Science Serving Florida's Coast

Florida Sea Grant
College Program
Year 2005
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
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Florida's citizens, industries and governments

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WORK PLAN 2005
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 Plan[1] is developed each two years and detailed work plans and progress reports are written annually. This is the work plan for 2005[2].

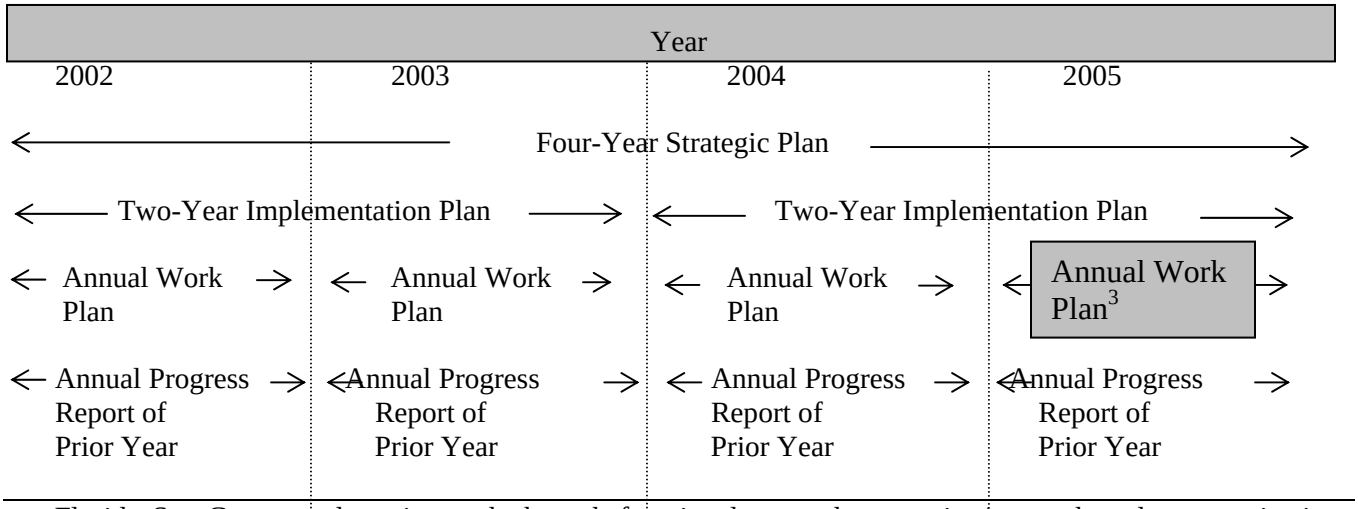
The Florida Sea Grant cycle of strategic planning, implementation of two-year activities, development of a detailed annual work plan and reporting on annual progress is shown in the table on the next page. Florida Sea Grant's Strategic Plan addresses issues that are important both nationally and in Florida, and reflects the input of hundreds of Floridians representing academia, government, industry and citizens. This plan defines Florida Sea Grant's strategic issues within the context of a number of strategic planning activities. First, it builds on seven Florida Sea Grant statewide workshops in 1996, involving hundreds of faculty, agency, industry and citizen participants. The priorities developed through this process were updated for the 2002-2005 strategic plan. They are presented within the context of the National Sea Grant Network Plan: Coastal and Marine Resources for a Sustainable Economy and Environment 1995-2005, which in turn defines overall Sea Grant issues at the national level within the context of NOAA's Strategic Plan: A Vision for 2005. The plan also considers Florida Sea Grant's role in Florida through participation in the development of Florida's Ocean Strategies, a 1999 planning process completed by the Florida Governor's Ocean Committee, and a follow-up Florida ocean research priority agenda developed in 2000-2001. 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

[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.

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 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.



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 10 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: Create Products and Processes from Florida's Coastal Resources Using Marine Biotechnology

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. (2006) (Kem/Soti: R/LR-MB-20)

1.3 Conopeptides are powerful neuropharmocological 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. (2006) (Mari/Fields: R/LR-MB-21)

1.4 To promote industry education and engagement, and media awareness of Florida marine biotechnology opportunities and constraints, and work will continue with BioFlorida and other stakeholders to implement a business plan for this subject. (Seaman)

1.5 To promote faculty cooperation and exchange to enhance research and training, a statewide marine biotechnology listserve will be continued, planning for the fifth statewide summit will continue, and venues to disseminate technical results will be explored nationally. (Seaman)

1.6 To promote awareness and understanding of marine biotechnology by Extension faculty, the possibility of establishing in-service training and a major program in this area will be explored. (Seaman)

Goal 2: Determine Production and Management Techniques Which Make Florida's 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. (2006) (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. (2006) (Ehrhardt/Olson: R/LR-B-57)

2.5 The FY02 National Sea Grant federal appropriation required the enhancement of Sea Grant's fisheries extension program.

- 2.5.1 Florida Sea Grant will increase the overall amount of its Sea Grant fisheries extension activity through its Fisheries Work Action Team. (Spranger/Adams/Otwell/Jacoby/Agents: E/FE-FSG)
- 2.5.2 Florida Sea Grant will participate in a regional activity for the Gulf of Mexico states by participation in the sustainability of the Gulf of Mexico shrimp industry. (Spranger/Adams/Agents: E/FE-GM)
- 2.5.3 Florida Sea Grant will work as a member of the South Atlantic Regional Fish Extension Project team that will address the topic of fisheries management. (Spranger/Jacoby/Adams/McGuire: E/FE-SA)

2.6 The FY03 National Sea Grant federal appropriation continued the required enhancement of Sea Grant's fisheries extension program. Florida Sea Grant will hire two new fisheries oriented county faculty (Bay, Collier) and increase its recreational fishery extension program activity by one-half FTE. (Spranger/Holland/Floyd: SGEP-13-FE)

2.7 All commercial shrimpers in Florida will become aware of the USDA Trade Adjustment Assistance program and decide whether to make an application and claim with USDA in an effort to seek relief from the market impacts of imported, aquacultured shrimp on the prices received for out-of-state landings. (Adams)

2.8 The Gulf and South Atlantic Foundation-funded project designed to determine the fair market value for a commercial shark permit and vessel in Florida will be completed (via a one-year extension). One hundred (100) commercial shark vessel owners will become better informed of the "fair

market value" for a vessel and/or a federal shark permit, and the bid development process associated with a buyback program. (Adams/Larkin)

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 Continue to provide scientific input to the Gulf of Mexico and South Atlantic Regional Fishery Management Councils. Attend various meetings and provide economic input in the derivation and selection of management options. Twenty-five (25) fishery managers will become more aware of the role of economics in the process of sustainable fishery management.

2.10.1 Serve on Scientific and Statistical Committees (Adams)
2.10.2 Review and comment on stock assessment analysis and draft management document. (Gregory)

2.11 Assist regional fisheries agencies with fisheries management plans and assessments. (Adams)

2.11.1 Continue to Chair the Gulf States Marine Fisheries Commission Sheepshead Management Task Force. Write an economics component for the draft management plan.

2.12 Give presentations at the following conferences: (Adams)

2.12.1 Aquaculture America Conference -- New Orleans, LA (paper on venting tool use)
2.12.2 American Fisheries Society Annual Meeting, Anchorage, AK
2.12.3 North American Association of Fisheries Economics and Trade, Vancouver, BC
2.12.4 International Pectinid Conference, Queensland, Australia
2.12.5 Harte Foundation-funded Gulf of Mexico Summit, Corpus Christi, TX

2.13 Work with the Southeast US Sea Grant Fisheries Extension Enhancement Team to explore how NMFS and Sea Grant can better cooperate and collaborate on extension and outreach programs within the region. Will hold a Workshop in Savannah, GA with representatives from NMFS, GSFMC, ASMFC, and state agencies to address this issue. (Adams, Spranger)

2.14 Assist the Gulf of Mexico grouper fishery industry leaders t develop a limited entry program for federal and state waters. (Gregory)

2.15 Increase the sustainability of fisheries resources in Brevard County. (Combs)

2.15.1 Conduct educational programs and provide materials and technical assistance for the Brevard Sport Fishing Association (SFA) and the Brevard County Commission Marine Advisory Council (BCCMAC) for the development, maintenance, and monitoring of artificial reefs off the Brevard County coast.
2.15.2 Assist two commercial fishing businesses at Port Canaveral and elsewhere in Brevard County that have been economically impacted by foreign competition in seafood products, such as shrimp and scallops, as they may seek "exit strategies" that will permit them to move from seafood production to some other enterprise, while maintaining profitability. Facilitate two meetings for interested fishermen with public officials, such as County Commissioners, and Port Commissioners, who are interested in resolving these challenges.
2.15.3 At least 30 recreational fishermen will learn environmentally and economically friendly management practices for recreational fishing. (fish venting, catch n' release, circle

hooks and mercury in fish) by attending an educational exhibit or receiving a brochure. Knowledge gained will be measured by a survey after training session.

2.16 In collaboration with Florida Fish and Wildlife Conservation Commission's Snook Carcass Intercept and Recovery Program, local anglers and tackle shops have been participating in this project. This research project is to provide a greater understanding of the statewide genetic stock structure, spawning potential and movement patterns. Plans are to increase angler awareness and participation through educational presentations. Preliminary results from 2004 data provide evidence of potential regional populations on each coast and genetic samples should aid in differentiating these populations. (Wasno)

2.17 Conduct a recreational fishing educational program in Santa Rosa County . (Verlinde)

2.17.1 Promote fishing techniques such as fish venting, circle hooks, proper handling and release of fish and fishery management issues for recreational fishermen.

2.17.2 Coordinate and promote the artificial reef program.

2.18 A sponge resource inventory will be conducted in the Northern Gulf of Mexico in the area near St. Marks. The annual sponge resource inventory in the area of Florida Bay from Everglades National Park to Marathon will be continued. Both studies are contracted to and funded by FWCC to provide information necessary to manage a sustainable commercial sponge fishery and evaluate the recovery of hard bottom habitats in Florida Bay. Findings will be presented to FWCC, FMRI, the multi-agency task force studying Florida Bay, FSG and the FKNMS. (Stevely/Wasno/Sweat) (EX-FWCC-2; EX-FWCC-5)

2.19 Continue scallop restoration program, including hatchery, nursery and stocking. Educate public with recreational scalloping workshop and distribution of new recreational scalloping publication. Present report on "Economic Impact of Recreational Scalloping in Citrus County, Florida" to 15th International Pectinid Workshop and 58th Annual Meeting of GCFI. (Sweat)

2.20 Conduct 17th Annual St. Petersburg Pier Kid's Fishing Tournament. Fishing techniques and ethics will be taught to 500 kids twelve years of age and younger. (Sweat)

2.21 Conduct fish survival workshops for recreational fishermen that address fish venting, circle hooks, proper handling, resuscitation tanks and fishery management issues. Assist Agent Wasno as weighmaster at recreational fishing tournaments. (Sweat)

2.22 Optimize planning, management and construction of artificial reefs to enhance fisheries production. (Stevely)

2.22.1 Plan and obtain funding for evaluation of Manatee Co. artificial reefs to meet permitting requirements.

2.22.2 Assist in organization of the Florida West Coast Artificial Reef Program Coordinators Workshop.

2.22.3 Work with Manatee Co. Extension Advisory Committee and Manatee County government to site new artificial reef location.

