

Science Serving Florida's Coast

**Florida Sea Grant
College Program
Year 2004
Work Plan**

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

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

Florida's citizens, industries and governments

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WORK PLAN 2004

FLORIDA SEA GRANT COLLEGE PROGRAM

Table of Contents

| | Page |
|--|------|
| Introduction | 1 |
| Goal 1: Marine Biotechnology | 3 |
| Goal 2: Fisheries | 5 |
| Goal 3: Aquaculture | 9 |
| Goal 4: Seafood | 14 |
| Goal 5: Water Dependent Businesses | 17 |
| Goal 6: Water Quality | 21 |
| Goal 7: Habitat | 23 |
| Goal 8: Storms and Hazards | 27 |
| Goal 9: Trained Workforce | 29 |
| Goal 10: Informed Citizens | 31 |

Introduction

The Florida Sea Grant College Program is committed to enhancing the practical use and development of coastal and marine resources while at the same time creating a sustainable economy and environment. Florida Sea Grant's Strategic Plan sets the four-year stage for program priorities. A competitive research proposal process selects two-year projects twice within the period and program areas are enhanced with additional projects funded through national competitions and other sources of funding. Detailed, peer-reviewed proposals are developed every four years for Extension, Communications and Management activities and they are updated at the middle of the four-year period. An Implementation Plan¹ is developed each two years and detailed work plans and progress reports are written annually. This is the work plan for 2004².

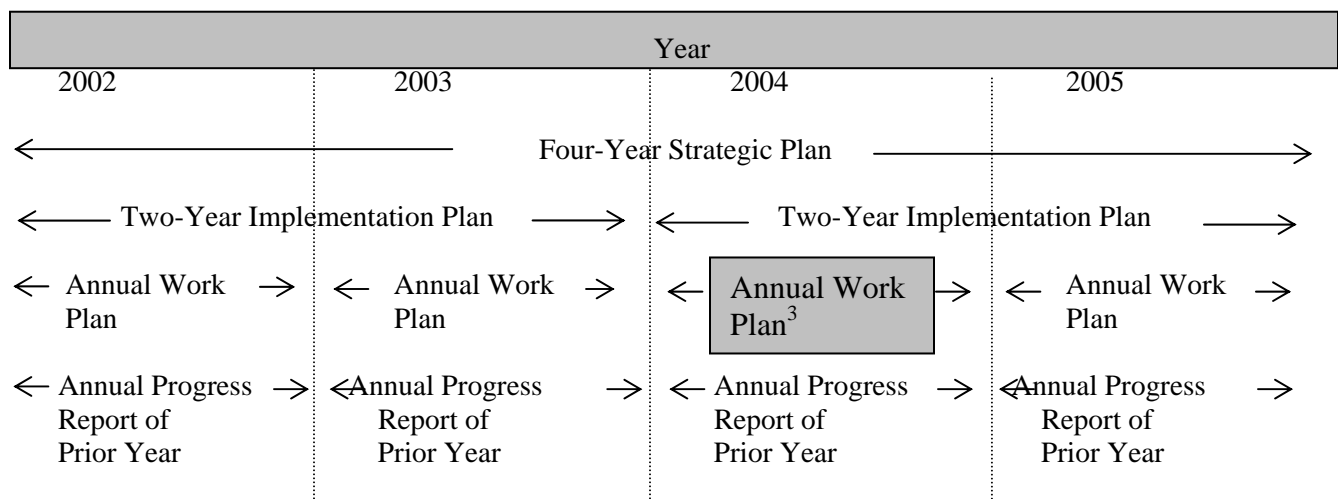
The Florida Sea Grant cycle of strategic planning, implementing of two-year activities, developing a detailed annual work plan and reporting on annual progress is shown in the table on the next page. Florida Sea Grant's Strategic Plan addresses issues that are important both nationally and in Florida, 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. Finally, the plan also considers Florida Sea Grant's role in research, education and extension through participation in the Florida FIRST strategic planning process of the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida in 2000 and beyond. This latter involvement 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

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.

are clearly useful and applicable in industry, management or science. A number of core values allow Florida Sea Grant to deliver results based on these criteria: 1) **Excellence**; Research is funded on a competitive basis, with scientific merit as the most important criterion. Extension programs are based on reviewed faculty plans of work. Communications efforts use the latest technology to achieve maximum output, visibility and citizen receipt of our science-based information; 2) **Participation**; High value is placed on the involvement of a large number of participating institutions in research, education and extension programs. Graduate student involvement is high and a diverse male and female faculty are involved, from assistant to full professors; 3) **Accountability**; Both external and internal processes are used to measure a wide range of achievements. These include tracking the scientific publication output of faculty and students, understanding the contribution to society of scientific discovery, measuring the way citizens receiving educational programs change their behavior, and determining the economic impact or level of new business activity resulting from a research project; 4) **Connection with Users**; A strong 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 A number of natural compounds from marine sources are now being used as anti-inflammatory agents in medicines and other products. Elisabethadione is a biosynthetic intermediate that leads to natural agents. The goal of this project is to develop a biotechnical production method of elisabethadione, which in nature comes from the sea whip. (Kerr/Lopez: R/LR-MB-14)
- 1.2 R-PCR is a quantitative molecular methodology that offers higher throughput potential from current types of analysis, providing results within hours, not days. The goal of the project is to develop real-time PCR for rapid, quantitative, cost-effective technology for enumeration of *Vibrio* spp. pathogens in oyster. The methods will be developed for practical applications in shellfish monitoring and for evaluation of post-harvest treatments. (Wright/Rodrick/Schneider: R/LR-MB-15)
- 1.3 Protection of marine surfaces against fouling organisms is a big business, but a difficult process to make environmentally friendly. These natural products will be characterized and tested for barnacle larvae settling inhibition, lethality, and crustacean chemoreceptor activities. These anti-fouling compounds will be tested in both laboratory and field settings. (Kem/ Soti: R/LR-MB-16)
- 1.4 Cancer is the second leading cause of death in the United States. Lasonolides appear to have a novel, but undefined mode of action to kill tumor cells. This project will help define the utility of the compounds by identifying the primary protein target for the compounds. (Wright/Longley: R/LR-MB-17)
- 1.5 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. More than 100,000 conopeptides exist; however, few have been sequenced to date. The goal is to obtain a novel set of conopeptides and evaluate their potential as a therapeutic agent. (Mari/Fields: R/LR-MB-18)
- 1.6 A statewide faculty coordinating committee organized by Florida Sea Grant to advance marine biotechnology will continue to operate. The goal is to partner with industry in a way that will yield both state and industry funds to support marine biotechnology research, education and economic growth in Florida. (Seaman/Cato)
- 1.7 Florida Sea Grant has one of the largest marine biotechnology research programs among all Sea Grant programs in the US. It is time to develop a complementary outreach program. This project will create a database for business and industry as a means of aiding science-based decisions concerning lines of research, policy and investment. Attributes to be summarized from the 24 FSG research projects to date include scholarly contributions, student training and actual or potential commercialization opportunities. (2005) (Seaman/Zimmerman/Kearl: PD-03-3)

- 1.8 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. (2005)
(Masterson/Pomponi/Clark/Reed: E/T-11)
- 1.9 Nemertines and sponges produce pyridyl alkaloids that affects 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)
- 1.10 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. A new class of conopeptides 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)
- 1.11 To promote industry education and media awareness of Florida marine biotechnology opportunities and constraints, outreach will communicate a profile of existing commercial activities and interests in Florida via a website and publication, and also in a proposed session at a national biotechnology conference (in cooperation with the national theme team) and proposed executive and teacher continuing education workshops. (Seaman)
- 1.12 To promote faculty cooperation and exchange to enhance research and training, a statewide marine biotechnology listserv will be continued, planning for the fourth statewide summit will continue, and the feasibility of an ad hoc faculty advisory panel will be determined. (Seaman)
- 1.13 To promote awareness and understanding of marine biotechnology by Extension faculty, an information packet of relevant materials and resources will be assembled and 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 Gag grouper is a highly prized fish in the Southeast United States. The fishery is under intense management, scrutiny and pressure. This project will link the importance of essential fish habitat to gag grouper population dynamics. This will allow management agencies to make science-based decisions related to essential fish habitat. (Lindberg/Mason/Murie: R/LR-B-53)
- 2.2 Declining shark populations worldwide have prompted concern about the sustainable health of the resource. Management on a species-specific basis is under consideration. This is currently not possible due to considerable difficulties in identifying shark carcasses and fins. The development of false identification methods is needed before valid data can be obtained and management measures developed. (Shivji: R/LR-B-54)
- 2.3 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. (2005) (Gruber/Hoenig/Feldheim: R/C-E-47)
- 2.4 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. (2005) (Heithaus/Marshall/Carrier: R/MI-12)
- 2.5 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)
- 2.6 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)
- 2.7 The FY02 National Sea Grant federal appropriation required the enhancement of Sea Grant's fisheries extension program.
 - 2.7.1 Florida Sea Grant will increase the overall amount of its Sea Grant fisheries extension activity through its Fisheries Extension Design Team. (Spranger/Adams/Otwell/Jacoby/Agents: E/FE-FSG)
 - 2.7.2 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)
 - 2.7.3 Florida Sea Grant Extension will work as a member of the South Atlantic Regional Fish Extension Project team that will address the topics of marine protected areas (MPAs), essential fish habitat (EFH) and fisheries management. (Spranger/Jacoby/Adams/McGuire: E/FE-SA)
- 2.8 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. (2006) (Spranger/Holland/Floyd: SGEP-13-FE)

