

PIER 2011 Annual Report

Puerto Rico Sea Grant

Official Level of Effort - Only Approved Funding

Report Generated by YULISSA GARCIA on 12/13/2021

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2011 Level of Effort

National Focus Area Name	SG Federal	Match	Pass Thru	Federal+ Match + Pass Thru	LOE without Leverage (%)	Leveraged (Managed)	LOE with Leverage (%)
Healthy Coastal Ecosystems	\$395,310	\$371,047	\$0	\$766,358	35 %	\$130,039	39 %
Safe and Sustainable Seafood Supply	\$0	\$0	\$0	\$0	0 %	\$0	0 %
Hazard Resilient Coastal Communities	\$183,707	\$181,830	\$0	\$365,537	17 %	\$0	16 %
Sustainable Coastal Development	\$531,913	\$459,750	\$46,000	\$1,037,663	48 %	\$0	45 %
Other	\$0	\$0	\$0	\$0	0 %	\$0	0 %
TOTAL ALL FOCUS AREAS:	\$1,110,930	\$1,012,627	\$46,000	\$2,169,558	100 %	\$130,039	100 %

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2011 Impacts & Accomplishments

Through Sea Grant Efforts the DNER PR Incorporates Stakeholders and Human Dimensions into their Management Efforts

NATIONAL FOCUS AREAS: Sustainable Coastal Development

- Impact
- PO Review Complete

RECAP: Managers from the Department of Natural and Environmental Resources incorporated SocMon as part of their management tool kit, and incorporated the public knowledge into ecosystem stewardship and the development of management plans.

PROGRAM FOCUS AREAS: SUSTAINABLE COASTAL DEVELOPMENT

Puerto Rico Sea Grant trained managers from the Puerto Rico Department of Natural and Environmental Resources (DNER) on the application of the Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon) in order to incorporate regional and local partners and facilitate community-based socioeconomic monitoring. Approximately 60 managers, social scientists and NGO volunteers were trained in the use of SocMon. Reports for the Tortuguero Lagoon, Boquerón and Las Cucharas natural reserves were completed. SOCMON is now part of the DNER strategies for the development of management plans, and the incorporation of the public dependence on coral reef resources, perceptions of resource conditions, threats to marine and coastal resources, and support for marine management strategies in resource and habitat stewardship.

PARTNERS: Puerto Rico Department of Natural and Environmental Resources;

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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Rio Loco Watershed Conservation Buffers

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Erosion and sedimentation generated by agricultural activities in the Guánica water-shed, are significantly impacting water quality of coastal areas and the health of marine ecosystems, in particular coral reefs and its associated habitats. Several educational activities including a workshop to demonstrate the effectiveness of a vegetation buffer zones pilot project for the conservation of the watershed, was coordinated for farmers, stakeholders, natural resources planners, engineers, and elected officials. Farmers from the watershed, learned about the benefits involved by adopting these practices, including the effectiveness in reducing the loss of fertile soil by implementing the vegetation buffer zones technique. Farmers were able to recognize, that small-scale impacts of individual agricultural practices, when added up, could have a significant impact on the watershed and its associated ecosystems.

PARTNERS: Natural Resources Conservation Service (USDA, NRCS);

ASSOCIATED PROJECT(S):

COASTAL COMMUNITY DEVELOPMENT (2010 - 2011)

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Puerto Rico Sea Grant Collaborates with Puerto Rico's Fisheries Management and Education of Resource Users

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Puerto Rico Sea Grant is a member of the Department of Natural and Environmental Resources (DNER) Fisheries Law Advisory Board. Specifically our program serves as a liaison among resource users and managers, collaborating in conflict mitigation among fisheries resource users and regulators and providing important recommendations and solutions that have been incorporated to the new Fisheries Regulations. Through our Marine Outreach Program (MOP) advisory efforts, the coordination of workshops and symposiums, the development of publications, and the transfer of our applied research results, fisheries resource users were educated on topics related to fishery: regulations, biological aspects, government incentives, conservation measures and strategies, fishing techniques, and diverse alternatives for increasing income.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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PR Sea Grant Releases Fisheries Blog