2.22.4 Utilize University of Tampa faculty and students to monitor algal populations on artificial reefs.

2.23 Provide educational programs assigned to enhance fish stocks.

2.23.1 Provide technical assistance to Red Start program as member of Red Start Science Advisory Board. (Wasno/Stevely/Staugler/Sweat)

2.23.2 Present Red Start poster exhibit at 2005 World Aquaculture Society Conference (Bali, May 9-13). (Wasno/Stevely/Staugler/Sweat)
2.23.3 Plan fish resuscitation workshops to improve survival of fish caught during live-release fishing tournaments. (Wasno/Stevely/Staugler/Sweat)
2.23.4 Prepare fish resuscitation publication. (Wasno/Stevely/Staugler)

2.24 Enhance artificial reef habitat in Charlotte County. (Staugler)

2.24.1 Identify site for a new Charlotte County artificial reef.
2.24.2 Enhance existing reefs in need of materials as money allows.
2.24.3 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.
2.24.4 Educate artificial reef volunteer divers on the essential elements of artificial reef monitoring, including reef mapping, fish identification, and quality assurance techniques.

2.25 Enhance Charlotte County fisheries through the development of an urban fishing program. (Staugler)

2.25.1 Work with Charlotte County Parks and Recreation, FWC and volunteers to identify and stock suitable fish species lakes at the South County Regional Park.
2.25.2 Develop educational programs, including fishing clinics, and catch and release tournaments.

2.26 Increase the sustainability of fisheries resources in Okaloosa and Walton counties. (S.Jackson)

2.26.1 Conduct fish survival workshops for recreational fishermen, charter boat operators and fishing tournament organizers that address such topics as fish venting, circle hooks, proper handling and release, and fishery management issues.
2.26.2 Conduct educational programs and provide materials and technical assistance for the maintenance and development of artificial reefs off Florida's coast.

2.27 A new Sea Grant Extension Program will be created in Taylor County. (Sapp)

2.27.1 Create Taylor County Artificial Reef Dive Team.
2.27.2 Pursue grant support for the creation of artificial reefs and work with private, state and university organizations to perform technical analysis and identify candidate locations for artificial reef development.
2.27.3 Identify cost-effective strategies for the manufacturing of artificial reef materials and for the deployment of these 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.

2.28 Continue work on Turtle Excluder Devices (TED's) with local shrimp industry. Work with Dale Stephens, NOAA Fisheries Service, to distribute new "leatherback TED's" for local off-shore shrimp fishermen to field-test and evaluate. Organize and teach at least one TED workshop for shrimp fishermen in Franklin County. (Mahan)

2.29 Contribute to the enhancement of artificial reef science, technology and use in Florida. (Lindberg)

2.29.1 Serve on the Gulf of Mexico Fishery Management Council's Special Reef Fish Scientific and Statistical Committee.

2.29.2 Serve on the State of Florida's Artificial Reef Advisory Board.

2.29.3 Co-Chair the Research & Conservation Working Group for FWC Division of Marine Fisheries Strategic Planning.

2.29.4 The State of Florida's goal to use artificial reefs directly in fisheries management will be advanced by completing Phase I development of the Steinhatchee Fisheries Management Area (FMA), as a demonstration project based on prior FSG research. In Phase I, 40 standardized reefs will be deployed along the 10-fathom contour of the northeastern Gulf of Mexico as monitoring stations for evaluating the output from the 100 sq. mi. FMA, which will be developed in Phase II. During Phase I the fishing public of the region will be educated about the purpose and plans for this FMA.

2.29.5 Florida west coast artificial reef coordinators will know what is required for a community to acquire, prepare and deploy large naval vessels as artificial reefs for economic development. As a result of an FSGE-organized workshop, they will learn the scope of effort and investments involved with such projects, and the economic/tourism benefits, and thus will be able to make informed decisions about initiating large vessel reefing projects.

2.29.6 State and local artificial reef coordinators, reef contractors and the fishing public will learn the scientific and resources management issues associated with artificial reef development, through the production and distribution of an extension publication tentatively titled "Understanding the Attraction-Production Issue for Artificial Reefs as Fisheries Habitat."

2.29.7 Best management practices for reef habitat enhancement in estuarine waters will be developed beginning in 2005, through a working group convened by FSGE in cooperation with the Florida FWC Artificial Reef Program. This group will include scientists, resource managers, environmental regulators and artificial reef coordinators, and will address, among other things, the efficacy of under-dock local deployments.

2.29.8 State artificial reef program managers and county reef coordinators will have access to technical advise on reef design and evaluation, through county FSGE agents and directly from the statewide Fisheries Habitat Specialist.

2.30 Mote Marine Laboratory will be assisted with a black grouper volunteer angler tag and release effort and a survey of black grouper spawning sites in South Florida in a NMFS cooperative Fishery Research Grant. (Gregory)

2.31 Increase the sustainability of fisheries resources in Escambia and Santa Rosa counties. (Diller)

2.31.1 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 our coastline.

2.31.2 Conduct fish survival workshops for recreational fishermen, charter boat operators and fishing tournament organizers that address such topics as fish venting, circle hooks, proper handling and release, and fishery management issues.

2.31.3 Conduct extension training session for Escambia County shrimp fleet applying for the USDA Farm Service Agency's Trade Adjustment Assistance program.

2.31.4 Continue local fish extension activities that may include topics such as derelict fishing traps, mercury in fish, shrimp management, marine protected areas, essential fish habitat and fish management.

2.32 The knowledge of marine fisheries policy will be increased through the exchange of information and methodologies to fisheries managers, non-governmental agencies, the fishing community and other user groups through the forum of the Gulf and Caribbean Fisheries Institute. (Creswell)

2.32.1 Promulgate and distribute the 56th Proceedings of the Gulf and Caribbean Fisheries Institute and disseminate it to members, libraries, universities, and computer databases.

2.32.2 Serve as chairman of the Steering and Program Committees for the 58th Gulf and Caribbean Fisheries Institute and publish its Book of Abstracts.

2.33 Behavioral changes in boaters and marine operators will be encouraged to cause environmentally friendly boating habits through exhibits, mass media, distribution of informational material, and the "Clean Marina/ Clean Boatyard" certification program. (Creswell)

2.33.1 At least four marinas and/or boatyards in St. Lucie, Martin, and Indian River Counties will complete or enlist in the "Florida's Clean Marina Program".

2.33.2 Complete re-installation of monofilament recycling stations in St. Lucie and Indian River Counties.

2.33.3 Continue to promote utilization of monofilament recycling through newspaper articles and radio programming.

2.33.4 Continue to plant mangrove seedlings along the Indian River Lagoon through the “IRL Mangrove Restoration Program”

2.33.5 Teach at least 30 fishermen and/or scientists the importance of venting fish bladders and demonstrate its method.

2.34 Conduct fisheries education program in Bay County. (Cameron)

2.34.1 Conduct ethical angling workshop for recreational fishermen, charter boat operators, and fishing tournament organizers and participants that address topics such as fish venting, circle hooks, releasing techniques, and fishery management issues.

2.34.2 Increase awareness of fisheries management regulations through the exchange of information among non-governmental agencies, governmental agencies, local media, and the fishing community in Bay County.

Goal 3: 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. (2006) (Turingen/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. (2006) (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. (2006) (Julian/Matos/Downs: E/INDST-4)

3.5 The availability of marine baitfish in Florida is limited. This project will evaluate the feasibility of producing a live baitfish (mud minnow) using water from a stormwater treatment system. If successful, the project will benefit the environment by removing nutrients and increase cash flow to farmers. (Reddin/Leteux:PD-04-8).

3.6 Interest in shrimp culture in Florida has increased dramatically. Currently, there is no financial information describing the culture of marine shrimp in earthen freshwater ponds in Florida. This project will provide a preliminary financial assessment of the culture of marine shrimp in outdoor freshwater ponds in Florida. (Adams: Ex-USDA-1).

3.7 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. (2006) (Scarpa/Baker/Sturmer/Adams: R/LR-A-39)

3.8 Assist Brevard Co. Sheriff Work Farm deputies and inmates in designing, constructing, and implementing a proposed small-scale Tilapia aquaculture project intended to serve as educational tool for inmates, and hopefully to provide food for County Jail system. (Combs)

3.9 Continue cooperative programming with Sea Grant Clam Aquaculture Specialist, Leslie Sturmer, in two workshops assisting clam aquaculture enterprises, in efforts to improve their economic efficiencies. (Combs/Sturmer)

3.10 Establish, coordinate and provide training for Lee County clam farmers. Two workshops to be held to provide post-hurricane recovery of destroyed clam crops. (Wasno/Sturmer)

3.11 Educate interested public with aquaculture information and consultation. Serve as aquaculture consultant to public schools in Citrus County. (Sweat)

3.12 Increase the scientific, industry and agency knowledge about Florida clam aquaculture through participation at regional and national conferences. (Sturmer)

- 3.12.1 Participate in the Aquaculture America 2005 conference in New Orleans. Invited to present papers on ongoing research and educational efforts in support of the Florida clam culture industry and an introduction to shellfish aquaculture.
- 3.12.2 Participate in the Gulf and South Atlantic States Shellfish Conference in South Carolina, and provide an overview of the Florida hard clam aquaculture industry highlighting this year a new program to collect clamshell at processing plants for restoration of local oyster reefs.
- 3.12.3 Give a presentation on the development and implementation of a pilot crop insurance program for Florida clam growers to the Louisiana Farm Bureau for oyster growers who are interested in exploring financial protection for their crops.
- 3.12.4 Give a presentation about Florida's clam farming industry and its dependence on clean water at a American Water Resources Association regional conference to be held in Cedar Key.

3.13 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)

- 3.13.1 Initiate and conduct workshops in support of the new clam farmers who are developing their farms on lease sites in Collier County. Topics to be addressed include seed sources and handling, culture equipment, stocking and planting methods, and rules and regulations. (with Wasno)
- 3.13.2 Continue to provide local workshops and technical assistance for potential and existing clam farmers in southwest Florida. This year, specifically working with growers in an effort to restore infrastructure lost as a result of the 2004 hurricane season by evaluating a community land-based nursery. (with Wasno)
- 3.13.3 Continue to work with new growers in Franklin County by providing current information to assist them in their business plans. Further will begin educating local citizens in the area about the new seafood product being raised in their coastal waters. (with Mahan)
- 3.13.4 Provide technical assistance to the clam growers in Levy County by helping them acquire funding for infrastructural needs, specifically boat access to lease areas and parking facilities.
- 3.13.5 Continue to provide individual consultations to clam growers on how to use a computerized spreadsheet program to enhance their record keeping and inventory management activities for a commercial clam culture operation.

3.13.6 Continue development of workshops and materials, as well as educational support, to shellfish growers who are participating in the USDA pilot crop insurance program and other crop assistance programs.

3.14 Continue a coordinated effort to enhance hard clam farming in Florida through a series of USDA funded projects. (Sturmer)

3.14.1 Continue field trials to compare the performance of multiple Florida strains of hard clams under aquaculture conditions and to assist researchers in collecting field data to correlate this performance with genetic diversity.

3.14.2 Continue to provide technical assistance to the 5-year Clam Lease Assessment, Management, and Modeling using Remote Sensing (CLAMMRS) project. Provide "farmer friendly" graphs of monthly archived water quality data, as well as post to a web site, and compare a 3-year continuous water quality database at 10 aquaculture lease sites in the state with clam production. This project allows for adoption of remote sensing technology for the clam aquaculture industry.

