"Performance Counts," 2002 Annual Report (TP 129)

The Florida Sea Grant College Program is committed to enhancing the practical use and conservation of coastal and marine resources for a sustainable economy and environment in a state whose coastline stretches for over 1,300 miles. 2002 represents the 32nd year for Sea Grant in Florida.

This annual progress report for 2002 is the fifth annual progress report submitted by Florida Sea Grant under the program evaluation procedures adopted during 1998 by the National Sea Grant College Program. This report covers the year 2002, but some historical data are included to provide baseline information for subsequent annual progress reports.

Florida Sea Grant had eleven different NOAA grants in effect during 2002. This annual report covers work completed and ongoing under all eleven grants.

Hard copies of this report (TP 129) may be obtained by contacting Florida Sea Grant.

Marine Biotechnology || Aquaculture || Seafood Safety || Fisheries || Marine Education
Boating & Waterways || Water Quality || Coastal Habitats || Coastal Storms || Graduate Education

University of Florida | Bldg 803 McCarty Drive | PO Box 110400 | Gainesville, FL| 32611-0400
(352) 392- 5870 - SUNCOM 622-5870 | (352) 392-5113 (fax) | Finding Florida Sea Grant
Contact the Webmaster

TABLE OF CONTENTS

1.0 INTRODUCTION

The Florida Sea Grant College Program is committed to enhancing the practical use and conservation of coastal and marine resources for a sustainable economy and environment in a state whose coastline stretches for over 1,300 miles. 2002 represents the 32nd year for Sea Grant in Florida. The program operates through a statewide, research, education and extension partnership of state and federal agencies, businesses and citizens. All eleven public universities, three private universities, and two private non-profit research laboratories constitute this virtual college without walls. The University of Florida serves as the host campus. Florida Sea Grant is one of 31 Sea Grant programs nationwide that together form the National Sea Grant College Program as authorized by federal legislation. It is the only university-based, statewide coastal research, education, extension/outreach and communications program in Florida.

This annual progress report for 2002 is the fifth annual progress report submitted by Florida Sea Grant under the program evaluation procedures adopted during 1998 by the National Sea Grant College Program. This report covers the year 2002, but some historical data are included to provide baseline information for subsequent annual progress reports.

Florida Sea Grant had eleven different NOAA grants in effect during 2002. This annual report covers work completed and ongoing under all eleven grants.

Florida Sea Grant awards from NOAA activities during calendar year 2001.			
Number	Keyword Identifier	Start Date	Current End Date
NA76RG-120 NA16RG-2195	Omnibus research, extension, communications and management	02/01/97 02/01/02	09/30/03 09/30/04
NA06RG-0046	Knauss Fellow	02/01/00	01/31/02
NA06RG-0068	National Aquaculture	02/01/00	07/31/02
NA06RG-0435	Florida Bay	09/01/00	08/31/02
NA16RG-1076	Knauss Fellow E/ST-24	02/01/01	01/31/02
NA16RG-1075	Knauss Fellow E/ST-25	01/02/01	01/31/02
NA16RG-1074	Knauss Fellow E/ST-26	02/01/01	01/31/02
NA16RG-1720	Aquatic Nuisance	10/01/01	09/30/02
NA16RG-1298	US/Japan Natural Resources	09/01/01	08/31/02
NA17RG-2992	South FL Marine Ecosystem Outreach	09/01/02	08/31/03

A summary of recent Florida Sea Grant accomplishments follows, with details for 2002 in the remaining ten sections of this progress report.

Addendum to 2002 Performance Counts

Selected
Impacts, Outcomes and Activities[1]
from Research, Education, Communications
and Extension Program Investments, 1999-02.

James C. Cato
14 January 2003

Aquaculture

Florida Sea Grant has cooperated with a number of partners and the industry in providing business management training, nursery technology and seafood safety techniques to create a hard clam industry that did not exist a decade ago. Florida's hard clam industry now annually generates nearly $34 million in output, $9 million in labor income and $12 million in value added.

Florida Sea Grant was the lead sponsor and organizer of the second international conference on marine ornamental species, Marine Ornamentals 2001: Collection, Culture & Conservation. Building on the first conference organized by Hawaii Sea Grant, 19 sponsors including nine Sea Grant programs, joined to create a program that attracted 336 participants from 23 countries. Program evaluations showed that 67% of the attendees would attend a subsequent conference and 91% indicated that the conference should be continued as is or expanded. Iowa State Press has been contracted to publish a book containing the scientific papers from the conference, expected in May 2003.

A Florida Sea Grant project has demonstrated that Dermo-free (void of *Perkinsus marinus*) oysters can be produced in Florida. The ability to produce these oysters in Florida with only slight modifications to existing hatchery technology has tremendous implications for the shellfish industry.

Tremendous progress in developing hatchery and grow-out technology for fingerling mutton snapper and greater amberjack has been achieved through Florida Sea Grant research in cooperation with an industry partner, the Aquaculture Center of the Florida Keys. Project results are now being applied in a full-scale cobia grow-out project in Puerto Rico, funded by a National Sea Grant strategic research initiative.

Florida Sea Grant cooperated with Michigan Sea Grant, Aquatic Designs, Inc., and Universidad Cento Americano in Nicaragua to demonstrate commercial-scale shrimp culture system using zero water-exchange technology. The project included pond construction, aeration installation and regulation, shrimp stocking, grow-out and final harvest. A complete economic analysis was provided. Two training workshops were held for farmers, bankers and regulators in Nicaragua and 85% of the attendees said they would use the information during the next growing season.

Florida Sea Grant scientists assessed the short-term impacts of rapid salinity declines on hatchery-produced clam seed in the Cedar Key area. Short-term salinity fluctuations were determined to be greater than suspected and corresponded with reports of high seed mortalities by growers. Growers are now using this information to make decisions about when to plant and transfer seed during salinity fluctuations.

[1] These examples are summarized from Florida Sea Grant annual Performance Counts reports for 1999, 2000, 2001, and marine extension annual reports for 2002. (These impacts, outcomes and activities are organized under the Theme Team program area categories as listed by the national Sea Grant network. For Florida Sea Grant, no activities are reported for the digital ocean or urban coast categories.

Florida Sea Grant aquaculture specialists were instrumental in obtaining sanctions to allow hard clam growers to qualify for USDA crop insurance -- the first eligibility of its kind for marine aquaculture in the United States.

Florida Sea Grant research on the investment potential of aquaculture and marketing of the Florida Bay Scallop included restocking efforts that contributed to the State's re-opening of a recreational scalloping season in Citrus and adjacent east coast counties in 2002, after a 9-year shut-down. More than 2,500 informational brochures on recreational scalloping were distributed to tackle shops and marinas in the region, and a survey was initiated with the Citrus County Tourist Development Council to determine the economic influence of scallops to the region.

Florida Sea Grant Extension faculty teamed with agency and university partners to organize the 5th annual Florida Hard Clam Industry Meeting, held in 2001. Seventy-five clam growers and primary processors learned about dry tempering validation, reduction of red toxins in clams, clam size limits in northeastern states and federal and state and regulatory issues.

Florida Sea Grant faculty organized a day-long workshop to examine the role of genetics in the clam culture industry. Thirty percent of the seed suppliers in Florida attended the workshop and 85% of them rated the workshop high and indicated they improved their understanding of genetic initiatives.

Marine Biotechnology

Applying the tools of biotechnology, Florida Sea Grant researchers are developing ways to duplicate natural products from marine organisms that can potentially be used as life saving drugs. One compound derived from mangrove tunicates holds promise as a potent anti-tumor treatment.

Despite Florida's recent entry into marine biotechnology, Florida Sea Grant accomplishments include discovery, licensing and development of a potent anti-cancer compound; development and licensing of a process to manufacture anti-inflammatory agents from local corals; and coastal-specific genetic selection of sea oats for erosion prevention and dune restoration efforts statewide.

Florida Sea Grant has created a virtual statewide academic department of faculty in marine biotechnology. A statewide directory of faculty and their interests/expertise in this area is available online. Two statewide meetings with industry have been held, the latest in 2002, to transfer scientific results to the marketplace and to link faculty and students with potential industry partners.

Based on methods developed and results obtained from a Florida Sea Grant research project, one industrial partner, Research Genetics, Inc., has produced a marine sponge cDNA library that is being used for the production, testing and demonstration of custom sponge-specific microarrays.

Coastal Hazards

Florida Sea Grant research results in disaster mitigation are being used to evaluate permits both for retrofitting existing coastal structures and for new construction in the coastal zone. Findings also help local communities develop risk-based policies for funding the costs of hurricane emergency management services.

Florida Sea Grant funded faculty developed and successfully tested a new gaming simulation as a training tool for disaster recovery and mitigation. Workshops based on "Simulation Training on Recovery and Mitigation (STORM) were attended by 78 local officials and 24 state agency staff. The STORM approach is suitable for use not only in Florida, but for any coastal state or U.S. territory.

A prototype remote sensing data system developed by Florida Sea Grant researchers has the capability to measure the entire data acquisition from inside a house during severe coastal wind events such as

hurricanes. The accompanying software enables on/off line visualization and mapping of the collected data. The system is now being tested.

Micro-propagation techniques developed by Florida Sea Grant researchers, working alongside innovative coastal plant nurseries, now allow the production of genetically superior sea oats being used to restore Florida's coastal dunes on a statewide basis. The principal industry partner, and one user of the technology, EcoGroup International Corporation (formerly Bundy Nurseries), Parrish, Florida, was recognized in Florida Trend Magazine (January 2003) as the largest producers of sea oats on the planet.

Florida Sea Grant is conducting the outreach and extension component of the NOAA Coastal Storms Initiative, a study of the St. Johns River Watershed. This first pilot project involves several other agencies within NOAA for research and data cataloging. The result will be a smaller footprint of prediction for storms, amelioration of effects of storms, and better planning efforts based on knowledge of potential for storm surges, flooding, and vulnerability to contaminant release during storms.

Florida Sea Grant is in the start-up stage as a partner in the Southeast Coastal Ocean Observing System (SEA-COOS) project in identifying stakeholders, providing information on the various projects and presenting results of the studies that will take place over the next months and years. This integrated effort, in cooperation with Sea Grant programs in North Carolina, South Carolina, Georgia and Florida, and a host of universities and agencies, is the Southeast U.S. contribution to create a national coastal ocean observing system.

Coastal Communities and Economies

Working with local governments, Florida Sea Grant has developed an award-winning plan to manage boating in southwest Florida's waterways that minimizes the impact of boats to the environment. The Florida legislature in 2002 authorized a pilot program in two Florida counties that allows general waterway/canal dredging permits if they follow Florida Sea Grant scientific guidelines. The end result is environmentally friendly permitting at lower cost in less time.

Florida Sea Grant produced a prototype small-craft chart with NOAA's Marine Chart Division in concert with NOAA's Coastal Service Center. The chart covers 150 miles of Florida's southwest coast and uses advanced mapping technology and superimposed imagery to include environmental and navigation information needs of the contemporary recreational boater. Added components such as shore-based landmarks, location of protected or sensitive areas such as sea grass beds, designated waterways and preferred anchorage information are incorporated into the new charts together with the latitude, longitude and bathymetry of traditional navigational charts.

Florida Sea Grant legal specialists developed a model harbor management ordinance that was adopted by the Regional Harbor Board in southwest Florida. The Town of Ft. Myers Beach and the Sarasota Sailing Squadron have adopted anchorage management plans based in part on the model ordinance. In addition, a five-year strategic plan was developed for the West Coast Inland Navigation District. A highly successful continuing education course for the Florida Bar Association entitled "Recreational Boating and the Environment," was developed and taught in 1999 and 2002.

Florida Sea Grant and the West Coast Inland Navigation District have published two volumes on the Historical Geography of Southwest Florida Waterways. The area of coverage is from Anna Maria to Lemon Bay (Volume I) and Charlotte Harbor to Cape Romano (volume II). The documents provide a historical perspective on Florida's coastal waterway environment and development history.

Florida Sea Grant is a full partner in the Florida Clean Boating Partnership, the original clean marina program in the nation. Contributions have included writing the curriculum for workshops on clean marinas and clean boatyards, participating in presentation of these workshops, and chairing committees on the partnership. The result to date of this collaboration between Florida Department of Environmental

Protection (funding) and the industry lead partnership is 56 clean marinas and 12 clean boatyards, with about 150 more “in the pipeline”. Ten other states are now involved in clean marina programs and six more are contemplating startup. Most of these programs have used elements of the Florida Clean Marina model.

During 2002, a $1.5 million payment from Carnival Cruise Lines was made to the University of Florida as the result of a federal court case involving environmental monitoring of ocean pollution laws. A Florida Sea Grant endowment has been established with the funds with the revenue from the endowment to be used in supporting the boating and waterway management program.

Ecosystems & Habitats

Florida Sea Grant has been active for more than two decades in advancing the scientific basis and technology of artificial reefs, and in advising anglers, divers and resource managers on reef planning, deployment and use. Sea Grant marine agents are routinely involved with artificial reef permitting in Florida coastal counties and in working with their county artificial reef coordinators.

To better predict the health of coastal waters and counter the growing problem of non-point source pollution, Florida Sea Grant researchers are developing innovative ways to track, measure and rate contaminants that flow through groundwater and ultimately into the coastal ocean.

A rapid and sensitive method has been developed for the quantitative detection of pathogenic human enteroviruses from coastal waters. An alternative lower coast technique for the rapid identification of enteroviruses was also developed. These findings are now being reported to the scientific community.

Florida Sea Grant as a major partner, managed a four-year Florida Bay Education project that ended in 2002. Over the life of the project, the five million residents of South Florida were educated using the scientific findings of the 100+ ongoing research projects in Florida Bay. NOAA was key partner and funded much of the research. Project profiles were completed and distributed in English and Spanish. A resource directory, a quarterly newsletter and a series of Florida Bay Watch synthesis and analysis reports were completed with partners. The project assisted with the organization, structure, and published proceedings of the Florida Bay Science Conferences in 1999 and 2001.