- 2.9 All commercial shrimpers in Florida will become aware of the USDA Trade Adjustment Assistance program and decide whether to file a petition and claim with USDA in an effort to seek relief from the market impacts of imported, aquacultured shrimp. (Adams)
- 2.10 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. One hundred (100) commercial shark vessel owners will become better informed of the bid development process associated with a buyback program. (Adams)
- 2.11 Conduct a study of the economic impact of the commercial fishing industry on the East Coast of Florida. This study will be funded by the National Marine Fisheries Service. The study will involve cooperation with UF FRED faculty. Twenty-five (25) fishery managers will become more aware of the role of economic impact assessments in the effective management of commercial fisheries in Florida. (Adams)
- 2.12 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.
 - 2.12.1 Serve on Scientific and Statistical Committees (Adams).
 - 2.12.2 Review and comment on stock assessment analyses and draft management documents (Gregory).
- 2.13 Assist regional fisheries agencies with fisheries management plans and assessments.
 - 2.13.1 Chair the Gulf States Marine Fisheries Commission Sheepshead Management Task Force. Write an economics component for the draft management plan (Adams).
 - 2.13.2 Participate in three stock assessment meetings of the National Marine Fisheries Service, Southeast data and assessment review workshops (Gregory).
- 2.14 Give presentations at the following conferences: (Adams)
 - 2.14.1 World Aquaculture Society Annual Conference – Honolulu, Hawaii
 - 2.14.2 Florida Artificial Reef Summit – Sarasota, Florida
 - 2.14.3 International Institute of Fisheries Economics and Trade – Tokyo, Japan
 - 2.14.4 Southern Agricultural Economics Association – Tulsa, Oklahoma
- 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 four 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 Increase the awareness of marine fisheries policy 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)
 - 2.16.1 Promulgate the 54th Proceedings of the Gulf and Caribbean Fisheries Institute and disseminate it to members, libraries, universities, and computer databases.
 - 2.16.2 Serve as chairman of the Steering and Program Committee for the 57th Gulf and Caribbean Fisheries Institute and publish its Book of Abstracts.
- 2.17 Increase the sustainability of fisheries resources in Escambia and Santa Rosa counties. (Diller)
 - 2.17.1 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.
 - 2.17.2 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.
 - 2.17.3 Conduct extension training session for Escambia and Santa Rosa County shrimp fleet applying for the USDA Farm Service Agency's Trade Adjustment Assistance program.
 - 2.17.4 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.
- 2.18 Increase the sustainability of fisheries resources in Okaloosa and Walton counties. (S. Jackson)
 - 2.18.1 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.
 - 2.18.2 Conduct educational programs and provide materials and technical assistance for the maintenance and development of artificial reefs off Florida's coast.
- 2.19 Assist shrimp fishermen working from Franklin County. (Mahan)
 - 2.19.1 Continue work on Turtle Excluder Devices (TED's) with local shrimp industry. Work with NMFS to distribute new "leatherback TED's" for local off-shore shrimp fishermen to field-test.
 - 2.19.2 Coordinate and teach at least two "shrimp classes" to the Florida Panhandle shrimp fishermen as required for the fishermen's participation in the USDA Trade Adjustment Assistance Program.
- 2.20 Enhance artificial reef habitat in Manatee County and statewide. (Stevely)
 - 2.20.1 Organize 2004 Florida Artificial Reef Summit. This conference will provide technical support to improve construction, planning and management of artificial reefs on statewide basis.
 - 2.20.2 Develop "Adopt-a-buoy" program for Manatee County Artificial Reef Program to insure reef sites are properly marked.
 - 2.20.3 Locate site for new Manatee County artificial reef.

- 2.21 Work will continue during 2004 for the RedStart fisheries (redfish) enhancement project. (Wasno, Stevely)
 - 2.21.1 Initiate second cycle of redfish fingerling growout. Fingerlings grown out to 10” will be turned over to the Sanibel-Captiva Conservation Foundation Marine Lab for scientific research post stocking.
 - 2.21.2 Present posters at Estuaries Enhancement Conference, World Fisheries Conference and World Aquaculture Society meetings.
 - 2.21.3 Continue semi-annual meetings of RedStart Advisory Committee.
 - 2.21.4 Continue the training and use of volunteers in the project.
 - 2.21.5 Provide technical assistance and training to project staff. (Creswell)
- 2.22 Conduct Florida Keys Sponge Survey to provide information necessary to manage a sustainable commercial sponge fishery and evaluate recovery of hard bottom habitats in Florida Bay. Present findings to FWC, FMRI, the multi-agency task force studying Florida Bay, FSG and the FKNMS. (Stevely, Sweat)
- 2.23 Lee County fishing guides document all snook catches for a Florida Marine Research Institute study that determines a catch per unit effort for local fisheries. These data demonstrate an overall population of snook in local waters and provides baseline data for future studies. Specific guides are picked to participate and are given an overview of study that allows them to discuss current trends with daily clients. All regional anglers are asked to drop off snook carcasses after harvest for scientists to do a necropsy to determine age and growth rate. Anglers are educated on the research and concerns for snook population and habitat. (Wasno)
- 2.24 Continue scallop restoration program, including hatchery, nursery and stocking. Educate public with recreational scalloping workshop and produce new recreational scalloping publication. Complete report on “Economic Impact of Recreational Scalloping in Citrus County, Florida” and present findings to Citrus County business interests, Board of County Commissioners and other interested agencies. (Sweat)
- 2.25 Conduct fish survival workshops for recreational fishermen that address fish venting, circle hooks, proper handling and release, and fishery management issues. (Sweat/Verlinde)
- 2.26 Assist Mote Marine Laboratory 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)

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

- 3.1 Suitable food for early life stages of cultured fish is a bottleneck for raising them for the ornamental fish hobby-based market. The goal of this project is to scale-up production of copepod species as food for rearing tropical ornamentals. (Marcus: R/LR-A-36).
- 3.2 Many marine ornamental species are collected from coral reef areas. Aquaculture is recognized as one solution to minimize the wild collection, while sustaining the aquarium industry and creating new commercial opportunities. This Sea Grant Industrial Fellow will continue former Sea Grant research to develop protocols to cultivate high value and popular marine ornamental shrimp. (Lin/Rhyne/Calman: E/INDST-2)
- 3.3 The aquaculture of marine ornamental fish is one way to reduce the collection of the fish from coral reef areas. A major problem is diseases contracted by the fish in culture situation or while on display in aquariums. Longer-lived fish mean fewer must be collected or cultured. This Sea Grant Industrial Fellow will examine the causes of head and lateral line erosion syndrome of the popular surgeonfish and attempt to find the solution to the problem. (Francis-Floyd/Tilghman/Stamper: E/INDST-3)
- 3.4 Most marine organisms marketed in the aquarium trade industry are collected from the wild, particularly from coral reef ecosystems. Some destructive harvesting techniques have dramatic impacts on the health and biodiversity of coral reef ecosystems. Developing aquaculture technology for marine ornamental species is urgently needed to guarantee a sustainable supply for the industry while minimizing the negative impacts on the natural environment. The goal is to develop and improve larviculture protocols for marine ornamental crabs and lobsters. (Lin: PD-03-09)
- 3.5 Florida has approximately 350 active clam growers producing a crop worth \$18.2 million in 2001. Recently, the need for a hardier clam strain has become evident as clam culturists in Florida report below average survivals or total losses during the prolonged hot summers. Triploid clams may be a solution to this problem as they are virtually sterile, thereby spawning does not occur and energy is available during this stressful period for basic metabolism. (2006) (Scarpa/Baker/Sturmer/Adams: R/LR-A-39)
- 3.6 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)
- 3.7 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)