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Puerto Rico Sea Grant Marine Outreach Program (MOP) Fisheries Electronic Portal, is an electronic "blog" which provides relevant information related to fisheries and aquaculture outreach and research conducted by MOP. Fisheries relevant information has been summarized and posted for public information and forum discussions <http://prsgfisheriesoutreach.wordpress.com/>. A section in the MOP fisheries' portal includes an open archive for SEAMAP-C data downloading, and offers access to other Puerto Rico Sea Grant fisheries publications. Other sections include applied fisheries studies and mariculture outreach projects.

PARTNERS: None listed in Database

Puerto Rico Sea Grant Promotes Best Management Practices for NonPoint Source Pollution

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

The "Puerto Rico Sea Grant Non Point Source Pollution (NPSP) Extension Initiative" has effectively advised four (4) NGO'S (more than 50 stakeholders) in the best management practices to control NPSP in the Río Culebrinas, Río Guanajibo and Río Yaguez watershed systems. These are three (3) of the largest rivers that discharge in the Bays of Mayaguez and Aguada which are included in the United States Geological Survey (USGS) first priority river protection list for Puerto Rico (Caribbean Water Science Center, 2012). The UPR-SG NPSP initiative attained the following positive impacts: (1) The conservation of more than 60 coastal wetland acres in the Río Culebrinas Watershed in Aguada; (2) Two kilometers of La Masa Creek, including the source of the river, tributary of the Río Guanajibo, was protected and is actually under a natural restoration process after more than 20 years of mining extraction impact; (3) The severe environmental impact of a flood control project in the Río Culebrinas at the Municipality of Aguada was postponed and (4) the Río Yaguez integrity was greatly conserved after the Department of Natural and Environmental Resources adopted the sustainable management practices as recommended by the Puerto Rico Sea Grant. Puerto Rico Sea Grant investment in the promotion and education on best management practices to control NPSP has impacted positively rivers, watersheds and coastal areas in western Puerto Rico by improving community knowledge and empowering environmental organizations.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
MARINE OUTREACH PROGRAM (2010 - 2011)

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Integration of stakeholders for the conservation and restoration of a natural reserve

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

NGO's on western Puerto Rico and residents of La Boquilla are interested in the protection of the endemic wildlife, endanger species, migratory and marine birds, water quality, cultural traditions and ecosystem health of this coastal reserve. UPR-SG facilitated the integration of diverse stakeholders (Municipal personnel, Academia, NGO's, residents and voluntaries) into a Working Group for the development of a sustainable-tourism and education project for the restoration, protection and conservation of the "Caño Boquilla Natural Reserve". Four (4) residents of Mayaguez were trained as environmental leaders and developed, in collaboration with UPR-SG, community meetings, field trips, conferences to school children and others. An internet section in the UPR-SG Web Page was also created. Members of the Working Group (12 members) are informally trained by learning about the ecosystem and watershed attributes in which UPR-SG has a major role. The Mayor of the Municipality of Mayaguez approved the Caño Boquilla Reserve project prepared by the NGO Mayaguezanos Por La Salud y El Ambiente and the UPR-SG, which resulted in the assignment of employees and fiscal resources for project implementation.

UPR-SG in collaboration with stakeholders developed a community presentation about Eco-Tourism Opportunities for Business and Employees in the "Caño Boquilla Reserve: A unique model harmonized with the environment". More than 20 residents were capacitated and five of them were motivated to continue its capacitating in green-economy for the eventual development of their own eco-sustainable enterprise around the Natural Reserve attributes.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
MARINE OUTREACH PROGRAM (2010 - 2011)

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Water quality and green employments

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Puerto Rico Sea Grant collaborates in a self-sustainable community project that integrates conservation strategies, ecosystem-based approaches and green employments for the protection of nearly 70 acres of an urban natural forest, and important contributor to the water quality of the Rio Guanajibo Watershed (RGW). The RGW is listed in the First Priority Protection List of the 2012 US Geological Survey (USGS) Caribbean Office. Puerto Rico Sea Grants' technical support and strategic alliance was instrumental in the establishment of a community project, the development of the Soil Conservation Plan and the USGS support.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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Development of an effective tool to empower citizens on environmental and community issues