Florida Sea Grant collaborated with the University of Florida's Center for Aquatic and Invasive Plants and the State's Department of Environmental Protection to develop a website on each of 24 species of invasive aquatic plants (http://plants.ifas.ufl.edu). The most important original scientific literature on each plant has been compiled along with original photographs, line drawings and management information. A full-color photomural was produced and distributed statewide to managers and educators, depicting 37 invasive non-native plants in the U.S., including ten species found only in Florida.

Florida Sea Grant has completed a recreation user study of Rookery Bay, a NOAA National Estuarine Research Reserve. It recommends which recreation management measures will work in a pristine coastal environment as opposed to traditional land-based recreation areas. Two important measures for this site that will affect user behavior are perceptions of environmental impact and the behavior of boaters.

Education & Human Resources

Since 1986, Florida Sea Grant funding has assisted 169 students in the completion of their degrees from Florida universities while working on Sea Grant projects. Thirteen of these students are now working in federal jobs, with seven employed in NOAA. Another 41 students are in the process of completing degrees, and 75 more have been supported by private funds generated by Florida Sea Grant.

At least 25% of Florida Sea Grant's federal research funds support graduate students working on a research project with a faculty advisor. About 20 graduate students per year are completing degrees with Florida Sea Grant support.

Florida Sea Grant faculty and communications staff produces between 80 and 90 publications per year. These range from scientific journal articles to workshop training materials and brochures for the general public. An informative website is maintained to ensure access to all Florida Sea Grant information (www.flseagrant.org).

Florida Sea Grant Extension faculty created and delivered 198 presentations specifically for workshops and conferences in 2001.

As an example of ongoing citizen education activities, one Florida Sea Grant agent made presentations to the Barefoot Bay Garden Club on invasive exotic species and their impact on the Florida environment, to the Eau Gallie Yacht Club marine summer camp on invasive species and to 150 commercial clammers in four workshops about how to recognize the green mussel, an invasive species.

A Florida Sea Grant agent educated over 1,500 adults and children in one Florida county in 2001. Ways to protect sea turtles were presented, including reducing artificial lighting, protecting dune systems and reducing marine debris. A follow-up survey indicated that all participants remembered at least one of the techniques.

In one other example of general education, a Florida Sea Grant agent taught 182 high school students the general concepts of aquatic husbandry, the general types of systems used to culture aquatic organisms and the similarities between aquaculture and land-based agriculture. Effectiveness testing indicated that the knowledge rate of the group increased of 20% to 80% of them increasing their understanding of the subject.

Florida Sea Grant supported the development of a coastal module for the statewide cooperative extension Master Naturalist Program in 2002. This multi-media training unit has been widely used in training trainers and is available for educational use statewide.

Fisheries

Using innovative modeling techniques, Florida Sea Grant scientists are predicting the health of the spiny lobster fishery and have competed an economic analysis of the State's trap certificate program. These results have been presented to the commissions that regulate and manage the fishery.

During 2000-02, a total of nine faculty receiving Sea Grant research (7) or extension (2) funding served on the scientific and statistical committee or an advisory panel of either the Gulf of Mexico Fishery Management Council or the South Atlantic Fishery Management Council. This ensures that the latest research results or requested information feeds directly and without delay into the NOAA fishery management process.

Florida Sea Grant scientific involvement during 2001 suggested that proposed options for reducing shrimp by-catch in the pink shrimp fishery in the Dry Tortugas would not work if existing by-catch reduction devices (BRDs) were used. Additional participation assisted in a recommendation that the Gulf of Mexico king mackerel population was no longer over-fished and that over-fishing criteria for cobia be established. Florida Sea Grant provided testimony on fisheries issues at four meetings of the Florida Fish and Wildlife Conservation Commission.

The largest fishing county in Florida is Monroe County (Florida Keys) where about one-fourth of the county's commercial fishing activity occurs. The four leading species are king mackerel, spiny lobster, snapper/grouper and stone crabs. Florida Sea Grant economists and biologists have completed an

analysis of these fisheries that are targeted by the same fishermen on a seasonal basis. This has produced framework information that will allow the managers to estimate the impact in one of the fisheries when management regulations are changed in another.

Florida Sea Grant analysis of the NOAA/NMFS economics data for the swordfish, tuna, sharks and other pelagic species fleet in the North Atlantic indicated that the vessels in the fishery are varied in their economic characteristics. Moreover, managers will need to take this variation into account when estimating the economic impact of proposed regulations on the fleet. Effects on individual vessels and their resultant economic behaviors will be similarly varied.

During 2001, Florida Sea Grant organized an artificial reef workshop for 35 participants, including 18 artificial reef coordinators from 10 coastal counties. The latest scientific findings were presented along with training in the latest technology on evaluation, design, planning, permitting, management and monitoring.

Federal fishery managers indicate that the recreational catch rate in some grouper fisheries is 85% undersized. The mortality rate of these released fish is high. In response, Florida Sea Grant funded research to develop techniques to deflate the swim bladder of these fish and increase the survival rate. These have been made available in articles of sport fishing magazines, local fishing column writers in newspapers, and in workshops. The use of circle hooks to reduce the catch of undersized fish is being promoted and a venting tool has been developed with over 5,000 distributed. Over 90% of participants in some workshops say they will use the tools. They have been distributed in over 12 states and five other countries.

Local radio was used in March and September, 2001 by Florida Sea Grant in one county to teach residents about artificial reefs and the biology, regulations, fishing ethics and fishing opportunities for local coastal fish species. The audience was measured at 12,000 listeners.

Seafood Safety and Science

Florida Sea Grant led the formation of the Seafood HACCP Alliance in 1994 and has coordinated the program since that time. This truly Sea Grant network-wide group and its agency and industry partners have trained more than 16,000 seafood processors and regulators in seafood-related Hazard Analysis and Critical Control Point procedures, required by federal regulation since 1996. Florida Sea Grant manages the supply of English and Spanish seafood HACCP training curriculum materials.

Florida Sea Grant continued its tradition of providing international training in seafood safety and quality. A Latin America Shrimp School was held in Nicaragua in 2001, with training in both HACCP procedures and sanitation. The course was taught in Spanish and materials were provided in English and Spanish. 87.5% of the 24 attendees rated the course very effective and 12% rated the course effective.

Florida Sea Grant funded researchers determined that limited freezing of oysters would reduce the levels of *Vibrio vulnificus*. Although consumers may detect fresh from flash-frozen oysters, the technique provides processors with a consumer-safe alternative marketing strategy. The flash-frozen product was demonstrated at Aquaculture Expo in Orlando, Florida in 2001.

The Florida Sea Grant Franklin County Extension Agent conducts briefings for the Franklin County Board of Commissioners and the oyster industry to transfer to them the latest information about *Vibrio vulnificus* in oysters. Technical support is provided to industry members that attend the meetings of the Interstate Shellfish Sanitation Conference, a group that influences the regulations of the oyster industry. Oysters are the main seafood commodity in Franklin County.

Florida Sea Grant's seafood specialist continues to interact directly with key industry, scientific and regulatory groups. They include the Seafood Committee of the Association of Food and Drug Officials;

Post-harvest Technology Committee, Interstate Shellfish Sanitation Conference; Seafood Division, Institute of Food Technology; Committee on the “Status of Performance Standards for Seafood Safety, National Academy of Sciences; Executive Director of the Seafood Science and Technology Society of the Americas; and U.S. Representative to the Board of Directors, International Association of Fish Inspectors.

The Aquatics Food Products building at the University of Florida was constructed in 1997 at a cost of $1.6 million. The money was raised by Florida Sea Grant, including 50 percent of the funding from private seafood industry contributions. Since then it has fostered a steady stream of research and educational programs that have involved hundreds of collaborators and participants, including those engaged in Florida Sea Grant funded research, HACCP seafood safety training, seafood processing schools, and joint undertakings and testing done together with private industry and government agency personnel.

2.0 PROGRAM ACCOMPLISHMENTS AND BENEFITS

"Performance Counts"

Acceptance of Sea Grant College status places a responsibility on that college for the continued pursuit of excellence in marine research, education and extension. During 1991 a "measures of performance plan" was developed for use by Florida Sea Grant at its administrative headquarters, the University of Florida, in assessing performance. This plan has been revised and used annually to describe the achievements of Florida Sea Grant, in terms of the efforts projected for the year in its annual plan, and is intended also to serve the needs of the University of Florida in generally furthering its evaluation of academic programs. The plan includes measures of performance for both the programmatic aspects of Sea Grant and for its administrative procedures.

Measuring Florida Sea Grant performance presents a challenging task due to the unique attributes of the program. Research is funded in many universities statewide. Extension faculty are located statewide. In all cases, research and extension faculty are integrated into the appropriate academic unit and report their annual academic activities through that unit. Collecting and interpreting all these activities each year necessitates in one sense, another bureaucratic layer. But using the Sea Grant umbrella, this is accomplished. In addition, Sea Grant records annually the students funded, papers published, and accomplishments and benefits, etc., on a project-by-project basis, and obviously records its own publications and media accomplishments through its Communications Program. The Sea Grant Extension Program also completes an annual accomplishment report, and the Sea Grant administrators work with all program components on a daily basis. Some leakages do occur in our ability to track performance, however. For example, we sometimes do not know of scientific articles published several years after the end of a project, although that faculty member reports that article in his or her own achievement report to his or her academic unit. The bottom line is that even though Sea Grant has far-flung multi-disciplinary and multi-institutional programs, every attempt is made to report on performance as best possible without expending additional precious resources to accomplish that goal. Even then, Sea Grant will be viewed as an efficient, productive program that benefits the people and the coastal resources it is designed to serve.

Strategic Issues

Florida Sea Grant's Strategic Plan for 1998-2001 is organized around three major areas: (1) Economic Leadership, (2) Coastal Ecosystem Health and Public Safety and (3) Education and Human Resources. Each of these major areas contains from two to five goals. Specific tasks are then defined for each goal as a way to guide faculty and program partners over the next four years to strategically invest capital and labor in the most effective way and focused on the most critical programs. This strategic plan was adopted on 1 February 1998, with an implementation plan that defined specific tasks scheduled for completion in 1998 or 1999. The plan was revised slightly for 2000 and 2001, with a new implementation plan enacted. Thus, for this 2001 annual report, program accomplishments and benefits are reported under those goals and tasks scheduled for 2001 completion in the Florida Sea Grant Implementation Plan. Research results are shown by (faculty name: project number). Extension results are shown by (faculty name) or (name of state major program leader: name of faculty completing task).

Economic Leadership

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

1.1 A statewide faculty task force formed by Florida Sea Grant in 1998 to advance marine biotechnology will continue to operate. The goal is to partner with industry in a way that will yield both state and industry funds to support marine biotechnology research and economic growth in Florida. (Seaman/Cato)

The task force has been expanded to a committee of representatives of key academic interests, who continue to work with economic and research sectors to advance this field. For example, the third Florida summit on marine biotechnology was held, attracting 73 attendees, the highest number yet.

1.2 A mixture of pseudopterosins is sold commercially in skin creams and some have potential as anti-inflammatory and analgesic agents. The overall goal of this project is to develop a biotechnological production method of the pseudopterosins and seco-pseudopterosins from the sea whip and to test them for their anti-inflammatory activity. (Kerr: R/LR-MB-8)

The two most important advances of this grant are the rapid elucidation of the biosynthetic pathway leading to the pseudopterosins (as a reference point, only the first two steps in taxol biosynthesis have been confirmed) using radioactivity-guided isolation, and purification of the cyclase. The enzyme is not yet purified to homogeneity but this is expected very shortly. When complete this will lay the groundwork for the development of a biotechnological production method of these potent anti-inflammatory agents. The significance of the progress made is that rapid gains have been made in understanding the biological origin of one of the most widely used marine natural products.

1.3 Protection of marine surfaces against fouling organisms is not only a big business, but also a difficult process to make coatings environmentally friendly. The world market for marine paints is over $2 billion annually. A worldwide ban on some paint ingredients will occur in 2003. The goal of this project is to develop nemertine bipyridyls from marine species, which have potential as potent antifouling agents. (Kem/Soti: R/LR-MB-9)

The species *Amphiporus angulatus* has been found to possess the widest variety of pyridyl alkaloids thus far. We have found more than 15 different alkaloids and identified the structures of the most abundant compounds. We have selected as primary candidates for field tests of antifouling activity the two bipyridyls 2,3'-BP and 2,2'-BP, based on their high potencies, economical syntheses, and desirable characteristics as models for future development of related analogs.

1.4 One solution to increase resistance by humans to pathogen treatment therapy is to identify novel antimicrobial compounds, which can serve as leads in drug discovery programs. Marine microbes are an exciting potential source of compounds. Bacteria will be isolated from several species of Floridian tunicates and sponges that produce bioactive compounds and tested for potential as clinical antimicrobiological agents. (Baker, B./Grimwade/Leonard: R/LR-MB-10)

Most searches for microbial bioactive compounds have revealed that approximately 10% of microbes produce active metabolites. Preliminary data indicate that focusing a search

on invertebrate-associated microbes, at least from warm waters, yields a significantly higher percentage of producing microbes. The transposon that was developed was a modification of a commercially available product. This transposon appears to be capable of generating selectable knock-out mutants in diverse marine bacteria. Having the ability to perform transpositional mutagenesis should facilitate all studies on marine bacterial physiology.

