

Science Serving Florida's Coast

**Florida Sea Grant
College Program
Year 2006
Work Plan**

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

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

Florida's citizens, industries and governments

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WORK PLAN 2006

FLORIDA SEA GRANT COLLEGE PROGRAM

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Introduction

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 sets the four-year stage for program priorities. A competitive research proposal process selects two-year projects twice within the period and program areas are enhanced with additional projects funded through national competitions and other sources of funding. Detailed, peer-reviewed proposals are developed every four years for Extension, Communications and Management activities and they are updated at the middle of the four-year period. An Implementation Plan¹ is developed each two years and detailed work plans and progress reports are written annually. This is the work plan for 2006².

The Florida Sea Grant cycle of strategic planning, implementation of two-year activities, development of a detailed annual work plan and reporting on annual progress is shown in the table on the next page. Florida Sea Grant's Strategic Plan addresses issues that are important both nationally and in Florida, and reflects the input of hundreds of Floridians representing academia, government, industry and citizens. This 2006 Work Plan defines specific tasks to be carried out under the Florida Sea Grant Strategic Plan: 2006-09. Florida Sea Grant is hosted by the University of Florida, the state's Land Grant university. This allows Florida Sea Grant priorities to consider land-based actions that affect the coast, activities along the shoreline, bays and estuaries, and ocean priorities in planning its research, education and extension goals.

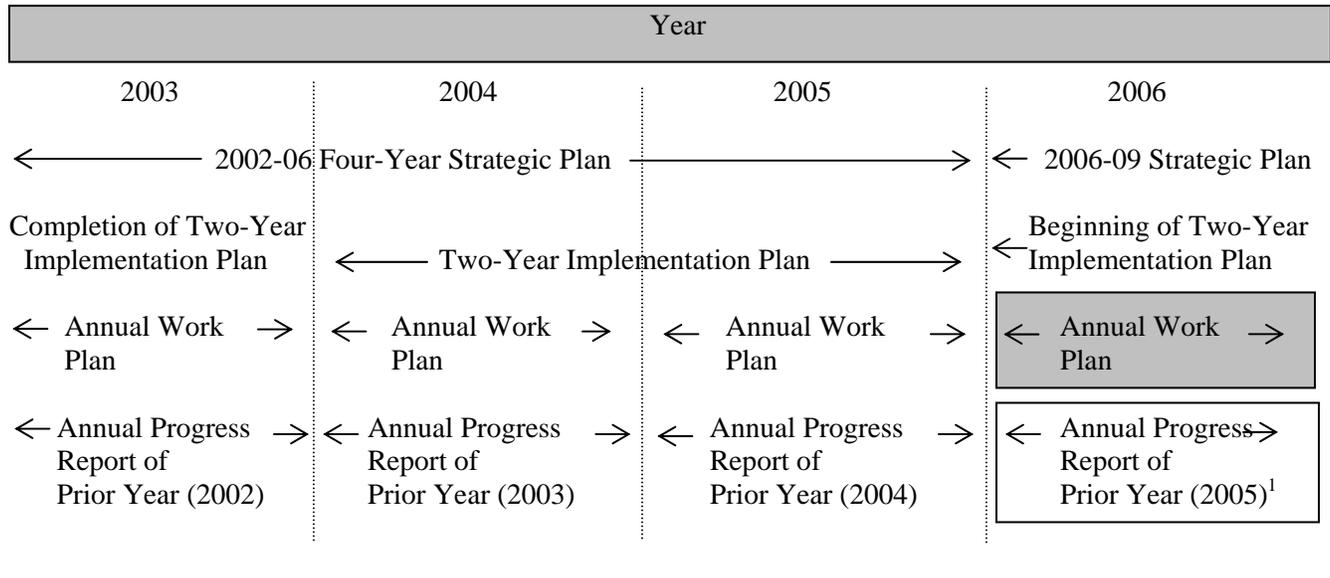
Every Florida Sea Grant activity outlined in this work plan satisfies three simple but tough criteria: 1) it is based on a strong rationale; 2) it demonstrates scientific or educational merit; and 3) it will produce results that are clearly useful and applicable in industry, management or science. A number of core values allow Florida Sea Grant to deliver results based on these criteria: 1) **Excellence**; Research is funded on a competitive basis, with scientific merit as the most important criterion. Extension programs are based on reviewed faculty plans of work. Communications efforts use the latest technology to achieve maximum output, visibility and citizen receipt of our science-based information; 2) **Participation**; High value is placed on the involvement of a large number of participating institutions in research, education and extension programs. Graduate student involvement is high and a diverse male and female faculty are involved, from assistant to full professors; 3) **Accountability**; Both external and internal processes are used to measure a wide range of achievements. These include tracking the scientific publication output of faculty and students, understanding the contribution to society of scientific discovery, measuring the way citizens receiving educational programs change their behavior, and determining the economic impact or level of new business activity resulting from a research project; 4) **Connection with Users**; A strong

¹ The Implementation Plan is the two-year "grants" document containing all project and program activity that is sent to the National Sea Grant Office, NOAA, USDC for processing to provide funds to Florida Sea Grant. The Implementation Plan referred to here is the condensed and programmatic version of that document.

² The annual Work Plan includes specific tasks that are planned for each year.

advisory process is used to define research priorities, to plan extension programs, and to measure the impact of programs. It is also used to build public and private support for Florida Sea Grant; 5) **Partnerships**; Faculty, students, and citizens all benefit when functioning in a partnership mode. Scientific results and education projects reach greater success levels and are implemented when partners, from agencies to businesses, provide financial support to an activity. Greater emphasis will be placed on developing partnerships.

The following table shows the 2006 Work Plan in the context of the Florida Sea Grant four-year cycle strategic plan, implementation plan and annual work plan.



Florida Sea Grant conducts its work through functional research, extension/outreach and communications activities. However, Florida Sea Grant strategically plans along goal areas focused on key issues. One goal may require mostly research to achieve the objective, and another mostly extension and communications activity. Yet another may require a mixture of both. Thus, each of Florida Sea Grant's 9 goal areas and the work planned within each contains research, extension and communications activity. Florida Sea Grant management provides oversight and makes available the resources to achieve each of the stated goals through the work outlined in this plan.

³ The current strategic plan, implementation plan, annual work plan and annual progress report are available at the Florida Sea Grant website www.flseagrant.org.

Economic Leadership

Goal 1: **Biotechnology: Use Marine Biotechnology to Create and Enhance Products and Processes from Florida's Coastal Resources**

- 1.1 There is a general lack of understanding of marine biotechnology by non-scientists. The goal of the project is to draw upon Sea Grant's vast national network of research, education and outreach resources to build an effective marine biotechnology website. It will be an effective tool for increasing awareness of this field among government officials, policymakers, students, educators, scientists, journalists, the general public, and industry professionals. (Masterson/Pomponi/Clark/Reed: E/T-11)
- 1.2 Nemertines and sponges produce pyridyl alkaloids that affect barnacle larvae. The goal is to develop single analogs of pyridyls that can be economically synthesized and could be practical antifouling additives for marine paints that are less harmful to the marine environment than currently used paint additives. (Kem/Soti: R/LR-MB-20)
- 1.3 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. A new class of conopeptides from snails has been discovered and the goal is to carry out extensive biological assays geared towards the evaluation of these new compounds as potential for therapeutic agents. (Mari/Fields: R/LR-MB-21)
- 1.4 The goal is to provide a novel approach to recombinant production of potent bioactive compounds produced by the marine sponge genus *Discodermia*. The resulting molecular sequence data will serve as a novel genetic resource (e.g. toolkit) for research and industry, enabling downstream experiments and sustainable production of unique bioactive marine natural products. (2008) (Lopez: R/LR-MB-23)
- 1.5 Lack of supply has hampered the development of many marine natural products. The aim of the project is to purify the native terpene synthase leading to eleutherobin and clone the corresponding gene. The long-term goal is to develop a commercially relevant production method of eleutherobin combining recombinant technology with chemical synthesis. (2008) (Kerr: R/LR-MB-24)
- 1.6 To promote industry education and engagement, and media awareness of Florida marine biotechnology opportunities and constraints, work will continue with BioFlorida and other stakeholders to develop outreach materials and implement a business plan for this subject, and a marine biotechnology development and outreach position will be proposed for a short-term, non-recurring budget item to the UF provost. (Seaman)
- 1.7 To promote faculty and student cooperation and exchange to enhance research and training, a statewide marine biotechnology listserv will be continued, planning for the fifth statewide summit will continue, and venues to disseminate technical results will be explored nationally. (Seaman)

Goal 2: Fisheries: Create and Teach Production and Management Techniques That Make Fisheries Sustainable and Competitive

- 2.1 The goal of this project is to provide critical fish habitat information necessary for the conservation and management of a protected, large coastal species, the lemon shark (*Negaprion brevirostris*) and to provide baseline conditions for the planned Marine Protected Area that will protect the mangrove seagrass nursery at Bimini, Bahamas. (Gruber/Hoenig/Feldheim: R/C-E-47)
- 2.2 There is widespread interest in the scientific application of underwater video units from researchers at academic institutions, government agencies, non-profit research foundations and the fishing industry. This project will test the application of CRITTERCAM on nurse, bull and hammerhead sharks. (Heithaus/Marshall/Carrier: R/MI-12)
- 2.3 This is an urgent need for better tracking of shark fisheries and trade on a species and population specific basis to better serve and manage sharks on a worldwide basis. This continues earlier work to develop identification markers for shark species that is already being used by NOAA law enforcement. (Shivji: R/LR-B-56)
- 2.4 The Caribbean spiny lobster is Pan Caribbean because of long larval life span (6-12 mo.) residing in strong ocean currents. In spite of a 50% reduction in traps, the Florida fishery shows a 57.8% decrease in landings during the 1999 to 2002 fishing seasons. Significant catch decreases are observed also in the Bahamas (26%), Cuba (30%) and Nicaragua (35%). No knowledge regarding the origin of these common decreasing trends is available, but regional overexploitation and environmental change are suspected. This proposal investigates the roots of such decreasing trends. (Ehrhardt/Olson: R/LR-B-57)
- 2.5 Knowledge of shark migration routes and local movement patterns could contribute to beach safety management. Recent advances in electronic tagging technology make it possible to gather and store detailed information on swimming depth, water temperature, and a daily record of location that is uploadable to ARGOS satellites. Objectives of this research are to identify and characterize the seasonal migratory patterns of bull sharks in the northern and eastern Gulf of Mexico off Florida, identify and characterize their habitat use patterns, and determine survival rates and overall fitness of those caught by longline fishing. (Burgess: PD-05-4)
- 2.6 Many fisheries scientists throughout the southeast U.S. have been using passive acoustics to identify spawning habitat of sound-producing fishes. This study will determine whether sound analyses can yield quantitative data on the number of eggs spawned by black drum. It will serve as a test case that can be used as a model for future studies of other important species, such as red drum and spotted seatrout, where issues such as egg transport and egg identification may be more difficult. (2008) (Mann: R/LR-B-58)
- 2.7 This proposal aims to develop an approach to evaluate the essential nature of fish nursery habitat by linking nursery-specific juvenile production with eventual recruitment to adult habitat. This study will examine population dynamics specific to gray snapper, but also will establish a quantitative, process-oriented approach to assessing habitat value that could be applied to any finfish species with a bipartite life history that includes distinct nursery and adult habitats. (2008) (Patterson/McBride/Allman: R/LR-B-59)
- 2.8 Conservation of sharks in the U.S. and worldwide in the face of intensive exploitation to supply the international fin trade requires comprehensive management and trade monitoring. The goal of the project is to make possible shark conservation, management, and trade monitoring on a species and population-specific basis by providing a comprehensive, multi-genetic marker assessment of global

