriculum is revised to better reflect current needs of the seafood industry.
- 6405 - New Medicine May Aid Oyster Hatcheries

3. **Program Goal: Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption, and who understand how to evaluate the safety of the seafood products they buy.**
   Accomplishment(s)
   - 20265 - Rhode Island Sea Grant Research Indicates Fisheries Certification Does Not Always Equate to a Sustainable Fishery
   - 19628 - Rhode Island Sea Grant's coastal and ocean magazine nearly doubles subscription and is "sold out"
   - 19559 - Rhode Island Sea Grant Law Fellow helps Maine fishing industry look at impacts of climate change
   - 17913 - Law Fellow Assists Maine Fishermen
   - 15211 - Graduate students engage as Fellows with the Rhode Island Sea Grant College Program.
   - 15093 - The University of Rhode Island Marine Biology Program hosts a "mini-conference" that highlights Sea Grant funded researchers.
   - 15091 - Sea Grant Annual Community Lecture series attracts over 250 participants.
   - 15082 - The 2011 Ronald C. Baird Sea Grant Science Symposium--"Developing the Rhode Island Seafood Knowledge Economy: Perspectives on Seafood Sustainability"was hosted in June 2011 at Johnson & Wales University.
   - 15029 - 110 Rhode Island lobstermen have enrolled in the USDA Trade Adjustment Assistance Program.
   - 15028 - A new benefits and risks of seafood consumption website was launched.
   - 13879 - Partnership with the URI Marine Biology program offers lectures about the Gulf Coast oil spill event that improves understanding of the event and impacts
   - 13866 - Shellfish Handling Workshops Stopped New FDA Post-Harvest Regulations
   - 13865 - Algae for Food:Turning a Pest into a Product
   - 6387 - Marine Law Symposium Analyzes Impacts of Magnuson-Stevens Act on Fisheries

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Full Text of Impacts and Accomplishments

20265 - Rhode Island Sea Grant Research Indicates Fisheries Certification Does Not Always Equate to a Sustainable Fishery

RELEVANCE: The intent of certification for various seafood products is to inform consumers that their purchase is coming from a fish population that is being sustainably harvested. It is assumed that certified fisheries will receive ecological benefits associated with sustainable harvest, such as stable population size, and that economic benefits will be received by fishermen who will see premium prices paid for certified species. There is little documentation however that ecological and/or economic benefits actually accrue to a fishery that has been certified.

RESPONSE: Rhode Island Sea Grant funded URI researcher Jeremy Collie to compare certified vs. non-certified fisheries and determine if certified fisheries have improved stock status relative to non-certified fisheries, and to determine if economic benefits have accrued by those vessels harvesting in certified fisheries.

RESULTS: It was anticipated that certified fisheries should increase in abundance at that fishing mortality should decrease relative to non-certified stocks. Overall, 3 taxa (hake, plaice, rock lobster) had improved stock status. However, none of the fisheries, certified vs. non-certified, showed differences in fishing mortality rate. With regard to economic benefits to fishermen, there was considerable variation in the degree of economic benefit, with some showing positive and some showing negative benefits. The mixed findings of this research suggest that consumers purchasing certified seafood is not, by default, supporting a sustainable fishery. Given the costs associated with gaining certification for a fishery, the unpredictability of the return of economic benefits to the fishermen may not, by default, warrant seeking certification.

RECAP: Rhode Island Sea Grant-funded research on whether fisheries certification did indeed improve stock sustainability produced mixed results showing that some stock status, specifically for hake, plaice, rock lobster, may be improved, but fishing mortality is not improved, and that economic

benefits to the fisherman are unpredictable based on market demand. Back to Goals

19628 - Rhode Island Sea Grant's coastal and ocean magazine nearly doubles subscription and is "sold out"
RELEVANCE: In response to a series of listening sessions to enhance the readership experience of 41N, the magazine began a series of steps to redesign the content and layout during this time.

RESPONSE: Rhode Island Sea Grant added freelance writers and photographers to improve and diversify content, add a section devoted to seafood, and made other improvements intended to broaden the audience of the magazine and reach more "lay" readers.

RESULTS: Subscribership has increased, along with requests for additional copies of the magazine for bulk distribution. Even with a larger print run, the latest issue of the magazine is "sold out."

RECAP: 41N, Rhode Island Sea Grant's biannual coastal and ocean magazine produced in collaboration with the University of Rhode Island Coastal Institute, has been undergoing redesign with increased subscriptions and the latest issue "sold out." Back to Goals

19559 - Rhode Island Sea Grant Law Fellow helps Maine fishing industry look at impacts of climate change
Relevance: Rhode Island Sea Grant was approached by the Island Institute in Maine to conduct background research on the impacts climate change is having on fisheries in the Gulf of Maine.

Response: Rhode Island Sea Grant Legal Program hired a Law Fellow to conduct research on climate change impacts to fisheries in the Gulf of Maine. The Law Fellow prepared a background report for a conference the Island Institute hosted in August, 2013. The Law Fellow attended the conference and assisted with the running of the conference.

Results: A non-profit organization received legal and policy research on a critical issue. Many constituents benefitted from the resulting workshop and report. A law student gained valuable hands-on experience and professional exposure.

RECAP: Rhode Island Sea Grant Law Fellow provided research on the impacts of climate change on Maine fisheries, and helped run a local conference, which provided workshops to look at climate change research and adaptation strategies. Back to Goals

19552 - Rhode Island Sea Grant Baird Science Symposium focuses the current and the potential future value of shellfish to Rhode Island
Relevance: A major shellfish management initiative is underway in Rhode Island, bringing a need to call together users, managers, and researchers together to jointly learn about the status of knowledge regarding shellfish in the state, and discuss what further needs to be known.

Response: Rhode Island Sea Grant convened the 2013 Ronald C. Baird Sea Grant Science Symposium in Warwick, Rhode Island in November 2013.

Results: Over 160 people attended the multi-day event, where researchers presented the best available information regarding shellfish ecology and the fishery in Rhode Island. Workshops convened as part of the symposium helped define current issues, research needs, and management objectives for consideration. These outputs are being used to help guide the shellfish management plan development process.
RECAP: The Rhode Island Sea Grant Baird Science Symposium focused on local and national knowledge and perspective to enhance the cultural, environmental, and economic aspects of Rhode Island's shellfish resource, which provided guidance for the state's Shellfish Management Plan (SMP) initiative. Back to Goals

19345 - Catch share pilot program for Rhode Island summer flounder increased fleetwide revenues by over $800K
Relevance: Rhode Island implemented in 2009 a catch share pilot program for summer flounder, a state-managed species jointly harvested by the Northeast Multispecies groundfish complex. The pilot tested premises of whether groundfish trawlers can selectively target, and whether targeting creates market opportunities, as well as whether non-sector vessels will be harmed.

Response: Sea Grant funded development of a theoretical model that would, based on fishermen behavior, predict economic outcomes for those engaged in the catch share program, and those that opted not to participate.

Results: Results showed that catch share members and non-members would harvest the resource at different times, and would not directly compete with one another. Furthermore, catch share members could potentially see a significant increase in market value because they would heighten fishing effort after non-members had exhausted their quotas. Non-members would also see increased market value, but not to the extent that members did.

This pilot program increased fleetwide revenues by over $800,000, including benefits of over $250,000

to non-sector vessels.

RECAP: Rhode Island's summer flounder fleet benefitted from increased revenues by over $800,000, including benefits of over $250,000 to non-sector vessels, from a catch share pilot program supported by research funded by Sea Grant. Back to Goals

19203 - Emerging oyster disease in Rhode Island waters could impact local aquaculture industry
Relevance: Little is know about Seaside Organism (SSO; Haplosporidium costale), an oyster disease that reduces growth and causes mortality, which may impact Rhode Island oyster farms. Oysters cultured in Rhode Island that were purchased as seed from a grower in Maine were observed with a 20 percent mortality attributed to SSO. Oyster seed from this grower had been previously used in Rhode Island without any unusual mortality report. More research is needed to understand the disease's origin and mode of transmission.

Response: Rhode Island Sea Grant funded Dr. Roxanna Smolowitz, marine disease expert at Roger William's University, at the request of the Rhode Island Biosafety Committee, to monitor and observe the spread and impact of SSO at those sites where oysters using the Maine seed stock were being grown.

Results: Preliminary results have found SSO at all sites tested, and that the intensity of infection was seasonal. Furthermore, based on patterns of infection, an intermediate host is likely involved but has not been identified due to the complexity and resources needed for accurate identification. Results also found that SSO was already present in Rhode Island waters based on patterns of infection in control groups, and not likely introduced by imported seed from Maine.