1.11 The biotechnology industry of Florida ranks 12th in size nationally. Neither it nor the marine-related sector have been assessed for needs, opportunities, and bottlenecks. This project prepared a characterization for industry use and long-range program development in Florida Sea Grant. Only a few firms out of the FIOFlorida core membership have any active involvement in the field, while several would like to learn more about opportunities. This aim is consistent with the FSG long-range planning goal for economic leadership. In case of biotechnology, a "clean" industry with jobs paying twice the national average, and the retention of Florida-educated scientists and technicians are common goals of the industry and academia. (Seaman/Scott: PD-02-03)

Florida's biotechnology industry is not large, ranking 10th in number of companies among all states, according to an Ernst and Young (2001) report. To determine its involvement with ocean-related subjects (e.g., "drugs from the sea") we contacted the 40 "core" organizational members of BIOFlorida, the statewide trade association. With guidance from Enterprise Florida, we posed questions about each organization's (1) effort in biotechnology overall and (2) any current or planned activity related to ocean resources and (3) level of interest in learning more about the field. Many biotechnology companies in Florida are small. While 22 of them provided information for this study, in several other cases either individuals simply were not available to respond to our telephone calls due to work outside the office, or else calls were received by answering machine instead of a receptionist. Most Florida companies focus on medical aspects of biotechnology (17 of 22 respondents), four focus on agriculture, and one addresses defense, while none addressed industrial compounds, quality of products or environment, or aquaculture. There is equal emphasis among the three activities of production/manufacturing, research, and business development/services for Florida biotechnology companies. (Eleven companies identified each of the three as major activities, with some identifying more than one.) Ocean-related biotechnology is at a low level in Florida. Five of the 22 businesses had involvement with aquatic and marine subjects, including two focused on medical aspects of plant and fish physiological processes. A majority of Florida biotechnology firms have some level of interest in the potential of marine biotechnology. None of the five firms currently active in the field dismissed future activity. Of the 17 not involved, eight expressed no interest while the other nine indicated some interest. Of 13 firms currently involved or at least interested in marine biotechnology, eight expressed interest in attending a three-day continuing education course in which marine biotechnology issues, opportunities and practices would be presented in sufficient detail to enable executives to make informed decisions about level of involvement in the field. (All eight organizations with no interest in the field also expressed no interest in continuing education.)

Results will be reported in an Extension Bulletin, which is consistent with the Florida Sea Grant approach to provide outreach to industry and legislators concerned with biotechnology.

1.12 The goal of the third summit is to bring together the marine biotechnology research community with government and industry representatives. In addition to discussions

concerning scientific advances, issues relating to business commercialization and legislative issues will be highlighted. (Kerr: PD-02-10)

The largest attendance yet, 74, advanced the informal statewide consortium when the Florida Marine Biotechnology Summit III was held. In additions to plenary scientific reviews, a panel on commercialization was held. (The previous meeting, in 2000, attracted 45.) A growing network of faculty and business development interests is poised to advance this field. (Kerr: PD-02-10)

1.13 Continue working with the marine biotechnology interests in Florida in order to advance both science and commerce. (Seaman)

As part of its long-range planning for marine biotechnology, FSG staff continued involvement in national and state activities, including: (1) completion of membership on the founding board of directors of BIOFlorida; (2) membership on the national Sea Grant theme team for marine biotechnology; (3) participation in two National Science Foundation review panels for marine biotechnology small business research; (4) initiation of an analysis of the technical results of all 19 FSG marine biotechnology research projects to date, with a science journalist; (5) maintenance of the statewide listserve for Florida 77 marine biotechnology faculty as a “virtual department” ; and (6) briefings on marine biotechnology to state legislative and economic development interests and national life sciences trade groups.

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

2.1 Commercial catches of small coastal shark species have increased dramatically in recent years, as large coastal sharks have been over fished. Management quotas have been set for small coastal sharks. A scientific framework for assessing the current status of small coastal sharks and to access the impact of future harvest strategies will be completed. (Simpendorfer/Burgess: R/LR-B-48)

An age-structured population within a Bayesian framework was developed and implemented for small coastal shark species. The best estimate of the status of the Atlantic sharpnose shark in 2000 is that the population had declined to 69% of its 1972 level. Estimates of the status of blacknose, finetooth and bonnethead populations are more uncertain due to poor quality data, but indicate that the populations have undergone small declines in abundance since 1972. Risk analysis shows that the current catch levels of small coastal sharks are sustainable, and that in some cases there may be room for increased catches. The principal investigators have been working with NMFS to provide the results of this assessment to stakeholders. The results will be presented at a Shark Evaluation Workshop for small coastal sharks run by NMFS. This meeting will include all stakeholders. The results of this research are being used in examining the current management strategies for small coastal sharks in the Gulf of Mexico and the Atlantic, and for determining the most appropriate future harvest strategies. This will allow resource users to obtain the best long-term return from their catches of small coastal sharks. One publication is in process and two presentations were made.

2.2 The gag grouper is one of the most valuable fisheries in the Southeast United States. The fishery is presently under intense management scrutiny and is a priority for federal fisheries research related to essential fish habitat. Thus, it is important to test the role of habitat in mediating predator-prey interactions and individual fish growth dynamics in gag grouper to ensure that appropriate management measures can be implemented to ensure fishery sustainability. (Lindberg/Mason: R/LR-B-49)

No consistent differences in pelagic prey fish density (0-10.7 fish m^{-2}) existed as a function of patch reef size, suggesting that reef habitat, of the size and complexity used in this study, does not determine the density of forage fish at reef sites. However, available analytical software did not allow estimation of abundance per school of pelagic prey fish, so tests for differences in absolute prey abundance between reef types cannot be made. Since the completion of this study, the appropriate software has been acquired to estimate school size and thus absolute numbers and biomass of prey fish in the school. These results will be forthcoming.

Significant year and month differences in pelagic prey fish densities reflected inter-annual and inter-seasonal variability. Pelagic prey fish were consistently present above study reefs during all sampling periods, with frequencies of occurrence at 100% in 2000 and 98-99% in 2001. Prey fish availability, as measured by the density of forage fish at a reef divided by the number of gag grouper on the reef, differed by reef size. The 4-cube reefs had greater prey availability than 16-cube reefs. Highest mean density per capita was found on a 4-cube array (0.22 fish/m^2/gag), and the lowest mean density per capita was also found on 4-cube array (0.02 fish/m^2/gag). Nevertheless, the mean pelagic density per capita of gag was higher on 4-cube reefs (0.11 fish/m^2/gag) than on 16-cube reefs (0.5 fish/m^2/gag).

Prey consumed by gag grouper from 4-cube and 16-cube arrays were predominately pelagic planktivorous fishes (based on number, mass and energy). Gag on 4-cube arrays consumed a greater diversity of prey than on 16-cube arrays (17 versus 8 species), whereas the diet of gag on 16-cube arrays contained relatively more portunid crabs than gag on 4-cube arrays (25% versus 7% by energy). Trends in average daily food consumption and average daily gross energy consumption suggest that gag from 4-cube arrays consumed greater quantities of prey than gag from 16-cube arrays (e.g., 22 versus 11 cal/g body weight, respectively), however, the differences were not significant either between reef array sizes or between sublegal-sized (<50 cm) and legal-sized gag (>50 cm).

Consistent with results from a 1997 project, mean overall abundance of gag was 2.32 times greater on 16-cube than on 4-cube reefs, with mean abundance of gag >50 cm being 3.21 times greater on 16-cube reefs and mean abundance of gag <50 cm being 1.97 times greater on 16-cube reefs. All of these differences were statistically significant. No differences were found in gag abundances between published and unpublished reefs within reef size. This was true for total abundances as well as the abundances of legal-sized gag. Additionally, abundances of gag on unpublished reefs were drastically reduced from 1997 numbers and were close to the abundances of published reefs. An overall reduction in gag abundance of 20% occurred between 1997 and 2001, with an average decrease of 38% on the 16-cube reefs and an average increase of 29% on the 4-cube reefs. Lack of a measurable difference in gag abundance between published and unpublished reefs suggests that all Suwannee Regional Reefs might now be subject to directed fishing.

Measures of relative weight and girth indicated that gag from 4-cube reefs tended to be in better condition, this being most evident for gag greater than 50 cm. These results are consistent with results from 1997. In 1997 there was a marginal interaction effect between fishing pressure and patch reef size on relative weight, this interaction was not apparent in 2001. Mean relative weights in 2001 were lower than in 1997 for all reef types. Mean relative weight on 4-cube reefs decreased from 111.75 in 1997 to 97.53 in 2001, a 13% reduction. Mean relative weight on 16-cube reefs decreased from 108.10 in 1997 to 95.65 in 2001, a 12% reduction.

Gag abundance and relative weights were lower in this study than in a 1996-97 study in the same experimental reef system, and the differences between 4- and 16-cube patch reefs were not as pronounced as documented earlier. Prey fish densities did not differ between reef types. Diet composition of gag differed between 4- and 16-cube reefs, and the energy intake was slightly but not significantly greater on 4-cube reefs. It now seems likely that prey availability and gross energy consumption alone may not explain observable differences in gag growth and condition.

This study has quantified inter-annual differences in factors that must be integrated to clearly answer that question. However, data from this brief study were too variable and the differences too slight to address the question effectively through bioenergetic modeling of just one snapshot in time. In combination with data from a follow-up Sea Grant project, and earlier studies in the same system, these dynamics will be modeled to better explain how habitat mediates predator-prey interactions and affects gag production.

Four graduate students received partial support from this project and seven presentations were made. Project results are contributing indirectly to federal fisheries management by

the Gulf of Mexico Fisheries Management Council through Dr. Murie's membership on the Reef Fish Stock Assessment Panel and Dr. Lindberg's membership on the Reef Fish Scientific and Statistical Committee. Likewise, project results are contributing to Florida marine resource management by Dr. Lindberg's membership on the recently created Artificial Reef Advisory Board for the Florida Fish and Wildlife Conservation Commission (FWC). This project is part of the scientific basis for the Steinhatchee Fisheries Management Area (FMA) as a large-area artificial reef development for fisheries conservation and rural economic development. This FMA is now in permit review and will be constructed as a public-private partnership of the University of Florida, the FWC and the business community in Florida's Big Bend.

2.3 The Florida spiny lobster is the most valuable fishery in Florida, when both the commercial and recreational economic impact of the fishery are considered. The stock relies on continued input of post larvae and the suitability of the habitat. This project builds on previous research investments and will provide Florida spiny lobster managers with an accurate method to predict the fishable lobster population several years in advance and to track the health of the essential nursery habitat. (Herrnkind/Butler: R/LR-B-50)

Postlarval collections from an earlier project were continued. Most sites sustained a relatively consistent trend in the numbers of postlarvae although there is substantial but similar variation among regions. Seasonal increases in postlarval influx in the December-April period are apparent for most sites. Some locations like Little Duck and Tom's Harbor characteristically received low input compared to other sites. The consistently highest sites were Long Key and Big Munson, which are the only two sites for which the FMRI has maintained long-term monthly catch records (~10 years).

Our initial tests of the suitability of lipid analysis as a measure of nutritional condition of reserves at metamorphosis to the benthic stage gave undependable results. The alternative method based on C/N ratios has turned out reliable and indicates substantial variation across cohorts in available reserves at settlement. In fact, there appears to be a significant negative relationship between the density of postlarvae in the plankton and C/N ratios, which implies a density-dependent effect on condition. Several months of additional C/N data will be analyzed to confirm this pattern.

Trimester surveys of benthic habitat and juvenile recruitment in nursery areas associated with each collector site have been completed. These data will allow model to be ground-truthed and test the degree of linkage between postlarval input and juvenile survival across the Keys. This is a huge data set, whose analysis is being completed.

Modeling simulation results have tested six different scenarios of differing postlarval lobster supply along the Florida Keys (e.g., random spatial distribution, equal distribution, north-south gradient distribution, etc.). Those indicate that the random distribution creates the most divergent results and also the model's largest predicted subsequent recruitment of subadults (age/size just as they enter the fishery). Modeling of recruitment will expand when the relationships among postlarval input and condition, juvenile recruitment, and the fishable population based on the data taken 1998-2002 are analyzed.

This project provided partial support to five Ph.D. and four M.S. students. Nine publications are completed or in process and nine presentations were made.

2.9 Coordinate and conduct a marine fisheries in-service training for interested Sea Grant agents on recent changes in management programs for both recreational and commercial fisheries in state and federal waters off Florida and the Southeast U.S. region. (Adams)

In-service training workshop has been conducted at KML on Long Key during September 18, 2002. The workshop was held as planned. Approximately 10 Florida Sea Grant Field Faculty have become better informed of recent changes in fishery management regulations and policy, as well as several other fisheries related topics such as fishing venting, sponge biomass assessment, scallop stock enhancement, blue crab management, and others.

2.10 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Fishery Management Councils. (Adams)

The Marine Economics Specialist has continued to serve on the Scientific and Statistical Committees of the Gulf of Mexico and the South Atlantic Regional Fishery Management Council. Twenty-five (25) state and federal resource managers are better aware of the role economics plays in fisheries management. Three committee meetings (two in New Orleans and one in Tampa) addressed a host of issues including red grouper management stock assessment, shrimp vessel permitting, and ITQ management with Gulf reef fish.

2.11 Conduct fish mortality reduction programs and/or distribute information to recreational and sport anglers on use of circle hooks, fish venting tools, proper fish handling techniques. (Adams, Combs, Crane, Creswell, Diller, S. Jackson, McGuire, Novak, Stevely, Sweat, Tavares, Wasno, Verlinde)

Approximately 1200 persons have been trained in the use of fish venting tools, and approximately 1000 tools / informational brochures have been distributed. The educational process was conducted at 8 workshops in the Miami, Sarasota, Charlotte Harbor, Jacksonville, Bradenton, and Largo, St. Petersburg, and Pensacola areas. In addition, approximately 200 persons were instructed in the use of venting tools at the 55th Gulf and Caribbean Fisheries Institute Conference in Xel-ha, Mexico. Training also occurred at 17 fishing tournaments including the Pensacola Recreational Fishermen's Association, St. Johns Bass Anglers Club, Bradenton Herald Fishing College, DeSoto Fishing Tournament, Croswaith Memorial Tournament, Pete Turner Fishing Classic. In addition, approximately 250,000 media hits occurred due to information presented in informational articles published in the Miami Herald, Saltwater Sportsman Magazine, Island Bystander, Anna Maria Sun, and Southwest Florida Weekly. These efforts have increased the awareness of the benefits associated with the use of venting tools, circle hooks, and other techniques to reduce release mortality.