- 3.8 Students enrolled in the St. Lucie County School District will increase their 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)
- 3.8.1 At least 100 students will learn more about aquaculture through classroom and distant learning programs.
 - 3.8.2 Compile an informational packet for individuals interested in shrimp aquaculture.
 - 3.8.3 Develop a series of two-page fact sheets on potential aquaculture species in Florida.
 - 3.8.4 Conduct at least six radio broadcasts (30 minutes each) dedicated to aquaculture topics.
- 3.9 Production will be enhanced, costs minimized, and opportunities improved for aquaculture businesses. (Creswell)
- 3.9.1 At least four one-half day workshops will be presented at the Shrimp Aquaculture Demonstration Site at the University of Florida Research and Education Center related to shrimp aquaculture.
 - 3.9.2 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.
 - 3.9.3 Conduct at least one workshop on the potential of baitfish aquaculture in Florida.
- 3.10 Provide technical assistance that includes startup considerations to new and existing aquaculturists in Florida and South Alabama. (S. Jackson)
- 3.11 Enhance the clam farming industry in Franklin County. (Mahan)
- 3.11.1 Continue to provide one-on-one consultations and technical support to individuals interested in marine aquaculture.
 - 3.11.2 Continue membership and work on FL DACS Statewide farm-raised Clam Marketing Advisory Committee.
- 3.12 In a collaborative project with Florida Gulf Coast University, a series of workshops will be set-up to work towards making local clam farmers more efficient with current stocks and to implement a plan to create an oyster growing facility to supplement income. (Wasno)
- 3.13 Educate aquaculturally interested public with aquaculture information and consultation. Provide water quality workshops to existing aquaculture ventures. Serve as aquaculture consultant to public schools in Citrus County. (Sweat)
- 3.14 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. (Adams/Sweat)
- 3.15 Increase the scientific, industry and agency knowledge about Florida aquaculture through participation at regional and national conferences.
- 3.15.1 Participate in the World Aquaculture Society 2004 conference in Hawaii. Invited to present a paper on structures and strategies for successful agricultural and aquacultural organizations at the East Meets West session for shellfish aquaculture industry members. This paper is the result of a study completed in the previous year with funding from the USDA Risk Management Agency. (Sturmer/Adams)

- 3.15.2 Participate in the Gulf and South Atlantic States Shellfish Conference in Georgia, and provide an overview of the Florida hard clam aquaculture industry highlighting certain projects, such as the CLAMMRS water quality monitoring program, genetics research projects, and the ark clam diversification study. (Sturmer)
 - 3.15.3 Invited to give a presentation on extension activities in support of the Florida clam aquaculture industry at the National Agriculture County Agents Association's Annual Conference to be held in Orlando. (Sturmer)
- 3.16 Establish, coordinate and provide training in counties where clam farming is ongoing. Counties involved include Levy, Dixie, Charlotte, Lee, Brevard, St. Lucie, Indian River and Franklin. (Sturmer)
- 3.16.1 Continue to conduct workshops in support of the new clam farmers who are developing their farms on lease sites in Franklin County. Topics to be addressed include marketing, clam physiology, land-based nursery technology and systems, and rules and regulations. In addition, will also educate local chefs and restaurants owners in the area on the new farm-raised, seafood product available to them. (Mahan/Sturmer)
 - 3.16.2 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)
 - 3.16.3 Continue to provide local workshops and technical assistance for potential and existing clam farmers. (Sturmer/Wasno)
 - 3.16.4 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. (Sturmer)
 - 3.16.5 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)
 - 3.16.6 Continue development of workshops and materials to shellfish growers who are participating in the USDA pilot crop insurance program. (Sturmer)
- 3.17 Continue a coordinated effort to enhance hard clam farming in Florida through a series of USDA funded projects. (Sturmer)
- 3.17.1 Initiate 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.
 - 3.17.2 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 two years of continuous water quality data 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.
 - 3.17.3 Provide technical assistance on the Expert Assistance and Distance Identification Network (EADIN), a project that establishes protocol and implementation procedures for the rapid distance identification of biological samples, specially focused on phytoplankton.
 - 3.17.4 Assist in completing a study that is providing baseline information on the presence and absence of shellfish pathogens in aquaculture lease areas. The final report of this study, which established a health monitoring program for the hard clam culture industry, will allow growers to increase their awareness of potential health problems for their stocks.

- 3.17.5 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)
 - 3.17.6 Disseminate results of a project addressing the issue of stock diversity in cultured clam stocks to commercial hatchery operators.
- 3.18 Evaluate the production and processing for alternative techniques and alternative species of clams for Florida clam growers.
- 3.18.1 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. (Sturmer)
 - 3.18.2 Serve as a liaison between industry partners and researchers in evaluating production of triploid and diploid clams under commercial nursery conditions in upland systems through the funding efforts of USDA Agricultural Research Service. (Sturmer)
 - 3.18.3 Work with project staff to determine proper culture techniques for blood ark and ponderous ark clams. (Creswell)
 - 3.18.4 Complete the determination of shelf life in refrigerated storage and nutritional analysis for the blood ark and ponderous ark clam. Assist the Agriculture Market Research Center in compiling a report on the magnitude of the potential domestic market and product attributes desired by the seafood trade for both ark clams. These findings will be used to educate shellfish wholesale dealers as to the market attributes of these alternative molluscan shellfish species. (Sturmer)
- 3.19 Provide state wide service to clam grower associations and state agencies.
- 3.19.1 Continue providing organizational support and technical assistance to local clam growers associations, and in working with the boards in developing an umbrella statewide organization. (Sturmer, Adams)
 - 3.19.2 Continue to serve on the education and conference committee of the Florida Aquaculture Association. This year will serve as co-chair of the association's annual conference to be held at Hillsborough Community College in Ybor City. (Sturmer)
 - 3.19.3 Represent Florida Sea Grant on the state's Aquaculture Interagency Coordinating Committee and assist in preparing the annual report to AICC. (Adams)
- 3.20 Provide easy access to up-to-date information on shellfish aquaculture in Florida. (Sturmer)
- 3.20.1 Develop and launch a web site for the shellfish aquaculture extension program where services provided can be directly accessible by the clam farming industry. The site will provide updates on research and extension projects, current suppliers lists, links to state and national publications addressing shellfish aquaculture and a calendar of events.
 - 3.20.2 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*.

- 3.21 Maintain a shellfish aquaculture research and education facility in Cedar Key. This is the first salt-water running laboratory on Florida's Gulf of Mexico coast, which allows UF faculty to address the research needs of the clam farmers. An open house and dedication is planned this year to recognize those stakeholders who assisted in making this facility happen. (Sturmer)

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

- 4.1 The use of reduced-oxygen packaging continues to expand for seafood despite warnings of potential food toxicity problems. This project will develop "smart-labels" for time-temperature integration and packaging film permeability. Unbiased, scientifically based controls can then avert regulatory interaction or product safety issues. (Balaban/Otwell/Welt/Kristinsson: R/LR-Q-22)
- 4.2 Millions of U.S. consumers eat oysters. However, for a small segment of the population, eating raw or undercooked oysters can cause serious illness or death from *Vibrio vulnificus*. The goal of this project is to educate consumers, conduct new oyster product research and processing technologies and education medical groups so that human safety risks can be minimized or eliminated while maintaining an industry. (Jamison/Jamir: R/LR-Q-23 [FL-G01-5])
- 4.3 Bacteriophage have been proven to be effective in the prevention and treatment of diseases in humans and animals. Previous Sea Grant research has shown that phage specific for *V. vulnificus* can prevent lethal disease in mice caused by this organism. This project extends that work to test scale-up systems for phage treatment to eliminate *V. vulnificus* from the system. (Duckworth/Gulig/Rodrick/Wright: R/LR-Q-24 [G01P-03])
- 4.4 *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. (2005) (Wright/Heil/Harwood: R/LR-Q-26)
- 4.5 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. (2005) (Heil: E/TP-3)
- 4.6 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)
- 4.7 Conduct annual training schools to ensure safety and quality of seafood products. (Otwell)
 - 4.7.1 Conduct the first annual Spiny Lobster School for industry and agencies, similar to the successful Shrimp School. Expectation is that the lobster school will be held in November 2004 in conjunction with the annual seafood science and Technology conference planned for Nassau, Bahamas.
 - 4.7.2 Continue to explore development of an annual Smoked Fish School for industry and agencies, similar to the successful Shrimp School. Expectation is that the school will be offered in 2005.
 - 4.7.3 Conduct annual international Shrimp School for industry and agencies during May 18-20 at the Aquatic Food Products Program, University of Florida.

- 4.8 Enhance the scientific knowledge of seafood safety for industry, government and the research community through participation in national conferences. (Otwell)
 - 4.8.1 Present compilation of 10 years work in advancing tempering as a technique to assure survival and extended marketability for Florida hard clams during 5th Annual Shellfish Safety Conference in Brunswick, GA.
 - 4.8.2 Organize and conduct international conference on Utilization of Carbon Monoxide and Reduced Oxygen Packaging for Seafood in Orlando, Feb. 2005.
 - 4.8.3 Organize and monitor special scientific forum on “Zero Tolerances for Seafood” during the annual Institute of Food Science (IFT) meeting in Las Vegas, July 2004. Program will address controls for bacterial pathogens, antibiotics and other food safety hazards in seafood.

- 4.9 Continue role as National Coordinator role for the Seafood HACCP Alliance that has provided 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 5,000 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. (Otwell)

- 4.10 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)

- 4.11 Continue in leadership positions with number of seafood technology organizations. (Otwell)
 - 4.11.1 National Seafood HACCP Alliance, National Coordinator
 - 4.11.2 Seafood Sciences & Technology Society (SST) of the America’s, Executive Director
 - 4.11.3 U.S. Representative on their Board of Directors for the International Association of Fish Inspectors (IAFI).