RECAP: Researchers, supported with Rhode Island Sea Grant funding, are investigating Seaside Organism, an emerging marine disease impacting oyster farms in Rhode Island that appears to spread through an unknown intermediate host. Back to Goals

19168 - Rhode Island researcher finds scallop waste an attractive fish feed that improves weight gain while reducing waste stream and costs
Relevance: Sea scallops are harvested for their succulent adductor muscles, with the remainder of the organism, the viscera, disposed as waste. The ability to utilize this waste product as a fishmeal replacement, or as a supplementary feed, could reduce the waste stream, remove costs for disposal, and provide added value for scallop harvesters, making them more profitable.

Response: Rhode Island Sea Grant funded research to test the use of sea scallop viscera as a feed product for European sea bass, a highly cultured species that is a major consumer of fishmeal products.

Results: Sea scallop viscera-based feeds were found to outperform traditional fish feed products in terms of improved fish weight gain, improved feed-to-fish conversion ratios, and were found to be more favored by fish as a food source.

RECAP: Rhode Island Sea Grant-funded researchers have found scallop waste products after harvest can serve as a beneficial fishmeal replacement, or supplement, that reduces costs for waste disposal, and overall waste stream, as well as provide added value for scallop harvesters. Back to Goals

18772 - Rhode Island mussel industry may benefit from alterations in existing longline materials to collect seed
Relevance: Mussels are a rapidly growing fresh seafood market product with good economic potential and opportunities. Southern New England mussels reach their peak condition during summer months when product from the largest competitor (Prince Edwards Island) are post-spawn and at their market low point. Current seed supply and grow out procedures, however, are not aligned to take advantage of this window of economic opportunity.

Response: Rhode Island Sea Grant-funded research looked at the production challenges, and deployed an array of longline materials for evaluation of their capacity to recruit settling blue mussels.

Results: Results from field trials found that existing mussel spat collecting technology, mussel rope, performed better than alternates, but that most mussels set in folds, wrinkles, and edges along knots in the rope. Experiments are being conducted to incorporate folds and wrinkles into existing mussel rope to improve spat collection, and if successful, has the potential to improve mussel culture operations.

RECAP: Rhode Island researchers, evaluating production methods to expand the state's mussel harvest, have found potential in manipulating mussel rope to include more folds and wrinkles, which may enhance the material's ability to attract and hold mussel spat. Back to Goals

17913 - Law Fellow Assists Maine Fishermen
RELEVANCE: Maine's fishermen have struggled in recent years with declining groundfish, scallop, shrimp, and lobster stocks accompanied by low dockside prices and increasing costs. To maintain

financial stability, many harvesters are looking to tourism as a way supplement their incomes. There are many legal concerns and barriers, however, with diversifying fishing operations such as licensing, liability and safety, and contracting with partners.

RESPONSE: Maine Sea Grant received funds from the National Sea Grant Law Center to research the legal barriers faced by Maine fishermen interested in the tourism industry, but lacked the legal expertise to perform such research. Rhode Island Sea Grant Legal staff responded to Maine Sea Grant's request for a law fellow by matching a student with experience in fisheries operations and management to provide legal research assistance to this specific topic.

RESULTS: A legal research report was produced analyzing the potential for Maine fishermen to increase their incomes by incorporating tourism into their operations and building partnerships. Nine fact sheets were also produced as a result of this report that are available on Maine Sea Grant's website to help fishermen and aquaculture farmers get started in tourism. These results were also utilized by Maine Sea Grant Extension agents in presentations at the Maine Fishermen's Forum to discuss tourism business opportunities for fishermen.
RECAP: Maine fishermen are struggling to maintain financial integrity through fishing operations alone. Many are now looking into opportunities to diversity their business by incorporating tourism into their fishing operations to gain financial stability. Rhode Island Sea Grant responded to Maine Sea Grant's request for a legal fellow to research the legal barriers fishermen face in diversifying their operations. Research from Sea Grant's Legal Fellow was compiled into a white paper and several fact sheets outlining the legal barriers and potential solutions to help fishermen and aquaculture farmers get started in tourism. Back to Goals

17492 - Building mussel aquaculture in Rhode Island
Relevance: The majority of mussels consumed in the U.S. come front Prince Edward Island, which has reached its biological carrying capacity for mussel production. Rhode Island has an opportunity to gain market share in this fishery with waters of upper Narragansett Bay capable of producing market-size mussels in 12-months. Water quality problems, however, keep this region of the Bay closed to shellfish harvest, and existing state policies regarding the growth and depuration of shellfish taken from closed waters, create an economically unfriendly environment for successful aquaculture efforts.

Response: Sea Grant funded a Law Fellow from the URI Marine Affairs and RWU Law School Joint Degree program to research the legal and policy conditions surrounding the issue of growing and depurating shellfish taken from closed waters in Rhode Island. This research included comparing Rhode Island's policies to other states as well as the guidelines mandated by the federal government and Canada for interstate and international shipping of shellfish.

Results: A white paper has been produced with findings that Rhode Island policy regarding the depuration of shellfish grown in closed waters is based largely on poorly defined assumptions, far exceeds those of other states, and is wildly exaggerated relative to that mandated by federal and international policy and regulation (12 months versus 30-days). The white paper has been reviewed by appropriate state shellfish management agencies, and its findings of fact will be used in a larger, ongoing initiative developing a shellfish management plan for the state, and may help remove a debilitating economic barrier to mussel aquaculture in Rhode Island.
RECAP: Rhode Island has an opportunity to capitalize on the mussel fishery, but state shellfish management regulations currently conflict with economic planning for mussel aquaculture. A Sea Grant Law Fellow found that existing policies are based on poorly defined assumptions and created a white paper detailing Rhode Island's policies regarding shellfish growth in closed waters in comparison to other states and federal guidelines. Findings from this research are being incorporated in the development of the state's new shellfish management plan. Back to Goals

17008 - Soybean Fishmeal Alternatives Enhance Summer Flounder Aquaculture
Relevance: There has been a strong effort in New England to develop groundfish aquaculture as a means to provide a safe, sustainable source of protein to supplement wild harvests in meeting market demands for a growing population. Summer flounder, a highly desirable groundfish in New England, has struggled in aquaculture efforts due to a lack of economical and sustainable feed source coupled with crippling disease outbreaks in culture facilities, which greatly inhibits groundfish aquaculture capacity for summer flounder in the region.

Response: Sea Grant funded Marta Gomez-Chiarri, researcher and professor at the University of Rhode Island, used Rhode Island Sea Grant funding to conduct research on the use of soy protein, a sustainable and economical resource, in fishmeal as an alternative to supplement feed for summer flounder that could encourage aquaculture efforts for this species. Gomez-Chiarri's research will also look into previous findings that indicate soy protein's potential in decreasing disease susceptibility in summer flounder stocks.

Result: Slower growth rates and decreased mortality rates from bacterial disease were observed in summer flounder stock treated with soy-based feed compared to socks fed traditional fishmeal products. These initial findings have promoted continued research on quantifying bacterial resistance and exploring additives to improve growth rates related to soy-based feed, as well as assessing economic benefits of a soy-based alternative.
RECAP: Barriers to aquaculture development, such as expensive feed sources and disease, of summer

flounder have hindered efforts throughout New England to supplement wild harvests of this species to meet consumer demands. University researchers are using Sea Grant funding to investigate soy protein as an alternative supplement in fishmeal to provide a more economical resource, as well as investigate previous research on soy proteins potential to promote disease resistance in summer flounder. Soy protein alternatives have shown to reduce growth rate while decreasing mortality rates in summer flounder stocks compared to traditional feeds. Researchers are continuing investigations on bacteria resistance related to soy protein, as well as assess the economic benefit of such an alternative fishmeal supplement. Back to Goals

15211 - Graduate students engage as Fellows with the Rhode Island Sea Grant College Program.

RELEVANCE: There is a continuing need to provide graduate students the opportunity to engage at a professional level in their field of specialization. These opportunities give students a chance to apply their academic talents in practical ways, to further build both their academic and professional strength, build professional networks, and to simply grow beyond the niche of their area of specialization.
RESPONSE: Sea Grant engages with URI and other academic institutions to provide academic and professional growth opportunities to graduate students through various fellowship programs.
RESULTS: For 2011, Rhode Island Sea Grant sponsored 1 graduate fellow working directly with program management, 15 graduate fellows engaged in extension activities (14 of them as Law Fellows with the RI Sea Grant Legal Program), and 15 graduate fellows engaged in scientific research with Sea Grant funded PIs. Furthermore, RI Sea Grant sponsored 4 candidates as Knauss Policy Fellows for 2011; 2 from the Roger Williams School of Law/URI Marine Affairs Institute Joint Degree Program, 1 from the URI Dept. of Marine Affairs, and 1 from the URI Blue MBA Program. In total for 2011, RI Sea Grant sponsored the engagement of 35 graduate students.
RECAP: A total of 35 graduate students were provided the opportunity to engage in professional activities with Sea Grant funded research, extension, legal program staff, and the Knauss Fellowship program during 2011. Back to Goals

15138 - Law Fellow projects inject legal research findings into the decision-making processes for a broad stakeholder community.