2.12 Conduct a random sample survey of recipients of fish venting tools and educational materials to determine effectiveness of educational program in reduction of fish mortality and future program efforts. (Adams, Novak, Stevely)

Survey was conducted during April 2002. A total of 673 recipients of venting tools / venting tool training were surveyed. A response rate of 51% was achieved. Information about their continued use of venting tools was solicited. Of those responding, 68% indicated that they have used their venting tool; 87% would purchase another if needed; 67% (31%) would pay less than $5 ($6-$10) for an additional tool. This information will help in improving the design of the venting tool, establishing the existence of a commercial

market, and developing plans for future educational efforts with the use of venting tools by recreational fishermen in Florida.

2.13 Develop vessel cost and earnings brochure for pelagic longline vessels utilizing logbook data as provided by NMFS and HMS. (Adams)

The development of the cost and earnings brochure was accomplished. The information was published in Marine Fisheries Review 62(2):49-60, which was distributed during early 2002. The MFR paper title is “Reported Trip Costs, Gross Revenues, and Net Returns for U.S. Atlantic Pelagic Longline Vessels”.

2.14 Provide technical assistance in development of an economic analysis on the multi-species, multi-gear fishery in the South Florida region. (Adams)

The Sea Grant-funded study to address the economic characteristics of the multi-species, multi-gear fishery in South Florida has been completed. A PhD dissertation is currently being completed by a student (Sharon Hutchinson) in the Food and Resource Economics Department. A copy of the dissertation, “Economic Assessment of Limited Entry Strategies in Multi-Species Fisheries in South Florida”, will be available upon request. The information was also presented at the Gulf and Caribbean Fisheries Institute meetings in late 2001, which won the best student paper award form GCFI. Findings suggest the key species groups may be more efficiently managed as a group, rather than through single species regulations. As a result, over 200 fishery managers and scientists better understand economic characteristics of the South Florida fisheries.

2.15 Continue to maintain contacts with Cuban counterparts at the University of Havana and the Cuban Ministry of Fisheries to exchange data and explore future collaborative efforts. (Adams)

Email contact has been maintained with Ministry of Fisheries representatives in Havana. No travel to Cuba was conducted during 2002. Tentative plans are to visit the Ministry of Fisheries (MIP) offices in Havana during fall 2003 to participate in a fisheries management conference.

2.16 Coordinate economic analysis and impact of Florida’s Blue Crab fishery. (Adams)

Funding was received from Florida Fish and Wildlife Conservation Commission to conduct scoping workshops with the blue crab industry in Florida. A total of 16 workshops were held. Over 200 individuals attended these workshops and provided input into the blue crab management process. These workshops provided FWC with information necessary to make management decisions concerning the blue crab industry. The existing permit moratorium, which expires in 2005, may be replaced with some other form of management. The industry has mixed feelings regarding what should replace the moratorium, if anything. The industry had expressed mixed opinions about effort limitation

programs (trap and license limitations), but expressed strong support for measures to reduce poaching and environmental degradation.

2.17 Present paper at the International Institute for Fisheries Economics and Trade Annual Conference. (Adams)

Approximately 30 fishery managers better understand the economic consequences of relaxation of import controls on the dockside price of spiny lobster in Florida. A paper was presented at the IIFET meetings in Wellington, NZ. The paper, entitled "Effect of Imports on Caribbean Spiny Lobster on the Dockside Price of *Panulirus argus* in Florida", addressed the recent change in rules concerning the importation of spiny lobster tails during the Florida closed season. The findings were not conclusive, but do suggest that imports have little effect on price. This runs counter to the prevailing viewpoint of industry, but does agree with the viewpoints of the distributors and processors.

2.18 Present poster at The Coastal Society's annual meeting. (Adams)

Sixty individuals have a better understanding of the economic impact of red tide events on coastal communities. A presentation entitled "The Economic Consequences of Red Tide Events on Coastal Communities in Florida" was given at the Coastal Society Annual Conference in Galveston, TX. The results addressed the effects of red tide events on coastal communities, and the limitations of existing data toward measuring these effects. Red tide was found to have a statistically significant effect on beach attendance in Manatee County. The economic impact on the Ft. Walton Beach and Destin economies was in excess of $20 million each month a red tide event existed in that region.

2.19 Present poster at the Southern Agricultural Economics Association's Annual Meeting. (Adams)

A poster was presented at the Annual Southern Agricultural Economics Association Meetings in Mobile, AL. The poster described the economic impact of the hard clam culture industry on the Florida economy. The study suggests that the Florida cultured hard clam industry contributes $40 million to the Florida economy. This results from the fact that at least 50% of the Florida cultured hard clams are exported out of Florida.

2.20 Promulgate the 53rd Proceedings of the Gulf and Caribbean Fisheries Institute (GCFI) and disseminate it to libraries and universities throughout Florida. (Creswell)

The St. Lucie County Agent edited, formatted, published and distributed the 53rd Proceedings of the Gulf and Caribbean Fisheries Institute Meetings, which was held in Biloxi, MS. The 700-page book includes chapters on marine health issues, invertebrate fisheries, marine fisheries management, aquaculture and stock enhancement, recreational fisheries, socio-economics, biology of reef and pelagic fishes, and essential fish habitats and habitat assessment.

2.21 Increase membership and library subscriptions to the GCFI proceedings by 15% over the next year. (Creswell)

2.22 Serve as Chair of the Steering and Program Committee for the 55th GCFI Annual Conference, and publish its Book of Abstracts. (Creswell)

The annual conference for the Gulf and Caribbean Fisheries Institute was held November 11 - 15, 2002 at Xel-ha, Mexico. The conference was hosted by Laboratorio de Biología Marina, CINVESTAV IPN Unidad Mérida, Yucatán, México and Xel-ha National Marine Park, with over 140 oral and poster presentations, a 25% increase over the previous institute (54th in Turks and Caicos Islands). Two special symposia focused on -"The Biology and Management of Fish Spawning Aggregations" and "Marine Fisheries Co-management Strategies".

2.23 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Fishery Management Councils. Membership will also continue on the Coastal Pelagics Stock Assessment Panel. (Gregory)

Participation by the Monroe County agent led to a determination by the Gulf Council that the Gulf of Mexico red grouper fishery is no longer overfished. This resulted from efforts made to question the validity of previous stock assessments. In addition, the Gulf Council agreed to make black grouper a priority species and conduct a stock assessment in 2003.

2.24 Provide technical assistance and training to fishermen so they will learn how to communicate effectively with regulatory agencies concerning proposed regulations. In turn, provide regulatory agencies with information about unintended consequences of regulations in order to lessen the social and economic impacts on fishing families. (Gregory)

Efforts by the Monroe County agent led to six additional local industry representatives being appointed to serve on federal fishery advisory panels. To date, 40 Monroe County residents serve on fishery advisory panels. This is an increase from 30 in 1997. Also, 15 commercial lobster divers now have better skills in providing accurate testimony to FFWCC due to a workshop held in Marathon. Subsequent participation by these industry participants has led FFWCC to increase dockside enforcement of trap tagging and provided FFWCC a better understanding of the extent of reallocation of lobster landings from trap to dive fishermen.

2.25 Evaluate the effectiveness of the Western Sambos Marine Reserve for enhancing spiny lobster sizes and abundance and adjacent fishery yields by analysis of data from four-year research project. (Gregory)

This was not accomplished due to the unanticipated termination of project. The NOAA Marine Sanctuary funding was changed from an in-house purchase order to a competitive process within NOAA, and funding for this project was not continued.

2.26 Maintain working relationship with Destin Charterboat Association by attending their meetings, and providing educational support to their programs. (S. Jackson)

Destin Charterboat Association members, Okaloosa County Marine Extension Advisory Committee and the Okaloosa Reef Advisory Committee now have a better understanding of the County's new reef regulation for individual reef builders. This was accomplished through a facilitated and organized informational meeting for these groups. Communication was also facilitated between this group and the Board of County Commissioners (BOCC) when the new regulations were written and adopted by the BOCC.

2.27 Support efforts in Okaloosa County to create inter-local participation among governments to manage and promote artificial reefs. Efforts will include serving on advisory committees, assisting in development of artificial reef plans, developing artificial reef monitoring programs. (S. Jackson)

Okaloosa County, the City of Valparaiso, the City of Destin, and Eglin Air Force Base, were supported in the development of joint artificial reef projects. Dr. Bill Lindberg provided a simple design for cooperative deployments to allow comparison of nested reef structures

to previously deployed single reef structures. These suggestions were incorporated into the group's 5-year deployment plan. Additionally, these government entities were assisted by acquiring and providing technical information to support their application for Florida Fish and Wildlife Artificial Reef grant packages. All were successfully funded.

2.28 Provide support to fledgling volunteer reef monitoring organizations in Okaloosa County. (S. Jackson)

A planned event for reef information for Eglin and Hurlburt Dive Clubs occurred during November 2002. The event was well attended by the community with 15 individuals learning more about REEF training sessions. Reef Environmental Education Foundation (REEF) identification classes have been planned and postponed. Similarly a SCUBA fest event at Hurlburt Air Force Base, showcasing the County's artificial reef program was planned and canceled due to military concerns and operations. The county's reef program and REEF opportunities were highlighted at Eglin's Earth day event in Niceville.

2.29 Implement an urban fishery program in Okaloosa county, directed toward non-traditional resource users. (S. Jackson)

Contact was made with a youth literacy program in Fort Walton Beach, and an environmental educational event for the urban fishery program at 4-H Camp Timpoochee was organized.

2.30 Develop a "rack card" for public distribution regarding the use of artificial reefs in Okaloosa and Walton Counties. (S. Jackson)

Okaloosa County GIS / IT was assisted in developing a website that includes a map with artificial reef site coordinates. A clickable map allows users to bring up additional information including video footage and monitoring reports. The rack card idea has not been pursued.

2.31 With community group and government support, develop 100 recycling stations for monofilament line at high volume fishing areas in Flagler, St. Johns, Duval and Nassau Counties. (McGuire)

Seventy-three monofilament recycling stations have been developed in Nassau, Duval, St. Johns and Flagler counties. Information and tickers have been provided for another 30 stations in Clay and Putnam counties; 20 in the Florida Keys; 20 in Santa Rosa county and 2 in Taylor county. In excess of 200 lbs of monofilament fishing line has been collected in these containers since January 2002. This is an ongoing project in which there will be surveys of recreational anglers and a poster contest to get artwork to use for promotional posters, t-shirts and calendars to use to raise awareness about the recycling program. Through a grant from the Columbus Zoo, Ohio, 29 recycle bins were constructed and mounted at local fishing piers and boat ramps. In cooperation with Florida Gulf Coast University, students maintain and collect monofilament at all sites. Collected monofilament is used as part of a display at the University.

2.32 Assist in a multi-agency fish survey in the intracoastal waterway in north Florida. This project is being led by the U.S. Geological Survey. (McGuire)

The NE Florida agent assisted on one sampling run of the USGS's fisheries-independent monitoring program (as part of a team of five people). This project will extend into next

year. On this day, three trawls and two seines were completed and more than 2000 juvenile and adult fish were identified and counted.

2.33 Coordinate efforts of the Charlotte Marine Research Team relative to reef and water quality monitoring. This will include the recruiting and training of 10 new members. (Novak)

Ten new Charlotte Marine Research Team (CMRT) volunteers were recruited and trained. More than 50 reef monitoring dives have been performed by the CMRT volunteers. The group surveyed bottom for permits, collected more than 20 hours of video, surveyed fish numbers, and provided monitoring of existing reef sites.

2.34 Continue development of the artificial reef system in SE Florida. These efforts will include selection and survey of at least two new artificial reef sites, submitting appropriate permit applications, recruitment of volunteers to construct concrete reef modules, and deployment of materials to site. (Novak)

One hundred ten reef module units were constructed and deployed near Cape Haze Reef. More than 75 volunteers were recruited. More than 1000 fishermen, boaters and divers were provided information on reef development, locations, proper use methods, etc. Two artificial reef-related grant applications were written, one for reef monitoring (funded for $7,000) and one for reef construction. Ten programs were presented to artificial reef users in the Charlotte County area.

2.35 Reduce fish mortality through various public awareness and educational activities. These include training fishing tournament organizers in the use of a “recessitation tank” to reduce mortality at catch-and-release events; provide 10 workshops on fish venting, circle hook and “catch/release;” write news articles and appear on local TV shows, construct and distribute with information materials the Sea Grant fish venting tool. (Novak)

Fifty fishers were shown the proper way to revive fish after they have been caught and assure the best possible chance for survival. A resuscitation tank is now used at eight Lee County back bay fishing tournaments.

2.36 Provide technical assistance and education at 8 local fishing tournaments. These will include two shark tournaments, five redfish/snook tournaments, and one kids’ day event. (Novak)

One-hundred individuals became better informed regarding proper fish handling techniques, manatee boat speed regulations, local fishing regulations and waterway courtesies. The information was provided via eight local fishing tournaments in the Lee County area.

2.37 Continue work on the REDstart Project, a redfish enhancement project at Tarpon Bay on Sanibel Island. (Novak, Wasno)

REDstart Project has continued and activities included completion of facility construction, fund raising, grant applications writing, volunteer support and acquisition of equipment/ materials. This project has an extremely high level of public visibility and has been well received by local fishermen groups and the media.

2.38 Assist a team of researchers from Stanford University, Duke University, Monterey Bay Aquarium and the National Marine Fisheries Service on a blue fin tuna tagging project. (Novak)

The annual tagging project was successful. Team fishing off North Carolina coast caught, tagged, and released over 100 blue fin tuna. This work was sponsored by Stanford University, Duke University, Monterey Bay Aquarium, and NMFS. The project has produced the most accurate and complete data set that exists on the migration of blue fin tuna. These data are used by management agencies such as the International Committee on the Conservation of Atlantic Tunas.

