

# ***Science Serving Florida's Coast***

**Florida Sea Grant  
College Program  
Year 2002  
Work Plan**

*A partnership program among the Florida Board of Education  
Florida Sea Grant College Program*

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*National Sea Grant College Program  
Oceanic and Atmospheric Research  
National Oceanic and Atmospheric Administration*

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*Florida's citizens, industries and governments*

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**Technical Paper 119**

**May 2002**



This technical paper was supported by the National Sea Grant College Program of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under Grant No. NA76RG-0120.

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# **Year 2002 Work Plan**

## **Florida Sea Grant College Program**

### **May 2002**

The Florida Sea Grant College Program is committed to enhancing the practical use and development of coastal and marine resources while at the same time creating a sustainable economy and environment. Florida Sea Grant's Strategic Plan for 2002-2005<sup>1</sup> defines the purpose of the program, highlights Florida's coastal wealth, and demonstrates the need for research and education. The plan also recognizes the three strategic areas of economic leadership, coastal ecosystem health and public safety, and education and human resources for Sea Grant investments and describes the programmatic framework for implementing the strategic plan.

The work plan for 2001 covered research, extension, communication and administrative goals and tasks scheduled to end in 2001 and beyond. The 2001 Florida Sea Grant annual progress report reported accomplishments and benefits against those tasks ending in 2001. This work plan for 2002 updates the 2001 work plan to include research, extension, communication and administrative tasks scheduled for completion during 2002 and beyond. The 2002 annual progress report, scheduled for May 2003, will cover accomplishments and benefits resulting from each of these tasks. Copies of the 2002-2005 Strategic Plan, previous Work Plans and annual progress reports can be obtained from the Florida Sea Grant College Program office.



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<sup>1</sup> Florida Sea Grant College Program Strategic Plan 2002-2005. Florida Sea Grant College Program Technical Paper 108. Gainesville: University of Florida.

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# Economic Leadership

## Goal 1: Create Products and Processes from Florida's Coastal Resources Using Marine Biotechnology

- 1.1 A statewide faculty task force formed by Florida Sea Grant in 1998 to advance marine biotechnology will continue to operate. The goal is to partner with industry in a way that will yield both state and industry funds to support marine biotechnology research and economic growth in Florida. (Seaman/Cato)
- 1.2 A mixture of pseudopterosins is sold commercially in skin creams and some have potential as anti-inflammatory and analgesic agents. The overall goal of this project is to develop a biotechnological production method of the pseudopterosins and seco-pseudopterosins from the sea whip and to test them for their anti-inflammatory activity. (Kerr: R/LR-MB-8)
- 1.3 Protection of marine surfaces against fouling organisms is not only a big business, but also a difficult process to make coatings environmentally friendly. The world market for marine paints is over \$2 billion annually. A worldwide ban on some paint ingredients will occur in 2003. The goal of this project is to develop nemertine bipyridyls from marine species, which have potential as potent antifouling agents. (Kem/Soti: R/LR-MB-9)
- 1.4 One solution to increase resistance by humans to pathogen treatment therapy is to identify novel antimicrobial compounds, which can serve as leads in drug discovery programs. Marine microbes are an exciting potential source of compounds. Bacteria will be isolated from several species of Floridian tunicates and sponges that produce bioactive compounds and tested for potential as clinical antimicrobiological agents. (Baker, B./Grimwade/Leonard: R/LR-MB-10)
- 1.5 A number of natural compounds from marine sources are now being used as anti-inflammatory agents in medicines and other products. Elisabethadione is a biosynthetic intermediate that leads to natural agents. The goal of this project is to develop a biotechnical production method of elisabethadione, which in nature comes from the sea whip. (2004). (Kerr/Lopez: R/LR-MB-14)
- 1.6 R-PCR is a quantitative molecular methodology that offers higher throughput potential from current types of analysis, providing results within hours, not days. The goal of the project is to develop real-time PCR for rapid, quantitative, cost-effective technology for enumeration of *Vibrio* spp. oyster. The methods will be developed for practical applications in shellfish monitoring and for evaluation of post-harvest treatments. (2004). (Wright/Rodrick/Schneider: R/LR-MB-15)
- 1.7 Protection of marine surfaces against fouling organisms is a big business, but a difficult process to make environmentally friendly. These natural products will be characterized and tested for barnacle larvae settling inhibition, letuality, and crustacean chemoreceptor activities. These anti-fouling compounds will be tested in both laboratory and field settings. (2004). (Kem/ Soti: R/LR-MB-16)
- 1.8 Cancer is the second leading cause of death in the United States. Lasonolides appear to have a novel, but undefined mode of action to kill tumor cells. This project will help define the utility of the compounds by identifying the primary protein target for the compounds. (2004). (Wright/Longley: R/LR-MB-17)

- 1.9 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. More than 100,000 conopeptides exist; however, few have been sequenced to date. The goal is to obtain a novel set of conopeptides and evaluate their potential as a therapeutic agent. (2004). (Mari/Fields: R/LR-MB-18)
- 1.10 This project provides leadership in a new direction to expand and enhance natural products research. It focuses the latest advances in biotechnology to identify and determine the mechanism of action of marine-derived compounds with pharmaceutical potential. It demonstrates the power of cross-species array technology for the development of unconventional model systems, such as marine invertebrates, to address questions in marine, cell and molecular biology. (2003). (Pomponi/Willoughby: R/LR-MB-19)
- 1.11 The biotechnology industry of Florida ranks 12<sup>th</sup> in size nationally. Neither it nor the marine-related sector have been assessed for needs, opportunities, and bottlenecks. This project will prepare a characterization for industry use and long-range program development in Florida Sea Grant. This aim is consistent with the FSG long-range planning goal for economic leadership. In case of biotechnology, a “clean” industry with jobs paying twice the national average, and the retention of Florida-educated scientists and technicians are common goals of the industry and academia. (Seaman/Scott: PD-02-03)

## **Goal 2: Determine Production and Management Techniques Which Make Florida's Fisheries Sustainable and Competitive**

- 2.1 Commercial catches of small coastal shark species have increased dramatically in recent years, as large coastal sharks have been over fished. Management quotas have been set for small coastal sharks. A scientific framework for assessing the current status of small coastal sharks and to assess the impact of future harvest strategies will be completed. (Simpendorfer/Burgess: R/LR-B-48)
- 2.2 The gag grouper is one of the most valuable fisheries in the Southeast United States. The fishery is presently under intense management scrutiny and is a priority for federal fisheries research related to essential fish habitat. Thus, it is important to test the role of habitat in mediating predator-prey interactions and individual fish growth dynamics in gag grouper to ensure that appropriate management measures can be implemented to ensure fishery sustainability. (Lindberg/Mason: R/LR-B-49)
- 2.3 The Florida spiny lobster is the most valuable fishery in Florida, when both the commercial and recreational economic impact of the fishery are considered. The stock relies on continued input of post larvae and the suitability of the habitat. This project builds on previous research investments and will provide Florida spiny lobster managers with an accurate method to predict the fishable lobster population several years in advance and to track the health of the essential nursery habitat. (Herrnkind/Butler: R/LR-B-50)
- 2.4 West Florida shelf-edge reefs are of major importance to reef fish fishery production in the Gulf of Mexico, yet little is known of the biological and geological characteristics of these reef systems. The commercial reef fish fishery of this region concentrates its effort on these shelf-ledge reefs. Virtually all of the important reef species are considered overfished; some are considered threatened. In 1999, the Gulf of Mexico Fishery Management Council set aside two 100 nautical-square-mile shelf-ledge areas for experimental purposes, providing opportunities to monitor fish demographics in protected areas. Monitoring of gag grouper (*Mycteroperca microlepis*) and scamp (*M. phenax*) spawning aggregations, movement patterns, and changes in year round distribution and abundance will provide comparison data for protected areas with unprotected areas of similar habitat. Benthic habitat characteristics and habitat changes will also be monitored at several scales in the study areas. (Koenig/Coleman/Levitan: R/LR-B-51)
- 2.5 Artificial reefs are a potentially powerful management tool that can be used to enhance fish production and divert deleterious impacts away from natural habitat. To date, their use is limited by some interests due to a scientific controversy over attraction-production. Solutions to this problem must quantify the negative effects of attracting fish away from natural reefs, the positive effects of providing new habitat, and the compensatory responses mediated by reducing density-dependence on natural reefs. Impact assessment, experimental design and a statistical framework will be developed for long-term studies of fish dynamics, using important ornamental reef fish species in the Florida Keys. These small reef fishes comprise an emerging fishery, and provide a tractable model system in which to explore the efficacy of artificial reefs. (Osenberg/St. Mary/Bolker: R/LR-B-52)
- 2.6 Gag grouper is a highly prized fish in the Southeast United States. The fishing is under intense management, scrutiny and pressure. This project will link the importance of essential fish habitat to gag grouper population dynamics. This will allow management agencies to make science-based decisions related to essential fish habitat. (2004). (Lindberg/Mason/Murie: R/LR-B-53)