- population structure in fin-trade sharks, determining the population of origin of market derived shark fins, and elucidating shark mating systems. (2008) (Shivji: R/LR-B-60)
- 2.9 Conduct an assessment of the economic consequences of potential FDA sanctions on the Gulf oyster industry. In addition, examine the market acceptance of frozen oysters produced via a patented freezing technique to be utilized by Florida processors (Adams/Otwell/Larkin/Degner).
- 2.10 The capability of organizations and technical staff concerned with coastal fisheries to utilize artificial reefs will be enhanced through planning a 2007 training course for an International Centre. (Seaman)
- 2.11 Continue to provide guidance to the Florida shrimp industry, via Southeastern Fisheries Association, regarding the eligibility of the industry to benefits of the USDA Trade Adjustment Assistance Program. (Adams)
- 2.12 Continue to serve on the Scientific and Statistical Committee of the Gulf of Mexico Regional Fishery Management Council. (Adams)
- 2.13 Continue to work on USDA-funded study to assess the economic consequences of proposed FDA-mandated closures on the harvest of oysters for raw consumption from Apalachicola Bay. (Adams)
- 2.14 Assist Lee County representatives with an assessment of the economic consequences associated with changing commercial and recreational fishery activities in the local estuarine waters. (Adams)
- 2.15 Continue to serve as Florida Coordinator for the South Atlantic Regional Fisheries Extension Enhancement team. Will conduct follow-up workshop(s) concerning the action items developed during 2005. (Adams)
- 2.16 Assist the Florida FWC develop a storm damage assessment methodology in cooperation with NOAA, Monroe County, Monroe County Commercial Fishermen Association, and the University of Miami. The effort will provide a methodology for determining commercial trap fishery losses due to storm events in Monroe County, and allow for an initial assessment of the information needed to forecast storm damages. (Adams)
- 2.17 Assist in the organizing and conducting of the W1004: Marketing, Trade, and Management of Fisheries and Aquaculture Resources Workshop in Cedar Key, FL. The workshop will be attended by individuals from the Pacific, Atlantic and Gulf of Mexico regions. (Adams)
- 2.18 Conduct an In-service training session at the Statewide In-Service Workshop in Gainesville, FL. The session will focus on the use of various methods to reduce release mortality in recreationally caught fish. (Adams)
- 2.19 Conferences and Professional Presentations: (Adams)
- 2.19.1 Present Paper at the Gulf of Mexico Summit, Corpus Christi, TX
- 2.19.2 Present Paper at the International Institute of Fisheries Economics and Trade, Portsmouth, England
- 2.19.3 Attend the Annual Southeastern Fisheries Association Meetings, Key Largo, FL
- 2.20 Conduct ethical angling workshops/displays and teach at least 30 fishermen the importance of venting fish, using circle hooks, proper handling skills, and proper length measurements. (Cameron)

- 2.21 Continue to increase awareness of fisheries management regulations through the exchange of information among non-governmental agencies, governmental agencies, local media, and the fishing industry. (Cameron)
- 2.22 Conduct educational programs to the public and provide assistance on methods of deployment and maintenance of artificial reefs and continue to work towards the development of an artificial reef program in Bay County. (Cameron)
- 2.23 Conduct kids fishing clinics with local agencies and businesses to increase the number of youth getting involved in fishing and other outdoor activities. (Cameron)
- 2.24 Promulgate and distribute the 57th Proceedings of the Gulf and Caribbean Fisheries Institute and disseminate it to members, libraries, universities, and computer databases. (Creswell)
- 2.25 Serve as chairman of the Steering and Program Committees for the 50th Gulf and Caribbean Fisheries Institute and publish its Book of Abstracts. (Creswell)
- 2.26 Serve as Program Chairman for the National Shellfisheries Association 99th annual meeting. (Creswell)
- 2.27 Conduct two-day youth fishing tournament. (Creswell)
- 2.28 Conduct educational programs for the public and provide assistance to the Escambia County Marine Resource Division in the monitoring, maintenance, and development of artificial reefs off the northwest Florida coastline. (Diller)
- 2.29 Conduct fish survival workshops for recreational fishermen, charter boat operators, and fishing tournament organizations that address such topics as fish venting, circle hooks, proper handling and release, and fishery management issues. (Diller)
- 2.30 Continue local fish extension activities that may include topics such as derelict fishing traps, by-catch, mercury in fish, shrimp TAA program, marine protected areas, essential fish habitat, and fish management. (Diller)
- 2.31 Continue to provide scientific advice to the various fishery regulatory agencies. (Gregory)
- 2.32 Participate in a South Atlantic regional workshop on fisheries issues across South Atlantic states. (Holland)
- 2.33 Hold a second workshop in South Florida to discuss recreational fisheries multicultural management issues, focusing on African American, Hispanic, and other minority recreational angler issues (Holland, Makopondo).
- 2.34 Continue discussions and representation of the Florida for-hire sector as issues arise. Begin preparations toward writing proposal to conduct decadal study of Florida's charter and headboat sectors. This will be the 3rd decadal report of topic. (Holland)
- 2.35 Develop information data base at the Florida county level of many indicators of recreational fishery's magnitude and relative importance to each counties recreational infrastructure or importance as a recreational activity. (Holland)
- 2.36 Continue representing FSG on the Gulf of Mexico Recreational Fisheries Implementation Team and the Socioeconomic Panel of the Gulf of Mexico Fisheries Management Council. (Holland)

- 2.37 Hold a workshop in Northwest Florida (Pensacola) to explore waterfront access and other fisheries management issues impacting African American, Hispanic and other ethnic minority recreational anglers. (Holland, Makopondo)
- 2.38 Conduct an exploratory study on the impacts of hurricanes on small and medium-scale minority-based commercial and recreational fisheries ventures. (Makopondo)
- 2.39 Participate in investigating issues and developing strategies to promote youth sport fishing competition and educational programs. (Makopondo)
- 2.40 Focus major program activities on artificial reefs. (S.Jackson)
 - 2.40.1 Renewal of Okaloosa Counties 3 Large Area Permit Sites which economically vital to our nations largest charter fleet (~100 vessels).
 - 2.40.2 At least 1 Monitoring Project will be conducted through a local network of volunteers in cooperation with Okaloosa County Government. Projects will seek to study previously deployed reefs to provide information to local managers regarding future construction projects.
 - 2.40.3 Provide assistance for a minimum of three local governments to submit construction grants in order to build new artificial reefs utilizing funds from Florida Fish and Wildlife.
 - 2.40.4 Construct a permanent display to educate visitors about our local artificial reef program. At least 250 exhibit visitors will view the display during 2006.
 - 2.40.5 Work with other Sea Grant Agents and Specialists to create website detailing Florida's Artificial Reefs.
- 2.41 Continue to provide scientific advice to the various fishery regulatory agencies. (Gregory)
- 2.42 Continue to support the Mote Marine Laboratory Volunteer Angler Tagging Program. (Gregory)
- 2.43 Conduct a major public event, The Florida Keys Seafood Festival in Key West, in conjunction with the Monroe County Commercial Fishermen industry association. (Gregory)
- 2.44 Progress extension efforts dealing with artificial reefs and their effects on fisheries. Participate in the environmental needs assessment being undertaken in Charlotte County. (Jacoby)
- 2.45 Contribute to the enhancement of artificial reef science, technology and use in Florida. Lead program activities related to the Steinhatchee Fisheries Management Area and to the development of artificial reef BMPs, and to provide expertise to county and multi-county reef extension programs. My planned activities include: (Lindberg)
 - 2.45.1 In partnership with FWC and local interests, (a) initiate funding requests for Phase II construction of the Steinhatchee Fisheries Management Area (SFMA) (~\$850,000), (b) continue to provide up-to-date SFMA information to the Taylor County Sea Grant Extension Agent for dissemination through the county program, and (c) design placement strategies for the Levy and Dixie County development of the SFMA area zoned for fishing reefs.
 - 2.45.2 In partnership with FWC, convene a working group of experts under the auspices of the State Artificial Reef Advisory Board for the purpose of drafting BMPs for particular applications of reef technology in resource management (e.g., estuarine nursery habitat).
 - 2.45.3 In cooperation with Sea Grant Extension Agents from the Florida Panhandle and other researchers, outline, organize and deliver a workshop in the Florida Panhandle addressing the science and management issues pertaining to Large-Area Artificial Reef Sites (LAARS), in conjunction with the first NW Florida Artificial Reef Coordinators' Meeting.

- 2.45.4 Author an extension publication tentatively entitled “Understanding the Attraction-Production Issue” targeted primarily for county artificial reef coordinators and industry sectors engaged in artificial reef development, to help foster more scientific approaches to reef development.
- 2.46 County advisory committees of participating Sea Grant Extension Agents have been engaged in identifying the SFMA Fishing Reef Zone and Panhandle LAARS workshop as priority needs. The State’s Artificial Reef Advisory Board identified an implementation plan as a top priority to follow FWC approval of the State’s Artificial Reef Strategic Plan; the FWC Artificial Reef Program staff, leading county reef coordinators and the USACOE Jacksonville District representative agreed that an expert working group on BMPs would be a major contribution toward science-based reef applications. (Lindberg)
- 2.47 Continue work with Gary Graham (Commercial Fisheries Specialist – Texas Sea Grant) on shrimp industry related topics such as turtle excluder devices (TEDs) and electronic data logs (EDLs) to assist area shrimp fishermen in dealing with current economic and fishery management issues. (Mahan)
- 2.48 Provide technical support to the newly formed Franklin County Seafood Taskforce on fisheries and Apalachicola Bay management issues. (Mahan)
- 2.49 Continue to provide technical information to the Franklin County Board of County Commissioners on area fisheries management issues and to be the Board’s liaison to DACS and other state agencies on Apalachicola Bay management issues. (Mahan)
- 2.50 Create a Taylor County Artificial Reef Dive Team, and work with private, state and University organizations to perform technical analysis and identification of candidate locations for artificial reef development, identify cost-effective strategies for the manufacturing of artificial reef materials, identify and pursue sustainable reef designs, and develop artificial reef systems that will have the greatest ecological and economic impact for the local community. (Sapp)
- 2.51 Following recommendations from SEACOOS year 4 workshops and white paper development for fisheries theme team, a test deployment will take place in May, 2006 on the West Florida Shelf to couple physical oceanographic data with fisheries data. Results will be used to determine how to broker partnerships in other areas of SEACOOS. Initial deployment is a partnership with (academic) USF, College of Marine Science and state (FFWCC) program resulting from meetings held in 2005. (Simoniello)
- 2.52 Planning committee member and co-chair of two IOOS sessions/panel discussions at The Coastal Society’s 20th International Conference. Applications of COOS for fisheries, NERR programs and ecosystem management will be the focus. (Simoniello)
- 2.53 Enhance artificial reef habitat in Charlotte County. (Staugler)
- 2.53.1 Identify site for a new Charlotte County artificial reef.
- 2.53.2 Enhance existing reefs in need of materials as money allows.
- 2.53.3 Educate resource users of reef locations and proper etiquette for using reef resources through the Boating and Angling Guide to Charlotte Harbor, and through the development of a Charlotte County Artificial Reef brochure and local Sea Grant extension website.
- 2.54 Participate in the planning and implementation of the Kids Cup Redfish Tournament. (Staugler)