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

UPRSG produced and designed the Guide: "Herramientas para un líder ambiental y comunitario efectivo" (Tools for an effective leadership on environmental and community issues), in collaboration with the Agricultural Extension Service staff of the University of Puerto Rico. The guide provides information to empower citizens to strengthen leadership and skills capacities to reinforce the water/land healthy ecosystem governance in Puerto Rico. More than 20 community leaders were trained using this guide. Public engagement, leadership, communication, collaboration, sustainable management and commitment were emphasized for addressing a successful management of our water ecosystems.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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Puerto Rico Sea Grant Researchers Developed Tool to Monitor Metal Contamination of Critical Fish Nursery Habitat

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

UPR Sea Grant researchers developed a tool based on the remote sensing techniques of mineral exploration to monitor mangrove wetlands for the presence of metal contamination and estimate the health of this critical fish nursery habitat. A handheld spectral radiometer is used to measure leaf reflectance of mangroves in areas contaminated and un-contaminated with metals. Both red and black mangroves were studied. A Normalized Difference Vegetation Index (NDVI) can be determined from leaf reflectance. Highly contaminated areas showed lower reflectance, higher NDVI and a red shift of reflectance spectral values. Natural resource managers from the Natural Resources Conservation Service (NRCS), NERR Jobos Bay and San Juan Bay Estuary (SJBEP) have expressed interest in the findings of this study.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

Puerto Rico Sea Grant Improves Ability of Virgin Islands Government to Make Sound Decisions to Protect Coral Reefs

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

The data provided by the Virgin Islands Marine Advisory Service (VIMAS) to the Government of the VI has improved their ability to make sound decisions about the status of the coral reefs and associated biota, in order to protect this ecosystem. The data provided to the VI Department of Planning and Natural Resources, will allow the Coastal Zone Management Program and Fish and Wildlife to establish benchmarks on the condition of coastal resources and assess whether or not management regulations are effective at improving near-shore water quality and marine life.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

US VIRGIN ISLANDS MARINE ADVISORY SERVICE (2010 - 2011)

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Virgin Islands Community Protects the Environment from Land-Based Sources of Pollution

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

VIMAS spearheaded "The Reef is Closer Than You Think" community campaign. Beginning in 2009 and continuing throughout 2012, the campaign spotlighted the importance of coral reefs of the Virgin Islands, promoted individual actions that will work to protect corals, and communicated the importance of these ecosystems to the economy. As part of this effort, VIMAS collaborated in the coordination of the VI Non Point Source Pollution Conference with over 200 participants from across the Caribbean and the US, including a special youth session attended by 33 local youth. In response to efforts by VIMAS the community better understands how to protect the environment from land-based sources of pollution.

PARTNERS: University of Virgin Islands;

ASSOCIATED PROJECT(S):

US VIRGIN ISLANDS MARINE ADVISORY SERVICE (2010 - 2011)

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Fishing community in Virgin Islands contributes scientific data about the distribution and abundance of Nassau grouper

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

The USVI fishing community in particular received opportunities to contribute scientific data pertaining to the distribution and abundance of Nassau grouper by participating in the Bring Back the Nassau Grouper campaign. "Fisher Scientist Kits" were provided to fishers at various venues and events and by request; these kits contained tools and information regarding how to safely release Nassau grouper when caught as

by-catch. This is part of VIMAS efforts to increase awareness in relation to fishery issues in the Territory and to offer volunteers and the general public opportunities to collaborate with scientists.