- 2.7 Declining shark populations worldwide have prompted concern about the sustainable health of the resource. Management on a species-specific basis is under consideration. This is currently not possible due to considerable difficulties in identifying shark carcasses and fins. The development of false identification methods is needed before valid data can be obtained and management measures developed. (2004). (Shivji: R/LR-B-54)
- 2.8 Diamondback terrapins range along the eastern and Gulf coasts of the US and prefer the same habitat as blue crabs. Large numbers of terrapins enter crab pots and drown as bycatch. Much of the mortality is avoidable with the use of bycatch reduction devices that limit the entrance size of trap funnels. This project is designed to test bycatch devices which can reduce turtle mortality. (2003). (Butler/Heinrich: R/LR-B-55)
- 2.9 Coordinate and conduct a marine fisheries inservice training for interested Sea Grant agents on recent changes in management programs for both recreational and commercial fisheries in state and federal waters off Florida and the Southeast U.S. region. (Adams)
- 2.10 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Fishery Management Councils. (Adams)
- 2.11 Conduct fish mortality reduction programs and/or distribute information to recreational and sport anglers on use of circle hooks, fish venting tools, proper fish handling techniques. (Adams, Combs, Crane, Creswell, Diller, S. Jackson, McGuire, Novak, Stevely, Sweat, Tavares, Wasno, Verlinde)
- 2.12 Conduct a random sample survey of recipients of fish venting tools and educational materials to determine effectiveness of educational program in reduction of fish mortality and future program efforts. (Adams, Novak, Stevely)
- 2.13 Develop vessel cost and earnings brochure for pelagic longline vessels utilizing logbook data as provided by NMFS and HMS. (Adams)
- 2.14 Provide technical assistance in development of an economic analysis on the multi-species, multi-gear fishery in the South Florida region. (Adams)
- 2.15 Continue to maintain contacts with Cuban counterparts at the University of Havana and the Cuban Ministry of Fisheries to exchange data and explore future collaborative efforts. (Adams)
- 2.16 Coordinate economic analysis and impact of Florida's Blue Crab fishery. (Adams)
- 2.17 Present paper at the International Institute for Fisheries Economics and Trade Annual Conference. (Adams)
- 2.18 Present poster at The Coastal Society's annual meeting. (Adams)
- 2.19 Present poster at the Southern Agricultural Economics Association's Annual Meeting. (Adams)
- 2.20 Promulgate the 53<sup>rd</sup> Proceedings of the Gulf and Caribbean Fisheries Institute (GCFI) and disseminate it to libraries and universities throughout Florida. (Creswell)
- 2.21 Increase membership and library subscriptions to the GCFI proceedings by 15% over the next year. (Creswell)



- 2.22 Serve as Chair of the Steering and Program Committee for the 55<sup>th</sup> GCFI Annual Conference, and publish its Book of Abstracts. (Creswell)
- 2.23 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Fishery Management Councils. Membership will also continue on the Coastal Pelagics Stock Assessment Panel. (Gregory)
- 2.24 Provide technical assistance and training to fishermen so they will learn how to communicate effectively with regulatory agencies concerning proposed regulations. In turn, provide regulatory agencies with information about unintended consequences of regulations in order to lessen the social and economic impacts on fishing families. (Gregory)
- 2.25 Evaluate the effectiveness of the Western Sambos Marine Reserve for enhancing spiny lobster sizes and abundance and adjacent fishery yields by analysis of data from four-year research project. (Gregory)
- 2.26 Maintain working relationship with Destin Charterboat Association by attending their meetings, and providing educational support to their programs. (S. Jackson)
- 2.27 Support efforts in Okaloosa County to create inter-local participation among governments to manage and promote artificial reefs. Efforts will include serving on advisory committees, assisting in development of artificial reef plans, developing artificial reef monitoring programs. (S. Jackson)
- 2.28 Provide support to fledgling volunteer reef monitoring organizations in Okaloosa County. (S. Jackson)
- 2.29 Implement an urban fishery program in Okaloosa county, directed toward non-traditional resource users. (S. Jackson)
- 2.30 Develop a “rack card” for public distribution regarding the use of artificial reefs in Okaloosa and Walton Counties. (S. Jackson)
- 2.31 With community group and government support, develop 100 recycling stations for monofilament line at high volume fishing areas in Flagler, St. Johns, Duval and Nassau Counties. (McGuire)
- 2.32 Assist in a multi-agency fish survey in the intracoastal waterway in north Florida. This project is being led by the U.S. Geological Survey. (McGuire)
- 2.33 Coordinate efforts of the Charlotte Marine Research Team relative to reef and water quality monitoring. This will include the recruiting and training of 10 new members. (Novak)
- 2.34 Continue development of the artificial reef system in SE Florida. These efforts will include selection and survey of at least two new artificial reef sites, submitting appropriate permit applications, recruitment of volunteers to construct concrete reef modules, and deployment of materials to site. (Novak)
- 2.35 Reduce fish mortality through various public awareness and educational activities. These include training fishing tournament organizers in the use of a “recessitation tank” to reduce mortality at catch-and-release events; provide 10 workshops on fish venting, circle hook and “catch/release;”

- write news articles and appear on local tv shows, construct and distribute with information materials the Sea Grant fish venting tool. (Novak)
- 2.36 Provide technical assistance and education at 8 local fishing tournaments. These will include two shark tournaments, five redfish/snook tournaments, and one kids' day event. (Novak)
  - 2.37 Continue work on the REDstart Project, a redfish enhancement project at Tarpon Bay on Sanibel Island. (Novak, Wasno)
  - 2.38 Assist a team of researchers from Stanford University, Duke University, Monterey Bay Aquarium and the National Marine Fisheries Service on a blue fin tuna tagging project. (Novak)
  - 2.39 Work with Sea Grant Extension Program Leaders from the South Atlantic (NC, SC, GA, FL) to develop regional fish extension projects, as part of the "unfunded fisheries extension mandate." (Spranger)
  - 2.40 Work with Sea Grant Extension Program Leaders from the Gulf of Mexico (TX, LA, MS, AL, FL) to develop regional fish extension projects, as part of the "unfunded fisheries extension mandate." (Spranger)
  - 2.41 Explore opportunities to develop fish extension projects for the National Fish Extension Competition that will occur in the Spring of 2002. (Spranger)
  - 2.42 Obtain funding from Florida Fish and Wildlife Conservation Commission's Marine Research Institute to continue sponge survey work in Florida Bay. (Stevely, Sweat)
  - 2.43 Analyze data from annual sponge survey, and develop annual report on sponge populations (density and size) to the Florida Fish and Wildlife Conservation Commission, Florida Sea Grant, and Florida Keys National marine Sanctuary Program. (Stevely, Sweat)
  - 2.44 Complete underwater photography for proposed publication, "A Field Guide to Florida Bay Sponges." (Sweat)
  - 2.45 Provide presentations on the long-term sponge survey work in Florida Bay at the 5<sup>th</sup> International Sponge Biology Congress, which is only held every four years. (Stevely, Sweat)
  - 2.46 Coordinate the annual workshop/field exercise for artificial reef coordinators in the ten SW Florida Counties in order that they more effectively design and permit reefs. (Stevely, Novak, Sweat, Wasno)
  - 2.47 Provide technical assistance in planning the deployment and monitoring of 600 "reef balls" at five inshore reefs in waters off Manatee County. (Stevely)
  - 2.48 Develop a new Sea Grant fact sheet on "How Old is That Fish I Caught?" (Stevely)
  - 2.49 Assist the local commercial fishing industry in responding to new, proposed stone crab trap reduction program. (Stevely)
  - 2.50 Continue in organization and coordination of the annual Cortez Commercial Fishing Festival. (Stevely)

- 2.51 Coordinate a workshop for recreational divers that will provide legal requirements, harvesting techniques, cleaning, handling and cooking of bay scallops in a newly opened fisher in Southwest Central Florida. (Sweat)
- 2.52 Provide logistical support and secure funding for the 14<sup>th</sup> International Petinid (scallop) Workshop that will be held in April, 2003 in St. Petersburg. (Sweat)
- 2.53 Develop training programs for community volunteers that will assist them in the creation, enhancement or restoration of oyster reefs, that will be utilized for local commercial and recreational fishing. (Wasno)
- 2.54 Work with community and student/teacher volunteers to establish multiple, small-scale demonstration projects on oyster reefs, and develop a volunteer-based monitoring program to evaluate restoration success. (Wasno)