- 4.12 Enhance seafood safety at local levels using education and local training events.
 - 4.12.1 Coordinate workshops and seminars at local festivals that provide home seafood consumers with seafood safety information. (Sweat)
 - 4.12.2 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)
 - 4.12.3 Current FDEP regulations provide that all filleted fish carcasses be disposed in a dumpster at the Punta Rassa Boat Ramp in Lee County. The local Florida health Department director has deemed this as a human health hazard. Permits are being secured to move a fish cleaning station back on the docks until a revamped fish cleaning station is built that will inject spent carcasses directly into a sewer. Permitting is in final stages. (Wasno)
 - 4.12.4 Assist Monroe County seafood processors with HACCP and seafood safety issues. (Gregory)

- 4.13 Develop food safety documents for retail and regulatory authorities on food processing in retail settings. Post guides for retail processing of Sushi, Smoked Fish and Reduced Oxygen Packaged Seafood on the Association of Food and Drug Officials (AFDO) website for national audiences. (Otwell)

- 4.14 Conduct continuing analysis of time and temperature controls for modified atmosphere packaging of processed fish. Introduce new innovative time-temperature integrators for packaged seafood. (Otwell)
- 4.15 Determine ways to advance the use of post-harvest treatment for oyster processing in Florida.
 - 4.15.1 Coordinators for current USDA Special Research Projects extending into 2007. Current work includes assessing use of special freezing techniques and development of regional lab facilities in Apalachicola, Florida to assist commercial adaptation. (Otwell/Mahan)
 - 4.15.2 Develop sensory profiles for raw oysters under post-harvest treatment. Work in conjunction with LSU, Miss. State University and Oregon State Univ. with plans to introduce first national 'virtual' sensory training program. (Otwell)
- 4.16 Enhance the safety and quality of oyster products. (Mahan)
 - 4.16.1 Continue work as a member of the Oyster Post Harvest Treatment (PHT) Advisory Committee to develop short and long-term goals for oyster PHT research being conducted under a USDA grant.
 - 4.16.2 Continue work as an appointed member on the Interstate Shellfish Sanitation Conference's *Vibrio vulnificus* Education Subcommittee, Biotoxin, Post Harvest Treatment, and Education Committees.
 - 4.16.3 Organize and coordinate the Annual Statewide Oyster Industry Workshop.
 - 4.16.4 Attend and participate in Interstate Shellfish Sanitation Conference Committee meetings as needed during the year to work on the committee's national goals and objectives.
- 4.17 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.(Otwell)
- 4.18 Assist FDA in 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, Panama, and Hawaii. (Otwell)
- 4.19 Assist in completing a final report 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)

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

- 5.1 The NOAA Coastal Services Center (CSC) has approved full funding for a new project, “A Coastal Data Information Server System for the Gulf Intracoastal Waterway and Adjoining Bay Waters of Southwest Florida.” The scope includes collating bathymetric and land use/land cover data generated in prior FSG projects, as well as scanning and georeferencing imagery and maps collected over years (e.g., 600+ Historic aerial photographs, hydrographic and topographic maps, etc.). The data and metadata will be provided to UF’s Florida Geographic Data Library (FGDL), which will soon become a Federal Geographic Data Committee (FGDC) node, so that it can be made available on the World Wide Web. (Fann: CDI-Fann)
- 5.2 Intensive boating by over one million boaters in Florida waterways puts tremendous environmental pressure on the waterways. This project will use technical and science-based education methods to educate Florida boaters. The goal is to have boaters become self-regulatory in order to maintain boating as an economically valuable enterprise while at the same time eliminate boating-related environmental damage. (Spranger/Swett: R/C-P-24)
- 5.3 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)
- 5.4 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. Often community decision-making lack the resources and training necessary to address these issues resulting in a new demand and a new opportunity for smart growth extension programming. (2006) (Spranger/Sidman: R/C-P-28CC)
- 5.5 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)
- 5.6 A GIS-based ‘Manatee Protection Decision and Education Support System’ will be developed to assist resource managers and educate stakeholders in the designation, classification, and evaluation of manatee protection zones within high-use boating regions. This is the first year of the two-year project (Swett/Sidman)
- 5.7 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)

- 5.8 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)
- 5.9 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/Sidman)
- 5.10 A service-area analysis will be conducted for Tampa and Sarasota Bay boating facilities to determine land-side market areas and water-use patterns. Spatial information about trip origins, favorite destinations, and intervening travel routes, obtained from a mail survey of Tampa and Sarasota Bay ramp and marina users will provide for model parameterization. The study addresses the need to provide adequate future public access to both the shore and water, while minimizing ecological impacts. (Sidman/Swett/Fik; Sargent-FMRI)
- 5.11 A Web-based data server will be developed to provide access to vessel registration information. This project will establish a Web-site that will allow for interactive queries of boater information obtained from the Vessel Title Registration System. A recent Florida Sea Grant research project documented the utility of Florida's Vessel Title Registration System (VTRS) to locate (geographic coordinates) and characterize recreational boating populations. Florida Sea Grant and many other entities use this information on a regular basis for research and outreach purposes. (Swett/Sidman)
- 5.12 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 (4) better public policy through a holistic, environmentally-based decision-making process. (Swett/Fann)
- 5.13 The St. Johns Water Management District requested Florida Sea Grant assistance to transform historical maps and imagery to digital formats as input into hydrodynamic models and to mesh with contemporary GIS datasets. The goal is to re-create the predevelopment hydrodynamic behaviors of estuaries in order to set Pollutant Load Reduction Goals, and to understand pre-development land cover. (Fann)
- 5.14 Geospatial extension services are being provided to the State Agricultural Response Team (SART) to support its mission to develop a statewide GIS in support of a coordinated, interagency effort to prepare and plan for, respond to, and recover from crop and animal-related emergencies in Florida. (Sidman/Sweat)
- 5.15 Serve as the principal Sea Grant liaison for the Florida Clean Boating Partnership. (D. Jackson)
- 5.15.1 Continue working with the Clean Boating Partnership to designate clean marinas, clean boatyards, clean boaters, and clean marine retailers.
- 5.15.2 Serve as chair of the Visions Committee of the Clean Boating Partnership to identify future efforts for the Partnership.

- 5.16 Assist marinas in Brevard County with specific programs and through participation in the Clean Marina Program as follows (Combs):
 - 5.16.1 Resolve stormwater issues at four marinas.
 - 5.16.2 Conduct on-site training and guidance to assure Clean Marina or Clean Boatyard designation at three marinas.
 - 5.16.3 Increase public awareness of Clean Marina/Clean Boatyard program by 10% by conducting educational programs on Brevard County Space Coast Government TV (SCGTV).
 - 5.16.4 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 educational programming at six Clean Marinas/Clean Boatyards in Brevard County.
 - 5.16.5 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.

- 5.17 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. Participate in two Adopt-An-Island field trips and two field work-days in accomplishing these goals. (Combs)

- 5.18 Enhance the environmental sustainability of marine businesses in Miami-Dade County. (Crane)
 - 5.18.1 At least 20 marine businesses will gain knowledge on the Clean Marina’s Program environmentally and economically friendly management practices for boating and marine industries as described in the Clean Marina Program by attending a workshop or site visit. Knowledge gained will be measured by a survey and the number of businesses participating in program.
 - 5.18.2 At least 100 boaters will gain knowledge on environmentally and economically friendly management practices to prevent fuel spills into the environment by receiving bilge socks and educational materials. Knowledge gained will be determined by survey and the number of participants in the program.

- 5.19 Promote behavioral changes in boaters and marine operators to exercise environmentally friendly boating habits through the exhibits, mass media, distribution of informational material, and the “Clean Marina/Clean Boatyard” certification program. (Creswell)
 - 5.19.1 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”.
 - 5.19.2 Complete installation of monofilament recycling stations in St. Lucie and Indian River counties.
 - 5.19.3 Continue to promote utilization of monofilament recycling through newspaper articles and radio programming.
 - 5.19.4 Continue to plant mangrove seedlings along the Indian River Lagoon through the “IRL Mangrove Restoration Program”.
 - 5.19.5 Teach at least 30 fishermen and/or scientists the importance of venting fish bladders and demonstrate its method.