RELEVANCE: There are many legal issues involved in resources management decision-making, yet these often get overlooked or put aside because resource managers and decision-makers don't have the time, the capacity, or the funds to hire an attorney to conduct legal research. The lack of legal research input reduces the effectiveness and perhaps longevity of the decisions made.
RESPONSE: The Rhode Island Sea Grant Legal Program developed a Law Fellows Program that matches law students with hosts needing legal research on a broad variety of issues. In 2010, the Law Fellow Program was greatly expanded and reorganized through the refocusing of the staff attorney position on this program.
RESULTS: 15 Law Fellows worked with the following hosts on the noted projects:
1. Nick Paine developed a document surveying the calculation of natural resource damage from the Deepwater Horizon disaster for the University of Rhode Island (URI) Coastal Resources Center.
2. Sarah Parker and Nels Schnobrich conducted an examination of climate change adaptation strategies in New England for the NOAA Climate & Societal Interactions Program.
3. Colin Lynch provided an examination of Marine Sanctuaries in relation to National Ocean Policy for the National Marine Sanctuaries Foundation.
4. Kaitlyn Sweeney and Brandon Biggs conducted an examination of land-based alternative energy in Rhode Island for the URI Coastal Resources Center.
5. Scott Gunst reviewed tourism, fisheries management and vessel operations in Maine for the Maine Sea Grant College Program.
6. Jenna Algee provided an examination of commercial mooring polices in Newport, RI for the Newport Waterfront Commission.
7. Will Yost provided an examination of federal consistency provisions of the Coastal Zone Management Act (CZMA) and its application in Rhode Island for the Conservation Law Foundation.
8. Zach Pendleton and Chris McNally provided an examination of public access water ways in Warren, RI to the Warren Harbor Commission.
9. Greg Hoffman provided an analysis of potential federal partners to preserve coastal ecosystems in the face of climate change to The Nature Conservancy Rhode Island Chapter.
10. Kristen Bonjour provided an examination of noise ordinances in Newport Harbor to the Newport Waterfront Commission.
11. Tim Blake conducted an analysis of impacts of offshore wind development on commercial fishing for Fishermen's Energy (New Jersey based).
12. Brandon Kopcienski prepared a background document on the Deepwater Horizon disaster for attendees of the Deepwater Horizon Conference hosted at Roger Williams University School of Law.
RECAP: 15 Law Fellows worked on 12 different projects, developing legal research findings for a variety of stakeholder/constituents in need of legal research services. Back to Goals

15137 - Roger Williams University Law Review dedicates an entire issue to the 2010 Marine Law Symposium, 2011 Deepwater Horizon Conference, and other marine affairs topics.

RELEVANCE: Important legal issues were presented and discussed regarding the history and implementation of the Magnuson-Stevens Act and the Deepwater Horizon catastrophe at two events hosted by the Rhode Island Sea Grant (RISG) Legal Program. These dialogues would be useful to a broad community of stakeholders and constituents not able to attend in person. Additionally, other experts in marine law and policy contributed timely pieces on marine spatial planning, coastal property

issues, and other current topics.
RESPONSE: Presenters developed manuscripts of their respective talks and expert commentators were invited to submit pieces, and these were published in the Winter 2012 (Vol. 17, No. 1) issue of the Roger Williams University Law Review.
RESULTS: A comprehensive publication on cutting edge, timely marine affairs issues by experts in the field is now available in print and in online versions for any and all audiences for their use and application.
RECAP: Publications by presenters at the Magnuson-Stevens Act Symposium and Deepwater Horizon Blowout conference, and other invited marine law and policy experts, are published in the Winter 2012 Roger Williams University Law Review. Back to Goals

15109 - A new Intellectual Property Patent application was submitted for approval.
RELEVANCE: Potential marine probiotics are regularly explored with the hopes of finding new mechanisms to control disease in aquaculture facilities without the use of pharmaceutical compounds which can be ecologically harmful.
RESPONSE: Sea Grant funded researchers David Rowley and Marta Gomez-Chiarri have applied for a patent on Intellectual Property: "Probiotic bacteria for marine aquaculture, and compositions thereof," in the spring of 2011. The probiotic improves oyster larval survival in a hatchery setting.
RESULTS: Fate of patent application not yet returned.
RECAP: Sea Grant funded researchers have filed application for a patent on intellectual property regarding marine bacterial probiotics for use in oyster aquaculture. Back to Goals

15093 - The University of Rhode Island Marine Biology Program hosts a "mini-conference" that highlights Sea Grant funded researchers.
RELEVANCE: Undergraduates in the marine sciences are exposed to classroom learning, laboratory exercises, and published research results. Rarely are they exposed to on-the-ground marine research projects where they can learn about project design, hypothesis development and testing, etc., from scientists and graduate students doing the actual work in a real time, real world setting.
RESPONSE: In collaboration with the URI Marine Biology Department, Sea Grant hosted a "mini-conference" that had Sea Grant funded researchers and their graduate students present just started research projects, explaining why the work was important, how it fit into existing knowledge bases, what was hoped to be found out and how that fit into the larger realm of marine science at large. (seagrant.gso.uri.edu/news/miniconference.html)
RESULTS: Attendance at the event was good, largely faculty, while the number of undergraduate students -- the target audience -- was much lower than desired. Hindsight suggests that the scheduled time of the event may have been conflicted, reducing participation. The event will be conducted again in 2012, but will engage undergraduate students in the planning so as to maximize their participation. Faculty turnout was however very good (approximately 60 people) and their response to the event was overwhelmingly positive.
RECAP: In collaboration with the URI Marine Biology Dept., a mini-conference highlighting Sea Grant funded researchers and graduate students was offered. Under participation of the target audience--undergraduate students--was below expectations, although faculty turnout was excellent; adjustments will be made and the event convened again in 2012. Back to Goals

15091 - Sea Grant Annual Community Lecture series attracts over 250 participants.
RELEVANCE: Improved understanding generally is considered to lead to improved decision making capacity, and understanding comes from education, both formal and informal. As such, there is a continuing need for education at various levels of knowledge about marine sciences and coastal and marine related issues.
RESPONSE: Sea Grant offers a Community Lecture Series targeted at general audiences/the public, and that address a broad variety of topical areas.
RESULTS: Over 250 participants attended a series of 6 lectures, the highlights of which were a seafood cooking demonstration with a noted local chef Normand Leclair, and a presentation of genetically modified salmon by Elliot Entis from Aqua Bounty.
RECAP: A Community Lecture Series program drew over 250 attendees to 6 events, with highlights being a seafood cooking demonstration and a talk on genetically modified salmon. Back to Goals

15082 - The 2011 Ronald C. Baird Sea Grant Science Symposium--"Developing the Rhode Island Seafood Knowledge Economy: Perspectives on Seafood Sustainability"was hosted in June 2011 at Johnson & Wales University.
RELEVANCE: Chefs, and their staff, deal directly and intimately with consumers on a daily basis, and are ideal conduits for dissemination of information on sustainable seafood. They often don't however, fully understand the meaning of sustainability or the science behind determining sustainability from a stock assessment/population biology perspective.
RESPONSE: Sea Grant, in partnership with Johnson & Wales University, developed the 2011 Ronald C. Baird Sea Grant Science Symposium around the theme of sustainable seafood -- "Ocean to Plate," targeted at engaging scientists, chefs and seafood processors/wholesalers in a dialog together about sustainability from their various unique perspectives.
RESULTS: Presentations on stock assessment, seafood wholesale and distribution, and food preparation for restaurant patrons were given. All participants engaged in the processing of whole fish into restaurant grade products, then cooked and served them (under the direction of JWU chefs and students) for consumption. Video taping was done so that follow up materials could be produced for future use (http://www.youtube.com/user/RISeaGrant --- "Celebrating Sustainable Seafood").