- 2.55 Continue to work cooperatively with the FWC fisheries independent monitoring program with their monthly fisheries sampling and on the development of a Sea Grant initiated Coral Creek fisheries monitoring program. (Staugler)
- 2.56 Continue evaluation of sponge population recovery in Florida Keys following a widespread mortality. Project funded by Florida Fish and Wildlife Commission. (Stevely)
- 2.57 Present results of the Florida Keys sponge survey at 8th International Sponge Biology Conference (Buzios, Brazil, May 2006). (Stevely)
- 2.58 Optimize planning, construction and management to enhance fisheries production. (Stevely)
- 2.58.1 Assist in organization of the Florida West Coast Artificial Reef Program Coordinator's Workshop.
- 2.58.2 Work with the Manatee County Extension Advisory Committee and Manatee County government to develop two new artificial reefs.
- 2.59 Serve clients with educational programming (workshops, seminars, presentations and publications) relating to seafood safety, coastal zone management and sport fishing. Will continue restorational effort programming with sponge, scallop and oyster reefs. (Sweat)
- 2.60 Provide fish survival information and ethical angling information for recreational fisherman and youth. (Verlinde)
- 2.61 Coordinate NW Florida Artificial Reef Conference, August 2006. (Verlinde)
- 2.62 Coordinate Santa Rosa County 2006 Artificial Reef deployment and FY 2006-2007 FWCC artificial reef proposal application. (Verlinde)
- 2.63 REDStart Fisheries Enhancement Program will be expanding to become a research facility for Florida Gulf Coast University, US Fish and Wildlife Service and Sanibel-Captiva Conservation Foundation. New research projects will be facilitated throughout the year. Projects that will be conducted include seagrass restoration work, oyster hatchery to supplement restored oyster reefs and mosquito fish (gambusia) to be used in US Fish and Wildlife Service Ding darling Refuge to keep mosquito populations minimized. (Wasno)
- 2.64 Continue to present circle hook technology, venting tools and proper fish handling techniques at fishing tournaments, boat shows and fishing clubs. (Wasno)
- 2.65 5th Annual Boca Grande Pass Clean-Up will be conducted in March. 41 certified SCUBA divers will spend 2 days removing debris from the bottom. Over 34 governmental and civic associations have signed up. (Wasno)
- 2.66 Assist in the development of a damage assessment and forecasting model for the commercial trap fisheries of Monroe County, Florida. The effort will be funded via NOAA, in conjunction with the FWC. Contributors to the effort include UF (FRED, Dept. of Geography), Florida Sea Grant, U Miami, Monroe County Commercial Fishermen's Association, and Monroe County. The project will develop a prototype model to assist the State of Florida in assessing damage to the commercial fishing industry due to a storm event, and provide the foundation for developing a damage forecasting model for the Keys region. (Adams)
- 2.67 Teach at least one program on proper catch & release techniques for fish. (Mahan)

- 2.68 Establish a new marine fisheries agent position in Collier County through development of county-base support. Work with UF IFAS Extension personnel to create the line, work with county board of supervisors who will provide county match for position, and work with Rookery Bay National Estuarine Research Reserve to secure office space at their site. (Spranger, Fluech: SGEP-13-FE)

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

- 3.1 The main objective is to develop innovative, reliable and environmentally sustainable hatchery technology for larval rearing and production of cobia fingerlings. This will be achieved by developing proactive health management methods aiming to reduce the input of microbes from major sources of contamination during the culture cycle (eggs/hatching/live food) and to increase survival and yield of fingerlings through the addition of probiotic bacteria to the larval culture tanks and to live feeds prior to feeding the larvae. A quantitative microbial management technology, using selected strains of probiotic bacteria will be adapted to cobia fingerling production. (2006) (Benetti/Orhun: R/LR-A-40)
- 3.2 High mortality during larviculture remains a major obstacle to successful rearing of a large number of marine ornamental fish species. In particular, catastrophic mortality is associated with first-feeding or the "critical period" during which larvae switch from endogenous to exogenous feeding. This phenomenon creates a need for research aimed at determining the causes of mass mortality during the early stages of exogenous feeding in hatchery-reared marine ornamental fish larvae. (Turingan/Creswell/Gaines: R/LR-A-41PD)
- 3.3 It is necessary to improve hatchery and offshore growout technology to expand marine fish aquaculture to the US. This project will perfect and transfer innovative, reliable and environmentally sustainable technologies and protocols for disease prophylaxis and management of cobia (*Rachycentron canadum*) eggs, larvae, post-flexion larvae, fingerlings, juveniles and adults. (Benetti/Orhun/Riley/Douillet: R/LR-A-42)
- 3.4 Biomarkers are biological changes that are observed in an animal following exposure to sublethal environmental or anthropogenic stressors. There are two approaches to biomarker work: traditional functional biomarkers that measure long-term responses and protein biomarkers that measure the molecular response to environmental stressors. In recent years, protein biomarkers have become increasingly powerful and popular tools in part because they test for evidence of stress at the level of organization primarily affected, the molecular level. However, few studies have attempted to validate the new molecular technology with the traditional functional techniques. That is the purpose of this fellowship. (Julian/Matos/Downs: E/INDST-4)
- 3.5 Florida has approximately 350 active clam growers producing a crop worth \$18.2 million in 2001. Recently, the need for a hardier clam strain has become evident as clam culturists in Florida report below average survivals or total losses during the prolonged hot summers. Triploid clams may be a solution to this problem as they are virtually sterile, thereby spawning does not occur and energy is available during this stressful period for basic metabolism. (2008) (Scarpa/Baker/Sturmer/Adams: R/LR-A-39)
- 3.6 The goal of this study is to develop effective and sustainable hatchery technology for the difficult-to-raise marine ornamental fish species *Centropyge flavissimus* (lemonpeel angelfish) and *Liopropoma carmabi* (candy basslet). These species demand a high price in the aquarium trade and have been successfully spawned in captivity. Researchers will use a novel approach that integrates the development of feeding kinematics, feeding mechanisms and feeding performance in the development of stage-specific feeding regimes that will enhance survivorship during the larval rearing of these species. (2008) (Turingan/Creswell/Gaines: R/LR-A-43)
- 3.7 The Florida clam industry is built on a single species. Diversifying the shellfish culture industry by developing farming technology and markets for other bivalve species will increase economic stability and growth of the industry. The sunray venus clam, *Macrocallista nimbosa*, is an attractive venerid clam distributed from South Carolina to Florida and the Gulf states. The study goal is to

- develop, test and demonstrate biological and technical methods to spawn and culture the sunray venus clam for its potential as a new molluscan species for Florida shellfish producers. (2008) (Scarpa/Sturmer/Creswell: R/LR-A-44)
- 3.8 Continue to work with Mote Marine Lab on assessment of the financial characteristics of pompano hatchery and nursery production. Project is funded via the Aquaculture Research Council. (Adams)
- 3.9 Continue to work on two Florida Sea Grant funded projects: (1) Triploid hard clam production and (2) sunray venus clam production. The economic characteristics of the hatchery, nursery, and grow-out stages will be the focus of the studies. (Adams)
- 3.10 Continue to work on the shellfish culture bio-fouling project, funded through the National Sea Grant Program Invasive Species Initiative. The project is in cooperation with the University of Connecticut. A grower survey will be conducted in early 2006, with an assessment of the economic costs and benefits associated with two fouling control methods to be completed by late 2006. (Adams)
- 3.11 Continue to serve as the Florida Sea Grant representative on the FDACS Aquaculture Interagency Coordinating Committee. Prepare a annual report for Florida Sea Grant-related activities for the AICC Annual Report. (Adams)
- 3.12 Continue to serve as Committee Chair for FRED MS student Jennifer Clark. Ms. Clark's MS thesis will address the financial feasibility of utilizing penaeid shrimp culture as an alternative enterprise for south Florida citrus growers. The thesis will examine several production technologies. An assessment of the risks associated with shrimp culture and citrus production will be a key feature of the analysis. (Adams)
- 3.13 Attend the Southeastern Regional Aquaculture Information Exchange Group (SERA IEG) meeting in Ruskin, FL. (Adams)
- 3.14 Conferences and Professional Presentations: (Adams)
- 3.14.1 Present Paper at the National Shellfisheries Conference in Monterey, CA
- 3.14.2 Paper to be presented (by co-author) at Aquaculture '06, Italy
- 3.14.3 Present Paper at the 7th International Sponge Conference in Buzios, Brazil
- 3.15 At least 100 students will learn more about aquaculture through classroom and distant learning programs. (Creswell)
- 3.16 Submit proposal to FDACS for state-wide teacher in-service training in the field of aquacultural science (Creswell, Ohs, Martinez, Chapman)
- 3.17 Develop a series of two-page fact sheets on potential aquaculture species in Florida. (Creswell, Ohs)
- 3.18 Conduct at least six radio broadcasts (30 minutes each) dedicated to aquaculture topics. (Creswell)
- 3.19 Present at least one ½ day workshop on the potential for baitfish/shrimp aquaculture in Florida. (Creswell/Ohs)
- 3.20 Promulgate a manual for the aquaculture of ponderous arks and blood arks from hatchery through harvest. (Creswell, Sturmer, Nunez, Baker)

- 3.21 Conduct collection and shipping trials of sunray venus clams. Initiate spawning trials for sunray venus clams in collaboration with Harbor Branch Oceanographic Institution, Inc. (Creswell, Sturmer, Stevely, Sweat)
- 3.22 “Project Red-start” – continue to provide technical assistance and training to project staff. (Creswell)
- 3.23 Write invited chapter entitled, “Best Management Practices for Shellfish Aquaculture”, for the book “Best Management Practices for Aquaculture Industry.” (Creswell)
- 3.24 Provide support and assistance to aqua-farmers and pond owners utilizing best management practices for managing these aquatic resources and associated businesses. (S.Jackson)
 - 3.24.1 Through the education programs and with the assistance of the Sea Grant Agent area farmers (5) will gain knowledge and fish culture skills necessary to explore potential aquaculture crops appropriate for the give local resources and marketing conditions.
 - 3.24.2 Fish pond owners (20) will gain knowledge in pond management through the Extension education programs and individual site visits conducted by the Agent.
- 3.25 Provide one-on-one consultations to individuals interested in learning more about aquaculture issues. (Mahan)
- 3.26 Continue work with Franklin County clam farmers to address local issues. (Mahan)
- 3.27 Continue to work with Lee County government with the creation of a clam nursery to improve farmer’s profit margin and industry foundation by providing consistent product for market. (Wasno)
- 3.28 Working with Florida Division of Aquaculture, facilitate the construction of an educational kiosk at a local boat ramp on Pine Island. The kiosk will feature many aspects of the clam farming industry. (Wasno)
- 3.29 Serve clients with aquacultural information with consultations, publications and site visits. (Sweat)
- 3.30 Establish, coordinate and provide training for Lee County clam farmers. (Wasno/Sturmer)
- 3.31 Increase the scientific, industry and agency knowledge about Florida clam aquaculture through participation at regional and national conference. (Sturmer)
- 3.32 Establish, coordinate and provide training and technical assistance in counties where clam farming is ongoing. Counties involved include Levy, Dixie, Charlotte, Lee, Brevard, St. Lucie, Indian River and Franklin. (Sturmer)
- 3.33 Continue a coordinated effort to enhance hard clam farming in Florida through a series of USDA funded projects. (Sturmer)
- 3.34 Evaluate the production and processing for alternative techniques and alternative species of clams for Florida clam growers. (Sturmer)
- 3.35 Provided statewide service to clam grower associations and state agencies. (Sturmer/Adams)
- 3.36 Provide easy access to up-to-date information on shellfish aquaculture in Florida through website, quarterly newsletter and fact sheets. (Sturmer)

- 3.37 Maintain a shellfish aquaculture research and education facility in Cedar Key. This salt-water running laboratory on Florida's Gulf of Mexico coast allows UF faculty to address the research needs of the clam farmers. (Sturmer)
- 3.38 Provide aquaculture consultations and shrimp pond assistance. (Sweat)