- 5.20 Continue working with the Clean Boating Partnership to establish additional clean marina designations and clean boatyard designations in 2004. Present Clean Boater educational materials to boaters at the Pensacola Boat show and other environmental events. (Diller)
- 5.21 Enhance the marine industries in Northeast Florida. (McGuire)
 - 5.21.1 Work with staff from the DEP's NE District to certify five new clean marinas or boatyards in NE Florida.
 - 5.21.2 Complete boater and angler recreational guide for Duval County.
 - 5.21.3 Work with Flagler County planners to develop a similar guide for Flagler County.
 - 5.21.4 Work with St. Augustine Ports and Waterway Authority and Florida Sea Grant waterways faculty to develop a boater guide for St. Augustine/St. Johns County.
- 5.22 Facilitate national meeting of parasailing operators to develop non-regulatory approach to improve safety. Activity requested by Tampa Coast Guard Marine Safety Officer. (Stevely)
- 5.23 Enhance the environmental sustainability of marine businesses in Lee County. (Wasno)
 - 5.23.1 A 300 yard section of Estero River has been eroded from boat wakes in the heavy vessel area. Volunteers will be recruited to place rip-rap materials at the sites.
 - 5.23.2 A brochure will be developed to guide novice/tourists boaters to destinations in Lee County. It is anticipated that environmental impacts by wayward boaters will be minimized.
 - 5.23.3 Lee, Charlotte and Collier county marinas have been aggressively recruited to participate in the Clean Marina Program. The goal is to add five new marinas this year.
- 5.24 Enhance the boating and marine industries around Pensacola Bay. (Verlinde)
 - 5.24.1 Promote the Clean Marina Program.
 - 5.24.2 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.
- 5.25 Conduct four workshops, meetings and coordinate commercial fishing input into Monroe County local land management processes to encourage maintenance of working waterfront access for the commercial fishing industry. (Gregory)
- 5.26 Recruit marinas and boatyards to participate in the Clean Marina and Boatyard Program in Broward County. Conduct workshops to instruct marina staff on proper pollution prevention and best management practices. Present participating facilities with literature and hands-on training regarding CMP components as outlined in the handbook. Inspect marinas for compliance with CMP required and optional criteria. Designate facilities as "Clean Marinas/Boatyards" through a flag ceremony. (Behringer)

Coastal Ecosystem Health and Public Safety

Goal 6: Protect and Enhance Coastal Water Quality and Safety

- 6.1 The potential for nitrogen and other inputs reaching coastal water via groundwater contaminated with sewage discharge is high. State of the art techniques will be used to assess the potential for sewage contamination of an urban bay (Sarasota) and a less populated bay (Apalachicola). The results will be useful to help manage the use of septic tanks in Florida's coastal zone. (Chanton/Burnett/Corbett: R/C-E-44)
- 6.2 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. (2005) (Wilhelm/Kirkpatrick: R/LR-Q-25)
- 6.3 South Florida represents a critical region for education and outreach on natural systems, their connections and how they respond to human activities. This region contains several unique natural systems, including the Everglades, Florida Bay and the Florida Keys. This work will design and deliver a public education and outreach plan for the region. (2006) (Jacoby/Spranger/Score: E/T-9)
- 6.4 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)
- 6.5 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. (2006) (Jacoby/Score: SFWMD-CERP-1)
- 6.6 Increase the quality of coastal and marine waterways in Brevard County. (Combs)
 - 6.6.1 Write a bi-monthly educational article for the UF/IFAS Brevard County Extension newsletter, "Agriculture and More".
 - 6.6.2 Present an educational program on Space Coast Government TV (SCGTV) concerning stormwater issues in Brevard County and how they are being addressed.
 - 6.6.3 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.
 - 6.6.4 Conduct two waterway cleanup exercises, designed to educate 50 participants in the environmental damages caused by litter in the marine environment.
 - 6.6.5 Develop two fact-sheets concerning storm water runoff and its environmental impact in the Indian River Lagoon.

- 6.7 Improve coastal water quality and monitoring program throughout Florida. (Jacoby)
 - 6.7.1 Work with partners throughout Florida and beyond to develop and improve volunteer monitoring programs. (Jacoby)
 - 6.7.2 Work with partners to develop and implement training and curricula dealing with a watershed approach to water quality. (Jacoby)
- 6.8 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)
- 6.9 Improve coastal water quality and monitoring programs in Okaloosa and Walton Counties. (S. Jackson)
 - 6.9.1 Work with boating user groups to promote BMPs that benefit coastal water quality.
 - 6.9.2 Work with volunteers and local community leaders to develop water quality monitoring program.
 - 6.9.3 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.
- 6.10 Continue work as a member of the Nature Conservancy's Apalachicola River Basin Invasive Exotics Workgroup. (Mahan)
- 6.11 Coordinate and supervise the use of herbicides to spot-treat invasive plant species living in the Apalachicola Bay drainage system along Hwy 65 during the FL DOT's repaving project. (Mahan)
- 6.12 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)
- 6.13 Work to enhance water quality around Pensacola Bay. (Verlinde)
 - 6.13.1 Coordinate sampling, training and collection of samples for the UF/IFAS Lakewatch program in Santa Rosa County.
 - 6.13.2 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.
 - 6.13.3 Contribute to the 2004 revision of the 1998 Pensacola Bay Watershed Management Plan.
 - 6.13.4 With UF researchers and watershed supporters, coordinate and provide projects for the Pensacola Bay Watershed Initiative Grant proposal to the US Environmental Protection Agency.
 - 6.13.5 Attend national Watershed Academy at Weeks Bay National Estuarine Research Reserve. Topics include: stream restoration, stormwater Best Management Practices, smart growth, community involvement, and watershed mapping and planning.

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)
- 7.2 Over the last several years swamp eels have been discovered in aquatic habitats in Georgia and Florida. These are large ambitious predators capable of dispersal over land with the potential to disrupt ecosystems. The goal of this project is to discover how eels are introduced, how this can be prevented, describe their ecology and life history, and support methods to control them. (Collins/Trexler/Nico/Loftus: R/C-E-46 [ANS-20])
- 7.3 A critical and emerging need for ocean sciences education is to determine and catalog the types and impacts of aquatic nuisance species in the Gulf of Mexico region. Leaders will learn and develop materials for K-12 classroom use. This is a joint project with Mississippi/Alabama Sea Grant and includes holding elementary, middle school and high school teacher workshops. (Spranger/Jacoby: E/NS-2)
- 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. (2005) (Walters/Olsen: R/C-E-49)
- 7.5 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. (2005) (Luo/Su/Serafy/Lorenz: R/C-E-48)
- 7.6 An invited scientific session on improvement of marine habitat for fisheries and conservation will be convened at the World Fisheries Congress. (Seaman)
- 7.7 Proliferations of an exotic invasive alga, *Caulerpa brachypus*, have been documented on reefs off of the east coast of central and south Florida. It has been suggested that elevated nutrients from ground water seepage is the cause for the increase in algal abundance and that *C. brachypus* is smothering Florida reefs. The goal of this project is to determine the potential for an invasive macroalga, *Caulerpa brachypus*, to establish populations within the Indian River Lagoon system based on salinity tolerances. (Irlandi: PD-03-11)
- 7.8 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)

- 7.9 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 public school workshops and publish a report with lesson plans. (Spranger/Jacoby: E/T-13)
- 7.10 Reduce the number of invasive marine species in Brevard County waters as follows (Combs):
- 7.10.1 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.
 - 7.10.2 Develop six one-page fact sheets addressing the environmental and economic impacts of invasive exotic marine species upon recreational and commercial fisheries.
 - 7.10.3 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.
 - 7.10.4 Set up four or more manned educational exhibits at the annual Grant Seafood Festival, the annual Brevard County Fair, the Brevard Marine Industries Association Boat Show, the Blue Water Open Deep Sea Fishing Tournament, and other related events to increase general public awareness of invasive exotic species in marine ecosystems, and the threat posed.
 - 7.10.5 Write a newspaper article about the environmental and economic impact of marine invasive exotic species.
 - 7.10.6 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.
 - 7.10.7 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) – meets monthly.
 - 7.10.8 Conduct eight classes for 60 commercial clammers concerning Indian River Lagoon water quality as potentially impacted by marine invasive exotic species.
 - 7.10.9 Conduct local workshops for K-12 teachers and interested citizens on marine invasives.
- 7.11 Improve the quality and quantity of coastal and marine habitat in Escambia County. (Diller)
- 7.11.1 Conduct local workshops for K-12 teachers and interest citizens on marine invasives.
 - 7.11.2 Develop coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems.
 - 7.11.3 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.
- 7.12 Improve the quality and quantity of coastal and marine habitat in Okaloosa and Walton counties. (S. Jackson)
- 7.12.1 Conduct local workshops for K-12 teachers and interest citizens about the recognition and management of invasive species in the coastal ecosystems.
 - 7.12.2 Develop coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems.