Participants acknowledged a new appreciation for the total value chain of seafood products from ocean origins--wild and cultured/ranched--to plate in a restaurant setting; all participants claimed a better understanding of the needs of other sectors in the ocean to plate chain, and that they would consider changes in their sector that would help improve efficiency and/or safety and/or value at other levels of the ocean to plate chain. The "Rhode Island Business Quarterly" magazine (circulation 30,000) published a feature article on the symposium (www.bluetoad.com/publication/?i=84377). Further partnership endeavors between Rhode Island Sea Grant and Johnson & Wales University were discussed and follow up has occurred, with discussion of a similar event for 2012.
RECAP: Johnson & Wales University and Rhode Island Sea Grant hosted the 2011 Baird Science Symposium with a focus on the integration of scientists, seafood processors/wholesalers, and chefs. Outcomes were improved understanding of the total value chain for seafood products from ocean habitation to plate out in a restaurant setting, and how the value chain could be improved to the benefit of multiple parties. Back to Goals

15045 - Adoption fo the Ocean Special Area Management Plan (SAMP) adoption spins off new implementation initiatives.
RELEVANCE: Moving from the planning to the implementation phase of a project requires new efforts to develop the proper fiscal and regulatory landscape to apply adopted policies in an efficient and effective manner.
RESPONSE: Sea Grant extension agents are collaborating in, and leading multiple efforts aimed at, implementation of the Ocean SAMP that will allow for and promote renewable energy development in Rhode Island coastal waters.
RESULTS: The Rhode Island Renewable Energy Siting Partnership (RESP) is building off Ocean SAMP efforts by developing the guidance for the siting of land-based renewable energy facilities. Learnings from the Ocean SAMP process are being applied so that a coordinated, state wide strategy is developed for renewable energy development. Also, the University of Rhode Island is fostering the development of a Center of Excellence for Ocean Spatial Planning and Renewable Energy (OSPRE) that would focus on multi-disciplinary research in the area of marine spatial planning. This center would work to fill knowledge gaps and to explore new mechanisms and strategies for ocean planning, building upon the strong foundation for marine spatial planning created during the Ocean SAMP process. The 11th Annual Ronald C. Baird Sea Grant Science Symposium will host international leaders in marine spatial planning to share lessons learned and application to Rhode Island. This symposium will foster improved understanding of current state of the art marine spatial planning techniques at a global scale, and will promote cross fertilization of new ideas.
RECAP: Momentum gained during the Ocean SAMP process is being harnessed to foster new initiatives focused on land-based renewable energy facilities siting, multi-disciplinary research in marine spatial planning, and on international lessons learned during marine spatial planning efforts and their application to Rhode Island and the US. Back to Goals

15030 - Commercial fishermen engage in cooperative research of bycatch gear technologies.
RELEVANCE: Bycatch is a major regulatory issue with significant economic impacts to fishermen. There is a need for research that leads to development of gear that reduces or eliminates bycatch. Fishermen have the gear knowledge and experience, but not the scientific background needed to document and statistically support findings that can successfully move finding into the regulatory arena.
RESPONSE: Sea Grant Fisheries extension agents have engaged with commercial fishermen in the trawl industry to develop, field test, and document gear modifications that reduce or eliminate bycatch of target species.
RESULTS: Four gear studies have been conducted: two studies in the squid fishery -- one using escape panels in the mesh to reduce scup and butterfish bycatch, one using a drop chain to reduce flounder bycatch; one study in the summer flounder fishery evaluating a topless trawl; one study in the summer flounder fishery evaluating Turtle Exclusion Devices. Results are currently undergoing analysis for further consideration and possible application into management and regulation.
RECAP: Four studies on bycatch reduction of scup, butterfish, summer flounder and marine turtles have been completed in collaboration with commercial fishermen. Results are being analyzed for further consideration and possible application to management. Back to Goals

15029 - 110 Rhode Island lobstermen have enrolled in the USDA Trade Adjustment Assistance Program.
RELEVANCE: Commercial fishermen know the field end of their trade extraordinarily well, but in a rapidly changing economic and regulatory environment, field knowledge is not enough to maintain economic viability over the long-term. To account for this, fishermen need a well thought out business plan, but generally do not have the time to attend traditional classes to learn how to develop one, and/or don't have the additional monetary resources to hire consultants to do a business plan for them.
RESPONSE: Sea Grant Fisheries extension agents, in collaboration with the Rhode Island Commercial Lobsterman's Association, developed a petition to the USDA under the Trade Adjustment Assistance (TAA) program.
RESULTS: A total of 110 Rhode Island lobstermen enrolled in the program and are now, through a combination of face-to-face workshops and online resources, developing business plans. Marketing and branding workshops are also being provided to help fishermen better find niche markets. To date 77 have completed initial business plans and 21 have completed the program by developing long-term business plans. These plans will help the long-term economic viability of the Rhode Island lobster

industry.
RECAP: Assisting lobstermen to engage in the USDA Trade Adjustment Assistance program has encouraged 120 into the program, with 77 completing initial business plans and 21 completing long-term business plans that will assist in improving their long-term economic stability. Back to Goals

15028 - A new benefits and risks of seafood consumption website was launched.
RELEVANCE: There is a constant need for unbiased, up-to-date, and correct information and guidance on the health benefits, and the risks, associated with eating seafood.
RESPONSE: Sea Grant food nutritionist Lori Pivarnik, in cooperation with the USDA, Oregon State University, Cornell University, Univ. Rhode Island, Florida State Univ., and Univ. California - Davis, made public a new website focused on the benefits and risks of eating seafood and seafood products (www.seafoodhealthfacts.org).
RESULTS: Over 2200 visitors viewed more than 6900 pages of information in the first 3 months that the website was online (launched late September 2011).
RECAP: A new website provides up-to-date, unbiased information the health benefits and risks associated with consumption of seafood and seafood products, and is being readily used by web patrons. Back to Goals

14169 - Rhode Island Sea Grant Provides Research Support for New Collaborative Fisheries Research
RELEVANCE: The RI Commercial Fisheries Research Foundation, a relatively new non-profit organization dedicated to promoting collaborative research between fishermen and scientists that enhances fisheries management, had funds to put into research, but lacked the experience and confidence to undertake a transparent, unbiased Request for Proposals.
RESPONSE: Rhode Island Sea Grant conducted a rigorous review process that was tailored to incorporate applicability of research outputs to the fisheries management community, and that required collaboration between research scientists and commercial fishermen actively engaged in the industry.
RESULTS: The process worked very well and was adopted by the foundation as their model for future RFP activities. Furthermore, the Final Review Panel convened varied from the RISG model in that a "relevancy team", comprised of representatives from the commercial fishing industry, sat in on scientific deliberations and provided input to the grant awarding/decision-making process with regard to the applicability and importance of the proposed research the commercial fishing industry. RISG has since added a relevancy team (comprised of state agency resource managers) to its final review panel deliberations, finding that it improves the decision-making process on research funding awards.

RECAP: RI Sea Grant conducted for the RI Commercial Fisheries Research Foundation and requested to assist them in the process of selecting research proposals for funding in a collaborative fisheries research initiative. Back to Goals

13879 - Partnership with the URI Marine Biology program offers lectures about the Gulf Coast oil spill event that improves understanding of the event and impacts
RELEVANCE: The Deepwater Horizon oil spill in the Gulf of Mexico spurred a massive amount of debate and concern, but the facts, figures and information coming out the region was both enormous and enormously confusing.
RESPONSE: In order to bring more clarity and understanding of the event, its impacts on the Gulf ecosystem, and what was being done to track, monitor and mitigate the spill, Sea Grant Communications and the URI Marine Biology Dept. hosted lectures given by URI researchers and oil spill modelers who had been/were on the front lines of the response.
RESULTS: Between 80 and 150 students, faculty, and general public attended each event, leaving with a deeper understanding of the oil spill event, what was being done to mitigate impacts, and what impacts were likely based on actual research and the application of oil spill modeling outputs.

RECAP: To untangle and clarify information/misinformation about the Deepwater Horizon spill, Sea Grant and the URI Marine Biology Dept. hosted lectures by URI researchers who had been in the Gulf as part of the research and response team. Back to Goals

13866 - Shellfish Handling Workshops Stopped New FDA Post-Harvest Regulations
RELEVANCE: Handling and processing of live shellfish product requires safe handling techniques so that product delivered to consumers is of high quality and is safe for consumption upon purchase. The FDA monitors and regulates seafood processing for health and safety purposes, and was considering the development of new post-harvest regulations for the shellfish growing industry.
RESPONSE: Sea Grant funding was provided to the East Coast Shellfish Growers Association to develop workshops and materials to provide to shellfish growers so they had the most up to date, proper understanding of safe post-harvest shellfish handling.
RESULTS: 28,000 instructional DVD were provided to shellfish handlers and growers, and 15 workshops were convened, and attended by 2,700 growers/handlers. The FDA halted development of new post-harvest regulations as a result of these training sessions that satisfied education needs in proper techniques in the shellfish growing/handling.