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

- 4.1 *Vibrio vulnificus* remains the leading cause of seafood-associated deaths. Current detection assays are consuming (2-7 days), labor intensive, expensive and not always reliable. FDA has increasingly turned to molecular detection, but problems have been reported with available assays. The objective of this project is to evaluate and improve molecular detection and typing methods for *V. vulnificus* in order to standardize evaluation of oyster and seawater samples. (Wright/Heil/Harwood: R/LR-Q-26)
- 4.2 The goal of this work is to define genetic elements that regulate the on/off switching involved in the phase variation from virulent to avirulent forms of *V. vulnificus*. Preliminary data have identified phase variable genes within the capsular polysaccharide (CPS) operon, and these mechanisms and others will be investigated for application to intervention strategies to reduce risk of oyster consumption and also for virulence-specific gene probes and/or molecular typing. (Wright: R/LR-Q-27)
- 4.3 A historical change is occurring in the production and marketing of oyster products due to federal mandates for alternative processing methods and changes on public perceptions and preferences. Specifically, the mandate for PHT will influence the sensory attributes of the traditional oyster products. Concurrently, public confidence is growing weaker concerning the safety of raw oysters and buyers are using more scrutiny in selection of raw oysters. Four university Sea Grant programs (UF, LSU, MSU, OSU) will collaborate in the development of a non-biased, scientific based sensory description analysis (DA) or profile description of raw oysters that provides the necessary product descriptors (lexicons), reference standards, vocabulary and intensity scales for a complete product characterization (PC) program. (2007) (Otwell: R/LR-Q-28)
- 4.4 In 2003, the Gulf of Mexico region produced 72 percent of the national oyster harvest (29.2 million pounds of meat), totaling \$74.16 million. One factor negatively affecting the Gulf oyster industry is the pathogen *Vibrio vulnificus*. Consumption of this pathogen by healthy individuals may result in ephemeral illness, but for individuals considered "at-risk" (i.e., those with compromised immune systems, diabetes or liver disease), *V. vulnificus* infections can result in a >50% mortality rate. The objectives of this research are to: 1) Conduct market segmentation studies to determine oyster consumer groupings and their demographic and oyster eating preferences to better direct educational and marketing efforts to reach the general and at-risk oyster consuming population; 2) utilize the results of the consumer segmentation research in complementary educational campaign targeting the general oyster consumer to increase awareness of VAP and PHP oyster products and the risk of *V. vulnificus*; 3) disseminate results of the consumer segmentation analysis to the Gulf oyster industry and other interested parties to allow them to assess the market/business potential of PHP and VAP oyster products in underdeveloped and new oyster consuming markets; and 4) disseminate results of a concurrent oyster sensory research program during educational efforts to allow oyster consumers and interested parties to identify and connect with the inherent flavor differences between oysters. (2007) (Jamison: R/LR-Q-29)
- 4.5 The FDA recently mandated validation and verification protocols for oysters that quantify *V. vulnificus* before and after treatment. However, standard assays are time-consuming, labor intensive, expensive, and unreliable. Direct comparison of quantitative PCR (QPCR) assays to standard methods is needed to establish the most effective approach for the seafood industry to address the validation and verification of PHP for reduction of *V. vulnificus* in oysters. Research will provide experimental analysis and field-testing of improved QPCR methods designed to provide the seafood industry with more accessible, practical, and cost-effective analysis of *V. vulnificus* in PHP oysters. (2008) (Wright/Rodrick: R/LR-Q-30)

- 4.6 Science-based direction, that supports and augments current research directed at developing and implementing educational and outreach programs, is needed to better inform consumers of the potential risks associated with *Vibrio vulnificus*. Researchers will develop methodology and determine consumer behavior toward seafood safety information across different media sources. Consumer responses will be measured and their relative impact on consumer behavior quantified. (2008) (Morgan/Huth/Martin: R/LR-E-19-PD)
- 4.7 The possibility, extent and quantification of “color enhancement” data using carbon monoxide is non-existent. Computer machine vision, electronic nose, microbial analysis, and sensory panel tests will be conducted to generate a complete data set regarding possible “color enhancement” of various fish. This type of data is needed to give regulatory agencies a scientific basis for decision making, and to guide the industry to develop effective CO treatment methodologies without the potential pitfalls and disadvantages of this technology. (2008) (Balaban/Kristinsson/Otwell: R/LR-Q-31)
- 4.8 Continue to work with Steve Otwell (FSG Seafood Specialist) on USDA CREES Grant to develop and certify post-harvest processing techniques to reduce that number of *Vibrio vulnificus* bacteria to non-detectable levels in Post-Harvest-Processed oysters. (Mahan)
- 4.9 Continue membership and Interstate Shellfish Sanitation Conference committee work on assigned topics. Committee assignments include; *Vibrio vulnificus* Education Subcommittee, Education Committee, Post-Harvest Processing Committee, and Biotxin Committee. (Mahan)
- 4.10 Continue work on the FL Department of Ag and Consumer Service’s *Vibrio vulnificus* Illness Reduction Workgroup. (Mahan)
- 4.11 Distribute the recently published book entitled “Use of carbon monoxide and other modified atmospheric conditions in seafood processing.” The use of carbon monoxide is currently under regulatory scrutiny and this book will make the latest scientific information available to everyone. (Editor-Otwell: PD-04-07)
- 4.12 Conduct annual Seafood Training schools. (Otwell)
- 4.12.1 International Shrimp School for industry and agencies in May 2006 for suppliers and buyers about the USA and world.
- 4.12.2 Second Annual ‘Certification School’ for Cooked Shrimp Processors in Feb 2007 in conjunction with the Laitram Equipment Corp (New Orleans) for domestic and other processing operation about the world cooking both warm and cold water species.
- 4.12.3 Initiate First Annual “Shrimp Product development School” in conjunction with the National Shrimp Industry Association in Orlando, April 2007.
- 4.13 Direct and maintain the National Seafood HACCP Alliance for Seafood Safety and Education. Anticipate revising the Alliance training protocol to accommodate the growing international interests and needs, plus revising all training materials to be consistent with new edition of FDA’s Fishery Product Control Guide anticipated by December 2006. (Otwell)
- 4.13.1 Continue role as National Coordinator role for the Seafood HACCP Alliance that provides seafood safety training for all federal FDA seafood inspectors in the nation, most state based inspectors and over 90% of all nationally based seafood processing firms, plus over 10,000 international participants from 30 nations. The training now includes the traditional 3-day HACCP courses and 1.5 day sanitation courses taught biannually in Florida, plus a special one-day support course taught for individuals that complete an established Internet course developed by the Seafood HACCP Alliance based at Cornell.

- 4.13.2 Maintain the inventory for all seafood HACCP education materials in support of Alliance training programs about the nation and world as certified and recorded in company with the national Association of Food and Drug Officials (AFDO).
 - 4.13.3 Specifically assist in preparation of revisions of the new FDA Fishery Products and Controls Guide due for release in late 2006.
 - 4.13.4 Redraft all current Alliance training material to remain consistent with the new FDA HACCP recommendations anticipated in the new Fishery Products Guide 2006.
 - 4.13.5 Plan and conduct a series of Seafood HACCP Update sessions about the nation to orient trainers and users per new regulatory mandates and changes in HACCP requirements.
 - 4.13.6 Plan and conduct another Alliance HACCP ‘Train-the-Trainers’ program to provide more qualified trainers for seafood safety with particular efforts to prepare bilingual trainers in company with AFDO regions.
 - 4.13.7 Revise the Alliance ‘Compendium of Methods’ as a technical resource for test methods and procedures in support of HACCP implementation in processing and regulatory inspections.
- 4.14 FAO/ OIE /World Health Organization (WHO) Committee member assigned to address Antibiotic Use in Aquaculture and Antibiotic Resistance. Report anticipated in 2006. (Otwell)
 - 4.15 Committee Member for the National Academy of Sciences report on Nutrient Relationships in Seafood: Selections to Balance Benefits and Risks due for completion December 2005. (Otwell)
 - 4.16 Continue in leadership and advisory positions with number of seafood technology organizations. (Otwell)
 - 4.16.1 National Seafood HACCP Alliance, National Coordinator.
 - 4.16.2 Seafood Science and Technology Society (SST) of the America’s, Executive Director. Conference scheduled for Nov 2006 in San Antonio, TX.
 - 4.16.3 U.S. Representative on the Board of Directors for the International Association of Fish Inspectors (IAFI) – convene in Beijing, China 2006 and Ireland in 2007.
 - 4.16.4 U.S. Advisory Representative to the European ‘Seafood Plus’ organization involving every EU nation collaborating in various aspects of seafood safety and quality research – convene in Tromso, Norway May 2006.
 - 4.17 Determine ways to advance the use of post-harvest treatments (PHT) for production of safer Florida oysters for raw consumption. Coordinator for current USDA Special Research Projects extending into 2009. Current work includes assessing use of special freezing techniques and development of a industry based lab for analytical certification for product safety based in Apalachicola, Florida to assist commercial adaptation. (Otwell)
 - 4.18 Participate in the development of a “Mark of Quality” program for the U.S. domestic shrimp industry. Coordinating WASI Certifier Training School to begin at UF/IFAS in September 2006. Work in collaboration with Sea Grant staff at TXAM, LSU, MSU, UGA, Clemson and NCSU. (Otwell)
 - 4.19 Assist FDA in continuing international study to determine proper handling methods to control and prevent development of histamine in for large tuna. Work locations for actual harvest include Grenada and Hawaii. Final report due in Fall 2006. (Otwell)
 - 4.20 Conduct seafood workshops and seminars at local seafood festivals and boat shows. (Sweat)
 - 4.21 Continue recreational scallop restoration program. (Sweat)
 - 4.22 Hold 18th Annual Kid’s Fishing Tournament. (Sweat)

- 4.23 Hold recreational fishing workshops. (Sweat)
- 4.24 Conduct annual commercial sponge survey in Florida Bay. (Sweat)
- 4.25 Assist Agent Wasno with Project RedStart and resuscitation workshops. (Sweat)
- 4.26 Provide one-on-one consultations to seafood dealers and harvesters on seafood related topics.
(Mahan)

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

- 5.1 Local waterfront governments often lack the time, funds or expertise to pursue waterfront policy innovation and secure this within their comprehensive planning structure. This will benefit from a comprehensive legal analysis of coastal policymaking authority, especially in the confusing nearshore jurisdictional environment, and from a systematic assessment of the planning tools at their disposal that are packaged in a useable format. This project will provide this assessment and incorporate non-regulatory alternatives such as tax and other land use incentives. (Ankersen/Hamann: R/C-P-27CC)
- 5.2 In coastal communities across the nation, there is a growing concern that current development patterns, dominated by what some call “sprawl,” are contributing to water quality and environmental degradation. Though supportive of growth, communities are increasingly seeking solutions to balance growth with community and environmental values. Projects will be developed on “smart growth” activities that address the land/water interface, in consultation with agencies and local decision-makers. (Spranger/Sidman: R/C-P-28CC)
- 5.3 Controversy currently exists between users of waterways and proponents that wish to protect manatee habitat. Manatee idle speed zones greatly impact coastline property values, constrain the construction of docks and boat ramps, and affect the total economic output of the Florida marine industry (\$14.1 billion dollars/180,000 related jobs). This research has the potential to significantly reduce the economic impact that round-the-clock idle speed zones have on boating associated businesses and recreational boating activities in Florida’s waterways, while maintaining the integrity of the manatee habitat. (Niezrecki/Beusse: R/MI-13-PD)
- 5.4 The interaction between recreational boaters in Florida and environmentally sensitive resources such as manatees often creates high profile debates. This project will develop a GIS-based manatee protection system to increase public awareness and to assist in the evaluation of proposed manatee protection zones. (Swett/Sidman: E/T-14)
- 5.5 The Florida Sea Grant Boating and Waterway Management Program will broaden the scope of the existing efforts to: 1) enhance smart growth planning and implementation in Florida by identifying and pursuing opportunities for smart growth collaboration with Florida’s coastal communities; 2) provide science-based information, planning models, and innovative tools and methods to state and local decision-makers to encourage sustainable growth and waterway management in coastal communities; 3) use Geographic Information Technologies to provide solutions that foster sustainable shorefront development and waterway management; and, 4) develop training opportunities for Extension faculty who will use the information in their individual educational activities. (2008) (Spranger/Swett/Sidman: R/C-P-29)
- 5.6 Local waterfront governments would benefit from a comprehensive legal analysis of their coastal policymaking authority, especially in the confusing nearshore jurisdictional environment, and from a systematic assessment of the planning tools at their disposal that is packaged in a usable format. This project will be an applied legal and policy research and model code development project, coupled with legal and planning extension to disseminate results. Working with selected communities, investigators will marshal information and develop locally applicable policy plans adapted to individual community needs. (2008) (Ankersen/Hamann/McLendon: R/C-P-30)
- 5.7 Florida Sea Grant Extension will continue its fourth-year outreach activity as a component of the Southeast Atlantic Coastal Ocean Observing System (SEACOOS). Four Sea Grant programs (North Carolina, South Carolina, Georgia and Florida) are cooperating in this regional project. Florida Sea