- 7.13 Provide general educational training and assistance to improve coastal habitats in Northeast Florida. (McGuire)
- 7.13.1 Conduct training for the 5th grade students (approx. 300 students), local and regional park staff and the general public about invasive species.
 - 7.13.2 Invasive species is a topic in the “Exploring our Environment” program which is offered at Marineland twice a year to a class of 20 adults each time.
 - 7.13.3 Invasive species is a topic that will be addressed in approximately seven summer camp programs (4-H and other) in 2004.
 - 7.13.4 Invasives are mentioned in the field component of the coastal Master Naturalist classes which are lead for Duval and Volusia counties (3-4 classes each year).
 - 7.13.5 Work with homeowner association in St. Augustine Beach to replant a section of dunes.
- 7.14 Provide general educational training and assistance to improve coastal habitats. (Stevely)
- 7.14.1 Present poster of oyster mapping work using GIS coverages and archived cartographic resources at World Fisheries Congress.
 - 7.14.2 Assist Tampa Bay Estuary Program in mapping historical locations of oyster reefs.
 - 7.14.3 Maintain functionary Sarasota Bay National Estuary Program Technical Advisory Committee in role as Chairman.
 - 7.14.4 Provide training to volunteers involved in mapping sediment types for anchorage survey in Jacksonville area.
- 7.15 A collaborative project with Florida Gulf Coast University, South Florida Water Management District, Florida Department of Environmental Protection and Sea Grant, will 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 placed in areas of historically documented reef areas. This project will be presented at the Estuary Enhancement Conference in Seattle, Washington – September, 2004. (Wasno)
- 7.16 Inform citizen groups about invasives which are coming into the Florida coastal ecosystems. (Sweat)
- 7.17 Provide general educational training and assistance to improve coastal habitats around Pensacola Bay. (Verlinde)
- 7.17.1 Provide aquatic nuisance species information to 4-H leaders, teachers, and the public at various talks and programs.
 - 7.17.2 Coordinate an oyster reef restoration project in East Bay. Oyster reef importance/ecology curriculum will be developed to support this project.
 - 7.17.3 Work with UF/IFAS West Florida Research and Education Center researchers on dune restoration research project. Will coordinate volunteers for planting, an informational kiosk at the site, a brochure and presentation about the project.
 - 7.17.4 Work with county and other agencies to coordinate funding for 330 acres of wet prairie/pine flatwood restoration project. Project will include an education program, and recreational activities.
 - 7.17.5 Continue to support Project Greenshores, a FDEP habitat restoration initiative.
- 7.18 Coordinate the Appreciation and Awareness focus area working group and serve as liaison to the Southeast Florida Coral Reef Initiative (SEFRCRI) coordinator. Develop a marketing identity and media awareness package and other educational initiatives. Funding will come from the United States Coral Reef Task Force. Some of the target audiences include boaters, fishers, divers and marine-related businesses. (Behringer)

- 7.19 Develop a shelling restoration program for the oyster fishery in Levy County by identifying a public site for collection of clam shells, developing local partnerships, and identifying funding sources. Clam shell is a byproduct of clam processing and makes an excellent cultch material for oysters. (Sturmer)

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 About 36,000 beachgoers are rescued from rip currents annually. About 30 rip current related deaths were reported in Florida in a recent year. The goal of this project is to develop rip current threshold criteria for rip current channels, identify conditions under which significant rip channels develop, and determine ways the beachgoing public can be warned of danger. It is a continuation of project R/C-S-40. (Thieke/Hanes/Dean: R/C-S-42)
- 8.3 Florida coasts are impacted by hurricane winds which create structural damage and public hazards. Affordable solutions to mitigate damage can only follow from an accurate quantification of the wind forces causing the destruction. This project will develop new instrumentation for ground-level wind fields, create tools to analyze the data and develop models to predict the effect of winds over a building. (Gurley/Pinelli/Subramanian: R/C-S-43)
- 8.4 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)
- 8.5 Forty-six percent of all hurricanes or tropical storms that pass over Florida will touch the St. Johns River watershed. A new offshore sentinel buoy near Jacksonville is providing weather and ocean conditions in real time. This NOAA coastal storms initiative will allow emergency managers to make better predictions on which areas to evacuate and determine the best evacuation routes among other uses. Florida Sea Grant is providing the education/outreach component of the project. This will be the final year of the project. (D. Jackson: E-T-10)
- 8.6 Florida Sea Grant Extension will continue its second year outreach activity as a component of the Southeast Atlantic Coastal Ocean Observing System (SEA-COOS). The four Sea Grant programs (North Carolina to Georgia) are cooperating in this regional project. The goal is to establish a dialog with non-scientific users, identify their information needs and the preferred formats and moods of information delivery. Florida will train its extension faculty, focus on regional groups (e.g., ports, hazards) and local sectors (e.g., fishers and emerging response offices), host sector workshops and convene three instate meetings with user groups. (On-going). (Spranger/Simoniello/D. Jackson/various county faculty: E/T-12)
- 8.7 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)
- 8.8 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)

- 8.9 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)
- 8.10 Help organize and participate in the National Rip Currents Conference scheduled for Jacksonville, Florida. (Spranger/Kearl)
- 8.11 At least 30 boaters will gain awareness of hurricane preparedness and how to protect their personal life and property by receiving the Hurricane Manual For Marine Interests. Knowledge gained will be measured by a survey at the end of training session and by the number of hurricane manuals distributed. (Crane)
- 8.12 Research and write at least two columns for the Apalachicola & Carrabelle Times Newspapers educating area homeowners on steps they can take to prepare for coastal storms. (Mahan)
- 8.13 Continue work with Franklin County Emergency Operations and Red Cross to educate residents on coastal storms. (Mahan)
- 8.14 Provide beach safety information at various events and programs. (Verlinde)

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 25 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-04-1)
- 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-04-2)
- 9.7 Extension faculty will attend at least four days of inservice training workshops or conferences that will support their educational programs. (All Agents)
- 9.8 Coordinate annual in-service meeting for Extension faculty that provides status of on-going research and extension activities, and organizes program planning efforts. (Spranger)

- 9.9 Serve as member of National Extension Tourism Program Planning Committee to coordinate annual conference that will be held in September 2004 in Orlando. (Spranger)
- 9.10 Serve as Extension Administrative Liaison in planning activities for annual Florida Association of Extension Professionals conference. (Spranger)
- 9.11 Continue coursework toward Master's Degree in Environmental Studies at University of West Florida. (Verlinde)
- 9.12 Continue coursework toward Master's Degree in Environmental Studies at Florida Gulf Coast University. (Wasno)
- 9.13 Continue planning work for a National Sea Grant Academy, and if funded serve on the initial staff for the first presentation of the Academy. This Academy will be designed to provide initial training and orientation for new agents and specialists from the 30 Sea Grant programs. The Academy will consist of two one-week sessions approximately six months apart with integrated distance learning between the sessions. It will be a nationally funded effort conducted by a rotating staff of four from various Extension programs. (D. Jackson)
- 9.14 Present session at the National Extension Tourism Conference as part of a 3-state presentation on successes and failures of clean marina programs in Florida, California and Texas. (D. Jackson)
- 9.15 Attend at least two one-day Coastal Training Program Workshops. At least one workshop will cover Wetland Restoration and Mitigation. (Mahan)
- 9.16 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. (Crane, Behringer)

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 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 Rockledge High School, the Clean Boating Partnership, and Brevard County government in production of approximately 100 Monofilament Collection bins to be distributed to Clean Marinas around the state of Florida – funding provided by the Clean Boating Partnership, bin-construction by 80 Rockledge High School Environmental Science Students.
- 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 Conduct public education programs in Miami-Dade County. (Crane)
 - 10.4.1 At least 75 volunteers who will participate in the Annual Coastal Cleanup will remove at least 50 bags of marine debris from the shoreline and will learn the basic concepts of the litter reduction. Knowledge gained will be determined by survey at the end of clean-up event. At least 80% of survey respondents will have learned concepts of litter reduction and will make a change to practice better litter reduction habits.
 - 10.4.2 A minimum of 15 out of 30 teachers who attend a teacher workshop will increase their knowledge on the basic concepts on the ecology of the coastal and marine systems involving invasive species and coral reefs and at least 10 teachers will teach this information to their classes. This increase in knowledge will be measured by pre and post test. Follow-up survey of teachers will indicate number of students reached with information from the workshop.

- 10.4.3 At least 50 volunteers will be recruited and trained to educate citizens on the impacts of discarded fishing line to the marine environment. Volunteers will construct bins, monitor bins, conduct shoreline clean ups, and survey recreational anglers on their awareness of the fishing line recycling program. Success of this activity will be measured by the number of volunteers who participate and the number of recreational anglers they have reached about the program. An oral presentation on the Mono Fishing Line Recycling Program will be presented at the Association of Natural Resources Extension Professionals (ANREP) in Wheeling, WV.
 - 10.4.4 At least 70% of youth (K-12 Grade) who will participate in marine lectures will increase their knowledge on the basic concepts of the coastal and marine systems such as coral reefs, marine debris, sharks, and sea turtles. Knowledge gained will be measured by survey at the end of the program. Of the anticipated audience of 200, at least 100 are targeted to increase knowledge.
 - 10.4.5 At least 13 adults will gain knowledge and interpretation skills of the marine environment by participating in the Florida Master Naturalist Coastal Module Class. This gain in knowledge and skills will be measured by a pre and post test.
 - 10.4.6 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 and post test.
 - 10.4.7 An educational poster titled “Have you Been Bay Friendly Today: will be developed with local stakeholder input on how to protect Biscayne Bay’s marine environment.
 - 10.4.8 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 500 people.
- 10.5 Stewardship of marine life will be enhanced through education. Three hundred 4th grade students will become more knowledgeable about the marine environment by attending a program at the St. Lucie County Marine Center. Two hundred 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. Three hundred 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 adaption to the environment. Two hundred 4-H, Indian River “Lagoon Days”, and other summer camp students will increase their knowledge of the Indian River Lagoon through field activities, such as beach seining, benthic sampling, and observation. (Creswell)
- 10.5.1 Conduct classroom instruction for “Motion in the Ocean” 5th grade program.
 - 10.5.2 Conduct ecology and canoeing instruction to 5th graders through the “Lagoon Days” program.
 - 10.5.3 Conduct field trip exercises with 4th graders through the “Ecosystem Explorer” program at the St. Lucie County Marine Center.
 - 10.5.4 Conduct field trip exercises with 7th graders through the “Ecosystem Explorer” program at the St. Lucie County Marine Center.
 - 10.5.5 Hold “4-H Indian River Exploration Summer Camp”.
 - 10.5.6 Provide marine day programs for 4-H summer camps (4).
- 10.6 The awareness of the citizens of St. Lucie County will be increased about the anthropogenic impacts on Florida’s coastal waters, and more specifically, the Indian River Lagoon. (Creswell)
- 10.6.1 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.