### **Goal 3: Develop the Food and Hobby Segments of Florida's Marine Aquaculture Industry**

- 3.1 Sturgeon is a high value aquaculture species in some regions of the world. Very little is known about the demand for and the value of sturgeon in Florida. Little is known about the production of sturgeon in ponds as opposed to tanks. The performance of sturgeon in ponds will be evaluated, market demand and packaging techniques for the meat will be tested and the economic feasibility of pond growout techniques will be determined. At least 10 prospective sturgeon growers will learn the economic characteristics of culturing sturgeon in tanks and ponds in Florida. (Lazur/Wirth/Zajicek/Zimet: R/LR-A-26)
- 3.2 Adequate seed availability is a major nuisance to the further development of the hard clam culture industry in the southeastern U.S. Critical shortages have occurred, and remote setting will allow nursery operators and growers to become less dependent upon traditional seed sources. Technical procedures will be developed and the economic feasibility determined of transferring remote setting technology from the Pacific Northwest molluscan shellfish industry to the Florida hard clam industry. Over 100 nursery operators and 300 growers will learn of the economic costs and benefits of utilizing remote setting to obtain clam seed for field planting. (Adams/Sturmer/Supan: R/LR-A-27)
- 3.3 The fishery for naturally occurring hard clams is of major cultural and economic importance to many eastern U.S. states. Landings from the traditional stock have declined in the past due to over harvesting and removal of spawning stock. Stock enhancement in natural settings is an alternative to increase stock size. The feasibility of introducing hatchery-sponsored larvae directly to the water column as a cost-effective means of stock enhancement for hard clams will be tested in the Indian River Lagoon. (Irlandi/Hitchcock/Arnold: R/LR-A-28)
- 3.4 In Florida, marine aquarium species are primarily collected from the wild (about \$4 million annually) while farm-level sales of freshwater fish reached nearly \$60 million in 1997. A Sea Grant goal is to increase the culture of marine ornamentals in order to generate economic activity in Florida while protecting the wild-caught stocks. Market information, the acceptability of various marine ornamental attributes, and the overall demand for marine ornamentals will be determined as a way to measure the potential of this culture industry. (Degner/Milon/Larkin: R/LR-A-29)
- 3.5 Certain marine algal species make up an important part of the natural diet of Atlantic surgeonfish, which have economic importance in Florida, and are traded globally for the aquarium trade. An experimental diet that approximates the natural diet of these fish will be developed and tested. The goal is to develop diets that can be used to improve the health and management of Atlantic surgeonfish and to enhance efforts for captive propagation. (Francis-Floyd/ Phlips/ Berzins/ Cardeilhac: R/LR-A-30)
- 3.6 Depletion of bay scallops in the Eastern Gulf of Mexico is largely due to loss of seagrasses that form an essential habitat. Seagrasses are recovering, but bay scallop spawning stocks are at an all-time low abundance in Tampa Bay. The goal is to significantly advance developing hatchery-release technology to replenish bay scallop populations on the Florida West Coast and to test the relative efficiency of cage versus free-planting cultured scallops in the field. (Leber/Halstead/Arnold/Blake: R/LR-A-34 [TAQ-99-104])
- 3.7 Suitable food for early life stages of cultured fish is a bottleneck for raising them for the ornamental fish hobby-based market. The goal of this project is to scale-up production of caepod species as food for rearing tropical ornamentals. (2004). (Marcus: R/LR-A-36).

- 3.8 Clam aquaculture is currently focused on a single species. Diversification is needed to allow the industry to grow. This project will help determine the production feasibility of two marine bivalve species. Limited stocks of these species have prevented the development of major fisheries, but aquaculture could provide a source of seed for both species. This project will focus on spawning and larval rearing technologies. (2003). (Baldwin: R/LR-A-37-PD)
- 3.9 This study utilizes a novel approach to understanding key factors about a major problem in aquaculture. High mortality rates occur during the first-feeding stage of hatchery-reared marine fish larvae. Development of techniques that will increase the survival rate is critical. (2003). (Turingan/Coleman/Creswell: R/LR-A-38)
- 3.10 The 30<sup>th</sup> Joint Meeting of the U.S.- Japan Natural Resources (UJNR) Aquaculture Panel was held in Fall 2001 in Florida. The proceedings of the symposium on stock enhancement and marine fish aquaculture will be published. (2003). (Leber: PD-01-3)
- 3.11 This project is inspired by the need to develop new, low-cost, open-ocean aquaculture cage systems. The feasibility of an aquaculture cage design based on flexible pressurized members will be determined. (Niezrecki: PD-01-5)
- 3.12 The objective of the 14<sup>th</sup> International Scallop (Pectinid) Biology and Aquaculture Workshop is to provide unique opportunities for researchers and managers to exchange new information. About 125 people from 25 countries are expected to attend the Conference to be held in Florida. University of South Florida researchers and Florida Sea Grant Extension faculty are organizing the conference. (2003). (Blake/Sweat: PD-01-08)
- 3.13 This project will lessen the potential for market acceptance of cultured sturgeon products in seafood markets within the Southeastern U.S. The information will help determine the feasibility of introducing cultured sturgeon products into the general seafood market of the U.S., including Florida. (Adams: PD-02-6)
- 3.14 Conduct an economic impact analysis on the hard clam industry by region and state that will demonstrate the economic contributions of the industry to Florida's economy (Adams, Sturmer)
- 3.15 Provide pro-forma analysis on the economic and financial characteristics of marine shrimp culture in freshwater ponds in south Florida. (Adams)
- 3.16 Develop a spreadsheet package that will facilitate the collection of necessary production data by commercial hard clam growers participating in the crop insurance program. (Adams, Sturmer)
- 3.17 50 Vocational/Technical Students, 200 high school students, and 5 science/vocational technical teachers will increase their general knowledge about aquaculture in St. Lucie County through their participation in Sea Grant programs. (Creswell)
- 3.18 10 clam aquaculture industry members holding leases in the Indian River Lagoon will implement up-to-date culture practices and demonstrate knowledge of applicable Florida Dept. of Agriculture and Consumer Services regulations through participation in Sea Grant programs. (Creswell)
- 3.19 Serve as co-editor of a book, Perspectives on Responsible Aquaculture for the New Millennium. The book is a series of essays that focus on seafood safety, quality assurance, environmental impacts,

aquaculture and coastal management and ethics. It is jointly sponsored by the World Aquaculture Society and the European Aquaculture Society. (Creswell)

- 3.20 Provide technical assistance to Sea Grant sponsored research project entitled “preliminary investigation of Blood Ark, Anadara ovalis, and Ponderous Ark, Noetia ponderosa, Culture to Initiate Diversification for the Hard Clam, Mercenaria mercenaria, Aquaculture Industry. (Creswell, Sturmer)
- 3.21 At least 20 residents of Okaloosa and Walton Counties plus Southern Alabama residents will receive information and assistance regarding potential aquaculture ventures and start-up considerations through Sea Grant sponsored educational programs. (S. Jackson)
- 3.22 10 farmers will receive information and technical support through a water quality workshop for aquaculture enterprises. (S. Jackson)
- 3.23 At least 15 Walton County middle-school children will learn about aquaculture through participation in Sea Grant programs and exhibits. (S. Jackson)
- 3.24 Due to increased interest in aquaculture, assist in reviving the high school Aquaculture Program. Conduct at least two training sessions at the school and evaluate the program at the end of the year. (Mahan)
- 3.25 Continue to establish and refine a shellfish education network within those counties where clam farming is ongoing by working with Sea Gant extension agents in these locales, and establishing a presence in these counties. Efforts in 2002 will focus on Brevard, Indian River, Charlotte, and Lee Counties. (Sturmer: Combs, Creswell, Novak, Wasno)
- 3.26 Expand the multi-county shellfish aquaculture shellfish advisory committee to an industry-wide advisory committee. (Sturmer)
- 3.27 Develop workshops on remote water quality monitoring systems and weather stations in Brevard, Charlotte, Indian River and Lee Counties, in order that shellfish growers understand the benefits of a continuous data base system, and to identify trends in environmental conditions related to clam health and production. (Sturmer)
- 3.28 Develop workshops for hatchery operators in Brevard, Indian River, Martin and St. Lucie Counties that focus on current production techniques and industry-specific issues so that they can make informed decisions in maintaining their seed business. (Sturmer)
- 3.29 Initiate a network in Franklin County where a new clam industry will begin during 2002 by working with the local Sea Grant Extension agent. (Sturmer, Mahan)
- 3.30 Coordinate and host the annual Hard Clam Growers Conference to discuss latest regulations, research findings, production and harvest techniques. (Sturmer)
- 3.31 Continue participation and assist university researchers and state agency staff in the Clam Lease Assessment, Management, and Modeling using Remote Sensing (CLAMMRS) project, a four-year project funded by the U. S. Department of Agriculture that is establishing real-time, remote water quality monitoring systems in various Florida locations. (Sturmer)