RECAP: Development of instructional materials for the safe post-harvest handling of shellfish product, provided to the industry via instructional DVDs and face-to-face workshops, updated industry knowledge on safe handling techniques. The trainings were viewed favorably by the FDA, which halted

the development of new post-harvest regulations that it had intended on imposing on the seafood industry. Back to Goals

13865 - Algae for Food:Turning a Pest into a Product
RELEVANCE: Oyster aquaculture is a growing economic sector of Rhode Island's seafood industry, and is rapidly becoming a profitable niche market for both growers and restaurateurs. One limitation in the culture process is the accumulation of algae on oysters, interfering with shell growth. This not only harms oyster growth, it adds expense in removing the algae prior to bringing the oysters to market, and subsequently limiting oyster aquaculture efforts in the state. A local oyster grower wanted to attempt a multi-trophic approach on his farm by integrating a major nuisance alga, Gracilaria, into the growing process. Gracilaria is an edible seaweed and the grower wanted to set up a pilot project to determine if it were feasible to turn the nuisance algae into a harvestable crop for the consumption market, thereby taking a farm cost and turning it into an economic asset.
RESPONSE: Sea Grant funded, in collaboration with Univ. of Connecticut researcher Charles Yarish, a pilot project at the oyster farm to test a multi-trophic aquaculture project that incorporated Gracilaria.
RESULTS: The oyster grower and researcher developed protocols for integrating the growth of Gracilaria into ongoing oyster aquaculture processes, and the algae is now an integrated part of a multi-trophic aquaculture system. Proof of concept has been achieved, showing that it is possible to incorporate the nuisance algae into the growing system in a way that leads to a harvestable product for the consumer market, and then integrating the proven concept into an existing aquaculture/oyster farm. The grower (Perry Raso, Matunuck Oyster Farm & Restaurant) is currently collaborating with URI researchers performing the nutritional assays and developing processing techniques (see Impact ID 13876) that meet RI Board of Health/US FDA standards to bring Graciliaria into his restaurant business as well as into the general marketplace.

RECAP: The development of a multi-trophic approach to oyster-algae aquaculture has shown that on-farm nuisance algae can be incorporated into the growing process and have the potential to enter the market for human consumption. Creation of this value added product could lead to improved economic stability of oyster farming in Rhode Island waters Back to Goals

7016 - The National Seafood HACCP Alliance Training Curriculum is revised to better reflect current needs of the seafood industry.
RELEVANCE: Seafood safety technologies and methodologies for handling, storage and shipping change over time, as do the preferences and perceptions of consumers, how information is transferred, and how best to reach target audiences. Seafood handlers felt that existing HACCP training materials needed updating to better meet the needs of the industry.
RESPONSE: A needs assessment was conducted by Sea Grant (Connecticut & Rhode Island programs in collaboration) to better define the needs of seafood handlers, and the findings of the research was compared to existing HACCP training materials and methods to determine how best to serve this stakeholder group.
RESULTS: The National Seafood HACCP Alliance Training Curriculum has revised based on the current and perceived future needs of seafood handlers and the industry at large. The newly revised curriculum and training materials will promote improved seafood safety throughout product handling chains, resulting in safer seafood products delivered to consumers.

RECAP: National HACCP training curriculum materials have been revised, in response to needs expressed by industry members, to better reflect currents needs of the seafood processing industry, and to promote improved seafood safety at the consumer level. Back to Goals

6405 - New Medicine May Aid Oyster Hatcheries
RELEVANCE: Oyster aquaculture has various risks associated with the growing process, particularly during juvenile growth phases in the hatchery when disease outbreak can cause loss of an entire annual crop, severely hampering the economic viability of the grower, more so for startup operations that have little accumulated capital from previous crops to fall back upon.
RESPONSE: Sea Grant funded research to investigate the probiotic potential of the microfauna associated with juvenile oysters. Initial findings have identified two candidates for in vivo testing, and further development as appropriate.
RESULTS: The development of new probiotic/antibiotic products for commercial application in the aquaculture industry is expected, with possible implications into the human health field.
RECAP: Several candidate microbes have been identified for possible development as a probiotic with application to the hatchery culture of oysters. Commercial application to the aquaculture industry is expected, with possible application in the field of human health. Back to Goals

6387 - Marine Law Symposium Analyzes Impacts of Magnuson-Stevens Act on Fisheries
RELEVANCE: Since passage in 1975, the Magnuson-Stevens Act has been the basis of one of the most compelling natural resource management issues of our time: the sustainable management of our nation's fisheries. The law has been amended several times and the subject of contentious debate and litigation in response to rapidly evolving information and policy objectives.
RESPONSE: The Rhode Island Sea Grant Legal Program and Roger Williams University Marine Affairs Institute convened the Marine Law Symposium to examine the current and future state of this body of law as a resource management scheme, including the complex integration of scientific, economic, and social information.
RESULTS: Nearly 150 practitioners in fishery management law, scholars, students and marine policy

stakeholders participated in the two-day symposium discussing the state of the law and possible future trends.

RECAP: The Marine Affairs Institute focused its biennial Marine Law Symposium on the state of the U.S. fisheries management law, to better inform changes in law and management going forward.

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Program Performance Measures (2010 - 2013)

Program Performance Measure	Program Plan Target (2010-2013)	Reported	Program Comments
Economic (market and non-market) benefits ($) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.	170,000,000	270,250,000	2011 - preservation of the $100 million commercial and recreational fisheries via sectors and other management engagements 2012 - currently unable to calculate/quantify a true figure with surety and so are under reporting a value as we cannot verify full value.
Jobs retained from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery.	1,700	2,700	2011 - Estimated via actions in resolving and/or mitigating bycatch issues / sector management issues (fluke) and via Lobster TAA efforts 2012 - estimated based users of mid-sized Ruhle trawls recently allowed to mitigate bycatch in groundfish fisheries.
Number of fishermen associations who adopt and implement responsible harvesting and processing techniques and practices.	5	15	2011 - RI Comm. Fish. Res. Foundation, RI Lobstermen's Assoc., RI Saltwater Anglers Assoc., RI Comm. Fisherimen's Assoc., RI Shellfishermen's Assocl. 2012 - increased due to efforts in Shellfish Management Planning
Number of fishermen, resource managers and seafood businesses (harvesters, aquaculturists, processors and recreational fishermen) who adopt	112	356	2011 - 119 HACCP + 2 via Law Fellow findings

and implement responsible harvesting and processing techniques and practices.			2012 - increased because of new Shellfish Management Planning initiative
Number of fishery management agencies who adopt and implement responsible harvesting and processing techniques and practices.	3	8	2011 - North Atlantic Mar. Fish. Cncl., RI Dept. Env. Managment Marine Fisheries, RI Coastal Resource Council Division of Aquaculture
Number of producers, distributors and consumers of seafood who modify their practices using knowledge gained in fishery sustainability, seafood safety and the health benefits of seafood.	6	292	2011 - 119 HACCP + 2 Law Fellow projects + 50% Baird attendees + 10% modified salmon attendees 2012 - increased due to initiative with chefs at Johnson & Wales Culinary Institute. We cannot currently assess consumer aspects with any surety.