- 10.6.2 Continue bi-weekly radio broadcast “At Home in St. Lucie” (1/2 hour program) discussing topics related to the impacts of coastal development and mans’ activities on the marine environment.
 - 10.6.3 Conduct at least two workshops dedicated to public education of marine invasive species.
 - 10.6.4 Distribute invasive species information to retail pet outlets throughout St. Lucie County.
 - 10.6.5 Continue to work with “The Caulerpa Taskforce” to develop strategies for public identification of this and other algal invasive to the Treasure Coast.
- 10.7 Conduct a general marine environmental education program for youth and adults in Escambia County. (Diller)
- 10.7.1 Maintain and update the Escambia County Marine Extension website with local marine resource information, sea turtle education, and educational events.
 - 10.7.2 Continue support and development of educational programs for teachers, boaters and interested citizens on marine debris, coastal clean-ups, and monofilament line recycling.
 - 10.7.3 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.
 - 10.7.4 Develop marine environmental programs for local K-12 teachers and youth. Continue Resource Rangers video series and educational programming.
 - 10.7.5 Develop online or hard-copy newsletter or newspaper articles on local marine/coastal topics that are distributed to interest citizens.
 - 10.7.6 Provide Master Naturalist Program training on coastal systems to interested citizens and continue to develop a local volunteer program for marine extension.
 - 10.7.7 Develop and coordinate the Turtle Friendly Beaches program for sea turtle awareness and protection. Produce an education brochure on protecting sea turtles. Provide educational assistance and Sea Grant Extension representation to various sea turtle working groups.
- 10.8 Conduct a general marine environmental education program for youth and adults in Okaloosa and Walton Counties. (S. Jackson)
- 10.8.1 Develop educational programs for teachers, boaters and interested citizens on marine debris and monofilament line recycling.
 - 10.8.2 Work with volunteers in annual fall coastal clean-up campaigns.
 - 10.8.3 Work with Extension 4H Agents in the development of marine environmental programs for local clubs.
 - 10.8.4 Develop marine environmental programs for local K-12 teachers.
 - 10.8.5 Develop online or hard-copy newsletter or newspaper articles on local marine/coastal topics that is distributed to interested citizens.
 - 10.8.6 Provide Master Naturalist Programs featuring wetlands and coastal systems to interested citizens and establish a volunteer coastal program for marine extension.
- 10.9 Conduct a general marine environmental education program for youth and adults in Franklin County. (Mahan)
- 10.9.1 Work with Panhandle-area FSG Agents to provide technical and educational support for Marine Science 4-H Camps.
 - 10.9.2 Research and write at least 20 columns this year for the Apalachicola & Carrabelle Times Newspapers on marine-related topics.
 - 10.9.3 Present at least 10 Marine Updates to the Franklin County Board of County Commissioners on a variety of local and state marine issues.
 - 10.9.4 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.
 - 10.9.5 Teach at least one homeowner program on a marine issue or topic.

- 10.10 Conduct a general marine environmental education program for youth and adults in Northeast Florida. (McGuire)
- 10.10.1 Work with Texas SG and Puerto Rico SG to develop monofilament recycling programs.
 - 10.10.2 Present monofilament recycling workshop at National Marine Educator's Association annual conference.
 - 10.10.3 Continue to manage monofilament recycling in NE Florida.
 - 10.10.4 Represent FSG on the US Fish and Wildlife Service's manatee entanglement and manatee education working groups.
 - 10.10.5 Help coordinate beach cleanup programs in April and September (St. John County).
 - 10.10.6 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.
 - 10.10.7 If funded by EPA, create 4-H marine project books.
 - 10.10.8 Conduct teacher workshops for formal and informal educators on marine-related topics.
 - 10.10.9 Present workshop on field studies at National Marine Educator's Association annual conference.
 - 10.10.10 If funded by EPA, conduct two 2-day workshops on field studies for formal (K-12) and informal educators.
 - 10.10.11 Produce a quarterly newsletter which is distributed to over 700 interested residents.
 - 10.10.12 The newsletter includes information about selected marine topics and upcoming marine/coastal events.
- 10.11 Experienced, certified SCUBA divers are organized to dive Boca Grande Pass over an April two-day event 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/Jacoby)
- 10.12 Conduct a general marine environmental education program for youth and adults in Lee County. (Wasno)
- 10.12.1 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 is in the process of being 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 2004 will be held in early December.
 - 10.12.2 Monitoring and collection of used monofilament fishing line will continue. 29 PVC mono recycling bins were built and are being placed throughout Lee County at fishermen access points. Bins are used to have mono deposited for collection and recycling. Recycled material is sent to be melted down and used to build plastic fish habitats for freshwater lakes. Mono bins will be depicted on a statewide Mono Recycling website providing locations and educational resources. FGCU students will be trained to discuss monofilament recovery concerns with citizens at bin recycling stations. Students will be educated to discuss deleterious effects of mono on wildlife and habitat.

- 10.12.3 Educational kiosks will be placed at all Lee County boat ramps and several qualified fishing piers depicting the history of the Caloosahatchee waterway and the changes that have taken place. Panels will depict historical references about the Caloosa River and its influence on the settlement of Fort Myers and southern Florida.
 - 10.12.4 An educational two-panel kiosk depicting fundamental fishing techniques that target children and adults that are trying fishing as a new activity will be placed at the Yankee Beach Fishing Pier Kiosk. Children will learn species of fish that may be caught in their specific area, typical baits and lures that are successful for their targeted species; fundamental knots and landing techniques that minimize fish injury.
 - 10.12.5 A sport fishing camp for 4-H youth will be held in Lee County. Two additional staff/instructors have been recruited for this project. All staff has been trained to teach kids all aspects of fishing to include casting, tackle crafting, local pond biology, fish cleaning and equipment maintenance. Target audience will be urban children in after school programs.
 - 10.12.6 Participation will continue in the Florida Marine Mammal Stranding Network-SW Region. This group responds to all Charlotte, Lee and Collier marine mammal (dolphins, whales) strandings and assist FWC staff during manatee stranding events. Twenty-three biologists, veterinarians and local citizens make up membership.
- 10.13 Conduct a general marine educational program for youth and adults in Santa Rosa County. (Verlinde)
- 10.13.1 With UF/IFAS researchers, North Carolina State University and US Fish and Wildlife Service, coordinate and present at two stormwater best management practices workshops.
 - 10.13.2 Coordinate level 2 stream restoration workshop.
 - 10.13.3 Provide coastal information articles to various media outlets.
 - 10.13.4 Continue to support, coordinate and develop curriculum and videos for the Resource Ranger Program, and environmental education program for 4-H and students. The program includes curriculum, videos and field trips about coastal issues.
 - 10.13.5 Coordinate the 4th annual Seagrass Awareness Celebration.
 - 10.13.6 Teach Florida Master Naturalist Program wetlands and coastal modules.
 - 10.13.7 Coordinate 20th annual NW Florida Rivers Clean-up and International Coastal Clean-up.
 - 10.13.8 Develop educational programs for 4-H, teachers, boaters and interested citizens on marine debris and monofilament recycling.
 - 10.13.9 Work with extension 4-H agents in the development of coastal programs and activities for local clubs.
 - 10.13.10 Develop on-line newsletter concerning coastal issues.
 - 10.13.11 Provide coastal information and activities at various environmental events.
 - 10.13.12 Provide Santa Rosa County community leaders with coastal information. Support the SRC marine advisory committee.
 - 10.13.13 With Andrew Diller, provide “Sea Turtle Friendly Beaches” program to beach residents.
 - 10.13.14 Provide coastal issue talks to various community organizations.
 - 10.13.15 Support 4-H marine and county camps. Provide 4-H leaders and teachers with coastal information and opportunities.
- 10.14 Conduct 16th 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)
- 10.15 Offer public education through two workshops in Brevard County concerning environmental and economic issues impacting marine industries, and the constantly changing local, state, and federal regulations that affect such issues. (Combs)
- 10.16 At least 50 youth will learn environmentally and economically friendly management practices for recreational fishing. Knowledge gained will be measured by a survey after training session. (Combs)