3.14.3 Assist in compiling a final report on study that provided baseline information on the presence and absence of shellfish pathogens in aquaculture lease areas. This report will allow clam growers to increase their awareness of potential health problems for their stocks.

3.14.4 Continue to provide technical assistance to the UF Whitney Lab in developing reliable spawning and larval rearing techniques, and monitoring the production performance of the blood ark and ponderous ark during nursery and growout phases. The project is evaluating alternative molluscan shellfish species for possible aquaculture production. (with Creswell)

3.14.5 Disseminate results of a project addressing the issue of stock diversity in cultured clam stocks to commercial hatchery operators.

3.15 Evaluate the production and processing for alternative techniques and alternative species of clams for Florida clam growers. (Sturmer)

3.15.1 Serve as a liaison between industry partners and researchers in evaluating production of triploid and diploid clams under commercial growout conditions in open-water aquaculture leases. This Florida Sea Grant-funded project will evaluate the use of triploidy, a basic breeding technique, for the improvement of hard clam culture, specifically to improve survival during the summer environmental stressors experienced in subtropical waters.

3.15.2 Assist the Agriculture Market Research Center in distributing a report on the magnitude of the potential domestic market and product attributes desired by the seafood trade for the blood ark and ponderous ark clams. These findings will be used to educate shellfish wholesale dealers as to the market attributes of these alternative molluscan shellfish species.

3.15.3 Develop a research and extension team and identify funding to begin evaluating the sunray venus clam as a new molluscan shellfish species for diversification of the Florida hard clam aquaculture industry. (with Creswell/Adams)

3.15.4 Serve on a national committee, the National Organic Aquaculture Workgroup, Shellfish SubGroup, that is developing guidelines and standards for organic shellfish labeling.

3.16 Provide statewide service to clam grower associations and state agencies. (Sturmer)

3.16.1 Continue providing organizational support and technical assistance to local clam growers associations, and in working with the boards in developing an umbrella statewide organization. (with Adams)

3.16.2 Continue to serve on the education and conference committee of the Florida Aquaculture Association.

3.17 Provide easy access to up-to-date information on shellfish aquaculture in Florida. (Sturmer)

3.17.1 Continue to update a web site for the shellfish aquaculture extension program where services provided can be directly accessible by the clam farming industry. The site provides updates on research and extension projects, current suppliers lists, links to state and national publications addressing shellfish aquaculture and a calendar of events.

3.17.2 Continue to provide information on new issues, concerns and trends at the local, state and national level related to shellfish aquaculture through publishing a quarterly newsletter, *The Bivalve Bulletin*.

3.18 Continue to provide one-on-one consultations and technical support to individuals in Franklin County interested in learning more about freshwater and marine aquaculture. (Mahan)

3.19 Complete the assessment of the economic feasibility of small-scale freshwater, penaeid shrimp culture in Florida. This study will provide guidelines for prospective culturists regarding investing in inland shrimp culture in Florida. Project received a one-year extension. (Adams, Sweat)

3.20 Continue to develop educational program and materials, update financial feasibility analysis for a small-scale clam culture operation, and provide technical assistance and educational support where clam farming operations are being considered in the state, in particular Collier County. (Sturmer/Adams)

3.21 Continue to represent Florida Sea Grant on the state's Aquaculture Interagency Coordinating Committee and assist in preparing the annual report to AICC. (Adams)

3.22 Begin working on National Sea Grant funded study addressing the financial costs associated with biofouling in marine aquaculture. This work will be done in cooperation with the University of Connecticut. (Adams)

3.23 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)

3.24 Provide technical assistance that includes startup considerations to new and existing aquaculturists in Florida and South Alabama. (S.Jackson)

3.25 Increase general knowledge of aquaculture through classroom instruction. The general public will be more aware of aquaculture as a potential industry in Florida through seminars, exhibits and mass media presentations. (Creswell)

3.25.1 At least 100 students will learn more about aquaculture through classroom and distant learning programs.

3.25.2 Compile an informational packet for individuals interested in shrimp aquaculture.

3.25.3 Develop a series of two-page fact sheets on potential aquaculture species in Florida.

3.25.4 Conduct at least six radio broadcasts (30 minutes each) dedicated to aquaculture topics.

3.26 Enhance production, minimize costs, and improve opportunities for aquaculture businesses. (Creswell)

3.26.1 At least four ½ day workshops will be presented at the Shrimp Aquaculture Demonstration Site at the University of Florida Research and Education Center related to shrimp aquaculture.

3.26.2 Continue to instruct fish farmers in Puerto Rico to aspects of collection, handling and growout of spiny lobster and provide information regarding development of formulated feeds for spiny lobsters.

3.26.3 Conduct at least one workshop on the potential of baitfish aquaculture in Florida.

3.27 Teach 3rd grade youth about aquaculture as part of Nassau County's "Ag Extravaganza." (McGuire)

Goal 4: 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. (2006) (Wright/Heil/Harwood: R/LR-Q-26)

4.2 One of the primary strategies to reduce the number of illnesses in the high risk population for *Vibrio vulnificus* is to educate and inform the medical community. The result will be that appropriate information will be transmitted directly to the high-risk patient at the time of treatment and/or counseling for the high-risk condition. This project will conduct 30 regional workshops at local chapters of the Florida Dietitians Association and Florida Nurses Association to provide educational materials developed by trained health educators. (Heil: E/TP-3)

4.3 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. (2006) (Wright: R/LR-Q-27)

4.4 Produce a 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. (Otwell: PD-04-07)

4.5 Conduct annual Seafood Training schools. (Otwell)

- 4.5.1 International Shrimp School for industry and agencies in May for suppliers and buyers about the USA and world.
- 4.5.2 First Annual 'Certification School' for Cooked Shrimp Processors in May 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.
- 4.5.3 Smoked Fish School for Florida Processors in September focused on controls to reduce and prevent *Listeria monocytogenes.*

4.6 Direct and maintain the National Seafood HACCP Alliance for Seafood Safety and Education. (Otwell)

- 4.6.1 Continue role as National Coordinator role for the Seafood HACCP Alliance that has 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.
- 4.6.2 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).
- 4.6.3 Specifically assist in preparation of revisions of the new FDA Fishery Products and Controls Guide due for release in early 2006.

4.6.4 Redraft all current Alliance training material to remain consistent with the new FDA HACCP recommendations anticipated in the new Fishery Products Guide 2006.

4.6.5 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.

4.6.6 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.

4.6.7 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.

4.7 Continue to serve on a technical committee developing an innovative, interactive Internet system recently titled, "Fish Port" (based on main frame -- ECOPORT). This technology support system is being developed in collaboration with FAO/World Health Organization. (Otwell)

4.8 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)

4.9 Continue in leadership and advisory positions with number of seafood technology organizations. (Otwell)

4.9.1 National Seafood HACCP Alliance, National Coordinator.

4.9.2 Seafood Science and Technology Society (SST) of the America's, Executive Director.

4.9.3 U.S. Representative on the Board of Directors for the International Association of Fish Inspectors (IAFI) – convene in Sydney, Australia, September 2005.

4.9.4 U.S. Advisory Representative to the European 'SeafoodPlus' organization involving every EU nation collaborating in various aspects of seafood safety and quality research – convene in Granville, France October 2005.

4.10 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 2008. 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)

4.11 Participate in the development of a "Mark of Quality" program for the U.S. domestic shrimp industry. Introduce Shrimp Harvester Awards Program to recognize excellence in performance by domestic vessels in Florida. Work aligned with the new *Wild American Shrimp Inc.*(Otwell)

412 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. (Otwell)

4.13 A historical change is occurring n the production and marketing of oyster products due to federal mandates for alternative processing methods and changes on pubic 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)

4.14 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)

4.15 Enhance seafood safety at local levels using education and local training events. Provide ongoing logistical support for six Brevard County commercial seafood producers, including commercial clamming and clam aquaculture, and seafood processing safety and sanitation procedures as implemented through the FDA-mandated program, Hazard Analysis and Critical Control Points (HACCP). (Combs)

4.16 Enhance seafood safety at local levels using education and local training events. Coordinate workshops and seminars at local seafood festivals that provide home seafood consumers with seafood safety information. (Sweat)

4.17 Assist in completing a final publication on the research and validation of a tempering process developed to assist shellfish wholesalers in improving the shelf life of hard clams in refrigerated storage. (Otwell/Wright/Sturmer)

4.18 Continue work as the FL Sea Grant representative on the DACS *Vibrio vulnificus* (Vv) Illness Reduction Workgroup. The workgroup is charged to meet at least annually to evaluate *Vv* illness data for FL and the Gulf of Mexico and make any required adjustments to Florida's *Vv* Illness Reduction Plan. (Mahan)

4.19 Continue work as a member of the Oyster Post Harvest Process (PHP) Advisory Committee to develop goals and set priorities for the oyster PHP research being conducted under several USDA – CSREES grants. (Mahan)

4.20 Continue work as an appointed member on the Interstate Shellfish Sanitation Conference's *Vibrio vulnificus* Education Subcommittee, Biotoxin, Post Harvest Treatment, and Education Committees. (Mahan)

4.21 Attend and participate in Interstate Shellfish Sanitation Conference's Biennial Meeting in Clear Point, AL. Attend and participate in the Conference's *Vibrio vulnificus* Education Subcommittee, Biotoxin, Post Harvest Treatment, and Education Committees. (Mahan)

4.22 Assist Monroe County seafood processors with HACCP and seafood safety issues on an as-needed basis. (Gregory)

Goal 5: Increase the Economic Competitiveness and Environmental Sustainability of Coastal 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. (2006) (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. (2006) (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. (2006) (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. (2006) (Swett/Sidman: E/T-14)

5.5 A boating and anchoring guide will be produced for St. Augustine, Florida 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. (Swett/Fann/Stevely: EX-SAPW-1)

5.6 Florida Sea Grant Extension will continue its third-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)

5.7 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)

5.8 In coastal communities across the nation, there is growing concern that current development patterns are contributing to water quality and environmental degradation. Smart growth training will be provided to agency staff and university faculty. (2006) (Sidman: SGEP-13-EPA)

5.9 Congress passed the Clean Vessel Act in 1992 to help reduce pollution from vessel sewage discharges. The Clean Boating Partnership has developed a voluntary, statewide incentive-based Clean Marina Program. This project will access the awareness of Florida boaters about these programs as a way to better target future efforts. (Swett: EX-FDEP-1)

5.10 A web presence is a valuable tool for providing program information and educational materials to existing and potential program clientele. The web pages devoted to the inventory of Southwest Florida recreational anchorages have been highly used. This project will implement dynamic, database driven web technology to enhance the FSG website on recreational anchorages. (Swett/Fann: PD-05-03)

5.11 The NOAA Coastal Services Center is identifying and evaluating the successful application of data and information from the integrated ocean observing system (IOOS) in addressing natural resource management issues. This project will compile 3-5 case studies for presentation to NOAA. (Simoniello: E/T-15)

5.12 Southwest Florida's coastal communities share a dilemma: how to balance growth in recreational boating and associated coastal development with conservation and management of natural resources. This project will obtain baseline information to map and describe activities, use patterns, and problems/needs of the Sarasota Bay boating community. (Sidman: EX-WCIND-2; EX-WCIND-3)

5.13 Assist marinas in Brevard County with specific programs and through participation in the Clean Marina Program as follows (Combs):

- 5.13.1 Address and provide recommendations regarding stormwater issues at four marinas.
- 5.13.2 Conduct on-site training and guidance to assure Clean Marina or Clean Boatyard designation at three marinas.
- 5.13.3 Increase public awareness of Clean Marina/Clean Boatyard program by 10% by conducting two educational programs on Brevard County Space Coast Government TV (SCGTV).
- 5.13.4 Reduce marine debris through industry adoption of proper disposal methods of waste petroleum products, cleaning solutions, dead batteries and other harmful products and increase use of pump-out stations through Clean Marina/Clean Boatyard educational programming at four marinas/boatyards in Brevard County.
- 5.13.5 Strengthen ties between the Marine Industries Association of Brevard, the Marine Industries Association of Florida, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, the US Coast Guard, and fellow Sea Grant Agents in expanding the influence of the Clean Boating Partnership around the state of Florida.