Grant will serve as a member of the SEACOOS Extension and Education WorkGroup. Regional and state educational products and resources will be developed for extension agents and marine and coastal resource users. (Simoniello/D.Jackson/Spranger: E/T-12)

- 5.8 Florida Sea Grant Extension will work with the research and education community to develop the Gulf of Mexico Coastal Ocean Observing System (GCOOS), providing technical assistance in development of the GCOOS memorandum of agreement, business plan, and creation of an Education and Outreach Council. (Spranger)
- 5.9 Work with the UF Law School on the coastal water access issue (via the Fisheries Extension Enhancement Committee). Assist the UF Law School with a survey to determine how water dependent business owners will avail themselves to recent changes in statutes that address water dependent uses, taxation, etc. (Adams)
- 5.10 Work with the UF Law School and the community of Cedar Key in assessing the potential economic benefit of allowing shoreside hard clam nursery operators to claim agricultural tax exemptions for their hard clam nursery facilities. (Adams)
- 5.11 Continue working with the Clean Boating Partnership and DEP staff to designate new Clean Marinas and Boatyards and assist recovery of marinas damaged by hurricanes in 2004 and 2005. Present Clean Boater education materials to boaters at the Pensacola Boat Show and other environmental events. (All agents)
- 5.12 Provide leadership and assist in development of lake management plans for all 15 coastal dune lakes in Walton County, through facilitation community discussion and educational programs. (S.Jackson)
- 5.13 Assist 4-H teen council project that will install at least five additional fishing line recycling bins in Okaloosa and Walton Counties; and collect and recycle at least 100 lbs. of fishing line during 2006. (S.Jackson)
- 5.14 Continue to work with local government on waterfront access issues. (Gregory)
- 5.15 Provide technical information to the consultants of Lampl/Herbert as they conduct a feasibility study on constructing a Seafood Industrial Park in Franklin County. (Mahan)
- 5.16 Provide technical information to the consultants of Ross International as they conduct a feasibility study/redevelopment plan for the City of Apalachicola's historic waterfront and Scipio Creek boat basin. (Mahan)
- 5.17 Collaborate with the Chamber of Commerce and local seafood producers and dealers to prepare for and host the Southern Foodways Alliance's, Center for the Study of Southern Culture at the University of Mississippi visit to Franklin County to sample and promote the area's seafood and culture. (Mahan)
- 5.18 Continue work to identify areas in Franklin County that are appropriate for the construction of boat ramps to provide increased public boat access in the county. (Mahan)
- 5.19 Work with Bob Swett to develop a boating guide for Flagler County. (McGuire)
- 5.20 Publications, technical assistance and special extension programming activities will be created to inform and educate the local citizenry of viable alternatives for productive careers in areas of aquaculture and nature-based tourism. These efforts seek to boost local economies while contributing towards a broad-based coastal conservation ethic and sustainable coastal

- development. (Sapp)
- 5.21 Support Hurricane Preparedness efforts of other Sea Grant agents by providing literature, explanations of technology used to measure topics of relevance-e.g. storm surge models, water level data; also provide maps of COOS asset locations so boaters can customize local forecasts and make more informed decisions. Provide PowerPoint presentations and other information to facilitate work of other agents. Engage legislators/decision makers from waterfront communities to participate in FL COOS Caucus meetings. (Simoniello)
- 5.22 Assist with water dependent enhancement activities in Charlotte County. (Staugler)
- 5.22.3 Develop an Abandoned Vessel program for Charlotte County by organizing and chairing a committee towards this end.
- 5.22.4 Work with Team Punta Gorda to develop a managed mooring field.
- 5.22.5 Work with Bob Swett to develop a Cruising Guide to Charlotte Harbor.
- 5.23 Complete the Boating and Angling Guide to Pensacola Bay, Summer 2006. (Verlinde)
- 5.24 The State of Florida, with the guidance of Florida Sea Grant (FSG), will develop a new administrative rule for dredging public waterways in Lee County under the authorization of a general permit. The rule will apply to traffichsheds with high priority maintenance dredging needs as identified by applications of the FSG Regional Waterway Management System. (2006-2007) (Swett/Fann/Sidman)
- 5.25 A boating and anchoring guide will be produced for Jupiter Inlet, with funding from the Jupiter Inlet District, to (1) enhance the experiences of local and transient boaters, (2) promote safe navigation and responsible boating and anchoring behaviors, and (3) provide boaters with information on area resources and amenities. (Fann/Swett/Sidman)
- 5.26 Local municipal regulations that govern boating activities on local waterways will be identified, documented, and incorporated into a statewide GIS database for use with the Florida Fish and Wildlife Conservation Commission's Coastal Resource Information System. The purpose is to assist the FWC and partners in implementation of more effect waterway management. The project will span multiple years, this year being the first. (2006-2007) (Swett/Ruppert/Ankersen/Fann/Purdy/Sidman/Sargent-FWC)
- 5.27 A seasonal characterization of recreational boating in Brevard County will be initiated to characterize the preferences, activities, and use-patterns of area boater populations. The information will be used for resource management and planning applications by Brevard County and the Florida Fish and Wildlife Conservation Commission. (2007). (Sidman/Swett/Fann/Sargent)
- 5.28 Advancing Waterway Access in Florida: Legal and Policy Tools to Implement the 2005 Working Waterfronts Legislation (HB 955/SB1316). The Conservation Clinic at the University of Florida School of Law and Florida Sea Grant will analyze the legal and policy context for regulatory incentives and criteria and identify implementation strategies to satisfy the requirements of the 2005 working waterfronts legislation. For selected strategies, models for adaptation and use by local governments will be provided. (Ankersen/Ruppert/Swett/Sidman)
- 5.29 The spatial patterns of recreational boaters who use Greater Charlotte Harbor will be analyzed according to trip origin type (marina wet-slip, dry-storage facility, ramp, private dock), using reported data from mail surveys conducted during the spring, winter, and fall seasons (2005-2006). This project will analyze test methods of obtaining spatial and descriptive data about recreational boating on Florida waterways. (Sidman/Swett/Fann/Sargent)

- 5.30 The Florida Coastal Training Program (CTP) provides coastal decision-makers with the best available science based information, tools, and techniques required to make responsible decisions about land use in Florida and the resulting effects on coastal resources. The Florida Conflict Resolution Consortium, the Center for Economic Forecasting and Analysis at Florida State University, and the Florida Sea Grant Program at the University of Florida will assist in this mission. Their objectives will include an assessment of the training and information needs of elected and appointed government officials and land use planners, a pilot project based on the results of the assessment, and an outreach plan to continue positive, long-term relationships with the target audience. (Taylor/Harrington/Swett/Sidman)
- 5.31 Alachua County's system of freshwater springs, lakes, and rivers represents a unique resource in the regional recreational geography, serving as destinations for various recreational pursuits. The University of Florida Department of Tourism, Recreation and Sport Management and the Florida Sea Grant Boating and Waterway Management Program will assist the County in the development of a countywide waterways master plan for achieving sustainable water-based recreation through community visioning, education, and waterway planning and management. (Confer/Delaney/Swett/Sidman/Schnell/Ankersen/Holland/Fann)
- 5.32 Waterfront communities and coastal counties are increasingly aware of the need to develop long-term plans for their public waterways and, in particular, to provide adequate public access to their coastal resources. Planning workshops will be conducted in Manatee and Santa Rosa Counties to assist local officials and management staff prepare waterway and public access plans. (Verlinde/Sevely/Swett/Sidman/Ankersen)
- 5.33 Florida Sea Grant and the Florida Fish and Wildlife Conservation Commission's Boating and Waterways Section will organize the first biennial conference of boating and waterway management in Florida, to be held from November 1 to 3, 2006 in Cocoa Beach. (Swett/Sidman/Spranger/Ankersen/Sargent/Ouellette/Alford)
- 5.34 Florida Sea Grant and the Department of Fisheries and Aquatic Sciences will conduct a 3 hour in-service training session to introduce UF/IFAS extension faculty to Geographic Information Systems (ArcGIS 9.1). The primary objective of the training is to provide faculty with an introduction to GIS. (Swett/Lindberg/Fann)
- 5.35 An important component of the mission of the University of Florida and National Sea Grant is to (1) facilitate understanding of, and solutions to, global human and natural resource issues; (2) disseminate knowledge and expertise on the U.S. extension model, its role, constraints and opportunities; and (3) develop opportunities for greater international participation in extension. The Conservation Clinic at the University of Florida School of Law and Florida Sea Grant will seek to collaborate with the University of Costa Rica to implement a marine and extension program in Costa Rica. (Ankersen/Spranger/Swett)
- 5.36 Continue producing information, brochures and other products to help Sea Grant agents in FL, GA, SC and NC educate the public about COOS. Lead effort for third poster in SEACOOS/COSEE series (Ocean Circulation). Oversee redesign of extension and education portion of www.seacoos.org website, including layout and content. Participation (lecture, lead field trips, provide exhibits) for a variety of educational forums: SEPORT workshops, COSEE Teacher Workshops, Marine Quest, Oceans Day at the Capitol, GK-12 Oceans program, Oceanography Camp for Girls, etc. Partner with Charlie Barans (SC DNR) on Design a Fish interactive kiosk at SC Aquarium. (Simoniello)
- 5.37 Serve as Florida Sea Grant liaison as voting member of the State of Florida Clean Boating Partnership that implements the Clean Marina and Clean Boatyard programs. Efforts will

- continue to expand these programs in the state, with county agents assisting in the development and designation of clean marinas and boatyards in their area. (Spranger)
- 5.38 Participate in state, regional, national and international activities that are associated with coastal ocean observing systems, providing “best management practices” and “lessons learned” through publications and presentations at workshops. (Spranger, Simoniello)
- 5.39 Continue to serve on the Public Education and Image Committee of the Marine Industries Association of South Florida Marine Master Plan Steering Committee. (Behringer)
- 5.40 Assist Sea Grant waterway management program in providing technical assistance in managing anchorages and boat ramps. (Stevely)