- 3.32 Continue “Shellfish Aquaculture,” a quarterly newsletter that is distributed to over 600 industry members with businesses in nine countries. (Sturmer)
- 3.33 Work with Florida Department of Agriculture and Consumer Services (DACS) staff in the development of BMP field demonstrations and a shellfish aquaculture BMP exhibit. (Sturmer, DAC staff)
- 3.34 Coordinate a clam production quality and marketing workshop. (Sturmer, Otwell, DAC staff)
- 3.35 Conduct several water quality monitoring for the shellfish industry. (Sturmer, Baker, Philips, DACS)
- 3.36 Coordinate several Crop Insurance Focus meetings for the shellfish industry. (Sturmer, USDA/RMA Crop Insurance specialists)
- 3.37 Coordinate a series of crop record keeping workshops for the shellfish industry. (Sturmer, Adams)
- 3.38 Assist in the development of a Shellfish Aquaculture Center in Cedar Key. The center will provide support for all phases of the “Aquaculture Florida” research project pertaining to shellfish. (Sturmer, UFFAS Faculty)
- 3.39 Assist local school groups who are farming clams on a Levy County management lease site. (Sturmer)
- 3.40 Assist the Suwannee River Water Management District staff by providing educational materials on clam farming to various school groups. (Sturmer)
- 3.41 Provide presentations and demonstrations at State 4-H Congress. (Sturmer)
- 3.42 Organize and participate in a session on recent advances in land-based nursery systems for shellfish aquaculture at the 94<sup>th</sup> Annual Meeting of the National Shellfisheries Association. (Sturmer)
- 3.43 Continue work with University of South Florida and Florida Department of Fish Wildlife and Conservation Commission scientists in the scallop restoration project. (Sweat)
- 3.44 Continue to provide technical assistance to net-banned fishermen on the blue crab fishery. (Sweat)
- 3.45 At least 50 stakeholders will learn more about the habitat and behavior of fishers, in ways that science have not been able to document, through the testimonials of patriarchal fishermen (both recreational and commercial) who have fished over the years out of Broward County. (Tavares)

## Goal 4: Improve the Product Quality and Safety of Florida's Seafood Products

- 4.1 Bacteriophage has proven to be effective in killing pathogenic bacteria in mice and farm animals. *Vibrio vulnificus* are a bacteria present in oysters. *V. vulnificus* is lethal when consumed by people in certain risk categories. Bacteriophage may offer a practical and realistic method for making oysters safe for human consumption. They will be used to test their ability to kill *V. vulnificus* in oysters. (Duckworth/Gulig: R/LR-Q-20 [GMO-99-1])
- 4.2 The use of reduced-oxygen packaging continues to expand for seafood despite warnings of potential food toxicity problems. This project will develop "smart-labels" for time-temperature integration and packaging film permeability. Unbiased, scientifically based controls can then avert regulatory interaction or product safety issues. (2004). (Balaban/Otwell/Welt/Kristinsson: R/LR-Q-22)
- 4.3 Millions of U.S. consumers eat oysters. However, for a small segment of the population, eating raw or undercooked oysters can cause serious illness or death from *Vibrio vulnificus* the goal of this project is to educate consumers, conduct new oyster product research and processing technologies and education medical groups so that human safety risks can be minimized or eliminated while maintaining an industry. (2004). (Jamison/Jamir: R/LR-Q-23 (FL-G01-5))
- 4.4 Bacteriophage have been proven to be effective in the prevention and treatment of diseases in humans and animals. Previous Sea Grant research has shown that phage specific for *V. vulnificus* can prevent lethal disease in mice caused by this organism. This project extends that work to test scale-up systems for phage treatment to eliminate *V. vulnificus* from the system. (2004). (Duckworth/Gulig/Rodrick/Wright: R/LR-Q-24 (G01P-03))
- 4.5 Plan, organize and teach at the 4<sup>th</sup> Annual Oyster Industry Workshop where industry representatives will be updated on current issues, such as *V. vulnificus*, new regulations and processing options. (Mahan, Otwell)
- 4.6 Attend and participate in regional and national Interstate Shellfish Sanitation Conference committee meetings to provide technical support to the local and Gulf of Mexico oyster industry representatives. (Mahan)
- 4.7 Organize and teach at least two clam aquaculture workshops in support of this potential new industry in North Florida. (Mahan, Sturmer)
- 4.8 Organize and recruit members for a Franklin County Aquaculture Task Force that will oversee the development of the clam aquaculture industry in the county. (Mahan)
- 4.9 Continue to work as a member of Florida's *V. vulnificus* (Vv) Risk Management Work Group to assist with the development and implementation of the statewide management plan to reduce Vv. Oyster related illnesses in Florida. (Mahan)
- 4.10 Continue as member of the Interstate Shellfish Sanitation Conferences *V. vulnificus* Education subcommittee in the development of a national Vv. Education plan to reduce Vv. Oyster related illnesses in the United States. (Mahan)
- 4.11 Develop handbooks to direct development of HACCP and "variances" in retail processing of foods. Six handbooks are expected that will cover the following topics: fresh juice, fresh cut produce, specialty meats, smoked fish, MAP/vacuum packaging, and sushi. (Otwell)



- 4.12 Assist in the implementation of post-harvest treatments for processing safe oysters in Florida (Otwell)
- 4.13 Conduct research and educational programs to verify tempering to control clam survival and reduce *Vibrio vulnificus*. (Otwell)
- 4.14 Work with other researchers on “controls for Carbon Dioxide applications with fish. (Otwell)
- 4.15 Conduct annual industry training sessions with the assistance of county faculty. (Otwell)
- 4.16 Conduct domestic and international Shrimp Schools. (Otwell)
- 4.17 Periodic training schools for HACCP and Sanitation Control Procedures for seafood processing and regulatory inspectors will continue. Schools will be held, as needed, in response to firms, agencies or organizations that insure 25 attendees. (Otwell)
- 4.18 Work with FAO/WHO and Smithsonian Institute in website development for ECOPORT “fisheries and seafood safety.” (Otwell)
- 4.19 Explore development of an annual lobster school, patterned after the successful shrimp schools. (Otwell)
- 4.20 Explore development of an annual smoked fish school, patterned after the successful shrimp schools. (Otwell)
- 4.21 Leadership will continue to be provided for numerous seafood technology organizations. (Otwell)
  - 4.21.1 National Seafood HACCP Alliance, 2001-2003, National Coordinator. (Otwell)
  - 4.21.2 Executive Director, Seafood Science & Technology Society of the America’s Annual Conference. (Otwell)
  - 4.21.3 U.S. Representative to the International Association of Fish Inspectors Annual Meeting. (Otwell)
  - 4.21.4 National Academy of Science’s Committee on the “Use of Scientific Criteria and Performance Standards for Safe Food.” (Otwell)
- 4.22 Coordinate workshops and seminars at local festivals and boat shows that provide at least 200 home seafood consumers with seafood safety information. (Sweat)
- 4.23 Continue the freezing/shelf-life studies of aquacultured scallops using vacuum packaging and quick freezing techniques. (Sweat, Otwell)

## **Goal 5: Increase the Economic Competitiveness and Environmental Sustainability of Coastal Water-Dependent Businesses**

- 5.1 Intensive boating by over one million boaters in Florida waterways plays tremendous environmental pressure on the waterways. This project will use technical and science-based education methods to educate Florida boaters. The goal is to have boaters become self-regulatory in order to maintain boating as an economically valuable enterprise while at the same time eliminate boating-related environmental damage. (2004). (Spranger/Swett: R/C-P-24)
- 5.2 The rapid increase in the number of boats in Florida has created environmental issues at the same time. Boats create huge economic impacts for the state. Currently, expensive on-the-water surveys are needed to compile data sufficient for boat traffic management use. This project will determine the feasibility of modifying the Florida vessel registration system to make it more usable for research purposes. (2003). (Swett/Sidman: R/C-P-25)
- 5.3 There is a need among state and local decision makers to achieve effective sustainable development solutions that resolve conflicts between boating and the environment of Florida's urban bays and waterways. This project will develop Geographic Information Systems (GIS) technology to educate decision makers, planners, and the boating industry. (Spranger/Swett: PD-01-4)
- 5.4 Florida Sea Grant has a long record of cooperative relationships with agencies in Southwest Florida through joint collaborative research and extension projects in urban boating and small craft management. This current activity will help in conceptualizing, publications, serving as Florida Sea Grant "Ambassador" to elected and appointed officials and monitoring current program staff. (Spranger/Antonini: PD-01-11)
- 5.5 Legal issues associated with waterway management and recreational boating have been developing and changing rapidly. A seminar will be held that provides legal and technical education to the marine community concerning the issues associated with use of the marine environment. (Ankerson/Hamann: PD-01-12)
- 5.6 Participate in efforts to develop a regional economic analysis and impact of the Atlantic Intercoastal Waterway System. (Adams)
- 5.7 Work with local marinas and boatyards to assist them in obtaining "clean marina/boatyard designations. (Combs, Crane, Diller, S. Jackson, McGuire, Verlinde)
- 5.8 Serve as project coordinator for Clean Marina/Boatyard Program and assist the Clean Boating Partnership in the development and delivery of educational programs. (D. Jackson)
- 5.9 Provide evaluation and measure effectiveness of "Prepare the Presenter" workshops for Boatyards that were conducted during 2001. (D. Jackson)
- 5.10 Assist in the development of the 2002 National Clean Marina Conference and present paper on Florida's program. (D. Jackson)
- 5.11 Secure funding, update and distribute 50,000 new Boater's Guide to Charlotte Harbor. (Novak)
- 5.12 Assist Charlotte County planners with a comprehensive plan for boating and beach access. (Novak)