2.39 Work with Sea Grant Extension Program Leaders from the South Atlantic (NC, SC, GA, FL) to develop regional fish extension projects, as part of the "unfunded fisheries extension mandate." (Spranger)

A regional project was developed and grant funds obtained on fish extension for the South Atlantic. This project focused on topics of marine protected areas, essential fish habitat, and fisher management issues.

2.40 Work with Sea Grant Extension Program Leaders from the Gulf of Mexico (TX, LA, MS, AL, FL) to develop regional fish extension projects, as part of the "unfunded fisheries extension mandate." (Spranger)

A regional project was developed and grant funds received on fish extension for the Gulf of Mexico. This project focused on topics of derelict crab trap fishing, mercury in fish, new shrimp trawl gear, and shrimp management issues.

2.41 Explore opportunities to develop fish extension projects for the National Fish Extension Competition that will occur in the Spring of 2002. (Spranger)

Florida Sea Grant faculty were aided in developing several modules for the 2002 National Fish Extension Grant competition.

2.42 Obtain funding from Florida Fish and Wildlife Conservation Commission's Marine Research Institute to continue sponge survey work in Florida Bay. (Stevely, Sweat)

Funding was obtained from the Florida Fish and Wildlife Commission to conduct annual sponge survey work in Florida Bay. This work was completed in July. Obtained $6,000 and $4,000 in kind services from Fish and Wildlife Commission. Contract final report was approved by FWC.

2.43 Analyze data from annual sponge survey, and develop annual report on sponge populations (density and size) to the Florida Fish and Wildlife Conservation Commission, Florida Sea Grant, and Florida Keys National marine Sanctuary Program. (Stevely, Sweat)

Data from the annual sponge survey was analyzed and an annual report on sponge populations (density and size) was prepared. This report was presented to the FWC, Fla. Sea Grant and the Fla. Keys National Marine Sanctuary Program. Data indicate that there has been significant recovery of some sponge species (including commercial varieties). However, recovery is not complete or uniform throughout the study area. Some species have not exhibited significant recovery in ten years.

2.44 Complete underwater photography for proposed publication, “A Field Guide to Florida Bay Sponges.” (Sweat)

Completion of the underwater photography for the proposed publication, “A Field Guide to Florida Bay Sponges” was not accomplished due time loss resulting from bad weather.

2.45 Provide presentations on the long-term sponge survey work in Florida Bay at the 5th International Sponge Biology Congress, which is only held every four years. (Stevely, Sweat)

Presentations on the long-term sponge survey work in Florida Bay were completed and were presented at the 5th International Sponge Biology Congress in Rapalo, Italy. The presentation, “The Recovery of Sponge Populations in the Florida Keys, USA Following an Extensive Mortality” and Poster “Sponge Biomass Estimates in the Florida Keys, USA” were attended by 150 persons.

2.46 Coordinate the annual workshop/field exercise for artificial reef coordinators in the ten SW Florida Counties in order that they more effectively design and permit reefs. (Stevely, Novak, Sweat, Wasno)

The workshop was held May 21-22, Mote Marine Laboratory, Sarasota, FL. The workshop was attended by 45 participants, including representatives of ten county artificial reef programs, research scientists, state and federal fishery resource managers. Agents Stevely, Sweat, Novak and Wasno coordinated logistical planning and held an annual workshop/field exercise for artificial reef coordinators and their staffs from 10 southwest Florida counties. These units learned to more effectively design, permit and build reefs. Participants have repeatedly reported adopting information and practices presented at the workshop in developing and managing reef programs.

2.47 Provide technical assistance in planning the deployment and monitoring of 600 “reef balls” at five inshore reefs in waters off Manatee County. (Stevely)

A total of 1,000 prefabricated reef modules have been deployed on five reef sites in Tampa and Sarasota Bays. The result will enhanced fishing opportunities for inshore, bay fishermen. These modules have been enthusiastically received by participants.

2.48 Develop a new Sea Grant fact sheet on “How Old is That Fish I Caught?” (Stevely)

This was not completed. This will be addressed during 2003.

2.49 Assist the local commercial fishing industry in responding to new, proposed stone crab trap reduction program. (Stevely)

Stone crab certification was implemented and there is no longer a need for this type of educational activity.

2.50 Continue in organization and coordination of the annual Cortez Commercial Fishing Festival. (Stevely)

The Cortez Commercial Fishing Festival was held during February. The event drew more than 10,000 participants. Educational talks were presented to 1,500 people on issues related to marine resource management, wetlands use, coastal water quality, and other

topics. In addition, the festival raised $40,000 toward the purchase of 95 acres of environmentally sensitive property adjacent to the village of Cortez. This project received national recognition in 2002 by receiving the First Place Gulf Guardian Award presented by the EPA.

2.51 Coordinate a workshop for recreational divers that will provide legal requirements, harvesting techniques, cleaning, handling and cooking of bay scallops in a newly opened fisher in Southwest Central Florida. (Sweat)

The workshop was held in Crystal River, Florida for recreational divers and provided legal requirements, harvesting techniques, cleaning, handling and cooking of bay scallops in a newly opened recreational fishery along the west central Florida coast. Over 200 persons attended the workshop and were provided with pertinent literature on this economically important recreational fishery.

2.52 Provide logistical support and secure funding for the 14th International Petinid (scallop) Workshop that will be held in April, 2003 in St. Petersburg. (Sweat)

Logistics and funding for the 14th International Pectinid Conference were the center of focus during 2002 for the April 2003 event in St. Petersburg. The fund drive was successful.

2.53 Develop training programs for community volunteers that will assist them in the creation, enhancement or restoration of oyster reefs, that will be utilized for local commercial and recreational fishing. (Wasno)

2.54 Work with community and student/teacher volunteers to establish multiple, small-scale demonstration projects on oyster reefs, and develop a volunteer-based monitoring program to evaluate restoration success. (Wasno)

This year's activities have been to complete the application for a grant through the Charlotte Harbor National Estuarine Program and to FDEP/ ACOE for a permit to place the oyster bar restoration sites. The following is a summation of grant activities: This project attempts, though public education and involvement, to restore and/or enhance oyster reefs, thereby improving habitat availability and quality within the Caloosahatchee River estuary. Reef-restoration efforts will include "oyster gardening" by local citizens who live on canals and along the river. Floating cages and juvenile oysters will be given to volunteers who will suspend the cages in water, and monitor growth and survival of juveniles. At the end of one year, volunteers will collect the oysters and seed them on constructed reefs. The appealing aspects of this project are that we have identified areas that will ensure successful restoration or creation of reefs given current water-management practices, the collaboration of various institutions, and public education and outreach. Initiation of this project will also result in the identification of additional sites suitable for restoration, and the application of funds from other agencies toward the development of large-scale, oyster-reef restoration.

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

3.1 Sturgeon is a high value aquaculture species in some regions of the world. Very little is known about the demand for and the value of sturgeon in Florida. Little is known about the production of sturgeon in ponds as opposed to tanks. The performance of sturgeon in ponds will be evaluated, market demand and packaging techniques for the meat will be tested and the economic feasibility of pond growout techniques will be determined. At least 10 prospective sturgeon growers will learn the economic characteristics of culturing sturgeon in tanks and ponds in Florida. (Lazur/Wirth/Zajicek/Zimet: R/LR-A-26)

Culture of Atlantic sturgeon in both university and private cooperator flow-through tank facilities has been mixed. Procurement of fry from Canada presented difficulties because of lost shipment or damage due to heat. Both shipments of fry experienced bacterial disease losses within 30 days of arrival. Once fish losses ceased, growth was observed to be good (comparable to Gulf of Mexico sturgeon) up to one pound. At this point an electrical power failure caused shortage of backup generator supply, causing low oxygen (less than 2.00 ppm) stress resulting in bacterial infection and 100% fish morality. The fish at the cooperating farm did not perform well and after 6 months of culture, many of the fish were weak and not gaining weight. Water quality analysis did not show causes of poor growth. Other water quality stressors not normally tested may have been a factor in poor growth. Pond culture was not evaluated due to fish mortality. Due to this mortality and limited availability of fry, the production objective was concluded.

Three commercial diets with different fat contents and compositions were used during feeding trials at the Gulf sturgeon demonstration farm facility (University of Florida, Blountstown, FL). Fish were received live at the Food Science and Human Nutrition Department at the University of Florida during the summer of 1999 (Gainesville, FL). Sensory panels to evaluate the taste and appearance, color studies over storage, proximate analysis and fatty acid composition were conducted to determine the most suitable diet. Feeding Gulf sturgeon with trout diet, containing the highest percent fat, resulted in the highest ratio of w3/w6 fatty acids found on sturgeon included in the study. However, trout diet imparted a yellow-orange coloration to the fish muscle, which was unappealing to consumers. Feeding Gulf sturgeon with catfish diet, containing the lowest fat content, results in a poor fatty acid profile, which is markedly different from the fatty acid profile of wild sturgeon muscle. Fillets from sturgeons fed hybrid bass diet performed well on consumer sensory panels for taste and appearance, and the fatty acid profile was similar to the profile of fillets from fish fed trout diet. Nonetheless, there was no detrimental pigmentation of the muscle due to feed. It was concluded that among the diets investigated bybrid bass is the most suitable to feed cultured Gulf sturgeons.

The Florida Department of Agriculture Bureau of Seafood and Aquaculture Marketing, which was to take the lead on the marketing portion of this study, withdrew from the project. In March 2001, this portion of the project plan was reorganized to meet objectives. This new plan included increasing involvement by existing investigators and the addition of Steve Otwell and his staff to investigate additional product attributes such as shelf life of fresh and frozen meat.

Two issues related to Atlantic sturgeon culture are in question based on this study. The first is availability of fry and related shipping challenges. Currently only one private supplier (New Brunswick, Canada) is available and price for fry is significantly higher than for white sturgeon from California. In addition, air shipment of fry in the summer months, when

Atlantic sturgeons are spawned in Canada, has not been without problems. One shipment was canceled due to a heat embargo on all live animal shipments and another shipment was completely lost by the airline. The second issue with sturgeon is that preliminary results as well as other studies, suggest that summer water temperatures in 4-5 foot depth ponds in Florida are excessive for good growth of sturgeon. Ponds with abundant cooler spring waters or deeper ponds with cooler water would be required. One graduate student worked on the project and two presentations were made.

3.2 Adequate seed availability is a major nuisance to the further development of the hard clam culture industry in the southeastern U.S. Critical shortages have occurred, and remote setting will allow nursery operators and growers to become less dependent upon traditional seed sources. Technical procedures will be developed and the economic feasibility determined of transferring remote setting technology from the Pacific Northwest molluscan shellfish industry to the Florida hard clam industry. Over 100 nursery operators and 300 growers will learn of the economic costs and benefits of utilizing remote setting to obtain clam seed for field planting. (Adams/Sturmer/Supan: R/LR-A-27)

Until the work conducted at the National Marine Fisheries Service center in Milford, Connecticut during the 1960s (Loosanoff and Davis 1963), mass culture of hard clam larvae and juveniles was not possible. Since then, hatchery techniques have become standardized. Increased numbers of commercial hatcheries producing seed have enabled clam aquaculture to become established in every state along the east coast of the United States. Recent efforts in shellfish aquaculture technology transfer programs focusing on economic development in fishery dependant communities in Florida and other states have furthered the expansion of this industry. These successful training programs have resulted in creating a demand for seed which exceeds the available supply from existing hatcheries. Given the increased demand for seed the information on alternative hatchery and nursery protocols obtained by this study is necessary for the future growth of this industry.

Technical procedures were developed and demonstrated during 2000-01 to determine the feasibility of transferring remote setting technology form the Pacific Northwest molluscan shellfish industry to the hard clam culture industry in Florida. Competent pediveliger larvae obtained from commercial hatcheries were refrigerated, stored overnight, and delivered chilled to remote setting locations for evaluation of technique, site, seasonal and annual variations. Participating land-based nurseries were modified to incorporate mechanical filtration of water supply, remote setting tanks, and downwellers. Management regimes evaluated in large-scale, field rearing trials included: 1) supplemental feeding with a commercial algal paste or cultured algae versus none and 2) duration of shipping times. Biological features documented included survival and time to reach a 1 mm seed, the minimum size presently obtained by nursery operators. The following results, summarized from these rearing trials, provide for operational procedures and guidelines for remote setting of hard clam seed.

1. In selecting a location for a remote setting facility, the site would require a water supply source in which salinities were stable, optimally ranging from 25 to 30 ppt, with natural phytoplankton abundance reaching 10 μg/l of chlorophyll *a* pigment.
2. Procedures for harvesting, handling, and packaging hard clam pediveliger larvae for shipment were developed. Pediveligers, or pre-set clams, were refrigerated and shipped up to 26 hours without detrimental effects to setting.

3. Varying shipping times from 2 hours to overnight delivery (20 hours) in rearing trials (n=2) resulted in negligible differences (2%-17%) in estimated survival of post-set clams to first sieve.
4. Setting success was not fully determined in this study, but survival at first sieve averaged 63% in all rearing trials (n=11), ranging from 40 to 88% per trial.
5. Production to a 1-mm seed size, based on a percentage of pediveligers stocked, ranged from 0 to 17% over a 6 to 8-week period during the Spring 2000 trials. During the spring 2001 trials, production to a 1-mm seed size ranged from 15 to 54% over a 7 to 10-week period. In the fall 2001 trials, production of 1-mm seed ranged from 13 to 41% over a 5 to 8-week period.
6. Production rates to a 1-mm seed size averaged 20% for all field rearing trials (n=11), ranging from 0 to 54% per trial.
7. Variability of results was due to several factors in this study including seed source and site location. For example, overall production attained in trials conducted at the west coast sites (n=5) in Cedar Key, was 142% greater than that attained at the east coast site (n=6) in New Smyrna Beach, or an average production rate of 29% versus 12%.
8. Variability of results was not due to seasonal differences in this study. During 2001, the overall production rate attained in the spring trials (n=4) averaged 28%; whereas, production in the fall trials (n=3) averaged 25%.
9. Addition of food was necessary to achieve adequate survival to a 1-mm seed size. Production was increased by 89% to 116% in those trials (n=3) in which the use of algal paste was compared to no supplemental feeding regime. In trials (n=3) which “live” cultured algae was compared to algal paste as a supplemental food, production was increased from 0 to 260%. These differences may also have been influenced by site location.
10. Technical procedures developed for remote setting of hard clam pediveliger larvae are not beyond the capabilities of most nursery operators.
11. Given current and assumed market conditions, the adoption of remote setting technology generates cost savings when compared to the purchase of 1-mm seed from commercial hatcheries.