5.14 The *Lee County Boaters Destination Guide* will be completed and 12,500 copies will be printed in April 2005. Distribution through Lee County Chamber of Commerce and waterfront businesses will begin May 2005. This guide will depict waterfront businesses that cater to boaters and describe boater-friendly destinations for pursuit of waterborne activities. (Wasno)

5.15 In a collaborative program with Florida Department of Environmental Protection, Marine Industries Association of Southwest Florida and Florida Sea Grant, the Clean Marina Program will certify 3 marinas. In addition, a workshop will be coordinated with Pelican Isle Yacht Club to introduce the program to prospective marinas. Goals are to have 25 local marinas and boatyard personnel attend and begin certification reviews for 5. (Wasno)

5.16 Enhance the boating and marine industries in Santa Rosa County. (Verlinde)

5.16.1 Promote the Clean Marina Program.

5.16.2 Redesign the Boater's Guide to Pensacola Bay. This guide will include safe and clean boating tips, recreational fishing information, boat ramp and marina locations, clean marina designations, boating issues, and information on endangered and exotic species.

5.17 An extension-style brochure, a Web-site, and map server will highlight significant accomplishments, such as the regional waterway management system and the general permitting effort, that have resulted from a 5-year cooperative agreement between Florida Sea Grant and the West Coast Inland Navigation District (WCIND). The public will be better equipped to support WCIND objectives if informed about accomplishments resulting from WCIND management actions on priority issues. (Swett/Fann)

5.18 A statewide survey will be conducted to assess boater awareness and impacts of the Clean Vessel Act (CVA) grant program and the Clean Marina Program (CMP). A secondary objective is to assess the ability of a Web-based survey to provide a statistically valid assessment of boater awareness of the CVA and the CMP. The success of these programs depends on marina and boater awareness of environmental laws, rules and regulations, and jurisdictions with which they must comply. (Swett)

5.19 A Recreational Boating Characterization for Greater Charlotte Harbor will be completed to characterize the preferences, activities, and use-patterns of area boater populations. A map-based questionnaire will be mailed to a random sample of boaters stratified by trip origin type (marina wet-slip, dry-storage facility, ramp, private dock). The information will be used for resource management and planning applications, and as the basis for developing map-based products intended to improve boating experiences and instill resource stewardship. (Sidman/Fik/Swett/Fann/Sargent: EX-FWCC-3)

5.20 A Recreational Boating Characterization for Sarasota County will be initiated to characterize the preferences, activities, and use-patterns of area boater populations. This project intends to satisfy important elements of local manatee protection plans that recommend (1) an analysis of boating patterns, (2) an assessment of marine facility uses, needs, and siting, and (3) increased public education for resource stewardship and manatee protection (2006) (Sidman/Fik/Swett/Fann/ Sargent: EX-FWCC-3)

5.21 Florida Sea Grant (FSG), the Florida Fish and Wildlife Research Institute (FWC) Boating and Waterways Section, and the Department of Highway Safety and Motor Vehicles will work to implement recommendations (Florida Sea Grant TP-138) to enhance the utility of the Florida Vessel Title Registration System (VTRS) as a planning and management tool. FWC and FSG also will implement a Web-based data server to provide access to and queries of vessel registration information derived from the VTRS. Florida Sea Grant, FWC, and many other entities use VTRS information on a regular basis for research and outreach purposes. (Swett/Sidman)

5.22 The State of Florida, with the guidance of Florida Sea Grant (FSG), is developing a new administrative rule for dredging public waterways in Lee County under the authorization of a general permit. The rule will apply to trafficsheds with high priority maintenance dredging needs as identified by applications of the FSG Regional Waterway Management System. Impacts include state policy based on "best available science", better efficiency and effectiveness in dredging and waterway maintenance, savings in dollars and staff time, and better public policy through a holistic, environmentally-based decision-making process. (Swett/Fann)

5.23 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. (Swett/Fann)

5.24 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. (Swett/Ankersen/Hamann/Sidman/Sargent-FWC)

5.25 Assist marine industries in Charlotte County. (Staugler)

- 5.25.1 Conduct on-site training and guidance to assure Clean Marina or Clean Boatyard designation at 4 pledged marinas.
- 5.25.2 Increase public awareness of Clean Marina/Clean Boatyard program through a redesigned Boating and Angling Guide to Charlotte Harbor.

5.26 In the last 10 years, regulatory changes have retired many traditional marine industry careers. Publications, technical assistance and special extension programming activities will be created for Taylor County 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)

5.27 Continue work with the Franklin County Board of County Commissioners and county staff to identify potential boat ramp/water access points for both commercial and recreational fishing interests. (Mahan)

5.28 Assist the local fishing industry, county planners, and interested public with workshops, meetings and research to provide waterfront management with the aim of maintaining a sustainable level of waterfront access for the commercial fishing industry. (Gregory)

5.29 Serve as the principal Sea Grant liaison for the Florida Clean Boating Partnership. (D.Jackson)

- 5.29.1 Continue to work with clean marina, clean boatyard, clean marine retailers, and clean boater programs with Sea Grant Extension faculty, the Florida DEP and industry.
- 5.29.2 Prepare and edit updates for the "Sources for Best Management Practices in Marine Facilities".
- 5.29.3 Conduct workshops for marina and boatyard operators and for marine retailers throughout the state as appropriate.

5.30 Participate at the Coastal Zone '05 Conference in New Orleans as part of a group presentation. The other participants will be Texas Sea Grant, California Sea Grant, and the Clean Water Trust of Boat/U.S. The topic will concern successes and failures in starting and organizing clean marina programs from each or our perspectives, using different funding, organization, and criteria in each program. (D.Jackson)

5.31 Continue working with Clean Boating Partnership to designate new clean marinas and clean boatyards in 2005. Help re-establish previously recognized facilities as they recover from Hurricane Ivan. Present Clean Boater educational materials to boaters at the Pensacola Boat show and other environmental events. (Diller)

5.32 Enhance the environmental sustainability of marine businesses in Miami-Dade County. (Crane)

5.32.1 Work with the Clean Marina's DEP staff to establish clean marina and boatyard designations through conducting workshops, site visits, and dissemination of informational materials. At least 2 marinas and/or boatyards will become designated or enlist in the Florida Clean Marina Program.

5.32.2 Continue working with marina managers on proper pollution prevention of fish waste, fuel spills, and other hazardous waste through the dissemination of fuel spill kit bags for boaters, fish waste signs "Don't be Kind to Pelicans" and other debris related information. Adopted pollution prevention practices will be measured by follow-up survey from the dissemination of materials to marina managers and boaters/anglers.

5.33 Recruit marinas to participate in the Clean Marina Program in Bay County. Conduct workshop to inform the dock masters and marina staff on the importance of a clean marina for pollution control and best management practices. Present facilities with literature and training regarding the Clean Marina Program. (Cameron)

5.34 Enhance the environmental sustainability of marine industries in Broward County through education about the Clean Boating Partnership and related environmental and economical best management practices through workshops, site inspections and facility designations. (Behringer)

5.35 Continue to serve on the Public Education and Image Committee of the Marine Industries Association of South Florida Marine Master Plan Steering Committee. (Behringer)

5.36 Enhance the marine industries in Northeast Florida. (McGuire)

- Work with staff from the DEP's NE District to certify five new clean marinas or boatyards in NE Florida.
- Work with staff at the Fish and Wildlife Research Institute to finalize print and distribute boater and angler recreational guide for Duval County.
- Work with Flagler County planners and staff at the Fish and Wildlife Research Institute to develop a similar guide for Flagler County.
- Help St. Augustine Ports and Waterway Authority distribute a waterways guide for St. Augustine.

Coastal Ecosystem Health and Public Safety

Goal 6: Protect and Enhance Coastal Water Quality and Safety

6.1 Current on-site sample collection and laboratory-based analysis is costly and time consuming in regards to approving coastal waters for shellfish growing for human consumption. Red tide is often a problem which requires constant sampling. This project will test the accuracy and effectiveness of satisfying red tide monitoring methods using remote sensing equipment rather than labor-intensive on-site sampling. (Wilhelm/Kirkpatrick: R/LR-Q-25)

6.2 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) (Jacoby/Spranger: E/T-9)

6.3 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. (2006) (Price/Swart: R/C-E-51)

6.4 Restoration and long-term sustained water quality of the South Florida Ecosystem is a priority among federal, state and local agencies, with billions of dollars being expended on a variety of projects over the next 25 years. The ultimate success of these projects will depend on the awareness, knowledge and decisions of citizens, business owners, and community leaders that are based on sound science. This project will serve as the educational link between science-based information developed by NOAA agencies and Sea Grant supported research and the citizens of South Florida. (2006) (Spranger/Jacoby: SFWMD-CERP-1)

6.5 Improve the quality of coastal and marine waterways in Brevard County. (Combs)

- 6.5.1 Write a bi-monthly educational article for the UF/IFAS Brevard County Extension newsletter, “Agriculture and More”.
- 6.5.2 Present an educational program on Space Coast Government TV (SCGTV) concerning stormwater issues in Brevard County and how they are being addressed.
- 6.5.3 Educate 10 members of the Brevard County Commission Marine Advisory Council on IFAS and Sea Grant resources available to assist this Council in achieving its goals, including derelict vessel removal from the Indian River Lagoon.
- 6.5.4 Conduct two waterway cleanup exercises, designed to educate 50 participants in the environmental damages caused by litter in the marine environment.
- 6.5.5 Develop two fact-sheets concerning stormwater runoff and its environmental impact in the Indian River Lagoon.
- 6.5.6 Provide educational assistance and support for “Olympic Team” of approximately 10 teenage boys incarcerated at Space Coast Marine Institute, Melbourne, in development of their 2005 Science Fair project concerning stormwater runoff, filtration, and purification,

and to solicit voluntary input and support from local private stormwater product manufacturer.

6.5.7 Continue, as during 2004, to provide ongoing local operational support as needed within Brevard Co. Waterways Management programs expected to be developed and implemented during 2005 through Florida Sea Grant by Dr. Bob Swett and Dr. Charles Sidman, and facilitate linkages between related local Waterways projects, such as the Derelict Vessel Removal program of the Brevard County Commission Marine Advisory Council (BCCMAC), and the Spoil Island restoration project of the Citizens for Florida's Waterways (CFW) boating group, by attending meetings of these groups, providing them Extension information, and developing new educational materials as needed in support of these efforts. (Combs)

6.6 Work to enhance water quality within the Pensacola Bay Watershed. (Verlinde)

6.6.1 Coordinate sampling, training and collection of samples for the UF/IFAS Lakewatch program in Santa Rosa County.

6.6.2 Coordinate and lead Pensacola Watershed Tour. This will be a tour of the watershed from Alabama to the coastal area of Florida for community leaders. The goal is to educate participants on watershed impacts on local water quality and continue collaborative efforts of watershed management for officials in both states of the watershed. This event was canceled due to Hurricane Ivan in 2004.