- 5.13 Provide technical assistance for the development of a Bradenton Beach anchorage. (Stevely)
- 5.14 Provide educational program at Anchorage Management Conference that will increase the ability of resource managers and elected officials to more effectively manage anchorage resources. (Stevely)
- 5.15 Work with the Urban Bay Waterways Management Program in exploration of a boater's component to the Florida Yards and Neighborhood Program. (Stevely)
- 5.16 Organize an Advisory Council to assist the Urban Boating/Bay Water Management Program to clarify and prioritize issues, develop program objectives, identify and establish partnerships with governmental entities, and evaluate program activities. (Swett)
- 5.17 Initiate and complete a waterway management analysis of the Braden and upper Manatee Rivers with Manatee County funding. Products will include GIS data layers of boats, depths, signs, derelict vessels, moorings, and trafficheds; 1:2400-scale neighborhood waterway analysis showing level of accessibility to open bay water for each boat, with draft restrictions at 0.5' intervals; 1:2400-scale neighborhood waterway analysis showing location and extent of channel depth restriction at 0.5' interval; Regional analysis atlas, 1:24,000-scale, identifying water depth of access channels, feeder canals, basins, open water areas, boating facilities and boats, habitat (sea grass, mangrove). (Swett, Fann)
- 5.18 Complete a waterway management analysis for 300+ miles of waterways along the Caloosahatchee River in Lee County with WCIND funding. Products will include GIS data layers of boats, depths, signs, derelict vessels, moorings, and trafficheds; 1:2400-scale neighborhood waterway analysis showing level of accessibility to open bay water for each boat, with draft restrictions at 0.5' intervals; 1:2400 neighborhood waterway analysis showing location and extent of channel depth restriction at 0.5' interval; Regional analysis atlas, 1:24,000-scale, identifying water depth of access channels, feeder canals, basins, open water areas, boating facilities and boats, habitat (sea grass, mangrove). (Swett, Fann)
- 5.19 Provide technical support to local, regional and state governments, in implementing regional waterway management plans. Thirty community leaders will be educated through three workshops, one extension bulletin, five meetings with state and local governments, and 15 individual consultations and meetings. (Swett, Sidman, Fann)
- 5.20 Provide scientific advisement and program support to the West Coast Inland Navigation District in the implementation of its five-year Strategic Plan. (Sidman)
- 5.21 Conduct an in-service training workshop in the utilization of GIS and GPS technology in addressing coastal management issues for 20 local, regional and state government staff. (Swett, Sidman, Fann)
- 5.22 Publish Volume 2 of the historical geography series titled "A Historical Geography of Southwest Florida Waterways—Charlotte Harbor to Cape Romano". This region-based publication provides a historical perspective on Florida's coastal waterway environment and development history (Fann, Antonini).
- 5.23 Initiate a 17-month collaborative effort with local, regional, and State entities, including the Fish and Wildlife Conservation Commission, Florida Marine Research Institute (FMRI); the Florida Marine

Patrol; and the Marine Trade Association of Florida, to enhance the content of and linkage between existing databases, such as the Florida Vessel Title Registration System, for use in inventory, management, and planning tools. The techniques to be developed have the potential to replace or augment existing field survey methods used for the Regional Waterway Management System. (Swett, Sidman)

- 5.24 Complete Charlotte Harbor recreational boating characterizations for the Florida Marine Research Institute. Products will consist of the following: 1) an enhanced regression-based model that estimates preferred destinations of recreational boaters, 2) a description and map showing the relationships between boating use intensity, diversity, accidents, and ecological sensitivity, and 3) a CD-ROM that organizes and formats existing data and reports. (Sidman)
- 5.25 Develop a method to provide a reliable and recurring source of bathymetric data, which meets NOAA standards, for areas where NOAA surveys do not show current conditions. This element is designed to meet the goal of cost sharing for data collection between the federal government and local/regional agencies. The data will provide local and regional agencies with the necessary information to meet resource management needs and provide NOAA supplemental information for nautical charts. (Swett, Fann)
- 5.26 Design a GIS-based management application to guide the placement of speed zones in coastal communities. The following supporting objectives will be pursued: 1) assign speed generation capabilities to the boat makes and models that are contained in the southwest Florida boat census conducted by Florida Sea Grant (FSG); 2) conduct a network analysis to determine speed generation profiles and service levels for southwest channel segments surveyed by FSG; 3) correlate speed generation profiles and service levels to existing speed zones; 4) produce an ArcView GIS management application with existing data layers and those spatial data layers developed during the project; 5) conduct a workshop to present results to the southwest Florida Marine Advisory Committee and the Florida Marine Research Institute. (Swett, Sidman)
- 5.27 The NOAA Coastal Services Center (CSC) has approved full funding for a new project, A Coastal Data Information Server System for the Gulf Intracoastal Waterway and Adjoining Bay Waters of Southwest Florida. The scope includes collating bathymetric and land use/land cover data generated in prior FSG projects, as well as scanning and georeferencing imagery and maps collected over many years (e.g., 600+ historic aerial photographs, hydrographic and topographic maps, etc.). The data and metadata will be provided to UF's Florida Geographic Data Library (FGDL), which will soon become a Federal Geographic Data Committee (FGDC) node, so that it can be made available on the World Wide Web. Work will begin in September 2002, with scheduled completion in August 2003. (Fann)

# Coastal Ecosystem Health and Public Safety

## Goal 6: Protect and Enhance Coastal Water Quality and Safety

- 6.1 A major and rapidly growing source of non-point source contamination in the coastal zone is nutrient loading from septic and other types of on-site disposal systems. This project will develop new approaches to study rates of water and nutrient transport via groundwater from on-site disposal systems. It will simulate both short- and long-term flow rates on St. George Island, Florida. (Burnett/Chanton/Corbett: R/C-E-42)
- 6.2 In 1987, persistent and widespread phytoplankton and cyanobacterial blooms have coincided with the large-scale decimation of sponge communities in Florida Bay. One hypothesis is that the large-scale loss of suspension feeding sponges has rendered the ecosystem susceptible to these recurring blooms. The goal is to experimentally determine the potential for suspension feeding sponges to control nuisance phytoplankton blooms caused by internal non-point source pollution. (Peterson/Fourqurean: R/C-E-43)
- 6.3 One major and rapidly growing source of non-point source contamination in the coastal zone is nutrient loading from septic and other types of on-site disposal systems. This is particularly true on barrier islands that seldom have centralized sewage treatment facilities. This project aims to develop new approaches to study rates of water and nutrient transport via groundwater, and better tools for evaluating such contaminant loading. The approach will use natural radium isotopes and an artificial tracer to assess long- and short-term average flow rates in the proximity of St. George Island, Florida. (Burnett/Chanton/Corbett: R/C-E-42)
- 6.4 The Florida Bay Education Project was established as a five year program effort, but funding by NOAA's National Ocean Service was not provided after year four. This final project was designed to assist in closing out the program. (Spranger: PD-02-04)
- 6.5 Provide technical assistance to resource management agencies and businesses in Manatee and Sarasota Counties in order that they have a better understanding of the economic consequences of red tide events. (Adams, Stevely)
- 6.6 Provide stormwater education programs where 80% of homeowners participation will adopt one or more "yard and garden practice" designed to reduce the amount of pollution in runoff entering the Perdido or Pensacola Bay systems. (Diller)
- 6.7 Train at least 20 4-H youth in water quality sampling techniques and be able to recognize impacted waterways in the Florida Panhandle through a practical exam. (Diller)
- 6.8 Support continued development of volunteer water quality monitoring efforts in Choctawhatchee Bay and the coastal lakes. (S. Jackson)
- 6.9 Assist in the preparation of a recreational guide and map for the coastal dune lakes for use by residents and tourists. (S. Jackson)

- 6.10 Coordinate and conduct an inservice training program for extension agents on “a watershed approach to water quality.” (Jacoby)
- 6.11 Co-author a review of water quality impacts in Florida’s watersheds. (Jacoby)
- 6.12 If funded, conduct research on links between water quality and seagrass health. (Jacoby)
- 6.13 Attend national workshop on NEMO (non-point pollution education for municipal officials) to review program and see about its application for water quality educational programs in Florida. (Jacoby)
- 6.14 Develop educational programs for Master Gardeners in Flagler, Putnam, St. Johns Duval, Clay and Nassau counties that focus on water quality issues and concerns. (McGuire)
- 6.15 At request of the Apalachicola National Estuarine Research Reserve’s Environmental Program Coordinator, arrange for Dr. Chuck Jacoby, Extension Coastal Estuarine Specialist, to participate in the ANERR’s guest lecture program. (Mahan)
- 6.16 Maintain membership on the Sarasota Bay National Estuary Program’s Technical Advisory Committee. (Stevely)
- 6.17 Develop educational programs for Master Gardeners in Hillsborough, Manatee, and Sarasota counties in water quality issues and coastal plant identification and ecology. (Stevely)
- 6.18 Produce a “nutrient loading fact sheet” for marine and horticulture extension agents and Master Gardeners. (Stevely)
- 6.19 Provide seminars and workshops on the importance of the fragile marine and coastal ecosystems to a minimum of 200 coastal residents in Southwest Central Florida. (Sweat)
- 6.20 Work with Florida Yards and Neighborhood Program to develop educational programs for waterfront communities within the New River district that will provide them with increased knowledge of local water quality issues (debris and stormwater run-off). (Tavares)
- 6.21 Assist volunteers in water quality monitoring activities in local waterbodies. It is anticipated that five Lakewatch programs will be established in area lakes, and that these volunteers will begin monitoring activities along Coldwater and Pond Creeks. (Verlinde)
- 6.22 Coordinate North Santa Rosa Water Quality Task Force Meetings. (Verlinde)