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Program Objectives (2010 - 2013)

Program Objective	Achieved (yes/no)	Program Comments
By 2010 conduct 2 Hazard Analysis and Critical Control Point (HACCP) trainings and develop a new curriculum with the HACCP Alliance to be used for future trainings.Trainings are conducted on an annual basis and new curriculum should be completed in 2011.	Yes	2011 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders. 2012 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders. 2013 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders.
By 2010, test one adaptive management approach using sector allocation on summer flounder in Rhode Island.	Yes	2011 - For 2011----a pilot fluke sector management process was implemented and trialed. After completion, RISG in collaboration with URI hosted a workshop to review outcomes, after which the RIDEM Director developed a memorandum stating no sector programs for the fluke fishery would be implemented for at least 1 year and/or until further study was conducted to clarify significant issues. 2012 - For 2011----a pilot fluke sector management process was implemented and trialed. After completion, RISG in collaboration with URI hosted a workshop to review outcomes, after which the RIDEM Director developed a memorandum stating no sector programs for the fluke fishery would be implemented for at least 1 year and/or until further study was conducted to clarify significant issues. 2013 - For 2011----a pilot fluke sector management process was implemented and trialed. After completion, RISG in collaboration with URI hosted a workshop to review

		outcomes, after which the RIDEM Director developed a memorandum stating no sector programs for the fluke fishery would be implemented for at least 1 year and/or until further study was conducted to clarify significant issues.
By 2010, 1 Sea Grant Collaborative will develop fisheries management synthesis products for use by RI fishermen and resource managers.	No	2010 - Suitable collaborative research to accomplish this was not selected for funding in the 2010-2012 omnibus period, so this objective has been removed/cannot be achieved. 2011 - Suitable collaborative research to accomplish this was not selected for funding in the 2010-2012 omnibus period, so this objective has been removed/cannot be achieved. 2012 - Suitable collaborative research to accomplish this was not selected for funding in the 2010-2012 omnibus period, so this objective has been removed/cannot be achieved. 2013 - Suitable collaborative research to accomplish this was not selected for funding in the 2010-2012 omnibus period, so this objective has been removed/cannot be achieved.
By 2010, a sustainable seafood website explains and compares "fish watch cards," and offers a searchable database of reference materials and research related to sustainable seafood.	Yes	2010 - URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html 2011 - For 2011----URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html. However, PI (Roheim) has left URI and so status of this website is currently unclear, though it is still online but not updated regularly. 2012 - For 2011----URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html. However, PI (Roheim) has left URI and so status of this website is currently unclear, though it is still online but not updated regularly. 2013 - For 2011----URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html. However, PI (Roheim) has left URI and so status of this website is currently unclear, though it is still online but not updated regularly.
By 2010, assist in the creation of 2 new fishermen led organizations for fisheries research and management.	Yes	2011 - The RI Commercial Fisheries Research Foundation and the RI Fisheries Center were created and are now functioning to assist stakeholders in their respective realms of influence. 2012 - The RI Commercial Fisheries Research Foundation and the RI Fisheries Center were created and are now functioning to assist stakeholders in their respective realms of influence. 2013 - The RI Commercial Fisheries Research Foundation and the RI Fisheries Center were created and are now functioning to assist stakeholders in their respective realms of influence.
By 2010, conduct 2 Hazard Analysis and Critical Control Point (HACCP) trainings and develop a new curriculum with the HACCP Alliance to be used for future trainings. Trainings are conducted on an annual basis and new curriculum should be completed in 2011.	Yes	2011 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders. 2012 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders. 2013 - For 2011----More than 12 HACCP trainings have taken place, a cirriculum has been developed and accepted for implementation, and 8 Train the Trainer sessions have been conducted for HACCP leaders.
By 2010, conduct a needs assessment survey on risks and benefits of seafood consumption and seafood health benefits to healthcare providers	No	2010 - Lead PI (Santerre/Perdue) was on sabbatical and start of project was delayed. Objectives to be met but with 12 month delay on timeline. 2011 - Lead PI (Santerre/Perdue) was on sabbatical and start of project was delayed. Objectives to be met but with 12 month delay on timeline. For 2011---project still not started during 2011 or early 2012 and PI unresponsive to

and practitioners.		start on project. Status unclear and not in our control. 2012 - For 2012---RISG lead staffer left for another position outside of Sea Grant and without capacity to engage we pulled out of this project before it got started with the PI back from sabbatical. Lead PI (Santerre/Perdue) was on sabbatical and start of project was delayed. Objectives to be met but with 12 month delay on timeline. For 2011---project still not started during 2011 or early 2012 and PI unresponsive to start on project. Status unclear and not in our control. 2013 - For 2012---RISG lead staffer left for another position outside of Sea Grant and without capacity to engage we pulled out of this project before it got started with the PI back from sabbatical. Lead PI (Santerre/Perdue) was on sabbatical and start of project was delayed. Objectives to be met but with 12 month delay on timeline. For 2011---project still not started during 2011 or early 2012 and PI unresponsive to start on project. Status unclear and not in our control.
By 2010, develop the criteria for use of high pressure processing in seafood, and have them adopted for use by seafood processors and USDA.	No	2011 - For 2011---target was dependent upon external funds and engagement of industry leader, neither of which happened in the target time frame. 2012 - For 2011---target was dependent upon external funds and engagement of industry leader, neither of which happened in the target time frame. 2013 - For 2011---target was dependent upon external funds and engagement of industry leader, neither of which happened in the target time frame.
By 2010, educate 40 undergraduate and 2 graduate students in sustainable fishing methods.	Yes	2011 - For 2011---2 classes taught at undergraduate level and more than 2 graduate students engaged in either fisheries research and/or extension activities. 2012 - For 2011---2 classes taught at undergraduate level and more than 2 graduate students engaged in either fisheries research and/or extension activities. 2013 - For 2011---2 classes taught at undergraduate level and more than 2 graduate students engaged in either fisheries research and/or extension activities.
By 2010, have 3 new gear types adopted for use in US and international fisheries.	Yes	2010 - Eliminator trawl and various adaptations of this are being developed and employed locally and abroad. 2011 - For 2011----Eliminator trawl and various adaptations (mini- and midi-Eliminators) of this are being developed and employed locally and abroad. Other gear modifications for the fluke and flounder fisheries, and for the squid fishery, are under review. 2012 - For 2011----Eliminator trawl and various adaptations (mini- and midi-Eliminators) of this are being developed and employed locally and abroad. Other gear modifications for the fluke and flounder fisheries, and for the squid fishery, are under review. 2013 - For 2011----Eliminator trawl and various adaptations (mini- and midi-Eliminators) of this are being developed and employed locally and abroad. Other gear modifications for the fluke and flounder fisheries, and for the squid fishery, are under review.
By 2010, have 4 collaborative research projects underway---1 focused on fisheries management; 3 focused on new gear technology	No	2010 - Collaborative research project not funded in 2010-2012 RfP 2 collaborative projects funded externally, not 3 as anticipated. 2011 - For 2011----Collaborative research project not funded in 2010-2012 RfP 2 collaborative projects funded externally, not 3 as anticipated. 2012 - For 2011----Collaborative research project not funded in 2010-2012 RfP 2 collaborative projects funded externally, not 3 as anticipated. 2013 - For 2011----Collaborative research project not funded in 2010-2012 RfP 2 collaborative projects funded externally, not 3 as

		anticipated.
By 2010, provide 5,000 "Fish Health Cards" to doctor and medical health practitioner offices to inform pregnant women on healthy fish consumption.	Yes	2010 - In collaboration with Perdue Univ. / USDA 2011 - For 2011----In collaboration with Perdue Univ. / USDA cards delivered to a broad number of locations via health centers, clinics, and private practice offices. Card was reprinted and distributed further in 2011/2012. 2012 - For 2011----In collaboration with Perdue Univ. / USDA cards delivered to a broad number of locations via health centers, clinics, and private practice offices. Card was reprinted and distributed further in 2011/2012. 2013 - For 2011----In collaboration with Perdue Univ. / USDA cards delivered to a broad number of locations via health centers, clinics, and private practice offices. Card was reprinted and distributed further in 2011/2012.
By 2010, the 2009 Sea Grant Science Symposium on the Integration of Renewable Energy and Aquaculture will be convened, allowing 250 planners and resource managers access to new ecosystem-based management approaches.	Yes	2011 - For 2011---Convened in Newport, RI during November 2009 with nearly 300 attendees. 2012 - For 2011---Convened in Newport, RI during November 2009 with nearly 300 attendees. 2013 - For 2011---Convened in Newport, RI during November 2009 with nearly 300 attendees.
By 2010, train 20 New England area fishermen on the use of whale friendly gear.	Yes	2011 - Completed workshops held and more than 30 fishermen were trained. 2012 - Completed workshops held and more than 30 fishermen were trained. 2013 - Completed workshops held and more than 30 fishermen were trained.
By 2011 new information on use of comanagement as a fisheries management tool will be available for use by fishermen and fisheries managers.	Yes	2010 - Uchida research project R/OF-0810-2-31 2011 - For 2011----Uchida research project R/OF-0810-2-31 manuscripts are in review and information used to inform fluke sector pilot project. 2012 - For 2011----Uchida research project R/OF-0810-2-31 manuscripts are in review and information used to inform fluke sector pilot project. 2013 - For 2011----Uchida research project R/OF-0810-2-31 manuscripts are in review and information used to inform fluke sector pilot project.
By 2011, a RISG/Johnson & Wales Fellow of the Culinary Arts is working through the Sea Grant Sustainable Seafood Initiative and with the seafood industry to improve integration of sustainable seafoods into the restaurant trade.	Yes	2010 - The 2011 Baird Symposium was in partnership with Johnson & Wales Univ., and next steps are being assessed during late 2011, and possible fellowships is under discussion, but not assured. 2011 - For 2010----The 2011 Baird Symposium was in partnership with Johnson & Wales Univ., and next steps are being assessed during late 2011, and possible fellowships is under discussion, but not assured. For 2011, a second symposium, on a smaller scale and more targeted at the restaurant chef audience, is being planned to take place in late 2012. 2012 - For 2012---Sea Grant staff present at a "Chef's Seminar" each semester about sustainable seafood, what it means, what certification means, how it is used, etc. Chef's have a dialog with Sea Grant staff about integrating sustainable seafoods into their kitchens and market practices. For 2011, a second symposium, on a smaller scale and more targeted at the restaurant chef audience, is being planned to take place in late 2012. For 2010----The 2011 Baird Symposium was in partnership with Johnson & Wales Univ., and next steps are being assessed during late 2011, and possible fellowships is under discussion, but not