6.6.3 With UF researchers and watershed supporters, coordinate and provide projects for the Pensacola Bay Watershed Initiative Grant proposal to the US Environmental Protection Agency.

6.6.4 Promote stormwater best management practices to community and industry leaders. Promote use of wetland plants in stormwater treatment designs, pervious surfaces, rain gardens. Develop a demonstration site within the county.

6.6.5 Support, participate in activities of the Bay Area Resource Council, a local watershed management organization.

6.7 Protect and enhance water quality in coastal Charlotte County. (Staugler)

6.7.1 Participate as a member of the Water Quality Quantifiable Objectives Sub-committee, of the Charlotte Harbor National Estuary Program.

6.7.2 Participate in the development of a community based watershed management plan for Lemon Bay.

6.7.3 Work with boating user groups, master gardeners and civic groups to promote BMPs for improved coastal water quality.

6.8 Improve coastal water quality in Okaloosa and Walton Counties. (S.Jackson)

6.8.1 Work with boating user groups to promote BMPs that benefit coastal water quality.

6.8.2 Work with volunteers and local community leaders to develop water quality monitoring program.

6.8.3 Continue regional fish extension activities that focus on topics of derelict fishing traps, mercury in fish, shrimp management, marine protected areas, essential fish habitat and fish management.

6.9 Improve coastal water quality and monitoring program throughout Florida. (Jacoby)

6.9.1 Work with partners throughout Florida and beyond to develop and improve volunteer monitoring programs. (Jacoby)

6.9.2 Work with partners to develop and implement training and curricula dealing with a watershed approach to water quality. (Jacoby)

6.10 Assist the Florida Yards and Neighborhood program and Florida Lakewatch program in Escambia County by working with volunteers and local community leaders to understand and develop water quality monitoring programs and reduce stormwater. (Diller)

6.11 As a member of the US Fish and Wildlife Service's manatee entanglement and manatee education working groups, continue to work on issues relating to derelict crab/fishing traps. (McGuire)

6.12 Work with staff from the Guana Tolomato Matanzas National Estuarine Research Reserve to investigate the feasibility of starting a NEMO program in Florida. (McGuire)

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

7.1 Large populations along Florida's coast have created conflicts between human uses of the waterways and natural resources such as oysters. This project will determine the impact of boat wakes on intertidal oyster reefs and will provide coastal managers with data on which science-based management decisions can be based. (Walters/Coen/Grizzle: R/C-E-45)

7.4 Since 1984, aquarium releases of *Caulerpa taxifolia* - Mediterranean strain have led to this "killer algae" becoming established in coastal waters in Europe, California and Australia. In all cases, the ecological and economic costs have been substantial. The goal of this project is to significantly reduce the likelihood that *Caulerpa taxifolia* will become established in Central Florida. (Walters/Olsen: R/C-E-49)

7.3 Many reef fishes are thought to make diel, seasonal, or ontogenetic migrations among multi-habitats. But most evidence of such movements is indirectly inferred from density and size-structure differences among the habitats. This project will provide quantitative results (time and spatial range) which will have direct utility for resource managers charged with designing and implementing management plans for tropical and subtropical coastal habitats and fisheries. (Luo/Su/Serafy/Lorenz: R/C-E-48)

7.4 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. (2006) (Ault/Smith/Bohnsack/Rubec/Miller: R/C-E-50)

7.5 Restoration and long-term sustained water quality of the South Florida Ecosystem is a priority among federal, state and local agencies, with billions of dollars being expended on a variety of projects over the next 25 years. The ultimate success of these projects will depend on the awareness, knowledge and decisions of citizens, business owners and community leaders that are based on sound science. This project will serve as the educational link between science-based information developed by NOAA agencies and Sea Grant supported research and the citizens of South Florida. (2007) (Spranger: E/T-9)

7.6 The need for current information on the types and impacts of aquatic nuisance species in informal education settings is critical to the public. As part of a four-state southeast regional effort, Florida will conduct several training programs for extension faculty and informal educators. These individuals will then develop aquatic nuisance species programs and materials in their respective locales. (Spranger: E/T-13)

7.7 In a number of geographic locations worldwide, species of the genus Caulerpa have become major invaders shallow water habitats and have displaced native populations of seagrass. This appears to be occurring in certain Tampa Bay areas. This project is designed to document this shift from seagrass to an alga. (Bell/Robbins: PD-04-11)

7.8 Provide public education opportunities concerning invasive exotic marine species in Brevard County waters as follows. (Combs)

7.8.1 Conduct six one-hour public seminars, targeting fishermen, in different locations in Brevard County, addressing the environmental and economic impacts of invasive exotic marine species upon recreational and commercial fisheries.

7.8.2 Develop six one-page fact sheets addressing the environmental and economic impacts of invasive exotic marine species upon recreational and commercial fisheries.

7.8.3 Present two educational programs on Space Coast Government TV (SCGTV) concerning marine invasive exotic species and their environmental and economic impacts, in order to heighten public awareness of the importance of these unwanted neighbors.

7.8.4 Set up four or more manned educational exhibits at popular public events such as the annual Grant Seafood Festival, the annual Brevard County Fair, the Brevard Marine Industries Association Boat Show, annual Deep Sea Fishing Tournaments, and other related events to increase general public awareness of probable negative impacts on marine ecosystems caused by invasive exotic species.

7.8.5 Write or be interviewed by a reporter for a newspaper article about the environmental and economic impact of marine invasive exotic species.

7.8.6 Develop three educational brochures, designed to enhance recreational boaters' understanding of endangered marine species, the importance of protecting them, and methods to do so, especially manatees, green seaturtles, and loggerhead seaturtles, all of which are found in the IRL during a part of their life-cycle.

7.8.7 Continue serving on the multi-agency Project Development Team (PDT) of the Indian River Lagoon-North (IRL-N), and the PDT Ecological Sub-Team, in addressing IRL issues that might impact the Comprehensive Everglades Restoration Program (CERP).

7.8.8 Conduct eight classes for 60 commercial clammers concerning Indian River Lagoon water quality as potentially impacted by marine invasive exotic species.

7.8.9 Conduct local workshops for K-12 teachers and interested citizens on marine invasive exotic species and their impacts on marine ecosystems.

7.9 Support implementation of COSEE Coral Reef Workshop for secondary school science teachers in July in Brevard Co., and participate as speaker concerning Oculina Bank (reef) Habitat Area of Particular Concern and Texas Flower Gardens National Marine Sanctuary. (Combs)

7.10 Conduct a collaborative project with Florida Gulf Coast University, South Florida Water Management District, Florida Department of Environmental Protection and Florida Sea Grant Program to continue to enhance oyster reefs at the mouths of 12 rivers and creeks in Lee and Collier Counties. Volunteers have created oyster bags from mined fossil oyster shells and will continue to enhance 2004 reef placement in areas of historically documented reef areas. (Wasno)

7.11 Make three presentations at the World Aquaculture Conference in Bali, Indonesia (Wasno)

7.11.1 "Stressor response model for the American oyster *Crassostrea virginica*: implications for restoration and enhancement of oysters in SW Florida estuaries."

7.11.2 "Seasonal and anthropogenic influences on the ecological and physiological responses of oysters: the role of adaptive resource management in SW Florida estuaries.

7.11.3 "REDStart: Community-based approach to fisheries enhancement." (with Stevely/Creswell)

7.12 The REDstart Community-Based Fisheries Enhancement Program is a collaborative project with Florida Fish and Wildlife Conservation Commission, South Florida Water Management District, Sanibel-Captiva Conservation Foundation Marine Laboratory, Mote Marine Laboratory, City of Sanibel, US Fish and Wildlife Service and Florida Sea Grant. This project will enter the research phase with the first release of fish into local waters. Fish will be tagged and research will be conducted by the SCCF laboratory. (Wasno/ Stevely/ Creswell)

7.13 Invited Team Member for the 8th Annual International Shellfish Restoration Conference to be held in Brest, France. Team meeting will be held to discuss final logistics, send acceptance letters to the

presenters, and finalize field trips. I will be presenting during the conference on clam aquaculture and organizing volunteers for stock enhancement in fish and shellfish projects. (Wasno)

7.14 Provide general educational training and assistance to improve coastal habitats in the Pensacola Bay Watershed. (Verlinde)

- 7.14.1 Provide aquatic nuisance species information to 4-H leaders, teachers, and the public at various talks and programs.
- 7.14.2 Assist with coordination of an oyster reef restoration project in East Bay. Teacher workshops and oyster reef importance/ecology curriculum will be developed to support this project.
- 7.14.3 Work with UF/IFAS West Florida Research and Education Center researchers to continue dune restoration research. Coordinate volunteers for dune restoration planting; provide information to the public on dune restoration techniques and using composite plantings.
- 7.14.4 Continue to support Project Greenshores, a FDEP habitat restoration initiative.
- 7.14.5 Develop “sea turtle friendly” guidelines for contractors working on the beachfront on Navarre Beach. These guidelines are to coordinate beach restoration and rebuilding contractors with sea turtle patrols and sea turtle nesting information.

7.15 Inform citizen groups about invasives which are coming into the Florida coastal ecosystems. (Sweat)

7.16 Continue providing support of a shelling restoration program for the commercial oyster fishery in Levy County. This year will assist the oystermen’s association in implementing a federal grant in which funds are to be used in collecting clam shells at local shellfish processing plants and storing at a county site. Clam shell is a byproduct of clam processing and makes an excellent cultch material for oysters. (Sturmer)

7.17 Enhance Sarasota Bay water quality. (Stevely)

- 7.17.1 Present results of efforts to restore Sarasota Bay oyster reef habitats at International Shellfish Conference.
- 7.17.2 Assist Sarasota Bay Estuary Program in development of long-range technical work plan to support restoration of Sarasota Bay habitats and water quality.
- 7.17.3 Maintain functional Sarasota Bay Estuary Program Technical Advisory Committee in role as Chairman.
- 7.17.4 Train 40 Extension Master Gardeners in Manatee and Sarasota Co. in coastal plant ecology and identification.
- 7.17.5 Assist Sea Grant waterway management program in providing technical assistance to Manatee Co., City of Bradenton Beach and possibly City of Palmetto in managing anchorages and boat ramps.

7.18 Provide general educational training and assistance to improve coastal habitats around Charlotte Harbor. (Staugler)

- 7.18.1 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.
- 7.18.2 Continue to chair the Charlotte Harbor NEP Hydrologic Alterations Subcommittee.
- 7.18.3 Provide educational programs to boating and fishing groups, master gardeners, civic groups and citizens on coastal habitats and invasive species.

7.19 Improve the quality and quantity of coastal and marine habitat in Okaloosa and Walton counties. (S.Jackson)

- 7.19.1 Conduct local workshops for K-12 teachers and interest citizens about the recognition and management of invasive species in the coastal ecosystems.
- 7.19.2 Develop coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems.