PARTNERS: University of Virgin Islands;

ASSOCIATED PROJECT(S):

[US VIRGIN ISLANDS MARINE ADVISORY SERVICE \(2010 - 2011\)](#)

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Efforts to develop a scientifically literate coastal society

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Sixty educators learned about marine science concepts that developed their skills and addressed the Puerto Rico Science Education Standards (SES) that were designed to "guide our island toward a scientifically literate society." Our series of teacher workshops laid the groundwork and provided materials to assist educators in the utilization of the marine environment as a tool to help students meet national standards. Through these effort 3,570 students were reached.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

[MARINE EDUCATION \(2010 - 2011\)](#)

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Volunteer Marine Turtle Monitoring Program Significantly Reduces Poaching and Raises Hatchlings

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

With the participation and support of the community (teachers, students and the general public), Sea Grant's Marine Education Center (MEC) developed an exemplary volunteer monitoring program for marine turtles in the municipalities of Maunabo, Yabucoa and Humacao. The integration of the volunteer groups in this effort prevented poaching, helped hatch and raise the hatchlings, and educated the local communities with regard to the importance of conservation of these endangered marine turtle species.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

[MARINE EDUCATION \(2010 - 2011\)](#)

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Beneath the Waves: An Underwater Photography Book Selected among the Best Art Books Of Puerto Rico

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

As part of our efforts to communicate the relevance of our marine and costal ecosystems, UPRSG published Bajo las olas (Beneath the Waves), an underwater photography book that provides an educational approach that contributes to the development of ocean literacy and environmental stewardship among the users of marine and coastal resources. At the end of December 2013, we received a very important recognition from the Artists' Coalition of Puerto Rico (Coalición de Artistas de Puerto Rico, COA by its abbreviation in Spanish). COA is the

organization that brings together artists and groups of artists of Puerto Rico. COA has an online magazine (<http://artecoa.com/>) where they published information about arts in Puerto Rico, artists, expositions, and reference publications, among other topics and resources. COA included Bajo las olas (Beneath the Waves), our book of underwater photography and marine sciences, among the Five Best Art Books of Puerto Rico on 2013.

To read about the recognition that UPR Sea Grant College Program received, please visit <http://artecoa.com/profiles/blogs/los-cinco-mejores-libros-de-arte-en-puerto-rico-five-best-art-boo>.

UPR Sea Grant is very proud of Dr. Héctor Ruiz, the author, and our communications team that participated in the edition, translation, scientific revision, and graphic art, as well. This recognition motivates us to continue publishing valuable, high-quality educational materials. UPR Sea Grant is committed to fulfill Sea Grant's mission and maintain the highest standards possible, always in accordance to Sea Grant's core values and focus areas.

The fifth edition of Fishes of Puerto Rico and the US Virgin Islands was published in a bilingual version (English and Spanish), and includes new information and illustrations in brilliant colors as well as a poster. It also includes information regarding average fishes weight and length, which are edible and fishing closed seasons.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
COMMUNICATIONS/PUBLICATIONS (2010 - 2011)

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Teachers and Communities Join the Sandwatch Program to Gather Valuable Coastal Environmental Data

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Sandwatch is an educational program in which Puerto Rico Sea Grant collaborates with UNESCO to increase environmental consciousness about the conservation and sustainable use of marine and coastal resources in Puerto Rico, through the participation of coastal communities, NGO's, schools and a diverse combination of community leaders and volunteers. This an activities orientated approach used to provide step by step instructions, to cover monitoring methods and data analysis, including observation and recording, erosion and accretion, beach composition, human activities, beach debris, water quality, waves, long-shore currents, plants and animals. Volunteers gather data about currents, waves, organisms, beach profile, water quality, sand composition and use of coastal resources and at the same time are applying and developing scientific and mathematical knowledge, writing skills, technical skills and creative abilities. Data collected by the volunteers can be accessed under our Sandwatch Project blog: <http://www.seagrantpr.org>. We have already nineteen groups enrolled, composed of 250 volunteers who visit the beaches, gather environmental data at least, three times a year and report the results to Sea Grant and UNESCO.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
MARINE EDUCATION (2010 - 2011)
COMMUNICATIONS/PUBLICATIONS (2010 - 2011)

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Puerto Rico Sea Grant in Facebook and Twitter