		assured. 2013 - For 2012---Sea Grant staff present at a "Chef's Seminar" each semester about sustainable seafood, what it means, what certification means, how it is used, etc. Chef's have a dialog with Sea Grant staff about integrating sustainable seafoods into their kitchens and market practices. For 2011, a second symposium, on a smaller scale and more targeted at the restaurant chef audience, is being planned to take place in late 2012. For 2010----The 2011 Baird Symposium was in partnership with Johnson & Wales Univ., and next steps are being assessed during late 2011, and possible fellowships is under discussion, but not assured.
By 2011, a working group on renewable energy and aquaculture will engage local leaders in developing guidance for integrated economic and ecological development of energy and food production at offshore renewable energy sites.	No	2010 - Such a working group was not an outcome of the Baird Symposium as was anticipated the group decided the time and economy were not suitable for such a group to effectively meet. 2011 - For 2011---Such a working group was not an outcome of the Baird Symposium as was anticipated the group decided the time and economy were not suitable for such a group to effectively meet. 2012 - For 2011---Such a working group was not an outcome of the Baird Symposium as was anticipated the group decided the time and economy were not suitable for such a group to effectively meet. 2013 - For 2011---Such a working group was not an outcome of the Baird Symposium as was anticipated the group decided the time and economy were not suitable for such a group to effectively meet.
By 2011, assess the validity of the use of RAMP (reflex action mortality predictor) techniques for summer flounder, and provide outcomes to fisheries managers (i.e. ASMFC, MAFMC)	Yes	2010 - Terry Bradley research project R/OF-0810-1-33 2011 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication. 2012 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication. 2013 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication.
By 2011, develop a one survey methodology to improve scup stock assessment, and provide it to fisheries managers (i.e. MAFMC)	Yes	2011 - For 2011---Scup survey funded and completed. Results are being analyzed and will be provided to resource managers in late 2012 or early 2013. 2012 - For 2011---Scup survey funded and completed. Results are being analyzed and will be provided to resource managers in late 2012 or early 2013. 2013 - For 2011---Scup survey funded and completed. Results are being analyzed and will be provided to resource managers in late 2012 or early 2013.
By 2011, new information on the economic and social role of women in the fishing industry will be available for use by regulators and resource managers, as well as by the fishing industry.	Yes	2010 - Karp research project R/OF-0810-32 2011 - For 2011----Karp research project R/OF-0810-32 was funded. Publications are now in progress, and multiple workshops have been conducted with both the industry and fisheries managers. 2012 - For 2011----Karp research project R/OF-0810-32 was funded. Publications are now in progress, and multiple workshops have been conducted with both the industry and fisheries managers. 2013 - For 2011----Karp research project R/OF-0810-32 was funded. Publications are now in progress, and multiple workshops have been conducted with both the industry and fisheries managers.
By 2011, new methodology for estimating summer flounder discard mortality will be	Yes	2010 - Bradley research project R/OF-0810-1-33 2011 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication.

available for use by fishermen and resource managers.		2012 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication. 2013 - For 2011---Terry Bradley research project R/OF-0810-1-33 was funded. RAMP technique proved useful and is undergoing field testing. Preliminary results were featured in a "News from Rhode Island Sea Grant" publication.
By 2011, new methodology for utilizing squid processing wastes as organic fertilizers will be available to fishermen and processors, allowing for increased profitability while reducing the seafood processing waste stream.	Yes	2010 - Lee research project R/OF-0810-53 2011 - For 2011----Lee research project R/OF-0810-53 funded and initial results show good potential as a home fertilizer slight odor problems after rain are being studied. Outcomes of this research were highlighted in a "News from Rhode Island Sea Grant" publication. 2012 - For 2011----Lee research project R/OF-0810-53 funded and initial results show good potential as a home fertilizer slight odor problems after rain are being studied. Outcomes of this research were highlighted in a "News from Rhode Island Sea Grant" publication. 2013 - For 2011----Lee research project R/OF-0810-53 funded and initial results show good potential as a home fertilizer slight odor problems after rain are being studied. Outcomes of this research were highlighted in a "News from Rhode Island Sea Grant" publication.
By 2012 collect information on lobster and lobster management in RI using the local ecological knowledge (LEK) techniques for improving stock assessments .	Yes	2011 - For 2011---Information from interviews and focus groups have been provided to state fisheries management personnel for review and consideration. 2012 - For 2011---Information from interviews and focus groups have been provided to state fisheries management personnel for review and consideration. 2013 - For 2011---Information from interviews and focus groups have been provided to state fisheries management personnel for review and consideration.
By 2012 create a research synthesis document for lobster shell disease that will be used by resource managers to better understand disease characteristics, and to devise management strategies to mitigate impacts.	Yes	2010 - 2010 Baird symposium outcomes (http://seagrant.gso.uri.edu/baird/2010_diseases.html) being used to develop this. 2011 - For 2011---2010 Baird symposium outcomes (http://seagrant.gso.uri.edu/baird/2010_diseases.html) being used to develop this. A website is available for users to download data, publications, breaking news, etc. A special issue of the Journal of Shellfish Research will be printed in 2012 as Vol. 3, No. 2. 2012 - For 2011---2010 Baird symposium outcomes (http://seagrant.gso.uri.edu/baird/2010_diseases.html) being used to develop this. A website is available for users to download data, publications, breaking news, etc. A special issue of the Journal of Shellfish Research will be printed in 2012 as Vol. 3, No. 2. 2013 - For 2011---2010 Baird symposium outcomes (http://seagrant.gso.uri.edu/baird/2010_diseases.html) being used to develop this. A website is available for users to download data, publications, breaking news, etc. A special issue of the Journal of Shellfish Research will be printed in 2012 as Vol. 3, No. 2.
By 2012 create synthesis documents for regional fisheries gear research funded over the past thirty years by various funding agencies, and make findings available to resource managers to improve understanding and guide management	No	2010 - Changed from "create synthesis" to "update and revamp the fisheries gear database and make the database accessible...." 2011 - For 2011---This effort dropped since NSGO FEE was stopped and therefore funds to conduct this program element were not available. However, limited external funds and student assistance is seeing this effort move forward, but very slowly. For 2010---Changed from "create synthesis" to "update and revamp the fisheries gear database and make the database accessible...." 2012 - For 2011---This effort dropped since NSGO FEE was