Coastal Stewardship and Public Safety

Goal 6: Ecosystem Health: Protect, Restore and Enhance Coastal Ecosystems

- 6.1 Identification of point-source and non-point sources of freshwater to coastal estuaries is essential in understanding the water quality of these areas. Planned future changes in freshwater deliveries to Biscayne Bay from point-source discharges via canals to non-point source discharge from wetlands and groundwater flow requires a monitoring method that effectively detects these changes, i.e., one that can detect changes in canal discharge versus groundwater seepage. The results of this project will provide a scientific-based tool for assessing the results of the freshwater redistribution plan. (Price/Swart: R/C-E-51)
- 6.2 The Florida Keys coral reef ecosystem, comprised of a network of interconnected inshore coastal bays, barrier islands, and offshore coral reef environments, supports highly productive and diverse fish and invertebrate communities and a multibillion dollar fishing and tourism industry. The goal is to develop robust methods for identification and quantification of reef fish habitat use that improves the statistical precision of ecosystem-wide fishery-independent reef fish visual census sampling surveys; enhances stock assessment capabilities; and, provides a framework for evaluation of marine reserves. (Ault/Smith/Bohnsack/Rubec/Miller: R/C-E-50)
- 6.3 South Florida represents a critical region for education and outreach on natural systems, their connections and how they respond to human activities. This region contains several unique natural systems, including the Everglades, Florida Bay and the Florida Keys. This work will design and deliver a public education and outreach plan for the region. (2007) (Spranger: Fletcher: E/T-9)
- 6.4 Health-related management of recreational coastal sites is currently undertaken by monitoring fecal coliform and enterococci by membrane filtration. The problem with this standard indicator monitoring is that there is a lag of at least 24-48 hours between when the sample is collected and when the data become available. The goal of the research is to develop portable sensor technology for rapid, sensitive and specific detection and quantification of enterococci bacteria in coastal water, providing health officials and coastal managers with near real-time data for decision making. (2008) (Patterson/Paul/Fries/Farmer: R/C-E-52)
- 6.5 The worm *Phragmatopoma lapidosa* contributes to the construction of natural nearshore reefs that provide habitat for many marine species. These worms extract and glue sand together to make sand tubes, forming vast “worm reefs” in intertidal and shallow subtidal water from Cape Canaveral to Key Biscayne. Their formation is impacted by such things as sediment transported offshore from beaches naturally, and from beach restoration projects, and mitigation techniques have not been consistently successful. Researchers will test the applicability of a marine byproduct to aid in the recovery and recruitment of worms and reef formation. (2008) (McCarthy: R/C-E-53-PD)
- 6.6 Develop educational programs that maintain and increase the quality of Florida’s estuaries and ecosystems through the North Florida NEMO (Nonpoint Education for Municipal Officials) Program with regards to water quality and critical fish habitat. (Cameron)
- 6.7 In collaboration with St. Lucie County Artificial Reef Coordinator establish an oyster restoration program for the Indian River Lagoon; secure necessary permits for deploying spat collectors and

- oyster cultch; establish a youth education and volunteer program for distribution and monitoring of “artificial oyster reefs”. (Creswell)
- 6.8 Continue to promote utilization of monofilament recycling through newspaper articles and radio programming. (Creswell)
- 6.9 Distribute invasive species information to retail pet outlets throughout St. Lucie County. (Creswell)
- 6.10 Continue to work with “The Caulerpa Taskforce” to develop strategies for public identification of this and other algal invasive to the Treasure Coast. (Creswell)
- 6.11 Partner with the Florida Yards and Neighborhood agent, natural resource agents, Florida Lakewatch, and other organizations to reduce stormwater runoff, provide watershed education, and develop water quality monitoring programs. (Diller)
- 6.12 Conduct local workshops for K-12 teachers and interest citizens on marine invasives. (Diller)
- 6.13 Develop and assist with coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems as they recover from Hurricane Ivan. (Diller)
- 6.14 Continue to work with the Project Greenshores team to develop site two of this coastal ecosystem restoration project in Pensacola Bay that includes oyster reefs, seagrass beds, and salt marsh habitats. Also develop other ecosystem restoration projects. (Diller)
- 6.15 Coordinate the Turtle Friendly Beach program for sea turtle awareness and protection. Conduct sea turtle lighting workshops and provide sand fencing information during the recovery from hurricanes in 2004 and 2005. Provide educational assistance and Sea Grant Extension representation to various sea turtle working groups. (Diller)
- 6.16 Continue support and development of educational programs for teachers, boaters and interested citizens on marine debris, coastal clean-ups, and monofilament line recycling. (Diller)
- 6.17 Work with agents in the Panhandle to adjust and implement projects related to stormwater using the materials from the national program, Non-point education for municipal officials (NEMO), as a base. (Jacoby)
- 6.18 Assist Florida Sea Grant Agent, Brian Cameron, in coordinating the NEMO pilot program in Franklin County. (Mahan)
- 6.19 Assist the staff of the Apalachicola National Estuarine Research Reserve in planning, coordinating and conducting a derelict crab trap clean-up in Apalachicola Bay. (Mahan)
- 6.20 Work with faculty at UNF to study distribution of Asian green mussels and advise the public and local decision makers about the results of this research. (McGuire)
- 6.21 Continue work identifying and organizing teams to build pilot projects that use COOS information to improve fisheries/ecosystem health monitoring. Joint efforts with USF CMS, UM, AOML, FLKNMS, FWRI, FMRI, USGS and NOAA Fisheries will be expanded. Course of action will depend on success of test deployment coupling physical and biological parameters off Passa-Grille Beach. Goal of pilot projects is to include biological parameters in main research plan rather than as afterthought post-data acquisition. This also includes timely release/awareness of availability/capabilities of new technologies as they come on line (e.g. WERA data off South Florida in 2005-2006; HF Radar test bed off South Atlantic Bight in 2006-2007) (Simoniello)

- 6.22 Continue work with Braxton Davis, USC Baruch Institute assessing needs of coastal managers through Coastal States Organization (initial surveys have been complete; Fall 2006 plan is to summarize survey results, provide priorities to SECOORA Board of Directors). (Simoniello)
- 6.23 Provide general educational training and assistance to improve coastal ecosystem health. (Staugler)
 - 6.23.1 Work with the Charlotte Harbor NEP to produce a seagrass video/DVD that will be used to educate SW Florida boaters through public broadcast and government television, educational programs and events.
 - 6.23.2 Continue to chair the Charlotte Harbor NEP Hydrologic Alterations Subcommittee. Participate as a member of the Water Quality Quantifiable Objectives Sub-committee, and Habitat Conservation Sub-committee of the Charlotte Harbor National Estuary Program.
 - 6.23.3 Work with boating user groups, master gardeners and civic groups to promote BMPs for improved coastal water quality.
 - 6.23.4 Provide educational programs to boating and fishing groups, master gardeners, civic groups and citizens on coastal habitats and invasive species.
- 6.24 Develop a Estuary/Marine needs assessment for the waters of Charlotte County – a database/GIS project to identify research, monitoring & educational efforts. (Staugler)
- 6.25 Assist with local mangrove transect monitoring effort to document recovery of mangroves post hurricane post hurricane Charley and changes to shoreline. Incorporate information into education and outreach efforts. (Staugler)
- 6.26 Work with NRLI fellows from FWC Division of Law Enforcement and UF Wildlife Ecology Program to put together a local stakeholder meeting and panel as part of a statewide seagrass management initiative and NRLI practicum. (Staugler)
- 6.27 Work to enhance water quality around Pensacola Bay. (Verlinde)
- 6.28 Coordinate materials, equipment and sample drop-offs for the Lakewatch program in Santa Rosa County. (Verlinde)
- 6.29 Coordinate and lead the 2nd Pensacola Watershed Tour. This will be a tour of the watershed from SW Alabama to the coastal area of Florida for community leaders from both states. The goal is to educate participants on watershed impacts and successes involving water quality issues and continue collaborative efforts of watershed management for officials in both states of the watershed. (Verlinde)
- 6.30 Provide general educational training and assistance to improve coastal habitats throughout the Pensacola Bay Watershed. (Verlinde)
- 6.31 Provide aquatic nuisance species information to 4-H leaders, teachers, and the public at various talks and programs. (Verlinde)
- 6.32 Coordinate an oyster reef restoration project in East Bay. Use oyster reef importance/ecology curriculum developed in support of this project. Provide updates on restoration and field activities to restoration sites for community leaders and students. (Verlinde)
- 6.33 Work with UF/IFAS West Florida Research and Education Center researchers on dune restoration research projects. Coordinate volunteers for planting. Provide educational materials on restoration sites and to various organizations. (Verlinde)

- 6.34 Continue to support Project Greenshores, a FDEP habitat restoration initiative. (Verlinde)
- 6.35 Coordinate Coastal Clean-Up and Monofilament Madness events with local elementary school students. Additional goal is to increase school participation. (Wasno)
- 6.36 Efforts related to the Florida COOS Caucus will help shape Florida's role in the R-COOS (regional COOS which is not necessarily SEACOOS). Finding ways to incorporate BIOSENSE effort into SEACOOS thematic areas (Fisheries/Ecosystems) will help transition SEACOOS into SECOORA by addressing IOOS societal goals related to ecosystem management and public health. (Simoniello)
- 6.37 As part of a four state effort in the Gulf of Mexico region, conduct and sponsor several training programs for extension faculty and formal educators that provide latest science on issue of aquatic and marine invasive species. (Spranger: ET-13)
- 6.38 Work with partners throughout Florida and beyond to develop and improve volunteer water quality monitoring programs. (Jacoby)
- 6.39 Work with partners to develop and implement training and curricula dealing with a watershed approach to water quality. (Jacoby)
- 6.40 Research cruise/dive support in August, 2006 to deploy/test fluorometers/sensors to be used in monitoring HABs, chlorophyll a and turbidity. Test platforms to determine if sensors are meeting IOOS operational requirements. (Simoniello)
- 6.41 Continue to conduct applied research on the economic consequences of red tide events on businesses and communities of SW Florida. Project is funded via U.S. EPA. The project will address the impacts on local businesses of red tide events in the Collier County to Pinellas County region. (Adams)
- 6.42 Present a paper at the International HAB Conference, Copenhagen, Denmark. (Adams)
- 6.43 Conduct educational programs on sea grass beds and salt marshes in St. Andrew Bay and how they are an important part of the ecosystem for various fish species and water quality. (Cameron)
- 6.44 Coordinate 2006 South Florida Extension Natural Resource Summit. The objective is to increase effectiveness and coordination of natural resource extension programming in south Florida. (Stevely)
- 6.45 Train 40 Extension Master Gardeners in Manatee and Sarasota County in coastal plan ecology and identification. (Stevely)
- 6.46 Conduct mangrove management program for property managers and landscape maintenance professionals in Manatee and Sarasota County. (Stevely)
- 6.47 Provide training session on relationship between nutrient loads and red tides for extension horticulture faculty. (Stevely)
- 6.48 Maintain functional Sarasota Bay Estuary Program Technical Advisory Committee. (Stevely)
- 6.49 Improve the quality of the Broward County coral reef ecosystem. (Behringer)

- 6.49.1 Continue to serve as the Local Navigator for the Appreciation and Awareness Focus Team of the Southeast Florida Coral Reef Initiative (SEFCRI).
 - 6.49.2 Develop a marketing identity for the Southeast Florida Coral Reef Initiative.
 - 6.49.3 Coordinate and conduct workshops to educate dive operators and businesses about sustainable diving and snorkeling practices.
 - 6.49.4 Educate the general public, resource user groups, educators and youth about the coral reefs, impacts to them and how to conserve them through workshops, festivals and other educational programs.
 - 6.49.5 Serve as the Outreach Committee Co-Chair for the 11th International Coral Reef Symposium.
- 6.50 Continue to work with the Apalachicola River Basin Invasives Workgroup to establish partnerships and educate elected officials and the general public on environmental problems associated with invasive species. (Mahan)