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Puerto Rico Sea Grant opened Facebook and Twitter pages. This action increased our website traffic and raised the number of visitors and followers in these social networks.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
COMMUNICATIONS/PUBLICATIONS (2010 - 2011)

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Marine Odysseys Educational Videos used as a New Tool in Favor of Ocean Literacy

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Marine Odysseys are a series of videos produced by PR Sea Grant to educate the general public on matters related to the conservation and sustainable use of marine and coastal resources. For the period reported, Puerto Rico Sea Grant produced 4 videos covering information on coral reefs, lionfish, the Sandwatch project and Encounter with the Sea. Videos are available in our YouTube channel:
<http://www.youtube.com/user/programaseagrantpr>.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
COMMUNICATIONS/PUBLICATIONS (2010 - 2011)

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School Teachers Benefit from Encounter With the Sea

NATIONAL FOCUS AREAS: Healthy Coastal Ecosystems

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: HEALTHY COASTAL ECOSYSTEMS

Encounter with the Sea is a workshop designed for school-teachers which covers topics related to the coastal and marine environment, including mangroves, sea grass beds, coral reefs, bioluminescence and land use planning. These workshops were designed to cope with the environmental education and ocean literacy needs in the schools of Puerto Rico. The Encounter with the Sea manual, as well as power point presentations and other UPRSG educational materials are provided to participants. Close to fifty teachers benefitted from the workshops and have put into practice the information gained by incorporating coastal and marine environment material to their curriculums.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):
COMMUNICATIONS/PUBLICATIONS (2010 - 2011)

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Puerto Rico Sea Grant Fisheries Publication Instrumental in the Development of Fisheries Plans for the Island

NATIONAL FOCUS AREAS: Safe and Sustainable Seafood Supply

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Puerto Rico Sea Grant published and distributed our fisheries quarterly magazine Fuede y Verguilla. This publication is distributed among more than 900 artisanal fishers, resource managers, scientists, students and the general public. There were three different publications of Fuede y Verguilla since February 2011. Themes highlighted included the lionfish and its impact on Puerto Rico's fisheries and Sea Grant's efforts to inform resource users and managers about the need to eradicate this invasive specie from our waters and coral reefs ecosystems. Other topics and issues addressed were: the management plans to implement NOAA's Catch Share Program in Puerto Rico; fisheries closed seasons; and women in the fisheries. Another fisheries related publication was " A View of the Fishermen World in Puerto Rico" which is

part of a series of Puerto Rico Sea Grant Public Policy Position Papers, which offer recommendations for the development of public policy on coastal and marine themes. The publication A View of the Fishermen World in Puerto Rico was very successful in the education of politicians that ran for office during the past elections. All governor candidates interviewed and consulted the author of the publication and adapted some of the recommendations offered as part of their plans for the development and management of fisheries in the Island.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

FISHERIES EXTENSION ENHANCEMENT (2006 - 2010)

MARINE OUTREACH PROGRAM (2010 - 2011)

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Puerto Rico Sea Grant Joins Forces with the Caribbean Fisheries Management Council and the Department of Natural and Environmental Resources to Control Lionfish Invasion

NATIONAL FOCUS AREAS: Safe and Sustainable Seafood Supply

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

With the collaboration of the Caribbean Fisheries Management Council and the Department of Natural and Environmental Resources of Puerto Rico, Puerto Rico Sea Grant developed a campaign to promote the fishing of lionfish in order to control lionfish invasion. This effort was carried out in different stages:

- Search for the advise of members from the scientific community.
- Visits to fishing villages, fishing associations, and independent commercial fishermen.
- Interview fishermen to raise awareness about the lionfish invasion.
- Publication of a special issue of our publication Fuede y Verguilla (FV) to explain how people can prepare lionfish for consumption.
- Publication of an article in FV's blog with recipes prepared by famous Puerto Rican Chef Giovanna Huyke.
- Development of 3 UPRSG Marine Odysseys videos aimed at different audiences:
 1. For restaurants to market lionfish to consumers
 2. For the general public to consume lionfish
 3. For artisanal and recreational fishermen to teach them about the methods to fish, handle and how to trim the venomous bones
- A proposal was submitted and approved by to the Caribbean Fisheries Management Council to purchase and distribute lionfish gear among artisanal fishermen.
- Professors, teachers, and students received information about lionfish invasion through five lectures given at several schools and universities.
- Three (3) Radio and one (1) TV presentations to talk about the lionfish invasion and how to deal with this invasive species were offered.