## **Goal 7: Protect, Restore, and Enhance Coastal Ecosystem Habitats**

- 7.1 Stock enhancement and habitat enhancement are methods being used to enhance and conserve estuarine fishes. The variability of environmental factors in known and potential nursery areas for red drum, snook and flounder will be determined by Florida, Texas and North Carolina Sea Grant as a way to improve the success rate of stock enhancement programs. (Leber: R/LR-A-25)
- 7.2 Persistent and widespread phytoplankton and cyanobacteria blooms have coincided with large-scale decimation of sponge communities in Florida Bay. One hypothesis is that the large-scale loss of suspension feeding sponges has rendered the ecosystem susceptible to these recurring blooms. The goal is to experimentally determine the potential for suspension feeding sponges to control nuisance phytoplankton blooms caused by internal non-point source pollution. (Peterson/Fourqurean: R/C-E-43)
- 7.3 The potential for nitrogen and other inputs reaching coastal water via groundwater contaminated with sewage discharge is high. State of the art techniques will be used to assess the potential for sewage contamination of an urban bay (Sarasota) and a less populated bay (Apalachicola). The results will be useful to help manage the use of septic tanks in Florida's coastal zone. (2004). (Chanton/Burnett: R/C-E-44)
- 7.4 Large populations along Florida's coast have created conflicts between human uses of the waterways and natural resources such as oysters. This project will determine the impact of boat wakes on intertidal oyster reefs and will provide coastal managers with data on which science-based management decisions can be based. (2004). (Walters/Coen/Grizzle: R/C-E-45)
- 7.5 Over the last several years swamp eels have been discovered in aquatic habitats in Georgia and Florida. These are large ambitious predators capable of dispersal over land with the potential to disrupt ecosystems. The goal of this project is to discover how eels are introduced, how this can be prevented, describe their ecology and life history, and support methods to control them. (2004). (Collins/Trexler/Nico/Loftus: R/C-E-46 (ANS-20))
- 7.6 A critical and emerging need for ocean sciences education is to determine and catalog the types and impacts of aquatic nuisance species in the Gulf of Mexico region. Leaders will learn and develop materials for K-12 classroom use. This is a joint project with Mississippi/Alabama Sea Grant and includes holding elementary, middle school and high school teacher workshops. (2004). (Spranger: E/NS – 2)
- 7.7 Several topical symposium sessions on issues of special relevance to the goals of Florida Sea Grant's Strategic Plan: 2002-2005 will be organized for the 31<sup>st</sup> National Benthic Ecology Meeting. The event is scheduled for March, 2002, in Orlando. (Levitan/Herrnkind: PD-01-6)
- 7.8 There is limited knowledge and awareness among Florida's citizens about the potential for harmful aquatic bioinvasions. A fact sheet will be developed that defines bioinvasions, explains their ecological and economic impacts, cite avenues of introduction, provide examples of recent introductions to Florida, and justify the necessity for preventative measures. (Walters/Baker: PD-01-7)
- 7.9 Provide assistance to Brevard County annual beach cleanup in September by recruiting 25 volunteers to assist in removal of marine debris. (Combs)

- 7.10 Provide assistance in annual Coastal Beach Cleanup in October by recruiting 25 volunteers to assist in removal of marine debris (Combs)
- 7.11 Provide Sea Grant coastal ecosystem publications and information to 10 Brevard County decision-makers in order to assist them in their management and planning decisions. (Combs)
- 7.12 Involve at least 75 volunteers in Annual International Coastal Beach Cleanup which will result in at least 50 bags of marine debris being removed from Miami-Dade County shoreline. (Crane)
- 7.13 Develop marine debris educational programs (Stash Your Trash, Keep Your Trash Onboard) for boaters in Miami-Dade County. (Crane)
- 7.14 At least 50% of youth involved in “stash your trash programs” will become better environmental stewards in Miami-Dade County. At least 10% will participate in beach cleanups or participate in other environmental programs (Crane)
- 7.15 At least 50% of teachers who participate in teacher workshop will incorporate marine educational materials into their classroom curricula. (Crane)
- 7.16 15 Gulf-front homeowners will be trained to plant dune vegetation to protect and increase dune height between their homes and the Gulf. (Diller)
- 7.17 Develop educational programs and materials on importance of sea grasses to marine ecosystems. 75% of boaters participating in programs will increase their knowledge of sea grasses and how to avoid prop-scarring. (Diller)
- 7.18 10 people will be trained as Master Naturalists in wetland systems to help educate local citizens and visitors of the importance of these systems. (Diller)
- 7.19 Conduct “Coastal Living Seminars” in Panhandle Counties where local homeowners will learn about recycling, reduction in household chemical usage, shoreline protection and enhancement projects that utilize vegetation. (Diller, S. Jackson, Verlinde)
- 7.20 Establish a demonstration site to teach the use of native vegetation and environmental landscaping specific to coastal dune lakes. Also, prepare a native plant guide for at least 5 coastal dune lakes and publish it on the web. (S. Jackson)
- 7.21 Develop educational programs on coastal native plants, leading to at least two plantings for restoration, stabilization or preservation in Okaloosa and Walton Counties. (S. Jackson)
- 7.22 Coordinate a workshop on marine invasive species and develop several marine invasive species factsheets. (Jacoby)
- 7.23 Assist in the development of the coastal module for the Master Naturalist Program. (Jacoby)
- 7.24 Continue development of publication “A Citizens’ Guide to Florida’s Estuaries. (Jacoby)
- 7.25 Assist in development of a “Estuaries 101” powerpoint presentation. (Jacoby)
- 7.26 Participate in Pollution Prevention Week at Marineland. (McGuire)



- 7.27 Advise the City of Fernandina Beach on the best methods for restoring a one-mile section of dunes along the northern part of Fernandina Beach. (McGuire)
- 7.28 Work with individuals in the development and submission of grant application for seagrass restoration in Charlotte Harbor. If funded, assist in restoration efforts. (Novak)
- 7.29 Coordinate presentations and teacher training workshops that focus on marine invasive species, as part of a three-state regional educational project. (Spranger)
- 7.30 Establish and nurture a “consensus Working Group,” borne out of contentious meetings last year that focused on marine protected areas. This workgroup, consisting of ten different stakeholder groups, will investigate problems affecting the Broward County coastline, and increase their knowledge about fisheries and ecosystem management techniques. (Tavares)
- 7.31 Develop educational workshops within Santa Rosa County that will increase citizen’s awareness of coastal ecosystems, functions, endangered species and emerging coastal issues. (Verlinde)
- 7.32 Assist in planning and delivery of educational programs and materials at the Sea Grass Awareness Festival. (Verlinde)
- 7.33 Assist in the coordination and development of the 2002 Rivers Symposium where attendees will increase their knowledge about local river history, issues, problems uses, and protection and conservation practices. (Verlinde)
- 7.34 Work with volunteers who will participate in natural shoreline stabilization and habitat enhancement projects that include dune, wetland and submerged aquatic vegetation. (Verlinde)
- 7.35 Assist in the development of a Master Naturalist Program for Santa Rosa County where trained naturalists will provide tourists and local residents with information about their local waterbodies and wetlands. (Verlinde)
- 7.36 Work with individuals involved in the Southwest Florida Feasibility Study (SWFFS) of the Comprehensive Everglades Restoration Program (CERP) that will lead to development of five conceptual models that will be used in establishment of a long-term monitoring and research plan. (Wasno)