Goal 7: Coastal Hazards: Respond to Shoreline Change and Coastal Hazards

- 7.1 Vulnerability of human settlements to damage from natural disasters is a significant constraint to local and global sustainability. Local growth management strategies have been advocated as a principal strategy for reducing such vulnerability, but empirical analysis of direct measures of the effectiveness of such strategies is very limited. Principal beneficiaries will include the Florida Department of Community Affairs, local governments of coastal jurisdictions in Florida, and state and local governments in other coastal areas of the United States. (Deyle/Chapin/Baker: R/C-P-26)
- 7.2 The implementation of affordable solutions to mitigate damage from hurricane winds can only follow from a quantification of the wind forces causing this destruction, models that relate wind forces to the capacity of man-made structures to resist them, and engineering-based evaluations of the cost effectiveness of various mitigation techniques. There is a strong need for a public risk model that will allow for a scientific and accurate evaluation of the cost effectiveness of mitigation measures on the scale of city, county, or state. (Gurley/Pinelli/Subramanian: R/C-S-45)
- 7.3 The fundamental motivation for this project is that rip currents have resulted in significant numbers of deaths both in the State of Florida and the Nation. A predictive rip current index can be employed to reduce the number of rip current related rescues and deaths by more accurately identifying the conditions under which the strongest and most dangerous rip currents will occur and hence providing real-time information with which to assist lifeguards with staffing decisions and to alert the public to the hazard. The goal of this project is to develop the index. (Thieke/Kennedy/Hanes: R/C-S-44)
- 7.4 Seismic waves (tsunami) are natural occurrences in all the earth's ocean and marginal seas. This project will adopt an advanced tsunami run-up model used on the U.S. west coast to conditions in the North Atlantic Basin. It is cooperative project with Puerto Rico Sea Grant. (Maul: PD-04-10)
- 7.5 Hurricane damage from waves and storm surge can be more disastrous than wind damage. However, the quantity of wave data near the coast is not adequate to improve predictions and thus planning and construction. Also lacking are collocated wind and wave measurements which could help to improve turbulence predictions and thus gust loading on houses. The goal is to quantify and improve descriptions of hurricane wave transformation near the coast and its effects, and to evaluate the accuracy and suitability of common existing wave transformation models during hurricane conditions. (2008) (Kennedy/Gurley/Sheremet: R/C-S-46)
- 7.6 The majority of hurricane damage is associated with storm surges and coastal flooding. This study will validate the new storm surge and coastal flooding modeling system CH3D-SSMS, which will be coupled with the SBEACH model for shoreline erosion, with extensive data obtained in 2004. This research will significantly advance our predictive ability of coastal hazards (flooding, erosion, and rip current) to mitigate damages to coastal communities. Outcome of the research will directly benefit NOAA's effort to improve its storm surge models. (2008) (Sheng: R/C-S-47)
- 7.7 Assist Sea Grant faculty with the development of the Specialized Marine Action Response Team (SMART) for response to disasters occurring in marine and coastal habitats. (Cameron)
- 7.8 Continue to provide educational programs/displays for beach safety and hurricane preparedness focusing on rip currents, shark awareness, sun safety, and boat preparation for hurricanes. (Cameron)
- 7.9 Assist Sea Grant faculty with the development of the Specialized Marine Action Response Team (SMART) for response to disasters occurring in marine and coastal habitats. (Cameron)

- 7.10 Continue to provide educational programs/displays for beach safety and hurricane preparedness focusing on rip currents, shark awareness, sun safety, and boat preparation for hurricanes. (Cameron)
- 7.11 Continue assisting Escambia County Marine Resource Division, and other groups to respond to storms, develop Specialized Marine Action Response Teams (SMART), and produce and distribute educational information. (Diller)
- 7.12 Continue to provide general and boating specific hurricane preparedness information to the general public via the local mass media outlets. (Gregory)
- 7.13 Provide one-on-one consultations to people on red tide and other coastal hazards. (Mahan)
- 7.14 Working with regional Florida Fish and Wildlife Conservation Commission, a public awareness campaign will be created to increase awareness of the direct economic and recreational value of marine fish species, the indirect economic value of sea grass beds, and the economic and ecological impacts of illicit harvest activities. Efforts may be initiated to increase funding and/or support for regulatory agencies and to increase awareness of such activities among regional organizations with regulatory power. (Sapp)
- 7.15 Expanding the Carolina's Coast project-a partnership between ocean observing system programs in the southeast and the Wilmington, NC Weather Forecast Office- into Florida. Extension efforts include facilitating meetings between the National Weather Service, SEACOOS data management folks and private stakeholder groups; forming a marine advisory group to provide feedback/test products developed through the Tampa WFO/SEACOOS project. Regional extension efforts to promote the Carolina's Coast project will commence when the NWS officially launches the website (expected Fall, 2007). Expanding the project to the Miami-Dade County. Promotional products for the Carolina's Coast project will be developed in conjunction with Jen Dorton, CORMP outreach coordinator and Payne Seal and Braxton Davis of USC Baruch Institute. (Simoniello)
- 7.16 Provide hurricane preparedness and water safety information at various events and programs. (Verlinde)
- 7.17 The Miami-Dade County Agent will provide hurricane preparedness information to area bait shops, marinas, and boating supply stores as they prepare for hurricane season. (Crane)
- 7.18 The Miami-Dade County Agent will continue to secure funding in effort to produce a comprehensive digital video guide on hurricane preparedness for marinas and boat owners. She will continue to work with a multi-disciplinary statewide Technical Advisory Committee to determine planning needs and assessments. (Crane)
- 7.19 Develop a regional training program on hurricane preparedness for marine agents, and establish a "specialized marine action and assessment response teams" (SMART) for response to coastal disasters in marine and coastal habitats. (D.Jackson, M. Spranger)

Scientific Literacy

Goal 8: Graduate Education: Produce a Highly Trained Workforce in Marine and Coastal Related Sciences

- 8.1 Enhance graduate education in disciplines related to the coast and ocean by active participation in public and privately funded graduate programs. (Cato)
 - 8.1.1 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.
 - 8.1.2 At least one national Sea Grant Industrial Fellow candidate (of 2-4 per year nationally) will be successful every three years.
 - 8.1.3 At least 30 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students.
 - 8.1.4 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.
 - 8.1.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship.
 - 8.1.6 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held.
- 8.2 A minimum of \$600,000 per year in non-national Sea Grant CORE program funding will be received from extramural funding sources to support Sea Grant programs. (Cato)
- 8.3 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)
- 8.4 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)
- 8.5 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-06-1)
- 8.6 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-06-2)
- 8.7 Sea Grant Extension faculty will improve their content and process skills by attending a minimum of 8 days of in-service training workshops or conferences that support their individual educational programs (all agents).

- 8.8 Coordinate annual in-service training meeting for Extension faculty that provides a status report of on-going research and extension activities, and organizes program planning efforts. (Spranger)
- 8.9 As part of a four state effort in the Gulf of Mexico, sponsor and conduct summer teacher Center for Ocean Science Education Excellence (COSEE) institute. Work with co-P.I.s in other states to coordinate activities, develop governance structure, develop online teacher training, and evaluate project activities (Spranger: COSEE-GOM)
- 8.10 Conduct evaluation of National Sea Grant Training Academy, by surveying attendees one year after the program has been completed to measure impacts and benefits. In 2005, 28 Sea Grant faculty from 20 states participated in this inaugural event. Results of the survey will be distributed to the National Sea Grant network, and data results will be used to solicit funds for continuation of the activity by the Sea Grant Assembly. (Spranger)
- 8.11 Participate as a Fellow in the Natural Resources Leadership Institute to develop skills necessary for effective natural resource leadership, communications, and conflict resolution. Over the course, seven 3-day seminars and activity sessions will be attended, and a course practicum completed. (Staugler)
- 8.12 Continue coursework toward a Masters Degree in Environmental Studies.
(Staugler/Wasno/Verlinde)

Goal 9: Marine Education: Create a Scientifically and Environmentally Informed Citizens

- 9.1 A number of educational activities are implemented under the previous goals. The following ones cross many goals and are implemented in general.
 - 9.1.1 Produce high quality publications and productions that effectively communicate results of Florida Sea Grant activities to both general and specialized audiences. Productions include Sea Grant Reports, Sea Grant Extension Fact Sheets and brochures, Sea Grant Technical Papers, books, book chapters, staff papers, conference proceedings, newsletters, posters signage and electronic formats including CD-ROMs and videos. (Kearl/Zimmerman)
 - 9.1.2 At least ten print or broadcast news releases will be produced. (Kearl/Zimmerman)
 - 9.1.3 The Florida Sea Grant Internet home page and website will be upgraded and maintained. (Zimmerman/Whitehouse/Damron/Wagner)
- 9.2 Continue to conduct marine educational programs on monofilament recycling, marine debris, and marine/natural resources for local K-12 teachers in Bay County. (Cameron)
- 9.3 Work with 4-H Extension agents in the development of marine environmental programs for local clubs and assist with county and marine 4-H camps. (Cameron)
- 9.4 Conduct public education program in Dade County. (Crane)
 - 9.4.1 Volunteers who will participate in beach clean up activities will remove marine debris from the shoreline and will learn the impacts of litter to the shoreline.
 - 9.4.2. Conduct presentations and workshops on marine environmental and ocean system topics for informal and formal educators/teachers.
 - 9.4.3 Continue to manage and work with volunteers to construct and install outdoor fishing line recycling bins and continue to educate citizens on the impacts of discarded fishing line to the marine environment.
 - 9.4.4 Conduct classroom presentations and field studies to teach youth (K-12 grade) the basic concepts of the coastal and marine ecosystems.
 - 9.4.5 Assist in conducting a workshop for landscape architects on mangrove maintenance in south Florida.
 - 9.4.6 Online or hard-copy newsletter will be developed on local marine/coastal topics that are distributed to interested citizens. Bi-monthly "At the Waters Edge" will be distributed to 200 people.
 - 9.4.7 Continue to maintain and update the Miami-Dade County Sea Grant website with current information of marine/coastal topics.
 - 9.4.8 Assist county staff in developing a youth fishing program to promote ethical angling practices.
 - 9.4.9 Work with Extension 4-H staff and club leaders in developing marine environmental program for local clubs.
 - 9.4.10 Work with county Extension staff in developing educational fair exhibits for the annual Miami-Dade County Fair.
- 9.5 Three hundred fourth grade students will become more knowledgeable about the marine environment by attending the "Ecosystem Explorer" program at the St. Lucie County Marine Center. (Creswell)

- 9.6 Two hundred seventh grade students will become more knowledgeable about the marine environment by attending the “Ecosystem Explorer” program at the St. Lucie County Marine Center in conjunction with classroom instruction at their schools. (Creswell)
- 9.7 Three hundred fifth grade students attending middle and high schools in the St. Lucie County School District will improve their knowledge of marine science through the “Motion in the Ocean” program, a hands-on instructional which focuses on the relationship between anatomical form, function and adaptation to the environment. (Creswell)
- 9.8 Two hundred 4-H, Indian River “Lagoon Days”, and other summer camp students will increase their knowledge of the Indian River Lagoon through field activities, such as beach seining, benthic sampling, canoeing, and observation. (Creswell)
- 9.9 Two hundred students attending middle and high schools in the St. Lucie County School District will improve their knowledge of marine invasive species in Florida and methods to decrease introductions of non-native marine species. (Creswell)
- 9.10 Continue bi-weekly radio broadcast “At Home in St. Lucie” (1/2 hour program) discussing topics related to the impacts of coastal development and man’s activities on the marine environment. (Creswell)
- 9.11 Conduct at least two workshops dedicated to public education of marine invasive species. (Creswell)
- 9.12 Maintain and update the Escambia County Marine Extension website with local marine resource information, sea turtle education, and educational events. (Diller)
- 9.13 Work with Extension 4-H specialists and agents in the development of marine environmental programs for youth. Assist with development and activities at state marine and county 4-H camps. (Diller)
- 9.14 Work with Extension 4-H specialists and agents in the development of marine environmental programs for youth. Assist with development and activities at state marine and county 4-H camps. (Diller)
- 9.15 Develop marine environmental programs for K-12 teachers and youth. Continue writing Resource Rangers video series and developing associated educational programming. (Diller)
- 9.16 Develop and assist production of website, newsletter, or newspaper articles on local marine/coastal topics that are distributed to interest citizens. (Diller)
- 9.17 Provide Master Naturalist Program training to interested citizens and continue to develop volunteer program for local Sea Grant extension programs. (Diller)
- 9.18 The Okaloosa/Walton County agent will provide support to teachers conducting classroom enrichment projects such as NaGisa at Niceville and South Walton High Schools. Additionally, a supporting team role will taken for COSEE and 4-H Camping Projects. Frontline planning and teaching roles will be taken for projects such as State Marine Camp, Local School programs such as Dunes in Schools, Florida Master Naturalist, Cooperative Teacher Education programs with Dauphin Island Sea Lab, and Sea Turtle Education programs. (S.Jackson)
- 9.19 Work with 4-H, Florida’s National Estuary Programs and National Estuarine Research Reserves, and other partners to implement a program dealing with estuaries. (Jacoby)