As a result of this effort lionfish consumption has incremented and a market for this invasive species has been developed.

PARTNERS: Caribbean Fishery Management Council (CFMC); Puerto Rico Department of Natural and Environmental Resources;

ASSOCIATED PROJECT(S):

FISHERIES EXTENSION ENHANCEMENT (2006 - 2010)

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Mariculture as a fisheries alternative for Puerto Rico

NATIONAL FOCUS AREAS: Safe and Sustainable Seafood Supply

- Accomplishment

- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

As part of the National Sea Grant office project "Sea Grant Aquaculture Extension 2010: Outreach Mariculture Project as a Fisheries Alternative for Puerto Rico; Growout of Yellowtail and Lane Snappers (*Ocyurus chrysurus*, *Lutjanus synagris*) in Recirculation Systems Managed by a Fishery Association" a closed recirculating marine aquaculture facility project was constructed at the Corozo Association of United Fishers (CAUF) Fishery Villa in Combate, Cabo Rojo. This project is part of an overall plan to promote the culture of marine fish to ameliorate fishing pressure on fragile tropical marine ecosystems. The main mission of the project is to serve as a training facility tool in transferring specialized knowledge and culture techniques to commercial fishers who have been closely involved since the initiation of the project. The outreach process started with the engineering methodologies of the construction phase and progressed to water quality management, harvesting of wild fish, nutritional aspects, and system maintenance. A total of more than 250 persons have been interested in the project while visiting the fishing villa or during organized "Open-house" activities. Twelve (12) commercial fishers have received various levels of training in relating to distinct phases of the growout project. Now that the project is successfully culturing fish, the interest continues to increase.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

SEA GRANT AQUACULTURE EXTENSION 2010: OUTREACH MARICULTURE PROJECT AS A FISHERIES ALTERNATIVE FOR PUERTO RICO; GROWOUT OF YELLOWTAIL AND LANE SNAPPERS (*OCYURUS CHRYSURUS*, *LUTJANUS SYNAGRIS*) IN RECIRCULATION SYSTEMS MANAGED BY A FISHERY ASSOCIATION (2010 - 2012)

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Resisting Disasters: Four Coastal Communities against All Odds

NATIONAL FOCUS AREAS: Hazard Resilient Coastal Communities; Sustainable Coastal Development

- Accomplishment
- PO Review Complete

RECAP: UPR Sea Grant promotes and encourages coastal communities' residents to develop an education and outreach agenda on climate change adaptation, and guidelines for resilience.

PROGRAM FOCUS AREAS: HAZARD RESILIENCE IN COASTAL COMMUNITIES; SUSTAINABLE COASTAL DEVELOPMENT

Three communities, located in the remnants of one of the largest mangrove forests and coastal marshlands in Mayaguez, Puerto Rico, volunteered to collaborate and participate in a project to assess and evaluate the resiliency of their communities to coastal hazards. Our team held three focus groups in the communities of San José, El Seco, and El Maní where participants provided information related to their knowledge, understanding and practices in relation to: tsunamis, hurricanes, storm surge, evacuation routes, home safety protocols, and resiliency. A workshop with the participation of commonwealth and municipal agencies was coordinated in order to conjointly develop future plans on relocation and evacuation routes based on the different needs and the socioeconomic and cultural characteristics of their respective communities. Publications highlighting evacuation routes, community shelters, storm surge maps and other information for the resiliency of the community have been developed for each community.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

COASTAL COMMUNITY DEVELOPMENT (2010 - 2011)
ENHANCING SEA GRANT'S ABILITY TO HELP COASTAL COMMUNITIES ADAPT TO CLIMATE CHANGE (2010)

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Sea Grant Educates Beach Seine Users