## **Goal 8: Prepare and Respond to Coastal Storms**

- 8.1 Coastal dune stabilization by planting nursery propagated sea oats is the most cost-effective practice to control erosion in the southeast United States. Effects of transporting different plant ecotypes between sites for transplanting is a concern. The goal is to determine the extent of genetic divergence among sea oat populations to determine if transplanting among areas is feasible. (Kane: R/C-S-36, PD-99-6)
- 8.2 Establishment of sea oats on restored beaches is critical for combating erosion losses. However, concerns about genetic diversity have lead to restrictions in harvesting and planting of sea oats. The overall goal is to enhance ecologically sound establishment of micropropagated sea oats by developing compatible plant/mycorrhizal fungus ecotype combinations for out planting onto Florida beaches. (Sylvia/Kane/Alagely/Milman: R/C-S-38)
- 8.3 A recently completed Sea Grant project on long-term shoreline position resulted in the identification of previously unrecognized shoreline characteristics which are important to the long-term management of Florida's and the nation's beaches. This project will investigate these characteristics of sand sediment sources and sinks on Florida's east coast, determine the causes of unpredicted shoreline and advancement, develop more rational sediment budgets and disseminate the information to professional and lay audiences for use in decision making and shoreline project planning. (Dean: R/C-S-39)
- 8.4 Rip currents account for 80 percent of beach rescues, accounting for 36,000 rescues in 1997. About 150 drownings (30 in Florida) occur each year due to rip currents. The ability to predict the occurrence of rip currents will reduce this dramatically. A database of rip currents will be developed and a predictive model will be developed and tested. (Hanes/Thieke/Dean: R/C-S-40)
- 8.5 Commercial sea oats micropropagation for dune restoration is limited by absence of a protocol for efficient production of multiple genotypes. Removing this limitation is critical for this technology to be used for commercial application of the technology for dune stabilization and restoration. The goal for this project is to develop an efficient protocol. (2004). (Kane/Wilson: R/C-S-41)
- 8.6 About 36,000 beachgoers are rescued from rip currents annually. About 30 rip current related deaths were reported in Florida in a recent year. The goal of this project is to develop rip current threshold criteria for rip current channels, identify conditions under which significant rip channels develop, and determine ways the beachgoing public can be warned of danger. It is a continuation of project R/C-S-40. (2004). (Thieke/Hanes/Dean: R/C-S-42)
- 8.7 Florida coasts are impacted by hurricane winds which create structural damage and public hazards. Affordable solutions to mitigate damage can only follow from an accurate quantification of the wind forces causing the destruction. This project will develop new instrumentation for ground-level wind fields, create tools to analyze the data and develop models to predict the effect of winds over a building. (2004). (Gurley/Pinelli/Subramanian: R/C-S-43)
- 8.8 A book for layman that explains how America's beaches work will provide a sound resource for those interested in beaches, including educators and officials. Florida is a leader in many areas of coastal emergency and coastal management. The book will be written for the general public. (Douglas: PD-01-09)

- 8.9 Florida has been a leader in beach management. This book will build on decades of Sea Grant projects and other agency research, authorized by one of the world's foremost coastal engineers. It will provide a "Legacy of Florida's Beaches." (2003). (Dean: PD-01-10)
- 8.10 Participate in the development and implementation of a NOAA Coastal Services Center pilot project, "Coastal Storms Initiative" that will focus on the St. Johns Watershed (St. Johns Water Management District). The purpose is to bring NOAA resources together in a geographic region that will hopefully lead to better storm predictions, and corresponding reduction in storm damage. (D. Jackson, Springer)

# Education and Human Resources

## Goal 9: Produce a Highly Trained Workforce

- 9.1 A minimum of two qualified applicants will be submitted annually to the Sea Grant John A. Knauss Marine Policy Fellowship national competition. Over each five-year period, an average of one Knauss Fellow per year (of 30 nationally) will be from Florida. (Cato: E/ST-24; E/ST-25; E/ST-26; E/ST-27)
- 9.2 At least one national Sea Grant Industrial Fellow candidate (of 2-4 per year nationally) will be successful every three years. (Cato)
- 9.3 At least 25 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students. (Cato)
- 9.4 A minimum of five graduate students will receive scholarship funding through private funds in cooperation with the Aylesworth Foundation for the Advancement of Marine Science and the Old Salt Fishing Club. (Cato)
- 9.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship. (Cato)
- 9.6 A minimum of \$400,000 per year in non-national Sea Grant CORE program funding will be received from extramural funding sources to support Sea Grant programs. (Cato)
- 9.7 Florida Sea Grant will participate in National Strategic Investment, National Outreach and National NOAA/Sea Grant proposal competitions when available. Funding data will be analyzed to measure the success rate of Florida Sea Grant against the other Sea Grant programs. (Cato)
- 9.8 At least 15 different academic disciplines and six different Florida universities and research laboratories will receive Florida Sea Grant funding in each proposal cycle. This can only be achieved through the encouragement of competitive proposals from many participants because peer review determines actual funding. At least six institutions participating in Florida Sea Grant will be visited each year to meet faculty and students to keep a high level of participation in Florida Sea Grant. Six faculty progress reports will be distributed annually to 800 faculty statewide to inform them of Sea Grant activities and opportunities. (Cato/Seaman)
- 9.9 An average of four Florida Sea Grant supported seminars will be funded annually as a way to increase the skills of faculty and students in ocean and coastal related academic disciplines. (Seaman/Cato: PD-02-1)
- 9.10 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held. (Cato)
- 9.11 Conferences, workshops and travel to conferences and workshops will be supported for Florida Sea Grant researchers and potential researchers and Florida Sea Grant Extension and Communications faculty. The activity will be supported when consistent with priorities in the Florida Sea Grant Strategic Plan: 2002-2005. (Cato/Seaman: PD-02-2)

- 9.12 There is a need for qualified, affordable help to assist in providing environmental education programs at parks, beaches and elsewhere in Florida. The Florida Marine Naturalist Program (FMNP) training develops knowledge, critical training and interpretive teaching skills to assist in environmental education statewide. This project will assist in developing the coastal module of FMNP. A minimum of eight instructors and 120 coastal naturalists will be trained. (Main: PD-02-5)
- 9.13 Sea Grant Extension County-based faculty will utilize a minimum of six state inservice training days to attend workshops and programs that will support their educational program areas. (All Agents)
- 9.14 Work with NOAA's Ocean Service Center to develop an inservice training program for extension faculty and community leaders on effective meeting management, dealing with conflict and controversy, and facilitation skills. (Spranger)
- 9.15 Coordinate annual inservice training meeting for Florida Sea Grant Extension faculty that provides administrative updates, reviews current Sea Grant research and extension activities, and organizes program planning efforts. (Spranger)
- 9.16 Provide presentations on "Grants Management" and "Sea Grant Extension Organization and Structure" at New Program Leader Training, during the biennial meeting of the Assembly of Sea Grant Extension Program Leaders. (Spranger)
- 9.17 Participate as member of second year class of the IFAS LEAD (Leadership Enhancement and Administrative Development) training program. (Spranger)
- 9.18 Provide support and presentation on environmental stewardship at Environmental Education Institute, held at Camp Timpochee for extension agents. (Spranger)
- 9.19 Serve as a member of the National Extension Tourism Program Planning Committee to identify speakers for national conference on tourism for extension faculty and staff. (Spranger)
- 9.20 Participate as a member of pilot International Extension Training Program. (Stevely)
- 9.21 Participate as a member of the University of Florida's Natural Resource Leadership Institute. (Tavares)
- 9.22 Continue course work toward Master's Degree in Environmental Studies at University of West Florida. (Verlinde)
- 9.23 Continue course work toward Master's Degree in Environmental Studies at Florida Gulf Coast University. (Wasno)

## **Goal 10: Create a Scientifically and Environmentally Informed Citizenry**

- 10.1 A number of educational activities are implemented under the previous goals. The following ones cross many goals and are implemented in general.
  - 10.1.1 High quality publications that effectively communicate the results of Florida Sea Grant activities to both general and specialized audiences will be produced. This includes Sea Grant Reports, Sea Grant Extension Fact Sheets and brochures, Sea Grant Technical Papers, books, book chapters, staff papers, conference proceedings, newsletters, posters and videos. The exact number will depend on the work plans and research results of faculty. (Kearl/Zimmerman)
  - 10.1.2 At least ten print news releases will be produced. (Kearl/Zimmerman)
  - 10.1.3 The existing Florida Sea Grant Internet home page will be upgraded and maintained. (Zimmerman/Whitehouse/Damron)
- 10.2 Involve 100 minority youth in Brevard County in environmental programs. (Combs)
- 10.3 Provide assistance to annual statewide 4-H Marine Ecology Youth Contest. (Combs)
- 10.4 Develop a new Brevard County Sea Grant educational factsheet on manatees. (Combs)
- 10.5 Participate in Melbourne Harbor Festival and provide Sea Grant coastal and marine information to attendees. (Combs)
- 10.6 Participate in summertime Canaveral National Seashore sea turtle survey during the summer nesting season. (Combs)
- 10.7 Participate in Merritt Island National Wildlife Refuge sea turtle survey during the summer nesting season, and instruct 25-30 visitors during each “beach walk” about sea turtles. (Combs)
- 10.8 Modify, streamline and keep updated the Brevard County Extension Service website, and insure marine and coastal information is included. (Combs)
- 10.9 Develop a periodically-issued, limited newsletter, which would be targeted at selected and specific audiences dealing with topical Brevard County issues. (Combs)
- 10.10 Provide 100 boaters and anglers a “brown pelican poster” and information sheet. At least 20% will become more aware and responsible in the impacts of feeding large fish bones to pelicans, measured by pre/post test surveys. (Crane)
- 10.11 Present poster on Miami-Dade County Marine Debris Education Project at Annual Conference of Association of Natural Resource Extension Professionals. (Crane)
- 10.12 Develop quarterly newsletter for local clientele groups that address marine and coastal issues. (Crane, Gregory, McGuire, Novak, Sweat)