3.3 The fishery for naturally occurring hard clams is of major cultural and economic importance to many eastern U.S. states. Landings from the traditional stock have declined in the past due to over harvesting and removal of spawning stock. Stock enhancement in natural settings is an alternative to increase stock size. The feasibility of introducing hatchery-sponsored larvae directly to the water column as a cost-effective means of stock enhancement for hard clams will be tested in the Indian River Lagoon. (Irlandi/Hitchcock/Arnold: R/LR-A-28)

The ultimate goal of this project was to test the efficacy of a new method for stock enhancement of hard clam populations that are recruitment limited. To date, success has not been achieved in getting hatchery spawned clam larvae to recruit to natural areas of the Banana River despite the release of several million larvae to the area. During the study, a better understanding of the physical control of larval dispersal in shallow-water, wind-driven systems was gained. Biological controls affecting successful settlement, an area of marine benthic ecology much in need of research were also explored. Lack of information on settlement processes affecting benthic invertebrates is in part due to the difficulties associated with measuring it. Quantifying settlement and understanding what factors influence successful settlement is essential, however, for assessment of restocking efforts for recruitment-limited populations whether the restocking program uses spawner-stock transplants or direct larval injection. Current and future efforts are focusing on

quantifying settlement and post-settlement processes. Two graduate and three undergraduate students participated in the study. Four publications were completed or in process. Six presentations were made.

Bill Arnold of the Florida Marine Research Institute holds educational seminars and workshops organized by Sea Grant Marine Agent Chris Combs and facilitated by Mr. Jerry Sansom of the Organized Fishermen of Florida for hard clam fishermen on a regular basis. The fishermen are required to attend these seminars to keep their clamming licenses. Dr. Arnold disseminates the information generated from this project to the local clam fishermen at these meetings. Five such seminars were held in spring 2001, three were held in fall 2001, and five in spring 2002. Seminars are taped for future presentations to clammers and other interested groups.

This project had direct applications to the restoration of an economically and culturally important fishery. Historically, this fishery has supported over 1200 licensed participants, although recent modifications to clam licensing requirements restrict the number of participants to 500. However, the extremely sporadic nature of the fishery causes periodic but considerable hardship for the participants. For example, during the early 1980s a clam set in southern Brevard County generated clam landings that averaged approximately $7 million in annual dockside value during 1984 through 1988. Landings decreased precipitously during 1989 through 1992 (mean dockside value = $2.5 million), and rebounded in response to a set discovered in Shellfish Harvest Area C of the lagoon (annual dockside value averaged $6.1 million during 1993 through 1996). Unfortunately, the fishery again collapsed in 1997 and has not recovered. The hope is to create local, harvestable clam populations to assist the clammers in times when natural populations are low. In addition these local population will provide spawning stock to help in replenishing recruitment limited populations throughout the lagoon. The results of the State's hard clam enhancement program, of which this Sea Grant study is a part, identified two practices (seeding and spawner transplants) that appear unsuitable for application in the IRL. The jury is still out on the larval release strategy, but if that approach is even moderately successful it will assist in the recovery of the completely collapsed (but at one time multimillion dollar) clam fishery in the lagoon.

3.4 In Florida, marine aquarium species are primarily collected from the wild (about $4 million annually) while farm-level sales of freshwater fish reached nearly $60 million in 1997. A Sea Grant goal is to increase the culture of marine ornamentals in order to generate economic activity in Florida while protecting the wild-caught stocks. Market information, the acceptability of various marine ornamental attributes, and the overall demand for marine ornamentals will be determined as a way to measure the potential of this culture industry. (Degner/Milon/Larkin: R/LR-A-29)

Respondents were asked to rate the importance of each product attribute (3 in total) for each species. A 5-point scale was defined: 1=not important, 3=moderately important, to 5=very important to the profitability of handling the product. The most important attribute for the fish species was source (collected, collected and MAC-certified, or tank-raised) with scores ranging from 3.67 to 4.43. The importance of source tied with fish size for hogfish. Survival guarantees were also important, and the most important for shrimp with an average score of 4.26. Although price ranked above source in terms of importance for shrimp, "low price" ranked third (last) in importance for all the fish species; the average importance scores for shrimp ranged from 3.40 to 3.60.

To reduce the length of the survey and reduce response time, we did not ask respondents about the acceptability of each attribute level. The acceptability questions would have required respondents to assign ratings to 48 species-attribute-attribute level combinations instead of 12. The lack of this data prevented the estimation of a full hybrid conjoint model. Use of the average weights did not improve the fit of the models. The lack of this data did not, however, compromise the intended analysis since a full hybrid conjoint could not be used to complete objective 4 (specifically to derive the breakeven prices).

The empirical analysis involved regressing a common set of product, firm, and respondent attributes (18 in total) against the assigned profitability ratings, annual demands, and stated purchase intention for each species. The profitability models were estimated using OLS and tobit (assuming censoring at –5 and 5). The tobit models were deemed more appropriate although they did not improve efficiency for all species. In addition, tobit models were estimated for each market level (i.e., intermediate versus retail). The aggregate and market level demands for each species were also estimated using tobit analysis assuming censoring at zero. Lastly, a logistic model was used to estimate the effect on the probability of purchasing each species.

Five variables in total (3 product attributes and 2 firm attributes) were statistically significant, and had the same sign, in all the models. The product attributes included price, large-sized fish (which was in the angelfish and hogfish models only), and survival guarantee (which was in the clownfish and peppermint shrimp models only). The price attribute was the only continuous variable, averaging from $0.79 for peppermint shrimp to $30 for queen angelfish. Higher prices resulted in lower average profitability ratings for all species. At the average prices, the effects on profitability ranged from -1.42 for the orange skunk clownfish to -3.26 for the spotfin hogfish. The magnitude of these effects is within the range of the remaining significant variables. Fish size was included only in the high-valued species experiments (i.e., angelfish and hogfish). Both the medium and large-sized angelfish increased the profitability rating above that of small angelfish (by 1.00 and 1.22, respectively), *ceteris paribus*. The survival guarantee was statistically significant and positive, as expected, ranging from 1.91 to 2.55.

The statistically significant firm attributes included the largest wholesalers (in terms of marine sales). The largest firms had average profitability ratings 2.10 to 4.83 below that of the smallest firms, *ceteris paribus*. The average ratings of wholesalers were significant for all species and lower than that of the base category (trans-shippers or distributors) by 0.94 to 3.04. This result could indicate that the wholesalers in this sample sell to trans-shippers and distributors instead of vice versa.

MAC certification was statistically significant only for the relatively high-valued species (i.e., queen angelfish and spotfin hogfish). MAC certification increased the average profitability rating of the angelfish and hogfish by 0.56 and 0.50, respectively. For comparison, these part-worth estimates were the smallest in absolute size of all the coefficients. The average profitability was, however, lower for those that are more familiar with and/or more likely to adopt MAC.

The average annual demand across profiles for each species was as follows: 85 queen angelfish, 66 spotfin hogfish, 348 orange skunk clownfish, and 2,255 peppermint shrimp. Firms demanded fewer MACcertified fish (387 fewer angelfish, 126 fewer hogfish, and 1,746 fewer clownfish); however, these firms are not familiar with the program and not at all likely to participate. Among firms that were not likely to adopt but were very familiar with the program, the annual increased demand for MAC-certified angelfish and hogfish would

be 27 and 155, respectively. Moreover, if very familiar with the program and somewhat likely to participate, the annual demand for a MAC-certified angelfish would increase to 195 and the annual demand for a MAC-certified hogfish would increase to 73. Annual demand would more than double (increase 115% for clownfish and 109% for shrimp) if a survival guarantee were offered.

Using the average prices and quantities for each species, price elasticities of demand were calculated as -1.72 and -2.58 for the queen angelfish and spotfin hogfish, respectively. Higher prices would reduce the demands for both species, however, the effect is larger for the hogfish. In particular, both demands are "elastic" such that for a given percentage price increase, demand would fall proportionately more. Thus, the markets for both species are highly competitive.

Among the variables that increase the odds of purchase, the odds ratios ranged from 1.93 to 27.8. The higher effect corresponded to a larger firm size; in particular, the odds that a mid-sized firm (whose annual sales range from $100,000 to $1 million) will purchase peppermint shrimp are 27.8 times higher than for firms in the smallest sales category (i.e., less than $100,000 annually).

The smallest positive effect on the odds ratio was recorded for those firms that are very likely to participate in the MAC-certification program; the odds of purchasing a MAC-certified peppermint shrimp increase by 93% for a firm that is very likely to carry MAC-certified specimens as compared to a firm that is not at all likely to carry MAC-certified specimens. Note that this is not saying that the probability of purchase increases 93%; firms very likely to participate in the MAC certification program increase the probability of purchase by approximately 9%. For comparison, the probability that these firms purchase angelfish would increase nearly 26%. Similarly, firms that are very familiar with the MAC certification program increase the probability of purchasing MACcertified angelfish, hogfish, and clownfish by 21%, 30%, and 25%, respectively. If the survival of orange skunk clownfish and peppermint shrimp are guaranteed, the probability of purchase increases by 30% and 18%, respectively.

The odds ratios reflecting a negative effect on the odds of purchase ranged from 0.001 to 0.7. For the fish species, the odds of purchase are lowest for the largest firms (in terms of sales); the odds of purchase by firms with annual sales between $1 million and $10 million) are 0.1% to 1.1% of the odds of purchase by a firm with sales below $100,000. These negative effects are, thus, much larger in magnitude than the positive effects. The odds of purchasing the lower-valued fish species (spotfin hogfish and orange skunk clownfish) were also significantly lower for the alternative market channels (versus trans-shippers or distributors); the odds ratios are 0.5% to 3.8% of the odds for the trans-shippers or distributors, which may carry larger product lines. As expected for a normal economic good, higher prices reduce the odds of purchase. If the price of queen angelfish and spotfin hogfish were to increase one standard deviation (i.e., $12.28 and $2.25, respectively), the odds of purchase are 23.5% and 66.1% of those species priced at the mean.

Breakeven prices, which represent the maximum price that the firm would be willing to pay, were calculated for each variable. The change in breakeven price represents a premium (if positive) or a discount (if negative) due to either differences in market segments, market conditions, or costs. The breakeven price would just allow the firm to cover costs and earn normal economic profits. The base-level breakeven prices for the angelfish, hogfish, clownfish, and shrimp were calculated at $79.19, $30.78, $5.95, and

$1.49, respectively. The base-level corresponds to a small trans-shipper/ distributor purchasing a small non-MAC certified specimen assuming the firm does not promote tank-raised species, has not handled the species in the previous year, and is neither familiar with nor likely to adopt MAC certification. In addition, the respondent is assumed to not have managerial responsibilities but is knowledgeable about the source of all marine species.

MAC certification would increase breakeven prices by $6.18 (8%) and $1.76 (6%) for angelfish and hogfish, respectively. By comparison, the larger angelfish would increase breakeven prices by $11.08 (14%) for a medium and $13.47 (17%) for a large. If a clownfish were tank-raised as opposed to collected from the wild, the breakeven price would increase $1.92 or 32% indicating a significant price premium for this cultured product. The survival guarantee, the final product attribute, would increase the breakeven price from $0.82 (shrimp) to $3.12 (clownfish), which represents between a 52% and 55% increase.

The breakeven prices for the largest firms were 38% to 55% lower for shrimp and angelfish, respectively. Thus, larger firms are willing to pay much less for the same product. Wholesale firms also have lower breakeven prices, from $0.98 to $10.32 (for shrimp and angelfish, respectively), compared to trans-shippers/distributors. For angelfish, retailers are willing to pay up to $94.42 or 19% more than transshippers/distributors. Firms that promote species as tank-raised (i.e., value sustainability) were willing to pay from 10% to 37% more depending on the species, but only for the fish species. Thus, the market value of the "tank-raised" promotion tool is significant.

Familiarity with the MAC certification program reduced the breakeven prices for the high-valued fish. If "somewhat" familiar with the program breakeven prices fell 36% for angelfish and 16% for hogfish. If "very" familiar with the program, the breakeven price for angelfish would fall 40%. Firms that are more likely to participate in the MAC certification program have lower breakeven prices (24% lower for angelfish, 9% lower for hogfish, 33% for clownfish). For both angelfish and hogfish the breakeven prices (i.e., maximum willingness-to-pay values) declined with familiarity of the program and likelihood of participation. In addition, these effects are compounded and vary by species.

A graduate student participated in the project. Six publications were completed or in process and two presentations were made.

3.5 This project is inspired by the need to develop new, low-cost, open-ocean aquaculture cage systems. The feasibility of an aquaculture cage design based on flexible pressurized members will be determined. (Niezrecki: PD-01-5)

The flexible pressurized open ocean aquaculture cage system is a potentially enabling technology that may significantly improve open ocean aquaculture cages. It allows for cages that are less expensive than existing designs. The cages are easily transportable prior to the first deployment of the cage and after harvesting as well. The cages are more easily manufactured than Sea Station. At harvesting time the cage can be deflated and the entire net system can be dragged aboard a ship. After harvesting the flexible cage is dumped back into the water and pressurized again.