NATIONAL FOCUS AREAS: Sustainable Coastal Development

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: SUSTAINABLE COASTAL DEVELOPMENT

The SG project Beach Seine Users Education on Management Restrictions and Gear Handling Practices for Reduced Impacts, was developed as a result of the longtime mistaken practices and attitudes related to the use of beach-seine gear in Puerto Rico and the implementation of new fishing regulations. The changes have resulted from recommendations of Sea Grant's Marine Outreach Program (MOP) beach seine

study and outreach educational workshops for fishers. The DNER-Aguadilla enforcement section reported no violations or misuse of gear after the implementation of the law and Sea Grants' informative fisher's workshops. As a positive result of these educational efforts, we have established internal co-management efforts among beach-seine owners to assure that beach-seine gear meets the mesh-size net limitation, combined with appropriate harvesting protocols to minimize by-catch.

PARTNERS: None listed in Database

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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A Socio-economic Monitoring Agenda for Marine Protected Areas in Puerto Rico

NATIONAL FOCUS AREAS: Sustainable Coastal Development

- Accomplishment
- PO Review Complete

RECAP: No Recap in database

PROGRAM FOCUS AREAS: SUSTAINABLE COASTAL DEVELOPMENT

The project A Socio-economic Monitoring Agenda for Marine Protected Areas in Puerto Rico: Application of the SOCMON Protocol (New) was developed in collaboration with the Interdisciplinary Center for Coastal Studies (CIEL) to raise awareness of the human dimension of MPA management and to foster a greater understanding of the need for sound research on socioeconomic indicators. Sea Grant responded to the need (identified by government agencies and NGOs) of incorporating the public into the ecosystem-based management strategies of MPAs.

As part of our strategies to implement projects on public stewardship and ecosystem-based management approaches Sea Grant, CIEL, the Department of Natural and Environmental Resources (DNER) and NOAA implemented the Socio-economic Monitoring Program (SocMon) in MPAs managed by the Department of Natural and Environmental Resources of Puerto Rico (DNER). Sea Grant and CIEL trained managers and NGO members, gathered socio-economic information with managers, engaged the public in a number of fact-finding activities, and enticed them to participate in the stewardship of the resources at the following coastal reserves: Tortuguero Lagoon, Boquerón, Mosquito Bay (Vieques), and Las Cucharas.

PARTNERS: Puerto Rico Department of Natural and Environmental Resources;

ASSOCIATED PROJECT(S):

MARINE OUTREACH PROGRAM (2010 - 2011)

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2011 Leveraged Funding

Project Level

Source	Project	Title	Amount	Type
US Department of Interior (US DOI)	8370 - USVI Marine Advisory Service (M-151-2-12)	Ecological Characterization of bioluminescence in Mangrove Lagoon, Salt River Bay, St. Croix, USVI	\$7,900.00	Managed
		TOTAL:	\$7,900	

Program Level

Source	Title	Amount	Type
National Marine Fisheries Service (US DOC, NOAA, NMFS)	Southeast Area Monitoring and Assessment Program - Caribbean (SEAMAP-C)	\$91,498.00	Managed
National Fish and Wildlife Foundation (NFWF)	Improved Reserve Management through Community Participation	\$18,641.00	Managed
US Fish and Wildlife Service (US DOI, FWS)	Species Protected by the Endangered Species Act (Factsheets)	\$12,000.00	Managed
	TOTAL:	\$122,139	

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Performance Measures

2011 Communities implementing hazard resiliency practices

County of the Coastal Community	Name of Coastal Community	Number of Resiliency Training/Tech Assistance provided	Community hazard resiliency improved
	El Mani	1	Yes

	El Seco	1	Yes
	San Jose	1	Yes

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2011 Sea Grant Products - (tools, technologies, info services)