- 10.13 At least 100 students attending middle and high schools in St. Lucie County will improve their knowledge of marine science (defined by Florida State Standards) through involvement in Sea Grant sponsored programs and activities. (Creswell)
- 10.14 Distribute “The Directory of Marine Science Educational Resources on the Treasure Coast” to all St. Lucie County schools. The utility of this resource will be evaluated through a post-distribution survey. (Creswell)
- 10.15 Conduct “Motion in the Ocean” educational program for middle and high schools in St. Lucie County. Performance will be evaluated by teachers through post-testing of instructional materials. (Creswell)
- 10.16 Conduct a 4-H Marine Camp that will utilize a watershed approach to understand the water quality of bay systems. 80% of attendees will be able to take water quality samples, recognize impacted waterways, and understand BMPs for agriculture and homeowners. (Diller, S. Jackson, B. Mahan, C. Verlinde)
- 10.17 Coordinate and develop a quarterly newsletter on marine and coastal issues for Panhandle residents. (Diller, S. Jackson, Verlinde)
- 10.18 200 4-H youth will improve their knowledge of endangered species utilizing local beachers and ways that they can help protect these species. (Diller)
- 10.19 25 teachers and 4-H Leaders will utilize the “Sea Turtle Science” section of the Escambia County Marine Extension website monthly with their students to increase their knowledge and awareness to decrease human impact on turtles during nesting season. (Diller)
- 10.20 Assist in coastal beach clean-ups and development of informational materials in Escambia county that will lead to a reduction in marine debris and litter. (Diller)
- 10.21 Assist in the tagging of loggerhead sea turtles for satellite tracking. (Diller)
- 10.22 Plan and develop a multi-county sea turtle awareness program. (Diller, S. Jackson, Verlinde)
- 10.23 Serve as a technical resource to at least 10 public and private school educators in Okaloosa and Walton Counties, providing age appropriate materials that will assist in the study of marine ecology and coastal resources. (S. Jackson)
- 10.24 Assist in development of a fact sheet on marine debris and entanglement. (Jacoby)
- 10.25 Develop an in-service training module on “nutrients in coastal waters” for Extension agents. (Jacoby)
- 10.26 Develop and conduct teacher training and 4-H workshops on marine science in Northeast Florida. (McGuire)
- 10.27 Assist in development of marine science materials and CD pictorial study guide for statewide 4-H marine ecology contest. (McGuire)
- 10.28 Provide presentation at League of Environmental Educators of Florida Annual Conference. (McGuire)

- 10.29 Provide presentation on coral reefs at Florida Marine Educators Association's Annual Conference. (McGuire)
- 10.30 Provide presentation at annual Earth Kinship Conference. (McGuire)
- 10.31 Recruit at least 10 4-H youth to be involved in one "environmental" community service project in order to learn about environmental issues. (Mahan)
- 10.32 Recruit at least five local youth to attend summer 4-H marine camps. (Mahan)
- 10.33 Provide educational programs to 15-20 civic clubs and organizations in SE Florida that address marine environmental conservation issues. (Novak)
- 10.34 Continue to maintain and update 16 educational kiosks that are located at marine access points throughout Charlotte County. (Novak)
- 10.35 Continue to write newspaper columns for local papers and a quarterly newsletter on marine and coastal issues. (Novak)
- 10.36 Coordinate the annual St. Petersburg Kid's Fishing Tournament where 250 youngsters and their adult sponsors will be introduced to conservation and fishing ethics. (Sweat)
- 10.37 Develop "Don't Splash Your Trash" educational campaign where at least 150 resource users will learn develop an awareness on the impacts of marine debris, which will result in a reduction of marine debris within Broward County. (Tavares)
- 10.38 Through a pilot project with the Broward County's Department of Planning and Environmental Protection and local volunteer groups, develop a monofilament recycling program. (Tavares)
- 10.39 Develop educational programs to area boaters that encourage best management practices that promote water quality. (Tavares)
- 10.40 Conduct workshops and educational fairs on marine science and coastal resource issues for area 4-H members and other school groups. (Tavares)
- 10.41 Work with groups such as the Greater Caribbean and Latin Chambers of Commerce to promote marine science programs to minority clientele groups. (Tavares)
- 10.42 Develop educational programs and field trips where at least 75 fifth graders will increase their knowledge about the beach ecology system. (Verlinde)
- 10.43 Develop a variety of educational programs on marine debris issues, types, origins, and prevention for at least 750 students. (Verlinde)
- 10.44 Assist in the coordination of underwater, river, and coastal cleanups in Santa Rosa County that will result in a reduction of debris and litter in the county. (Verlinde)
- 10.45 Assist in the development and installation of monofilament recycling stations in Santa Rosa County. (Verlinde)



- 10.46 Provide marine science displays and educational activities at the Blackwater River Festival and Navare Fun Fest. (Verlinde)
- 10.47 Work with the Environmental Education Coordination Team on local and regional Environmental Education projects. (Verlinde)
- 10.48 Participate in Southwest Florida Marine Mammal Stranding Network that will assist in the rescuing of injured or entangled marine mammals in the tri-county area of Charlotte, Lee and Collier Counties. (Wasno)
- 10.49 Work with Keep Lee County Beautiful and Florida Gulf Coast University student volunteers to establish a monofilament line recycling project in Lee County. (Wasno)
- 10.50 In cooperation with the Boca Grande Pass Tarpon Fishing Guides Association, develop an underwater marine debris program for the pass. This underwater marine debris project will involve senior, experienced divers. (Wasno)
- 10.51 Provide several guest lectures on marine resources issues in Lee County to Marine Systems Course at Florida Gulf Coast University. (Wasno)

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## Key to Individual Responsibilities

Adams .....	4, 8, 9, 11, 14, 17
Alagely .....	22
Ankerson .....	14
Antonini .....	14, 15
Arnold .....	8
Baker .....	1, 11, 19
Baker, B .....	1
Balaban .....	12
Baldwin .....	9
Berzins .....	8
Blake .....	8, 9
Bolker .....	3
Burgess .....	3
Burnett .....	17, 19
Butler .....	3, 4
Cardeilhac .....	8
Cato .....	1, 24
Chanton .....	17, 19
Coen .....	19
Coleman .....	3, 9
Collins .....	19
Combs .....	4, 10, 14, 19, 20, 26
Corbett .....	17
Crane .....	4, 14, 20, 26
Creswell .....	4, 9, 10, 26, 27
D. Jackson .....	14, 23
Damron .....	26
Dean .....	22
Degner .....	8
Diller .....	4, 14, 17, 20, 27
Douglas .....	22
Duckworth .....	12
Fann .....	15, 16
Fields .....	2
Fourqurean .....	17, 19
Francis-Floyd .....	8
Gregory .....	5, 26
Grimwade .....	1

Grizzle.....	19
Gulig.....	12
Gurley.....	22
Halstead.....	8
Hamann.....	14
Hanes.....	22
Heinrich.....	4
Herrnkind.....	3, 19
Hitchcock.....	8
Irlandi.....	8
Jacoby.....	17, 18, 20, 27
Jamir.....	12
Jamison.....	12
Kane.....	22
Kearl.....	26
Kem.....	1
Kerr.....	1
Koenig.....	3
Kristinsson.....	12
Larkin.....	8
Lazur.....	8
Leber.....	8, 9, 19
Leonard.....	1
Levitan.....	3, 19
Lindberg.....	3
Loftus.....	19
Longley.....	1
Lopez.....	1
Mahan.....	10, 12, 18, 27, 28
Main.....	25
Marcus.....	8
Mari.....	2
Mason.....	3
McGuire.....	4, 5, 14, 18, 20, 26, 27
Milman.....	22
Milon.....	8
Murie.....	3
Nico.....	19
Niezrecki.....	9
Novak.....	4, 5, 6, 10, 14, 20, 26, 28
Osenberg.....	3

Otwell .....	11, 12, 13
Peterson.....	17, 19
Phlips .....	8, 11
Pinelli.....	22
Pomponi .....	2
Rodrick .....	1, 12
S. Jackson .....	4, 5, 10, 14, 17, 20, 27
Schneider .....	1
Scott.....	2
Seaman.....	1, 2, 24
Shivji.....	4
Sidman .....	14, 15, 16
Simpendorfer .....	3
Soti .....	1
Spranger.....	6, 14, 17, 19, 21, 23, 25
St. Mary .....	3
Stevely .....	4, 6, 14, 15, 17, 18, 25
Sturmer .....	8, 9, 10, 11, 12
Subramanian .....	22
Supan .....	8
Sweat.....	4, 6, 9, 11, 13, 18, 26, 28
Swett .....	14, 15, 16
Sylvia .....	22
Tavares.....	4, 11, 18, 21, 25, 28
Thieke .....	22
Trexler.....	19
Turingan.....	9
Verlinde .....	4, 14, 18, 20, 21, 25, 27, 28
Walters.....	19
Wasno .....	4, 6, 7, 10, 21, 25, 28, 29
Welt.....	12
Whitehouse.....	26
Willoughby.....	2
Wilson.....	22
Wirth.....	8
Wright.....	1, 12
Zajicek .....	8
Zimet.....	8
Zimmerman .....	26