It has been shown that constructing an aquaculture cage from flexible pressurized members is feasible. This conclusion is based on the experimental results obtained from investigating the bending behavior of pressurized flexible columns and the fabricated

prototype aquaculture cage. A test rig was constructed to investigate the bending behavior of a flexible pressurized column. Deflection measurements were made as the variables of column length, internal pressure, diameter, and load were varied. As expected, it was found that the bending stiffness increases as the column length is reduced while the diameter and pressure are increased. For thin walled pressure vessels, the membrane stress increases proportionally with pressure or diameter. However, it was found that the bending stiffness (EI) of the column tested increased quadratically with tube diameter. This is indicative that these members will perform better as their diameter is increased.

A scale model having a geometry similar to an Ocean Spar, Sea Station® cage was developed using the pressurized flexible members. When fully deployed, the prototype cage has a diameter of approximately 12 feet and a height of 11.5 feet. The weight of the cage including netting is approximately 50 pounds. When collapsed, the cage occupies a space measuring approximately 16x20x24 inches. Additionally, the cage can be fully deployed within 30 minutes by two people.

The cage prototype was tested in a swimming pool having a depth of 12 feet. The cage was pulled and pushed by the team members to investigate its structural integrity. Although the cage was not tested in ocean currents or in waves, the system appeared to be structurally robust.

3.6 This project will lessen the potential for market acceptance of cultured sturgeon products in seafood markets within the Southeastern U.S. The information will help determine the feasibility of introducing cultured sturgeon products into the general seafood market of the U.S., including Florida. (Adams: PD-02-6)

Although recent attempts to culture sturgeon on a pilot scale in Florida have been problematic, the potential for culture still exists. At present, several investors are proceeding with additional pilot scale culture operations. To maximize the likelihood of eventual success, potential investors in the culture process need to know the market feasibility of cultured sturgeon, which is a relatively new product within the seafood market of Florida. An awareness of the acceptance of such products by potential retail buyers, as well as the product characteristics of highest demand by buyers, will help potential growers and seafood suppliers make wise decisions regarding future participation in the sturgeon product market.

The findings provide insight into the type of sturgeon meat product that will be in demand by buyers within the retail and food service sectors of the southeastern US. Surveys were sent to 4,279 seafood buyers. A response of less than 10% resulted. Although close to 90% of the buyers were familiar with sturgeon meat products, only 10% of the retail respondents and zero restaurants currently stock sturgeon. However, 39% and 42% of restaurants and retailers would substitute cultured sturgeon products for wild-caught. Findings suggest that 21% and 31% of restaurants and retailers would purchase cultured sturgeon if available. Approximately 20% of respondents would buy directly from farmers if available. While 90% of restaurants preferred a filleted product, only 70% of retailers did so. The restaurant sector preferred a 6.05-9.90 ounce fillet, while retailers preferred 8.95-17.89 fillets. Fresh product was preferred over smoked or frozen. Filleted product was preferred over whole or bullet forms. Year-round availability was preferred over seasonal. A purchase price of about $3.00 per pound deemed appropriate. The most important product attribute influencing the potential purchase of sturgeon products for the restaurant buyer was product form, whereas the most important product form for retail buyers was product condition (i.e. quality). The market potential of cultured sturgeon will rely heavily

on increasing familiarity and awareness of buyers. Market promotion will be key. Research into the nature of this promotion is needed. The wholesale sector of the industry also needs to be addressed. Consumer attitudes regarding sturgeon products is needed to estimate the underlying demand for such non-traditional products. One graduate student completed a thesis as part of the project.

3.14 Conduct an economic impact analysis on the hard clam industry by region and state that will demonstrate the economic contributions of the industry to Florida's economy. (Adams, Sturmer)

The economic impact of the cultured hard clam industry in Florida was accomplished. This study provided an overview of the market channels for cultured hard clams and an assessment of the economic impact of the industry on several regions of Florida, as well as the overall Florida economy. The overall economic impact to the Florida economy from the culture and sale of hard clams was approximately $34 million. Leslie Sturmer assisted the marine economics specialist (Chuck Adams) and other faculty in the Food and Resource Economics Department in publishing a report through the Florida Sea Grant Program on the economic impact of the Florida clam aquaculture industry. The technical report (SGR 123), published in December 2001, was distributed to the 49 shellfish wholesale dealers statewide who participated in the survey, and to marine agents and extension directors in clam-producing counties. Further, the report was distributed upon request to over 200 interested individuals. Results have been useful in providing a more accurate measure of the contribution that clam culture is making to Florida's economy. This report has become an important tool for industry members, local government officials, economic planners, and state legislators. Further, this information was used by industry members to garner legislative support in an effort to procure funding in the 2002 state session. In June the Governor approved the 2002-03 state budget in which $100,000 was designated for marketing farm-raised clams.

3.15 Provide pro-forma analysis on the economic and financial characteristics of marine shrimp culture in freshwater ponds in south Florida. (Adams)

This work is continuing at present. Funding was received from a USDA appropriation. The study will examine the economic feasibility of a hypothetical, semi-intensive shrimp farm in Florida. The farm will consist of a single, un-lined earthen pond, with the pumping and well capacity to expand to four ponds. Production parameters will be utilized that are appropriate for Florida (i.e., stocking density, survival rate, growth rate, FCR, etc.). The analysis will provide interested investors with information regarding a low cost, low tech method for initiating a pilot shrimp culture facility.

3.16 Develop a spreadsheet package that will facilitate the collection of necessary production data by commercial hard clam growers participating in the crop insurance program. (Adams, Sturmer)

The CLAM spreadsheet package has been developed. The users manual and software will be available soon. The software provides hard clam growers with a means by which to maintain an inventory of product on a given lease site. The software allows the grower to track seed from purchase, nursery plant, through growout harvest. Survival at each step is measured. Revenues are calculated. Costs are summarized. A map of the lease site allows the user to keep track of exactly where on the lease clams are located. The software will provide users with a means to corroborate loses in the event of a crop insurance claim.

Funding from the USDA Risk Management Agency allowed for the development of simplified computerized spreadsheets using an existing software package, Microsoft Excel, that are specific to the management practices employed by the Florida clam aquaculture industry. The marine economic specialist (Chuck Adams) was a co-principal investigator in this project. The software program (beta version) named *C.L.A.M., Computer Logbook and Management*, was published by the Florida Sea Grant College Program in October to be used as a business tool for clam growers. A users guide that discusses the need for record keeping and serves as a manual for the spreadsheet software program was also published. A flyer with ordering information is currently being distributed to all growers in the state.

3.17 50 Vocational/Technical Students, 200 high school students, and 5 science/vocational technical teachers will increase their general knowledge about aquaculture in St. Lucie County through their participation in Sea Grant programs. (Creswell)

A session on aquaculture was organized for the Small Farm Days conference held in Okeechobee, FL. Six presenters discussed various types of aquaculture in Florida, their current status, and future opportunities for development. Two presentations: clam farming in Florida and tropical marine fish aquaculture for the aquarium trade were made. Approximately 35 attendees received informational brochures about Florida aquaculture. Other events that provided educational opportunities were the St. Lucie County Agriculture Tour (10), Ft. Pierce Farmer's Market (37), Indian River Citrus Seminar (17), St. Lucie County Fair (83).

3.18 10 clam aquaculture industry members holding leases in the Indian River Lagoon will implement up-to-date culture practices and demonstrate knowledge of applicable Florida Dept. of Agriculture and Consumer Services regulations through participation in Sea Grant programs. (Creswell)

Eight site visits were made to clam farmers along the Indian River Lagoon to discuss hatchery production, system design and water quality, animal health management, and growout techniques. All of the clients were experienced in clam hatchery technology, and as such the topics discussed during these visits were very technical and specific to individual hatcheries. The clients confirmed that suggestions provided by the agent would be implemented in their hatchery protocols. The Dunklin Memorial Camp was assisted in establishing pond-based cage aquaculture of tilapia that will be used to help feed the residents of the facility. Floating docks have been designed and constructed, cages have been fabricated, and aeration equipment has been deployed. The cages were stocked in early December 2002. During the spring of 2003 the fish will be harvested and served to the residents of the Dunklin Memorial Camp.

3.19 Serve as co-editor of a book, Perspectives on Responsible Aquaculture for the New Millennium. The book is a series of essays that focus on seafood safety, quality assurance, environmental impacts, aquaculture and coastal management and ethics. It is jointly sponsored by the World Aquaculture Society and the European Aquaculture Society. (Creswell)

The book was published in 2002 by the World Aquaculture Society.

3.20 Provide technical assistance to Sea Grant sponsored research project entitled "preliminary investigation of Blood Ark, Anadara ovalis, and Ponderous Ark, Noetia ponderosa, Culture

to Initiate Diversification for the Hard Clam, Mercenaria mercenaria, Aquaculture Industry. (Creswell, Sturmer)

Jose Nunez with the Department of Fisheries and Aquatic Sciences and LeRoy Creswell with Florida Sea Grant were assisted in setting up an experimental molluscan shellfish hatchery at the Whitney Laboratory with funding acquired through the USDA Cooperative State Research, Education, and Extension Service (CSREES) during 2001-02. Live ponderous and blood ark clams were collected from several wholesalers across the state and held for use as broodstock in spawning and larval rearing trials conducted during 2002. These species, both promising aquaculture candidates, naturally set in clam bags at selected leases. Technical assistance was provided to the Whitney Lab staff in conducting spawning and larval rearing trials during the spring and fall. With additional funding for this project procured through the USDA CSREES for 2002-04, a marketing team was assembled to assess the magnitude of the potential domestic market for these alternate molluscan species. These funds will also allow for continued evaluation of seed culture techniques at the Whitney Lab. Robert Degner with the UF Agricultural Market Research Center and an undergraduate student in the Food and Resource Economics Department developed a market survey that was sent to 2,134 shellfish wholesalers in the nation during November. A partnership with John Baldwin at the Florida Atlantic University was developed to document the embryological development for production of ark clam seed.

3.21 At least 20 residents of Okaloosa and Walton Counties plus Southern Alabama residents will receive information and assistance regarding potential aquaculture ventures and start-up considerations through Sea Grant sponsored educational programs. (S. Jackson)

Sixteen individual contacts through phone calls, office consultations, and site visits provided information for potential aquaculture ventures. A CD providing information for marketing, business planning, water quality considerations, potential species, and Florida Aquaculture BMPs was created from existing resources (SRAC, EDIS, etc). Results of these activities encouraged potential aquaculturists to make informed business decisions and conduct market research before initiating a new aquaculture enterprise.

3.22 Ten farmers will receive information and technical support through a water quality workshop for aquaculture enterprises. (S. Jackson)

Rather than a workshop, individuals were provided information as needed. Two farmers participated in aquaculture ventures on a consistent basis during the growing season of 2002; one in Opp, AL and the other in Baker, FL. Practicing farmers received onsite instruction for improved husbandry and water monitoring techniques to maximize production and profits.

3.23 At least 15 Walton County middle-school children will learn about aquaculture through participation in Sea Grant programs and exhibits. (S. Jackson)

Twelve Walton County youth and three adults cultured Tilapia from January to June 2002. Participants demonstrated increase in aquaculture knowledge based on pre and post tests. The program used Internet technology to supplement educational activities. A special Educational Technology award was received from FAE4-H and an abstract presented at FAEP in Panama City, FL. Results of this project created aquaculture education curriculum that is appropriate for both youth and adults. http://walton.ifas.ufl.edu/4h%20Aquaculture/4haquaculture.htm

3.24 Due to increased interest in aquaculture, assist in reviving the high school Aquaculture Program. Conduct at least two training sessions at the school and evaluate the program at the end of the year. (Mahan)

Although the science teacher at Apalachicola High School was very interested in reviving the school's aquaculture program, problems associated with decreasing student enrollment and the teacher's classroom assignments prevented the program from becoming reestablished this year.

3.25 Continue to establish and refine a shellfish education network within those counties where clam farming is ongoing by working with Sea Gant extension agents in these locales, and establishing a presence in these counties. Efforts in 2002 will focus on Brevard, Indian River, Charlotte, and Lee Counties. (Sturmer: Combs, Creswell, Novak, Wasno)

Efforts this year have continued on working with marine agents in the counties of Brevard (Chris Combs), Charlotte (Rich Novak), Franklin (Bill Mahan), Indian River (LeRoy Creswell), and Lee (Bob Wasno). Each of these agents have hosted and participated in industry meetings within their county, providing local support and assisting in identifying specific industry issues of concern within their areas. This network strengthens the interaction between extension and the clam aquaculture industry by providing a "local" contact as well as providing resources to that agent.

3.26 Expand the multi-county shellfish aquaculture shellfish advisory committee to an industry-wide advisory committee. (Sturmer)

At present, a statewide shellfish aquaculture advisory committee has not been formally established. Utilization of regional growers associations may be an appropriate mechanism in which to obtain statewide input on programmatic needs. These local associations have recently recognized the need to not only work together from a regional perspective but also from an overall industry perspective. Recent challenges and threats to the clam aquaculture industry statewide, such as marketing and overproduction, have prompted these reactions. Consequently, at the request of the boards of these associations the Shellfish Aquaculture Extension Program will conduct educational workshops next year that will introduce growers to several successful agricultural industry organizations. It is anticipated that an umbrella organization may be developed that will allow local associations to address common industry issues. This umbrella organization may also be the mechanism with which to establish a joint statewide advisory committee.

3.27 Develop workshops on remote water quality monitoring systems and weather stations in Brevard, Charlotte, Indian River and Lee Counties, in order that shellfish growers understand the benefits of a continuous data base system, and to identify trends in environmental conditions related to clam health and production. (Sturmer)

CLAMMRS workshops, in conjunction with staff from the DACS Division of Aquaculture, were held in Cross City (Dixie County) on April 2, in Cedar Key (Levy County) on April 3, in Wabasso (Indian River County) on May 14, in Cocoa (Brevard County) on May 15, in Matlacha (Lee County) on July 23, and in Englewood (Charlotte County) on July 29. Over 100 growers were introduced to the project, the monitoring equipment, and the web site. Participants were taught how to access the water quality data, interpret their values, and assess the effects on clam growth and survival. In addition, physiology trials, phytoplankton monitoring, and development of a clam production model were reviewed.