- 9.20 Teach 4-H and other youth programs (including summer camps) relating to marine issues/topics. (McGuire)
- 9.20.1 Teach workshops for 4-H marine ecology judging event.
 - 9.20.2 Conduct teacher workshops on invasive species, working with deaf clients, field studies, including presentations at NMEA, FMSEA conferences.
 - 9.20.3 Coordinate and teach Kids' Day activities for First Coast Birding & Nature Festival (2 days). Serve on planning committee for First Coast Birding & Nature Festival.
 - 9.20.4 Continue to write the quarterly newsletter "aqua-notes".
 - 9.20.5 Continue to write monthly articles for the Flagler News Tribune.
 - 9.20.6 Judge at local, regional and state science fairs. Select Skoch Scholarship recipient at state science fair.
 - 9.20.7 Continue to represent FSG on US Fish and Wildlife Service's Manatee entanglement and manatee education working groups.
 - 9.20.8 Continue to coordinate monofilament recycling program in NE Florida.
 - 9.20.9 Teach field trip programs for Coastal Master Naturalist classes.
- 9.21 Working primarily with key faculty in the University of Florida Department of Fisheries and Aquatic Science, a public awareness and education campaign will be continued to gain broad public support for a new project aimed at enhancing essential fish habitat off the coast of Taylor and Dixie Counties. Increased awareness of the Steinhatchee Fisheries Management Area project will be achieved through public presentations, comprehensive web-based publications, and through various regional print publications. (Sapp)
- 9.22 Plan, market and produce a regional fishing tournament titled, "4-H Nature Coast Classic." This event will feature specific adult and youth education programs focusing on responsible angling and fisheries enhancement and conservation that are consistent with Florida Sea Grant. It will also feature a commercial expo that will draw many of the top boat, tackle, and marine-related equipment manufacturers in the State. Grant funding will be pursued to support the marketing of this event. (Sapp)
- 9.23 Continue to update and improve the development of the highly successful Taylor County Extension Service Web site, while directly referencing Florida Sea Grant and Florida Sea Grant programs in all Taylor County Marine program areas. Through direct marketing, effective design principles, and consistent "cross-promotional" efforts (direct reference in various outreach campaigns, web site traffic will increase by 150-200% during the second year (after increasing by over 1,500 % in the first year). (Sapp)
- 9.24 Initiate a broad community education program that seeks to increase knowledge and awareness of Florida Sea Grant programs including aquaculture, fisheries, coastal habitats, boating and waterways, water quality, and coastal storms. Program areas will be tailored to issues and concerns that are relevant to Taylor **Error! Bookmark not defined.** County and the "Nature Coast." Consistent with regional demographic indicators, education will focus on the principles of empowerment and ownership. (Sapp)
- 9.25 Conduct public education programs in Charlotte County. (Staugler)
- 9.25.1 Develop and maintain a Charlotte County Marine Extension website with local marine resource information.
 - 9.25.2 Research and write at least 12 columns for the WaterLIFE Magazine on marine-related topics, monthly distribution of 30,000.
 - 9.25.3 Write marine-related column for quarterly Extension Newsletter.
 - 9.25.4 Participate in the planning and aquatics testing section of the Envirothon competition for high school students in SW Florida.

- 9.25.5 Work with CCA, & U.S. Coast Guard Auxiliary, and 4-H Marine Ecology Club to assemble, install and maintain monofilament recycling bins at marinas, ramps and fishing piers within the County.
 - 9.25.6 Help coordinate Coastal Cleanup and derelict crab trap clean up events.
 - 9.25.7 Provide coastal information and activities at various marine-related events.
 - 9.25.8 Provide marine-related speaker programs to at least six community organizations.
 - 9.25.9 Work with Wasno to organize the Boca Grande Pass cleanup event.
 - 9.25.10 Distribute 40,000 Boating and Angling Guides.
- 9.26 Enhance the sustainability of the commercial fishing heritage of Cortez. (Stevely)
- 9.26.1 Organize 25th Annual Cortez Commercial Fishing Festival. This festival reaches 15,000 citizens with information on environmental issues. The festival generates the revenue (approximately \$60,000/year) to purchase 95 acres of environmentally sensitive land.
 - 9.26.2 Assist the Florida Institute for Saltwater Heritage (FISH) in conducting educational programming to support acquisition and management of the FISH Preserve, development of the Florida West Coast Maritime Museum at Cortez, and restoration of the 1912 Cortez School House.
- 9.27 Conduct a general marine educational program for youth and adults in Santa Rosa County. (Verlinde)
- 9.28 Provide coastal information articles to various media outlets. (Verlinde)
- 9.29 Continue to support, coordinate and develop curriculum and videos for the Resource Ranger Program, and environmental education program for 4-H and students. The program includes curriculum, videos, day camps and field trips about coastal issues. (Verlinde)
- 9.30 Coordinate the 6th annual Seagrass Awareness Celebration and 3rd annual Coastal Encounters event. (Verlinde)
- 9.31 Teach Florida Master Naturalist Program wetlands and coastal modules. (Verlinde)
- 9.32 Coordinate 21st annual NW Florida Rivers Clean-up and International Coastal Clean-up. (Verlinde)
- 9.33 Develop educational programs for 4-H, teachers, boaters and interested citizens on marine debris, safe boating and monofilament recycling. (Verlinde)
- 9.34 Work with extension 4-H agents in the development of coastal programs and activities for local clubs. (Verlinde)
- 9.35 Provide coastal information and hands-on activities at various environmental events. (Verlinde)
- 9.36 Provide Santa Rosa County community leaders with coastal information. Support the SRC Board of County Commissioners Marine Advisory Committee. Work with Florida Sea Grant Waterfront group to develop a long range waterway management plan for Santa Rosa County. (Verlinde)
- 9.37 Provide “Sea Turtle Friendly Beaches” program to beach residents. (Diller/Verlinde)
- 9.38 Provide coastal issue talks to various community organizations. (Verlinde)
- 9.39 Support 4-H marine and county camps. Provide 4-H leaders and teachers with coastal information and opportunities. (Verlinde)

- 9.40 Publications to be completed in 2006: *Hazardous Marine Creatures, Fish Resuscitation Tank System, Exotic Fishes and Invertebrates of Southwest Florida*. (Wasno)
- 9.41 Envirothon Academic Challenge – Plan is to increase school participation and have one school place in top 3 at state competition. (Wasno)
- 9.42 Conduct “Fishing for Success” presentations at Lee County Library System. This is a series of four presentations for different skill levels. In addition to fishing skills, invasive species, outdoor safety, circle hooks, venting tools and fish identification is covered. (Wasno)
- 9.43 Fishermen’s Educational Display covering 18 different topics of concern will be displayed at local fishing tournaments, boat shows and environmental events. This display will be used throughout southwest Florida by all Marine Agents. (Wasno)
- 9.44 Research and write at least 40 newspaper columns on a variety of environmental issues and topics. (Mahan)
- 9.45 Continue to work with the Apalachicola River Basin Invasives Workgroup to establish partnerships and educate elected officials and the general public on environmental problems associated with invasive species. (Mahan)
- 9.46 Provide teacher workshops for the marine collectors permit, Florida’s Black Bear, Project Learning Tree. (Verlinde)
- 9.47 Provide levels one and two stream restoration workshops for agency, industry and private consultants. (Verlinde)
- 9.48 Provide presentations on Florida Sea Grant, extension activities and success stories to clientele and stakeholder groups across the state and region, upon request. Continue to develop linkages collaborative efforts and programs with state, national and international audiences. (Spranger)
- 9.49 Conduct a general marine education program for youth and adults to increase community awareness and protection of coastal and marine environmental resources in Broward County. (Behringer)
- 9.49.1 Develop and conduct marine educational programs for adults, 4-H clubs and K-12 teachers and students.
- 9.49.2 Coordinate coastal and waterway cleanups and educate participants about the impacts of marine debris on the marine environment.
- 9.49.3 Develop a manatee educator tool box and coordinate the Manatee Awareness and boater safety art contest for Broward County schools and 4-H clubs.
- 9.49.4 Increase manatee awareness and boater safety through educational programs.
- 9.49.5 Develop an online and electronic newsletter on local marine/coastal topics that are distributed to interested citizens.
- 9.49.6 Maintain and update the Broward County Sea Grant Marine Extension website with relevant marine resource information and educational events.
- 9.49.7 Provide research and technical support and serve as a judge for the Broward County Public Schools Science Fair.
- 9.50 Research and write at least 40 newspaper columns on a variety of environmental issues and topics. (Mahan)

Key to Individual Responsibilities

Adams	5, 9, 11, 12, 13, 20, 27	Hoenig.....	4
Alford.....	22	Holland.....	6, 7, 22
Allman.....	4	Huth.....	16
Ankersen.....	19, 21, 22	Jacoby.....	7, 25, 27, 34
Ault.....	24	Jamison.....	15
Baker.....	11, 12, 29	Julian.....	11
Balaban.....	16	Kearl.....	33
Behringer.....	23, 27, 37	Kem.....	3
Benetti.....	11	Kennedy.....	29
Beusse.....	19	Kerr.....	3
Bohnsack.....	24	Kristinsson.....	16
Burgess.....	4	Larkin.....	5
Cameron.....	5, 6, 24, 25, 27, 29, 30, 33	Lindberg.....	7, 8, 22
Carrier.....	4	Lopez.....	3
Cato.....	31	Mahan.....	8, 9, 13, 16, 18, 20, 25, 28, 30, 37
Chapin.....	29	Makopondo.....	6, 7
Chapman.....	12	Mann.....	4
Clark.....	3	Mari.....	3
Confer.....	22	Marshall.....	4
Crane.....	30, 33	Martin.....	16
Creswell.....	6, 11, 12, 13, 25, 33, 34	Martinez.....	12
D.Jackson.....	20, 30	Masterson.....	3
Damron.....	33	Matos.....	11
Degner.....	5	Maul.....	29
Delaney.....	22	McBride.....	4
Deyle.....	29	McCarthy.....	24
Diller.....	6, 25, 30, 34, 36	McGuire.....	20, 25, 35
Douillet.....	11	McLendon.....	19
Downs.....	11	Miller.....	24
Ehrhardt.....	4	Morgan.....	16
Fann.....	21, 22	Niezrecki.....	19
Farmer.....	24	Nunez.....	12
Feldheim.....	4	Ohs.....	12
Fields.....	3	Olson.....	4
Fletcher.....	24	Orhun.....	11
Fluech.....	10	Otwell.....	5, 15, 16, 17
Fries.....	24	Ouellette.....	22
Gaines.....	11	Patterson.....	4, 24
Gregory.....	6, 7, 20, 30	Paul.....	24
Gruber.....	4	Pinelli.....	29
Gurley.....	29	Pomponi.....	3
Hamann.....	19	Price.....	24
Hanes.....	29	Purdy.....	21
Harrington.....	22	Reed.....	3
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