Description	Developed	Used
UPR Sea Grant research findings are providing a means to increase awareness of sources of fecal contamination in sites around Puerto Rico. These research results have been made available to resource managers from DNER, EQB and USEPA. This research supports agency goals to sustain a healthy environment and human population and the new method enables the detection of human fecal contamination in as little as 3-6 hours. In collaboration with the EQB of Puerto Rico the method will be further tested to calibrate and establish confidence limits with the current but much slower 36 hour method for human fecal determination. When adopted, the near real-time assessment of beach contamination will contribute significantly to public safety and the coastal economy.	Yes	
UPR Sea Grant has developed a tool based on the remote sensing techniques of mineral exploration to monitor mangrove wetlands for the presence of metal contamination and estimate the health of this critical fish nursery habitat. A hand held spectral radiometer is used to measure leaf reflectance of mangroves in areas contaminated and un-contaminated with metals. Both red and black mangroves were studied. A Normalized Difference Vegetation Index (NDVI) can be determined from leaf reflectance. Highly contaminated areas showed lower reflectance, higher NDVI and a red shift of reflectance spectral values. Natural resource managers from the Natural Resources Conservation Service (NRCS), NERR Jobos Bay and San Juan Bay Estuary (SJBEP) have expressed interest in the findings of this study. In order to tend to these interests an "Ocean Chat" is scheduled for the first day of August.	Yes	

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2011 Economic (market and nonmarket) impacts

Description	Businesses Created / Retained	Jobs Created / Retained	Economic Benefit	Patents
	/	/		

2011 National Performance Measures - General

Performance Measure	Annual Target	Reported	Program Comment
Number of fishers who adopt and implement responsible harvesting techniques and practices.	2,356	24	
Number of stakeholders who modify their practices using knowledge gained in fisheries sustainability, seafood safety, and the health benefits of seafood.	34,268	200	
Number of coastal communities who have adopted/implement sustainable - economic and environmental - development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities.	71	3	
Number of coastal communities who have restored degraded ecosystems as a result of Sea Grant activities.	27		

2011 Program Performance Measures

Program Performance Measure	Annual Target	Reported	Program Comment
Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities.	100	250.000	
Number of coastal communities engaged in activities (e.g. visioning, resource inventories, analysis of development policies) or making informed development decisions that address the sustainability of economic and environmental resources as a result of Sea Grant's capacity building, tools, data, technologies, and/or education of community leaders.	10	8.000	
Number of coastal communities who have adopted/implement sustainable - economic and environmental - development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities.	30	3.000	
Number of fishermen, resource managers (harvesters, and fishermen) who	500	24.000	

adopt and implement responsible harvesting and processing techniques and practices.			
Number of coastal communities provided with information/trained in local hazard resiliency, and hazard mitigation tools, techniques, and best practices.	48	25.000	
Number of coastal municipalities who adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events.	15	25.000	
Number of citizens provided with information/trained in local hazard resiliency, and hazard mitigation tools, techniques, and best practices.		30000.000	

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2011 Metrics

Staffing Numbers	Individuals	SG FTEs	non-SG FTEs
Administrative	6.00	2.67	2.83
Communications	11.00	1.50	6.49
Education	4.00	2.10	0.50
Extension	9.00	3.15	3.60
Research	19.00	4.39	1.50

Core Funding	Proposals	Institutions Involved	From Home Institution
Pre-Proposals	32	18	12
Full Proposals	14	8	7
Proposals Funded	4	3	2

Student Support	Number of New Students	Number of Continuing Students	Number of Degrees Awarded
Sea Grant Supported Undergraduate Students	1	21	
Sea Grant Supported MS/MA Graduate Students		12	4
Sea Grant Supported PhD Graduate Students	1	5	
Other Sea Grant Supported Professional Degree Graduate Students			

Other Metrics	Amount
VolunteerHours	6500
Number of P-12 Students Reached Through Sea Grant-Trained Educators or Directly through Sea Grant Education Programs	
Number of P-12 Educators who participated in Sea Grant education programs	
SG-Sponsored/Organized Meetings/Workshops	45
Attendees in SG Meetings/Workshops	14964
Public or Professional Presentations	57
Attendees at Public or Professional Presentations	2850
Clean Marina Program -- Certifications	
HACCP -- Number of people with new certifications	