- 10.17 Conduct a general marine educational program for youth and adults in Broward County. (Behringer)
- 10.17.1 Implement the Monofilament Recovery and Recycling Program (MRRP). Funding will be secured and volunteers will build the PVC recycling bins to place at local marinas. Volunteers will be contacted through Ocean Watch, a local dive club. Marina staff will be educated on the purpose and process of monitoring and collecting the used monofilament fishing line. Local bait and tackle shops will be identified as monofilament collection sites. The bin locations will be depicted on the statewide MRRP website providing locations and educational resources.
 - 10.17.2 Develop an interactive coral reef display for use at Water Matters Day in March 2004 to educate visitors on the coral reefs of Broward County, with specific emphasis on water quality. Approximately 2,000 people attended last year's event.
 - 10.17.3 In March 2004, 200 volunteers will be organized to remove trash and debris from the North Fork of the New River, on of the remaining natural waterways in Broward County. This waterbody is located in an economically depressed area. Last year volunteers removed 15 cubic yards of debris including a drum of toxic waste. Girl Scout troop leaders will be educated about the impacts of trash and debris in our waters and taught hands-on activities to engage their troops in (150 Girl Scouts) on the day of the event.
 - 10.17.4 In April 2004, 25 4-H youth will be educated on the coral reefs of Broward County. Through lecture and hands-on activities, the youth will understand the values of the coral reefs, identify the threats and impacts to the ecosystem and demonstrate what they can do to help.
 - 10.17.5 100 land based volunteers and certified SCUBA divers will be organized to remove trash and debris from Hollywood beach. Volunteers are educated on the impact that trash and debris has on our coastal environment. They are instructed to record the different types of debris collected from this one site. A total of 20 sites participate in this event. Additionally, a Coastal Cleanup/Sea Grant display will be created for the Broward County Government Center the week before Coastal Cleanup. September 2004.
 - 10.17.6 Serve as the marine resources panel representative for the Leadership Broward Foundation Class XXIII and present coral reef management and conservation issues to class participants as part of the History, Urban and Environment Day. LBF is a 20+ year old program that attracts prestigious professionals from the business, civic and non-profit communities to participate in its premier leadership development program. Participants learn about the infrastructure of Broward County and the critical issues it faces. October 2004.
 - 10.17.7 Increase manatee awareness and boater safety.
 - 10.17.7.1 A manatee education toolbox will be developed containing information and activities for informal and formal educators to use with their students. Through a workshop, 10 4-H leaders will be educated on manatee awareness and boating safety and show demonstrations from the toolbox. This toolbox will be available on loan to educators. October 2004.
 - 10.17.7.2 In honor of Manatee Awareness month, students and youth groups will be invited to participate in a poster contest to artistically demonstrate their knowledge of manatees and boating safety. School/club winners will enter a regional contest and winners will be selected by the Manatee Awareness Group – a regional group made of federal, state, local government and non-profit representatives. Regional winners are formally presented with plaques. November 2004.
 - 10.17.8 Partner with the Miami-Dade agent to conduct a workshop to educate middle school teachers on southeast Florida's coral reefs. Teachers will be instructed on coral reef ecology, threats and impacts and the Southeast Florida Coral Reef Initiative. November 2004.

- 10.17.9 Serve as mentor to a student chosen to participate in this County Commission-lead program. Provide qualified high school students comprehensive, structured work and hands-on experience to educate them on the professions available in public service. Fall Semester 2004.
- 10.18 Continue educational programs for teachers, boaters and interested citizens on monofilament line recycling. (Sturmer)
- 10.19 Develop and conduct a seminar series to explore the importance and regional impact of the Gulf of Mexico's marine resources on the coastal communities of the Big Bend region. (Sturmer)
- 10.20 Conduct a general shellfish aquaculture program for youth and adults. (Sturmer)
 - 10.20.1 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.
 - 10.20.2 Serve on a steering committee in developing a 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. (Sturmer)
 - 10.20.3 Provide educational programs on shellfish aquaculture to local K-12 teachers and to 4-H youth. (Sturmer)
- 10.21 Train 50 Extension Service Master Gardeners in identification and ecology of coastal plants. (McGuire)
- 10.22 Organize 23rd Annual Cortez Commercial Fishing Festival. Annually this festival reaches 15,000 citizens with information in environmental issues, and raises \$35,000 - \$55,000 for acquisition of environmentally sensitive land. (Stevely)

Key to Individual Responsibilities

| | |
|---------------------|-------------------------------|
| Adams | 5, 6, 9, 10, 11, 12 |
| Ankersen | 17 |
| Ault | 23 |
| | |
| Baker | 9, 27 |
| Balaban | 14 |
| Behringer..... | 20, 25, 30, 36 |
| Benetti..... | 9 |
| Beusse | 17 |
| Bohnsack..... | 23 |
| Burnett..... | 21 |
| | |
| Calman | 9 |
| Carrier | 5 |
| Cato | 3, 29 |
| Chanton..... | 21 |
| Chapin..... | 27 |
| Clark..... | 4 |
| Coen | 23 |
| Collins..... | 23 |
| Combs | 6, 11, 15, 19, 21, 24, 31, 35 |
| Corbett..... | 21 |
| Crane | 19, 28, 30, 31 |
| Creswell | 7, 8, 9, 10, 12, 19, 32 |
| | |
| D. Jackson..... | 18, 30 |
| Damron | 31 |
| Dean | 27 |
| Deyle..... | 27 |
| Diller | 7, 20, 22, 24, 33, 35 |
| Duckworth..... | 14 |
| | |
| Ehrhardt..... | 5 |
| | |
| Fann..... | 17, 18 |
| Feldheim | 5 |
| Fields..... | 3, 4 |
| Fik | 18 |
| Floyd | 5 |
| Francis-Floyd | 9 |
| | |
| Gaines | 9 |
| Gregory | 6, 8, 15, 20 |
| Grizzle..... | 23 |
| Gruber | 5 |
| Gulig | 14 |
| Gurley | 27 |

| | |
|-------------------|-------------------------------|
| Hamann | 17 |
| Hanes..... | 27, 28 |
| Harwood..... | 14 |
| Heil..... | 14 |
| Heithaus | 5 |
| Hoenig..... | 5 |
| Holland..... | 5 |
| | |
| Irlandi..... | 23 |
| | |
| Jackson..... | 27 |
| Jacoby | 5, 21, 22, 23, 24, 34 |
| Jamir..... | 14 |
| Jamison | 14 |
| | |
| Kane | 27 |
| Kearl..... | 3, 28, 31 |
| Kem..... | 3, 4 |
| Kennedy | 28 |
| Kerr | 3 |
| Kirkpatrick | 21 |
| Kristinsson | 14 |
| | |
| Lin..... | 9 |
| Lindberg..... | 5 |
| Loftus | 23 |
| Longley | 3 |
| Lopez..... | 3 |
| Lorenz | 23 |
| Luo | 23 |
| | |
| Mahan | 7, 10, 11, 16, 22, 28, 30, 33 |
| Marcus..... | 9 |
| Mari..... | 3, 4 |
| Marshall | 5 |
| Mason..... | 5 |
| Masterson..... | 4 |
| McGuire | 5, 20, 22, 25, 34, 37 |
| Miller..... | 23 |
| Murie..... | 5 |
| | |
| Nico..... | 23 |
| Niezrecki..... | 17 |
| | |
| Olsen | 23 |
| Olson..... | 5 |
| Orhun | 9 |
| Otwell..... | 5, 14, 15, 16 |
| | |
| Pinelli | 27 |

| | |
|-------------------|-----------------------------------|
| Pomponi | 4 |
| Price | 21 |
| Reed | 4 |
| Rhyne | 9 |
| Rodrick..... | 3, 14 |
| Rubec | 23 |
| S. Jackson..... | 7, 10, 22, 24, 33 |
| Sargent | 18 |
| Scarpa..... | 9 |
| Schneider..... | 3 |
| Score | 21 |
| Seaman..... | 3, 4, 23, 29 |
| Serafy | 23 |
| Shivji..... | 5 |
| Sidman | 17, 18 |
| Simoniello..... | 27 |
| Smith..... | 23 |
| Soti | 3, 4 |
| Spranger | 5, 17, 21, 23, 24, 27, 28, 29, 30 |
| Stamper | 9 |
| Stevely..... | 7, 8, 17, 20, 25, 37 |
| Sturmer..... | 9, 10, 11, 12, 13, 16, 26, 37 |
| Su | 23 |
| Subramanian | 27 |
| Swart | 21 |
| Sweat..... | 8, 10, 15, 18, 25, 35 |
| Swett | 17, 18 |
| Thieke | 27, 28 |
| Tilghman..... | 9 |
| Trexler..... | 23 |
| Turingen..... | 9 |
| Verlinde..... | 8, 20, 22, 25, 28, 30, 35 |
| Wagner..... | 31 |
| Walters | 23 |
| Wasno | 8, 10, 11, 15, 20, 25, 30, 34 |
| Welt..... | 14 |
| Whitehouse | 31 |
| Wilhelm..... | 21 |
| Wilson..... | 27 |
| Wright | 3, 14 |
| Zimmerman..... | 3, 31 |