7.20 Taylor County is still an active area for illegal shrimp and fish harvest activities. These illegal activities contribute to the loss of significant numbers of juvenile species of both commercial and recreational relevance and to the destruction of a significant amount of native sea grass beds off the coast. Working with regional Florida Fish and Wildlife Conservation Commission, a public awareness campaign will be created to increase awareness of the direct commercial and recreational economic value of these marine species, the indirect economic value of sea grass beds, and the economic and ecological impacts of these illicit 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)

7.21 Continue work as a member of the Nature Conservancy's Apalachicola River Basin Invasive Exotics Workgroup. (Mahan)

7.22 The need for enhanced ocean education is clearly recognized by scientists in the oceanographic community, including both classroom and informal educators. One specific need is public education on aquatic nuisance species. As part of a four-state southeast regional effort, Florida will conduct a number of training workshops for formal and informal educators, finalize and distribute lesson plans, and co-author and distribute a boaters alert card. (Spranger/Jacoby: E/T-13)

7.23 Serve on regional and national committees that are associated with Coastal Ocean Observing Systems. (D.Jackson/Spranger/Simoniello)

7.24 Improve the quality and quantity of coastal and marine habitat in Escambia County. (Diller)

- 7.24.1 Conduct local workshops for K-12 teachers and interest citizens on marine invasives.
- 7.24.2 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.
- 7.24.3 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.

7.25 Increase awareness of sea grass beds in St. Andrew Bay and how they are an important part of the ecosystem. This will be done by conducting educational programs on the importance of sea grass beds for marine resources. (Cameron)

7.26 Improve the quality of the Broward County coral reef ecosystem. (Behringer)

- 7.26.1 Continue to serve as the Local Navigator for the Appreciation and Awareness Focus Team of the Southeast Florida Coral Reef Initiative (SEFCRI).
- 7.26.2 Develop a marketing identity for the Southeast Florida Coral Reef Initiative.
- 7.26.3 Conduct a needs assessment of citizen and visitor knowledge, values and practices related to coral reefs, as well as an assessment of existing coral reef education materials and program to develop a more effective coral reef education program.

7.26.4 Develop a media kit and hotel tent card to educate media, visitors and resource user groups (boaters, divers, fishers, etc.) about coral reefs, impacts to them and how to conserve them.

7.26.5 Develop a website about southeast Florida coral reefs and the Southeast Florida Coral Reef Initiative.

7.26.6 Coordinate and conduct workshops to educate dive operators and businesses about sustainable diving and snorkeling practices.

7.26.7 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.

7.26.8 Serve as the Outreach Committee Co-Chair for the 11th International Coral Reef Symposium.

7.27 Begin EPA-funded study on the economic consequences of red tide effects on SW Florida communities. The study will assist community planners in the SW-region of Florida to better understand the potential economic impact of red tide events to local businesses. (Adams)

7.28 Give presentation at the 2005 Florida International University Beaches Conference. The attendees (150) will become more aware of the effects of red tide events on local communities. They will also better understand the educational needs and opportunities that exist regarding the coastal population. (Adams)

7.29 Give presentation on the economic effects of red tide events at the Coastal Zone 05 Conference in New Orleans, LA. Attendees will gain a better understanding of the types of impacts red tide events can impose on coastal communities. (Adams)

7.30 Provide general educational training and assistance to improve coastal habitats in Northeast Florida. (McGuire)

7.30.1 Invasive species is a topic in the “Exploring our Environment” program which will be offered at Marineland three times in 2005 to classes of 20 adults each time.

7.30.2 Give presentation at National Marine Educators’ Association annual conference about “Stop the Invasives” interactive education program for fifth graders.

Goal 8: Prepare and Respond to Coastal Storms

8.1 Commercial sea oats micropropagation for dune restoration is limited by absence of a protocol for efficient production of multiple genotypes. Removing this limitation is critical for this technology to be used for commercial application of the technology for dune stabilization and restoration. The goal for this project is to develop an efficient protocol. (Kane/Wilson: R/C-S-41)

8.2 Florida has been a leader in beach management. This book will build on decades of Sea Grant projects and other agency research, authorized by one of the world's foremost coastal engineers. It will provide a "Legacy of Florida's Beaches." (Dean: PD-01-10)

8.3 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. (2006) (Deyle/Chapin/Baker: R/C-P-26)

8.4 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. (2006) (Gurley/Pinelli/Subramanian: R/C-S-45)

8.5 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. (2006) (Thieke/Kennedy/Hanes: R/C-S-44)

8.6 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)

8.7 Attend 6th South East Asia Sea Partnership International Sea Grant and Coastal Hazards Conference, Jakarta, Indonesia, May 1-4 2005; make presentation on role of Sea Grant field Agent within US Sea Grant Program; Chair Workshop on Emergency Management/Coastal Hazards. Conduct four public educational seminars based on attending and participating in South East Asian Sea Grant Conference. (Combs)

8.8 Provide beach safety, boating safety and hurricane preparedness information at various events and programs. Promote, coordinate and present at Coastal Recovery workshop and "Ivan, what have we learned?" workshop. (Verlinde)

8.9 Participate in Charlotte County's hurricane recovery efforts ongoing from 2004 and preparation for future coastal storms and hazards. (Staugler)

8.9.1 Participate on the County's Task Force on Waterway Cleanup and Restoration.

8.9.2 Provide educational information to area bait shops, marinas, and boating supply stores as they reopen for business.

8.10 Recruit marinas and boatyards to participate in the Clean Marina and Boatyard Program in Taylor County. Conduct outreach to inform marina staff of proper pollution prevention, disaster avoidance and best management practices. Present prospective facilities with literature and hands-on training regarding CMP components as outlined in the handbook. Coordinate inspection for qualification and compliance with CMP criteria. Designate facilities as "Clean Marinas/Boatyards" through web-based documentation, newspaper articles and a flag ceremony. (Sapp)

8.11 Research and write at least three columns for the Apalachicola & Carrabelle Times Newspapers educating area homeowners on steps they can take to prepare for coastal storms or be safe from coastal hazards. (Mahan)

8.12 The NOAA Coastal Storms Program (formerly Initiative) will have its final public forum in early 2005. The education/outreach component of this project will be completed at the end of this forum, and the project will be ended. Two more pilot programs are started, one at the mouth of the Columbia River, involving Oregon and Washington Sea Grant programs, and the other will concentrate on the Southern California Bight. Experience with the outreach and education efforts in the St. Johns River Watershed pilot will be shared with the respective Sea Grant programs. (D.Jackson)

8.13 Assist Escambia County residents and businesses recover from Hurricane Ivan and prepare for future storms. Work with Sea Grant and other groups to develop Hurricane Response teams and educational information. (Diller)

8.14 The Miami-Dade County Agent will work with local marine agencies to secure funding in efforts to produce a DVD on Hurricane Preparedness and Safety for Florida boaters and marina managers. Agent will work with boater user groups to determine planning needs and proper emergency responses in the event of a hurricane. Agent will also work with state and local agencies to secure funding for DVD hurricane preparedness guide. (Crane)

8.15 Initiate a coastal hazards awareness program in Bay County. (Cameron)

8.15.1 Help organize and present a hurricane preparedness program in Bay County. The program will educate boat owners on how to prepare their vessels for hurricanes.

8.15.2 Conduct educational program on rip currents to inform citizens and tourist on the dangers of rip currents and what to look for, what to do if you get caught in one, and how to determine when it is safe to enter the water.

8.15.3 Participate in NOAA Coastal Services "Storm Surge User Needs Assessment" workshop to determine needs of the community for storm surge warnings and preparations.

8.15.4 Provide newspaper article on "Hurricane Preparation for Boat Owners" at the beginning of hurricane season to educate boat owners on how to prepare for a hurricane.

8.16 Facilitating Principal Investigator/User interaction in three thematic areas has been identified as high priority by SEACOOS. Fisheries, Search and Rescue, and Sediment and Waves have been targeted as the major themes. The regional extension and education coordinator will continue serving on each of the three committees and facilitate meetings with appropriate groups. For example, for the Fisheries Theme Team, will continue organizing and facilitating meetings among West Florida Shelf scientists from USF, UM, NOAA Fisheries, FWC, and members of commercial and recreational fisheries. (Simoniello)

8.17 SEACOOS public awareness will be achieved by enhancing model buoys previously constructed with appropriate signage and supporting information. Jennett's Pier, North Carolina, the Georgia Marine Extension Service Aquarium in Savannah, the South Carolina Sea Grant Consortium, and Florida Sea Grant each has a model. Information will be created to reflect each state's ocean observing activities and to show relevance and increase awareness to citizens. (Simoniello)

8.18 SEACOOS brochures will be developed in conjunction with Florida Sea Grant publications personnel. Two or three versions of the brochure will be designed, depending on funding, so that different audiences can be targeted. One will be written for the general public (for display at aquaria, museums, etc) and another will be designed to target those engaged in boating and fishing (for distribution at marinas, boat shows, bait and tackle shops, etc). If time and funds permit, a third brochure targeting those engaged in resource management will be designed. (Simoniello)

8.19 A workshop will be planned and conducted for approximately ten extension and education professionals engaged in ocean observing activities. The objective is to work with Chris Calloway (University of North Carolina) to learn how to add content to the SEACOOS web site. As part of the workshop, each participant will be expected to upload at least one education activity/lesson plan to the Community and Classroom section of the www.seacoos.org website. Without dedicated web support, giving SEACOOS extension and education work group members the ability to add content is the only way to keep the website updated and dynamic. (Simoniello)

8.20 SEACOOS in-reach (activities that build relationships among SEACOOS work groups) efforts related to the Florida COOS Caucus will help shape Florida's role in the R-COOS (regional COOS which is not necessarily SEACOOS). Governance issues and composition of the Board of Directors-activities that will help transition SEACOOS into SECOORA are areas where efforts will be focused. Will also serve on an extension and education committee for the Gulf of Mexico COOS with the objective of exploring ways to enhance interaction between the two regions. (Simoniello)

8.21 A region-wide (NC, SC, GA and FL) inventory of ocean observing assets is underway. GIS specialists Bob Swett and David Fann are collaborating to build on the SEACOOS equipment inventory. A team of SEACOOS extension professionals from the four states will be coordinated in order to increase the 12% response rate of the initial 3 week survey. Results from the project will be used to help determine where/how regional ocean observing system assets will be allocated. (Simoniello/Swett/Fann)

8.22 In conjunction with Ocean.US, and SECOORA, a regional meeting is planned to engage business/private sector people in ocean observing system planning and development. The objective is to increase awareness of the Integrated Ocean Observing System, and obtain feedback for the SECOORA Business Plan from this sector before the plan is finalized and considered for acceptance by the national office. The objective is to conduct the meeting before 2006. (Simoniello)

Education and Human Resources

Goal 9: Produce a Highly Trained Workforce

9.1 Enhance graduate education in disciplines related to the coast and ocean by active participation in public and privately funded graduate programs. (Cato)

- 9.1.1 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.
- 9.1.2 At least one national Sea Grant Industrial Fellow candidate (of 2-4 per year nationally) will be successful every three years.
- 9.1.3 At least 30 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students.
- 9.1.4 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.
- 9.1.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship.
- 9.1.6 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held.