decisions.		stopped and therefore funds to conduct this program element were not available. However, limited external funds and student assistance is seeing this effort move forward, but very slowly. For 2010---Changed from "create synthesis" to "update and revamp the fisheries gear database and make the database accessible...." 2013 - For 2011---This effort dropped since NSGO FEE was stopped and therefore funds to conduct this program element were not available. However, limited external funds and student assistance is seeing this effort move forward, but very slowly. For 2010---Changed from "create synthesis" to "update and revamp the fisheries gear database and make the database accessible...."
By 2012 develop local knowledge with floating fish trap industry including fish behavior in association with fish traps.	Yes	2011 - For 2011----Underwater video and photographic imaging materials (limited) have been developed along with fishermen interview materials to develop an anecdotal summary of fish behaviors. 2012 - For 2011----Underwater video and photographic imaging materials (limited) have been developed along with fishermen interview materials to develop an anecdotal summary of fish behaviors. 2013 - For 2011----Underwater video and photographic imaging materials (limited) have been developed along with fishermen interview materials to develop an anecdotal summary of fish behaviors.
By 2012 information will be used to develop outreach information â€" paper, brochure, website â€" for the target audiences including healthcare practitioners and their patients. Co-organize conference involving researchers, government, and representative from consumer groups to develop the best positive message on seafood benefits and risks.	Yes	2010 - URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html Fish Watch card developed in collaboration w/Perdue Univ (Santerre) and distributed to RI Hospital and Dr. offices Baird 2011 Symposium focus on Sustainable Seafood 3 RI News cards distributed, etc. 2011 - For 2011---While this target was achieved, PI Roheim left URI and so the long term status of the website and other materials is currently under discussion. URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html Fish Watch card developed in collaboration w/Perdue Univ (Santerre) and distributed to RI Hospital and Dr. offices Baird 2011 Symposium focus on Sustainable Seafood 3 RI News cards distributed, etc. 2012 - For 2011---While this target was achieved, PI Roheim left URI and so the long term status of the website and other materials is currently under discussion. URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html Fish Watch card developed in collaboration w/Perdue Univ (Santerre) and distributed to RI Hospital and Dr. offices Baird 2011 Symposium focus on Sustainable Seafood 3 RI News cards distributed, etc. 2013 - For 2011---While this target was achieved, PI Roheim left URI and so the long term status of the website and other materials is currently under discussion. URI Sustainable Seafood Website http://seagrant.gso.uri.edu/sustainable_seafood/index.html Fish Watch card developed in collaboration w/Perdue Univ (Santerre) and distributed to RI Hospital and Dr. offices Baird 2011 Symposium focus on Sustainable Seafood 3 RI News cards distributed, etc.
By 2012, 4 Law Fellow projects and 2 workshop/symposia events supporting sustainable fisheries management will be convened on topics of interest to stakeholders.	Yes	2010 - 1 symposium convened and 3 Law Fellow projects completed. 2011 - For 2011---2 symposia convened (Magnuson-Stevens Act Revisited Deepwater Horizon Legal Legacy) and 7 Law Fellow projects completed. 2012 - For 2011---2 symposia convened (Magnuson-Stevens Act Revisited Deepwater Horizon Legal Legacy) and 7 Law Fellow projects completed. 2013 - For 2011---2 symposia convened (Magnuson-

		Stevens Act Revisited Deepwater Horizon Legal Legacy) and 7 Law Fellow projects completed.
By 2013, educate 50 people in the general public on sustainable fishing and seafood choices.	Yes	2010 - Baird 2011 = 35 people 2011 - For 2011----Magnuson-Stevens Act Revisited Syposium 2010 = 60 peopled Baird 2011 = 45people 2012 - For 2011----Magnuson-Stevens Act Revisited Syposium 2010 = 60 peopled Baird 2011 = 45people 2013 - For 2011----Magnuson-Stevens Act Revisited Syposium 2010 = 60 peopled Baird 2011 = 45people
By 2014, 8 Sea Grant Law Fellow projects and 4 workshop/symposia events supporting sustainable fisheries management will be convened on topics of interest to stakeholders.	Yes	2011 - For 2011----7 Law Fellow project completed and 2 symposia completed (Baird 2011--Seafood Ocean to Plate Marine Affairs Symposium on Magnuson-Stevens Act Revisited) 2012 - For 2012----21 Law Fellow projects completed and 3 symposia completed (9th Marine Law Symposium on legal and policy issues related to changing climate and resources management). Target will likely be met in 2013. For 2011----7 Law Fellow project completed and 2 symposia completed (Baird 2011--Seafood Ocean to Plate Marine Affairs Symposium on Magnuson-Stevens Act Revisited) 2013 - For 2013---Over 10 Law Fellow projects have addressed areas of concern for sustainable fisheries management, 4 symposia convened (Baird 2013 on shellfish management SMP workshop on RI shellfish regulations). For 2012----21 Law Fellow projects completed and 3 symposia completed (9th Marine Law Symposium on legal and policy issues related to changing climate and resources management). Target will likely be met in 2013. For 2011----7 Law Fellow project completed and 2 symposia completed (Baird 2011--Seafood Ocean to Plate Marine Affairs Symposium on Magnuson-Stevens Act Revisited)
By 2017, 50% of Rhode Island seafood consumers understand the principles of sustainable fisheries as a result of outreach being conducted by commercial fishing organizations.	No	2011 - For 2011---RI Seafood Collaborative formed and is actively developing branding and marketing materials, and working with restaurants and markets to conduct outreach using fishermen (e.g., series of "seafood nights" at various restaurants where a fisherman or processor, or both, discuss the species being highlighted). 2012 - For 2102---Effort continues with the RI Seafood Collaborative as well as new efforts working with Johnson & Wales University with their and area restaurant chefs who take new understanding out into the marketplace. For 2011---RI Seafood Collaborative formed and is actively developing branding and marketing materials, and working with restaurants and markets to conduct outreach using fishermen (e.g., series of "seafood nights" at various restaurants where a fisherman or processor, or both, discuss the species being highlighted). 2013 - For 2013---Efforts with the collaborative continues, with fishermen now allowed to participate in farmer's market and provide information on sustainable fisheries fishermen continue collaborating with restaurant chefs and owners to offer "sustainable seafood dinners." For 2102---Effort continues with the RI Seafood Collaborative as well as new efforts working with Johnson & Wales University with their and area restaurant chefs who take new understanding out into the marketplace. For 2011---RI Seafood Collaborative formed and is actively developing branding and marketing materials, and working with restaurants and markets to conduct outreach using fishermen (e.g., series of "seafood nights" at various restaurants where a fisherman or processor, or both, discuss the species being highlighted).

By 2017, 90% of the Rhode Island fishing industry has adopted a code of responsible fishing, evidenced by a change in ethics reflected in use of more selective and less damaging gear, innovative management and financial investment in research and management.	No	2011 - For 2011---A state level Shellfish Management Plan is being scoped out for development by the RI Dept. Environmental Management RI Coastal Resources Management Council Aquaculture Division promotes the East Coast Shellfish Growers Association's code of conduct. 2012 - For 2012---State level shellfish management plan is underway in partnership with the responsible state agencies (RIDEM & RICRMC) Mid Atlantic Fisheries Council has adopted mid-sized versions of the Ruhle trawl to selectively reduce winter flounder bycatch and allow continued fishing for haddock Over 70% of lobster fishermen have developed sustainable economic fishery & business plans with Sea Grant assistance. For 2011---A state level Shellfish Management Plan is being scoped out for development by the RI Dept. Environmental Management RI Coastal Resources Management Council Aquaculture Division promotes the East Coast Shellfish Growers Association's code of conduct. 2013 - For 2013---A statewide Shellfish Management Plan is in development with RI Sea Grant facilitating the process with a late 2014 adoption date anticipated. For 2012---State level shellfish management plan is underway in partnership with the responsible state agencies (RIDEM & RICRMC) Mid Atlantic Fisheries Council has adopted mid-sized versions of the Ruhle trawl to selectively reduce winter flounder bycatch and allow continued fishing for haddock Over 70% of lobster fishermen have developed sustainable economic fishery & business plans with Sea Grant assistance. For 2011---A state level Shellfish Management Plan is being scoped out for development by the RI Dept. Environmental Management RI Coastal Resources Management Council Aquaculture Division promotes the East Coast Shellfish Growers Association's code of conduct.
By 2017, at least 50% of Rhode Island state fisheries are managed with a long term view involving biology as well as economic, social, and ecosystem aspects.	No	2011 - For 2011---Fluke sector management pilot program is informing fisheries management in Rhode Island. 2012 - For 2012---Shellfish management plan is underway Sea Grant funded research is targeted at shellfish management for 2014-2016 mid-size Ruhle Trawls approved by Mid Atlantic Fisheries Council. For 2011---Fluke sector management pilot program is informing fisheries management in Rhode Island. 2013 - For 2013--Shellfish Management Plan well underway with late 2014 anticipated adoption date. For 2012--- Shellfish management plan is underway Sea Grant funded research is targeted at shellfish management for 2014-2016 mid-size Ruhle Trawls approved by Mid Atlantic Fisheries Council. For 2011---Fluke sector management pilot program is informing fisheries management in Rhode Island.
By 2017, Hazard Analysis and Critical Control Point (HACCP) is adopted from harvesters to consumers and is implemented in 10 international countries.	No	2012 - For 2012---this effort was contingent upon outside funding, which was gained, but the Sea Grant portion of the effort was no longer valid as the faculty person doing the international work is no longer affiliated with Sea Grant in functional way. This target will not be met and will not be further pursued. 2013 - For 2012---this effort was contingent upon outside funding, which was gained, but the Sea Grant portion of the effort was no longer valid as the faculty person doing the international work is no longer affiliated with Sea Grant in functional way. This target will not be met and will not be further pursued.