9.2 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)

9.3 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)

9.4 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)

9.5 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-05-1)

9.6 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-05-2)

9.7 Organize and conduct the Program Assessment Team evaluation of the Florida Sea Grant program. The last evaluation was in 2000. (Cato)

9.8 Extension faculty will attend at least four days of inservice training workshops or conferences that will support their educational programs. (All Agents)

9.9 Coordinate annual in-service meeting for Extension faculty that provides status of on-going research and extension activities, and organizes program planning efforts. (Spranger)

9.10 Continue coursework toward Master's Degree in Environmental Studies at University of West Florida. (Verlinde)

9.11 Continue coursework toward Master's Degree in Environmental Studies at Florida Gulf Coast University. (Wasno)

9.12 Participate as a Fellow in the Natural Resources Leadership Institute to develop the skills necessary for effective natural resources leadership communication and conflict resolution. Over the course of 2004, seven 3-day seminar and activity sessions will be attended, a course practicum completed and graduation attended. (Sturmer/Sidman/S.Jackson)

9.13 The trend for ocean science education is clearly recognized by the science and education communities. This regional activity among the Gulf of Mexico states will "bridge the gap" between science and education through summer teacher institutes, online programs, informal educator workshops and lesson plans. (Spranger: COSEE-GOM-1)

9.14 The goal of this workshop is to introduce pre-K through 12th grade educators to current topics in coral reef research, as well as some of the exciting and novel techniques being employed to restore these ecologically and economically critical habitats. Post-workshop, teachers will be required to develop age-specific lesson plans that meet and exceed the state of Florida and national standards for science education. To maximize dissemination of lesson plans, all plans will be made available on the world-wide web. Additionally, all educators will be required to present their ideas at either a national/regional educators meeting (FAST, FMSEA, NMEA, etc.) or at an in-service teacher's workshop. (Walters: PD-04-6)

9.15 Conduct professional development training programs. (Verlinde)

- 9.15.1 With Environmental Education Focus team leader, coordinate UF/IFAS 2005 Environmental Education Training In-service for extension agents.
- 9.15.2 Provide teacher workshops such as WOW! Wonder of Wetlands, Oyster Reef habitats, field sampling techniques, assist w/ marine collectors permit workshop.
- 9.15.3 Provide professional development opportunities information to teachers, 4-H leaders and various industry and agency professionals.

9.16 Work with ANERR staff to organize and teach a workshop for natural resource leaders/educators/administrators on "Working with the Press to get your Story Out." (Mahan)

9.17 The National Sea Grant Extension Academy has been approved and the first sessions will be held during 2005. Will assist with planning for all three sessions, delivery of instruction, and coordination of the actual program which will require cooperation of a small cadre of Sea Grant personnel, the national office, and several state offices. The Academy will consist of two one-week sessions separated by 6 months of study and integrated distance learning activity. The planning number for trainees is 25 – 30 for this first Academy. (Spranger/D.Jackson)

9.18 Hurricane Response Teams will be organized, trained, and dispatched as appropriate if the need arises. These will be volunteer agents and specialists who will work in small teams toward helping various marine industries back into operation following any major storm events, with special concern following hurricanes. An important mission will be to learn as much as possible about boats that are affected by the storm for preparation of future education programs on prevention of

damage and disruption. The plan will be for these teams to be self-sufficient and self-contained so as to have no impact on local services, supplies, or equipment. (D.Jackson)

Goal 10: Create a Scientifically and Environmentally Informed Citizenry

10.1 A number of educational activities are implemented under the previous goals. The following ones cross many goals and are implemented in general.

10.1.1 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)

10.1.2 At least ten print or broadcast news releases will be produced. (Kearl/Zimmerman)

10.1.3 The Florida Sea Grant Internet home page and website will be upgraded and maintained. (Zimmerman/Whitehouse/Damron/Wagner)

10.2 Conduct public education programs concerning endangered species in Brevard County. (Combs)

10.2.1 Offer public education through two workshops in Brevard County with newly developed "custom" written materials concerning proper methods of protecting and conserving endangered species, especially manatees and seaturtles.

10.2.2 Work with the Clean Boating Partnership in distribution of approximately 30 Monofilament Collection bins to be distributed to Clean Marinas around the state of Florida – funding provided by the Clean Boating Partnership; bin-construction (total 100 bins constructed) during 2004 by 80 Rockledge High School Environmental Science Students. Such Monofilament Collection Bins provide on-site public educational opportunities concerning importance of preventing introduction of environmentally unfriendly products, such as monofilament, into marine and aquatic environments where they might be ingested by endangered species or any other species, causing probable health hazards to these species.

10.3 Assist federal, state and local agencies in development of sea turtle awareness programs. (Combs)

10.3.1 Conduct eight 1-2 hour sessions of programming for Brevard County 4-H youth and adults interested in participating in the annual State 4-H Marine Ecology Event; subject areas studied will include marine ecosystems, marine plants, marine invertebrates, and marine vertebrates.

10.3.2 Enter a Junior Team and a Senior Team from Brevard County in the annual State 4-H Marine Ecology Contest.

10.3.3 Develop three educational brochures, designed to enhance recreational boaters' understanding of endangered marine species, the importance of protecting them, and methods to do so, especially manatees, green seaturtles, and loggerhead seaturtles, all of which are found in the IRL during a part of their life-cycle.

10.4 Teach youth and adults about environmental issues in Lee County.

10.4.1 Experienced certified SCUBA divers will be organized to dive Boca Grande Pass March 17 and 18, 2005 to recover debris from the Pass. Divers attend a workshop provided by Mote Marine Laboratory and Florida Sea Grant on a marine invasive species-Green Mussel. This particular species has been introduced to our coastal area in the Tampa area and has been spreading throughout Florida waters. This is an aggressive species that will encroach on native species and disrupt ecosystems. Divers are educated as to identifying, surveying and reporting all sightings. This is important in order to understand its behavior, range and adaptive nature; thus, putting a plan together to stifle further growth.

Divers are provided a refresher lecture on proper dive techniques and safety protocols. (Wasno/Stevely/Jacoby/Staugler)

10.4.2 Conduct general marine environmental education programs for youth and adults in Lee County. (Wasno)

10.5 The Gulf Coast Regional Envirothon Board of Directors will be focusing on recruiting additional high school participation in the five county area of Southwest Florida. A colorful brochure has been printed for distribution to all science teachers/coordinators in the area. The brochure highlights past events and will serve as an introduction for future high school visits by Envirothon recruiters. Envirothon 2005 will be held in early December. (Wasno/ Staugler)

10.6 REDstart volunteers will participate in a 2-day workshop on concepts of aquaculture and proper fish handling techniques. As this project moves towards the research phases, total number of fish reared will be increased and thus elevate risks of fish die-offs due to stress and disease. This workshop will be conducted in early Fall 2005. Participating agencies that will offer presentations will include Mote Marine Laboratory, Ruskin Aquaculture Facility, Florida Fish and Wildlife Service, Florida Sea Grant, Sanibel Captive Conservation Foundation Marine Laboratory and US Fish and Wildlife Service. (Wasno/ Stevely/Creswell)

10.7 *Fisherman's Educational Kiosk* – Through a Charlotte Harbor National Estuary Program grant, an educational kiosk focusing on issues pertinent to fishing tournament participants will be developed. This kiosk will highlight 18 issues of importance to include fish handling, venting tools, sea grass protection as well as some research projects that Sea Grant is involved with locally. A few of the research projects would be the REDstart Project, Oyster Reef Enhancement and Red Tide. This kiosk will be displayed at 12 Lee County fishing tournaments with a potential audience of 3,500 participants. It will also be made available for agents in Charlotte, Sarasota and Hillsboro Counties. (Wasno/Staugler/ Stevely/Sweat)

10.8 A grant through the West Coast Inland Navigation District will provide funding for boat fuel for an elite high school dive research team. Under the guidance of Lee Counties Marine Agent, this group of 10 high school students will meet on a bi-monthly basis to conduct artificial reef research on Lee County Reef Systems. (Wasno)

10.9 Conduct a general marine educational program for youth and adults in Santa Rosa County. (Verlinde)

10.9.1 With UF/IFAS researchers, North Carolina State University and US Fish and Wildlife Service, coordinate and present at stream restoration workshop.

10.9.3 Provide coastal information news articles to various media outlets.

10.9.4 Continue to support, coordinate and develop curriculum and videos for the Resource Ranger Program, an environmental education program for 4-H members and students. The program includes curriculum, videos and field trips about coastal issues.

10.9.5 Coordinate the 5th annual Seagrass Awareness Celebration. As part of the Santa Rosa County Beaches to Woodlands Tour, coordinate the "Coastal Encounters" event.

10.9.6 Teach Florida Master Naturalist Program wetlands and coastal modules.

10.9.7 Coordinate 21th annual NW Florida Rivers Clean-up and International Coastal Clean-up.

10.9.8 Develop educational programs for 4-H, teachers, boaters and interested citizens on marine debris and monofilament recycling.

10.9.9 Work with extension 4-H agents in the development of coastal programs and activities for local clubs. Continue to provide activities and curriculum for senior 4-H marine club.

10.9.10 Provide information concerning coastal issues to public through e-mail lists.

10.9.11 Provide coastal information and hands-on activities at various environmental events such as Earth Day, Navarre Fun Fest, NW Florida Wildlife Sanctuary's Open House.

10.9.12 Provide Santa Rosa County community leaders with coastal information.
10.9.13 Support the Board of County Commissioners marine advisory committee. Coordinate an open public forum on boating, access and waterway issues. Respond and coordinate waterway management issues.
10.9.14 With Andrew Diller, provide "Sea Turtle Friendly Beaches" program to Navarre beach residents.
10.9.15 Provide coastal issue talks to various community organizations.
10.9.16 Support 4-H marine and county camps at Camp Timpoochee. Provide 4-H leaders and teachers with coastal information and opportunities.

10.10 Conduct a general shellfish aquaculture program for youth and adults. (Sturmer)

10.10.1 Provide information about the economic and environmental benefits of shellfish aquaculture to a variety of groups, including youth, students, citizens, local government officials, state agency representatives, legislators and the media, through tours, presentations and written materials.
10.10.2 Serve on a steering committee in developing the 2nd annual Clamerica Celebration to be held on 4th of July in Cedar Key. This community event is planned to focus attention on the importance of the area's aquaculture industry.
10.10.3 Provide educational programs on shellfish aquaculture to local K-12 teachers and to 4-H youth.

10.11 Enhance the sustainability of Cortez, Florida. (Stevely)

10.11.1 Organize 24th Annual Cortez Commercial Fishing Festival. Annually this festival reaches 15,000 citizens with information on environmental issues, and raises $55,000-$65,000 for acquisition of environmentally sensitive land.
10.11.2 Assist 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.

10.12 Conduct public education programs in Charlotte County (Staugler)

10.12.1 Develop and maintain a Charlotte County Marine Extension website with local marine resource information.
10.12.2 Research and write at least 12 columns for the WaterLIFE Magazine on marine-related topics, monthly distribution of 30,000.
10.12.3 Write marine-related column for quarterly Extension Newsletter.
10.12.4 Participate in the planning and aquatics testing section of the Envirothon competition for high school students in SW Florida.
10.12.5 Work with Keep Charlotte Beautiful, CCA, & U.S. Coast Guard Auxiliary, to assemble, install and maintain monofilament recycling bins at marinas, ramps and fishing piers within the County.
10.12.6 Help coordinate Coastal Cleanup and Adopt a Shore programs.
10.12.7 Provide coastal information and activities at various marine-related events.
10.12.8 Provide marine-related speaker programs to at least six community organizations.
10.12.9 Develop Mangrove & Seagrass program and Watersheds & Water Quality program for Master Gardener training.
10.12.10 Work with Wasno and Jacoby to organize the Boca Grande Pass cleanup event. (with Wasno/Jacoby)
10.12.11 Redevelop and reprint the Charlotte Harbor Boating & Angling Guide.
10.12.12 Distribute 40,000 Boating & Angling Guides.

10.12.13 Work with Charlotte County Environmental & Extension Services to develop and implement “Environmental Traveling Show” for youth grades 3-5.

10.13 Conduct a general marine environmental education program for youth and adults in Okaloosa and Walton Counties. (S.Jackson)

10.13.1 Develop educational programs for teachers, boaters and interested citizens on marine debris and monofilament line recycling.
10.13.2 Work with volunteers in annual fall coastal clean-up campaigns.
10.13.3 Work with Extension 4H Agents in the development of marine environmental programs for local clubs.
10.13.4 Develop marine environmental programs for local K-12 teachers.
10.13.5 Develop online or hard-copy newsletter or newspaper articles on local marine/coastal topics that is distributed to interested citizens.
10.13.6 Provide Master Naturalist Programs featuring wetlands and coastal systems to interested citizens and establish a volunteer coastal program for marine extension.

10.14 In Taylor and neighboring counties, the gag grouper is a highly valuable fish for both recreational and commercial anglers. Working primarily with key faculty in the University of Florida Department of Fisheries and Aquatic Science, a public awareness and education campaign will be established 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. The gag fishery is currently under intense management and pressure. This educational campaign will also serve to increase awareness of general principles of coastal health and ecology and also of management techniques that make Florida’s fisheries both sustainable and competitive. This will create a better educated citizenry and increase support for similar long-term enhancement projects in the future. (Sapp)

10.15 Plan, market and produce a regional fishing tournament titled, “4-H Nature Coast Classic.” This event, tentatively scheduled for May of 2006, 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. The event will serve to raise awareness among both citizens and industry in the region about the key programs of Florida Sea Grant and Florida 4-H, while raising money for Taylor County 4-H and artificial reef development programs. Grant funding will be pursued to support the marketing of this event. (Sapp)

10.16 Plan and implement complete re-development of the Taylor County Extension Service web presence, 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 250-400% during the first year. (Sapp)

10.17 Initiate a broad-based community education program that seeks to increase knowledge and awareness of primary 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 County and the “Nature Coast.” Consistent with regional demographic indicators, education will focus on the principles of empowerment and ownership (ex. Fisheries conservation will be promoted through a sense of personal responsibility, specific reference to the individual gain from collective efforts, and practical steps to achieve productive fish populations) and will include monthly articles in regional sportsman publications (ex. In each

issue of Woods-N-Water, a regional publication with a distribution of 65,000, I will contribute a feature article that deals with a specific theme of relevance to Florida Sea Grant and makes specific reference to Taylor County Extension and Florida Sea Grant. Each article will include a specific reference to the Taylor County web site, where I will create a detailed series of web-based publications that serve to further increase knowledge and understanding of the current issue.), print and web-based publications, presentations to local civic groups, and creative ways of "cross-promotion" with local government organizations including the Chamber of Commerce and local Tourism Board. (Sapp)

10.18 Research and write at least 20 columns this year for the Apalachicola & Carrabelle Times Newspapers on marine/natural resources-related topics. (Mahan)

10.19 Present at least 10 Marine Extension Updates to the Franklin County Board of County Commissioners on a variety of local and state marine issues. (Mahan)

10.20 Continue work with County High Schools to help provide research and technical support for student's science fair projects and to be a judge at the Annual Science Fair. (Mahan

10.21 Teach two homeowner education programs to educate homeowners on how the can help protect our local natural resources by selecting the proper pesticide and using it safely. (Mahan)

10.22 Conduct a general marine environmental education program for youth and adults in Escambia County. (Diller)

- 10.22.1 Maintain and update the Escambia County Marine Extension website with local marine resource information, sea turtle education, and educational events.
- 10.22.2 Continue support and development of educational programs for teachers, boaters and interested citizens on marine debris, coastal clean-ups, and monofilament line recycling.
- 10.22.3 Work with Extension 4-H agents in the development of marine environmental programs for local clubs. Assist with development and activities at state marine and county 4-H camps.
- 10.22.4 Develop marine environmental programs for local K-12 teachers and youth. Continue writing for Resource Rangers video series and developing related educational programming.
- 10.22.5 Develop online or hard-copy newsletter or newspaper articles on local marine/coastal topics that are distributed to interest citizens.
- 10.22.6 Provide Master Naturalist Program training to interested citizens and continue to develop a local volunteer program for marine extension.
- 10.22.7 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 Hurricane Ivan. Provide educational assistance and Sea Grant Extension representation to various sea turtle working groups. (with Verlinde)

10.23 Conduct a general marine educational program for youth and adults in Santa Rosa County. With Andrew Diller, provide "Sea Turtle Friendly Beaches" program to beach residents. (Verlinde/Diller)

10.24 Enhance stewardship of marine life through education in St. Lucie County. (Creswell)

- 10.24.1 Conduct classroom instruction for "Motion in the Ocean" 5th grade program. 300 - 5th 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.

10.24.2 Conduct ecology and canoeing instruction to 5th graders through the “Lagoon Days” program.

10.24.3 Conduct field trip exercises with 4th graders through the “Ecosystem Explorer” program at the St. Lucie County Marine Center. 300 - 4th grade students will become more knowledgeable about the marine environment by attending a program at the St. Lucie County Marine Center.

10.24.4 Conduct field trip exercises with 7th graders through the “Ecosystem Explorer” program at the St. Lucie County Marine Center. 200 - 7th grade students will become more knowledgeable about the marine environment by attending a program at the St. Lucie County Marine Center in conjunction with classroom instruction at their schools.

10.24.5 Conduct in-class presentations on marine invasive species in Florida. 500 - 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.

10.24.6 Provide marine day programs for 4-H summer camps (4). 200 - 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, and observation.

10.25 To increase the awareness of the citizenry of St. Lucie County of the anthropogenic impacts on Florida's coastal waters, and more specifically, the Indian River Lagoon. (Creswell)

10.25.1 Conduct “Our Coastal Environment” seminar series (four part series relating coastal ecology and environmental landscaping through FYN) to at least five homeowner associations and other civic groups in St. Lucie County.

10.25.2 Continue bi-weekly radio broadcast “At Home in St. Lucie” (½ hour program) discussing topics related to the impacts of coastal development and mans’ activities on the marine environment.

10.25.3 "Clean Boating" - A "Clean Boating" display, including an audio-visual presentation, the "Clean Boating Habits" booklet, hurricane preparation for boating interests, and other printed material were presented at public events. These included: "Florida Shallow Water Fishing Expo'" , "Ft. Pierce Boat Show", "St. Lucie County Chamber of Commerce Fishing Tournament", and "Nature Days" (Ft. Pierce Manatee Center).

10.25.4 Conduct at least two workshops dedicated to public education of marine invasive species.

10.25.5 Distribute invasive species information to retail pet outlets throughout St. Lucie County.

10.25.6 Continue to work with “The Caulerpa Taskforce” to develop strategies for public identification of this and other algal invasive to the Treasure Coast.

10.26 Conduct public education programs in Miami-Dade County. (Crane)

10.26.1 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. Knowledge gained will be determined by survey at the end of clean-up event.

10.26.2 Conduct workshops on marine environmental topics for informal and formal educators/teachers. Knowledge gained and skills learned will be measured by pre and post test. Follow-up survey will indicate number of students reached with information from the workshop.

10.26.3 Continue working with volunteers to construct and install at least 15 outdoor fishing line recycling bins and educate citizens on the impacts of discarded fishing line to the marine environment. Success of this activity will be measured by the number of volunteers who

participate and the number of recreational anglers reached about the program. At least 80% of anglers will agree to use the bins if placed where they regularly fish.

10.26.4 Teach youth (K-12 Grade) the basic concepts of the coastal and marine systems such as coral reefs, marine debris, sharks, and sea turtles. Knowledge gained will be measured at the end of the program by program survey.

10.27 Develop and conduct Marine Science Career Day for local high school youth and teachers. (Crane)

10.27.1 A local workshop will be conducted for landscape architects on Mangrove Biology, Ecology, Trimming Regulations, and Restoration Activities in south Florida. Knowledge gained will be measured by pre-post test.

10.27.2 Host and conduct Environmental Immersion Day for high school students to learn about Miami's marine and coastal environment.

10.27.3 Online or hard-copy newsletter or newspaper articles will be developed on local marine/coastal topics that is distributed to interested citizens. Bi-monthly "At the Waters Edge" will be distributed to 300 people.

10.27.4 Develop and present a program on Shark Awareness and Conservation at the Florida Association of Science Teachers Annual Conference.

10.28 Conduct public education programs in Bay County. (Cameron)

10.28.1 Develop educational programs for teachers, boaters and interested citizens on marine debris, monofilament line recycling, and marine/natural resources.

10.28.2 Work with Extension 4-H agents in the development of marine environmental programs for local clubs. Assist with development and activities at a state marine and county 4-H camps.

10.28.3 Develop marine environmental programs for local K-12 teachers in Bay County.

10.29 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)

10.29.1 Develop and conduct marine educational programs for adults, 4H clubs and K-12 teachers and students.

10.29.2 Coordinate coastal and waterway cleanups and educate participants about the impacts of marine debris on the marine environment.

10.29.3 Implement the Monofilament Recycling and Recovery Project in Broward County and conduct educational programs on the impacts of discarded monofilament and other marine debris.

10.29.4 Increase manatee awareness and boater safety through educational programs.

10.29.5 Develop an online and electronic newsletter on local marine/coastal topics that are distributed to interested citizens.

10.29.6 Maintain and update the Broward County Sea Grant Marine Extension website with relevant marine resource information and educational events.

10.29.7 Provide research and technical support and serve as a judge for the Broward County Public Schools Science Fair.

10.30 Develop new publication "Ahead of the Class: Florida Sea Grant Delivers Marine Education," that will provide documentation on the formal and nonformal educational activities, resources and services that has been provided over the past several years. (Spranger/Cato/Kearl/Zimmerman)

10.31 Conduct a general marine environmental education program for youth and adults in Northeast Florida. (McGuire)

- Work with Texas SG and Puerto Rico SG to develop monofilament recycling programs.
- Continue to manage monofilament recycling in NE Florida.
- Represent FSG on the US Fish and Wildlife Service's manatee entanglement and manatee education working groups.
- Help coordinate beach cleanup programs in April and September (St. Johns County).
- Continue to help state 4-H staff make improvements to the state marine ecology judging event. Work with youth in northeast Florida to prepare them for the competition.
- Teach youth about marine issues as part of summer camps (4-H and non 4-H) in St. Johns and Flagler Counties.
- Conduct workshops for formal and informal educators on marine-related topics.
- Lead field trip at Florida Marine Science Educators Association annual conference.
- Help coordinate and teach a "Kids' Day" for the First Coast Birding and Nature Festival; lead field trips for the Festival.
- Write monthly articles on marine topics for the Flagler News Tribune newspaper.
- Produce a quarterly newsletter which is distributed to over 750 interested residents. The newsletter includes information about selected marine topics and upcoming marine/coastal events.

10.32 Train 50 Extension Service Master Gardeners about watersheds and water conservation. (McGuire)

Key to Individual Responsibilities