Assistance to growers was provided on an individual basis in accessing and interpreting water quality data on 89 occasions. Over 35% of the active growers in the state reviewed the "real-time" continuous water quality data posted to a web site. These growers are beginning to identify trends in environmental conditions critical to clam health and production. This information will let the industry refine and improve management practices, such as when to plant and transfer seed. Ultimately, this will lead to improved production and profitability.

3.28 Develop workshops for hatchery operators in Brevard, Indian River, Martin and St. Lucie Counties that focus on current production techniques and industry-specific issues so that they can make informed decisions in maintaining their seed business. (Sturmer)

Presentations and publications on both a national and state level were conducted in an effort to make information on remote setting of hard clam seed available to the shellfish aquaculture industry. Presented the results of this work at the Florida Aquaculture Association's Fall Conference on November 9 in Tampa. About 120 aquaculturists statewide were made aware of the proposed benefits of remote setting technology though these presentations, specifically the potential of helping to ensure a consistent supply of inexpensive clam seed to this segment of the clam aquaculture industry. This work is the culmination of a 2-year demonstration project funded through the Florida Sea Grant Program.

3.29 Initiate a network in Franklin County where a new clam industry will begin during 2002 by working with the local Sea Grant Extension agent. (Sturmer, Mahan)

During 2001, the Franklin County Sea Grant Agent networked with Leslie Sturmer (UF_IFAS Aquaculture Agent) and the FL Department of Agriculture and Consumer Services to organize, host and teach three Clam Aquaculture Workshops to educate prospective clam farmers on clam farming. An average of sixty-two people attended each workshop. In addition, Mahan was invited to attend a brainstorming session with representatives from USDA, the Apalachee Regional Planning Council, Gulf State Bank and individuals interested in the development of the local clam aquaculture industry. Twelve people attended the meeting and discussed a wide variety of topics including; USDA loans, crop insurance, bank loans, and what the Regional Planning Council can do to help. Finally, the Mahan and Sturmer attended the DACS Clam Lease Selection Workshop where the 47 Franklin County residents who were selected to receive a Clam Aquaculture Lease made their selection. Once the leases are surveyed and approved by the Governor & Cabinet the clam farming activities can begin. Approval of the leases was granted and clam farming operations began in April 2002.

Organized and taught in The Basics of Buying, Handling, and Planting Clam Seed Workshops on April 11 at the FSU Marine Laboratory in Carrabelle. These 2 workshops introduced 23 new clam growers in Franklin County to seed suppliers, basic seed descriptors, transportation and handling recommendations, stocking rates, and planting strategies. Wrote a 2-page extension flyer, entitled *Clam Seed Buying, Transporting, and Handling Tips*, and distributed at the new growers workshops and training sessions in Franklin County. Conducted 5 "hands-on" training sessions held on June 28, June 29, August 23, and August 24 at the FSU Marine Laboratory in Carrabelle during which 20 growers actually sieved seed, estimated numbers by volumetrically subsampling, constructed clam belts, stocked and planted clams. The county marine agent (Bill Mahan) hosted workshops and assisted in sessions.

Procured funding for a "real time" water quality monitoring station to be deployed at the Alligator Harbor Aquaculture Use Area in Franklin County. Funding for CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing): Franklin County was acquired through a special research grant by the USDA CSREES for 2002-03. The station was deployed by the DACS Division of Aquaculture project partners on May 7. Funding in this 2-year project also supports educational opportunities for these new growers. The county marine agent (Mahan) is a co-investigator in this project. Organized and hosted CLAMMRS workshops, in conjunction with staff from the DACS Division of Aquaculture, in Carrabelle on October 8. The county marine agent (Mahan) hosted the 2 workshops.

3.30 Coordinate and host the annual Hard Clam Growers Conference to discuss latest regulations, research findings, production and harvest techniques. (Sturmer)

The annual Hard Clam Growers Conference to discuss latest regulations, research findings, production, and harvest techniques was not conducted this year. Instead, a forum was held in Tampa on November 8 in which 21 representatives from regional clam growers associations participated. The intent of the forum was to open up discussions between these groups as well as to introduce them to other successful agricultural and aquacultural organizations. Representatives from The Catfish Farmers of America, the Florida Strawberry Growers Association, and the Florida Tropical Fish Farmers Association shared their stories on how their organizations evolved and work to meet their industry's needs. This forum was the first activity in a project entitled Organizational Structures and Strategies for Hard Clam Aquaculture Industry in Florida. Funding for this project to be conducted during 2002-03 was solicited from the USDA Risk Management Agency.

3.31 Continue participation and assist university researchers and state agency staff in the Clam Lease Assessment, Management, and Modeling using Remote Sensing (CLAMMRS) project, a four-year project funded by the U. S. Department of Agriculture that is establishing real-time, remote water quality monitoring systems in various Florida locations. (Sturmer)

The DACS Division of Aquaculture was assisted in deploying water quality monitoring equipment and weather stations at 4 lease areas in the Big Bend region, 3 lease areas in the Indian River, and 2 lease areas in south west Florida as part of the CLAMMRS, Clam Lease Assessment, Management, and Modeling using Remote Sensing, Project. Further, a web page was developed by the Department of Agriculture and Consumer Services (DACS) where "real time" data are downloaded for viewing. This is the culmination of over 3 years of effort to acquire funding and implement a system in which timely information can be made available to clam growers for management decision-making.

With the Department of Fisheries and Aquatic Sciences faculty (Shirley Baker, Ed Phlips), published a 6-page technical bulletin entitled *Water Quality and its Role on Hard Clam Production*. This was distributed at CLAMMRS workshops and provided to growers upon request. Assisted DFAS faculty in creating a poster highlighting the CLAMMRS Project components. This was presented at the National Shellfisheries Association annual meeting on April 14-16 in Connecticut, the Cedar Key Seafood Festival on October 19-20, and the Florida Aquaculture Association annual meeting on November 8-9 in Tampa. Participated in meetings with CLAMMRS Project partners in Gainesville on several occasions to discuss standardization of procedures and to review quality assurance/quality control protocols.

3.32 Continue “Shellfish Aquaculture,” a quarterly newsletter that is distributed to over 600 industry members with businesses in nine countries. (Sturmer)

A quarterly newsletter, *Shellfish Aquaculture*, with 3 issues (February, July and October) was sent to 740 producers, nursery operators, equipment suppliers, wholesalers, distributors in 11 counties, as well as to state agency representatives, elected officials, and community leaders. Each issue featured pertinent information on national, state and local issues affecting the clam aquaculture industry.

3.33 Work with Florida Department of Agriculture and Consumer Services (DACS) staff in the development of BMP field demonstrations and a shellfish aquaculture BMP exhibit. (Sturmer, DAC staff)

Served as a cooperator on a project headed up by the Department of Agriculture and Consumer Services, Division of Aquaculture to demonstrate on-farm implementation of aquaculture best management practices (BMPs) for the clam industry through the development, construction, and demonstration of a permanent aquaculture BMP exhibit to be located at the Cedar Key Shellfish Extension Office. Funding obtained from the Clean Water Act section 319 was awarded by the Department of Environmental Protection to DACS in 2001. Met with the DACS project partners in Cedar Key on November 7 to finalize verbiage and photo selection for the exhibit.

3.34 Coordinate a clam production quality and marketing workshop. (Sturmer, Otwell, DAC staff)

Reported under 3.30.

3.35 Conduct several water quality monitoring for the shellfish industry. (Sturmer, Baker, Phlips, DACS)

With Department of Fisheries and Aquatic Sciences faculty (Ed Phlips, Shirley Baker) began to develop a system and protocol for rapid identification of biological samples, in particular, phytoplankton. EADIN: Expert Assistance and Distance Identification Network is funded for 2001-03 through a special research grant by the USDA CSREES. Microscopes equipped with digital imagery were set up at the Department in Gainesville and at the Shellfish Extension Office in Cedar Key. Protocol and sampling to be developed next year will link industry members with IFAS experts on the ecology and biology of the Big Bend region.

3.36 Coordinate several Crop Insurance Focus meetings for the shellfish industry. (Sturmer, USDA/RMA Crop Insurance specialists)

At the request of one of the reinsured companies that handles over 70% of the clam insurance policies in the state an informal meeting was arranged with four of their regional representatives and selected clam growers in Cedar Key on November 13. The intent of the meeting was to gain a better understanding of how the policy provisions and loss adjustment procedures were being implemented. In addition, a tour of clam leases and shore-based facilities was organized for this group. Suggested improvements to the loss adjustment procedures may be implemented by the reinsured companies in 2003. Forty-nine meetings with growers, insurance providers, field supervisors and loss adjusters to review various crop losses and policy provisions. Information provided included water

quality data from the CLAMMRS monitoring stations or meteorological data from the NOAA buoy stations. The pilot program is to be continued for the crop year 2003.

3.37 Coordinate a series of crop record keeping workshops for the shellfish industry. (Sturmer, Adams)

This has not been accomplished. These workshops will be conducted in Spring, 2003. Training in the use of the *C.L.A.M., Computer Logbook and Management*, software to growers in counties where the pilot crop insurance program is being implemented will be conducted in 2003 through workshops and consultations on an individual basis.

3.38 Assist in the development of a Shellfish Aquaculture Center in Cedar Key. The center will provide support for all phases of the “Aquaculture Florida” research project pertaining to shellfish. (Sturmer, UFFAS Faculty)

The Shellfish Aquaculture Center is located in Cedar Key, where the hub of the clam aquaculture industry is based. The Center will provide support for all phases of the "Aquaculture, Florida" research project pertaining to shellfish. The construction of the Center was completed in 2002. Installation of a saltwater delivery system, an effluent discharge system, and half of the fiberglass tanks was also completed. The Center is anticipated to become operational during the spring 2003.

3.39 Assist local school groups who are farming clams on a Levy County management lease site. (Sturmer)

The management use agreement with the Levy County Board of County Commissioners for a lease site off Cedar Key where local school groups are farming clams was updated.

3.40 Assist the Suwannee River Water Management District staff by providing educational materials on clam farming to various school groups. (Sturmer)

The Fish and Wildlife Conservation Commission staff and the Suwannee River Water Management District staff were assisted by providing educational materials and displays on clam farming for various school groups touring Cedar Key.

3.41 Provide presentations and demonstrations at State 4-H Congress. (Sturmer)

The clam aquaculture educational program, *A Day in a Clam Farmer’s Life*, was not conducted this year due to time limitations set by the 4-H Youth Congress.

3.42 Organize and participate in a session on recent advances in land-based nursery systems for shellfish aquaculture at the 94th Annual Meeting of the National Shellfisheries Association. (Sturmer)

Technical and financial aspects of the clam remote setting demonstration project were summarized in a PowerPoint presentation. These results were presented at the East Coast Bivalve Industry Session held in conjunction with the National Shellfisheries Association annual meeting on April 15 in Connecticut. In addition, an abstract summarizing project results was published in the National Shellfisheries Association's peer-reviewed journal.

3.43 Continue work with University of South Florida and Florida Department of Fish Wildlife and Conservation Commission scientists in the scallop restoration project. (Sweat)

Continued working with USF and FWC on shellfish (scallop) restoration project off Citrus County coast.

3.44 Continue to provide technical assistance to net-banned fishermen on the blue crab fishery. (Sweat)

Active technical assistance effort with net-banned fishermen trained in soft-shelled crab project was completed. However, assistance to individuals will continue to be provided upon request.

3.45 At least 50 stakeholders will learn more about the habitat and behavior of fishers, in ways that science have not been able to document, through the testimonials of patriarchal fishermen (both recreational and commercial) who have fished over the years out of Broward County. (Tavares)

Not completed due to resignation of Tavares.

3.46 Organized a regional workshop on interstate shellfish and transport. (Sturmer)

Leslie Sturmer served on the organizing committee and participated in the Eastern U.S. Interstate Shellfish Seed Transport Workshop held in Charleston, South Carolina on February 21-22. Sponsorship of the workshop and proceedings were provided through funds procured from the Big Bend Shellfish Aquaculture Advisory Committee and Florida Sea Grant. The workshop provided an exchange of information concerning the need to protect resource interests, reduce risks associated with shellfish importation, and facilitate interstate commerce. Five seed suppliers from Florida and a DACS agency representative also participated in this gathering. Through a gathering of shellfish seed suppliers, state regulators, pathologists, researchers, and extension agents from 13 east coast states at a forum addressing interstate transport of seed, recommendations were made for developing a uniform set of criteria for shipment of bivalves between jurisdictions. This unanimous support could facilitate implementation at the state level.

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

4.1 Bacteriophage has proven to be effective in killing pathogenic bacteria in mice and farm animals. *Vibrio vulnificus* are a bacteria present in oysters. *V. vulnificus* is lethal when consumed by people in certain risk categories. Bacteriophage may offer a practical and realistic method for making oysters safe for human consumption. They will be used to test their ability to kill *V. vulnificus* in oysters. (Duckworth/Gulig: R/LR-Q-20 [GMO-99-1])

Over 20 different phages have been purified and used to type 57 strains of *V. vulnificus* that were isolated from either patient material or oysters. All these bacterial strains have been characterized as to their pathogenicity in our mouse model of *V. vulnificus* disease. We do not yet know if we will be able to differentiate pathogenic bacteria from non-pathogenic bacteria using the phage. In studying the stability of these phage we have found that several are much more stable if grown on protease negative mutants of the *V. vulnificus*. However, we don't have these mutants for every phage host. Thus one thing that we will be doing that was not anticipated will be isolating protease negative mutants of the hosts of our most active phage.

We have found that some of the phage will reproduce in common laboratory nutrient media but that to grow and kill optimally some require the presence of sea salts. We have found that of the latter group, some require only additional Mg++ and Ca++. We are now looking to see if mammalian blood serum will increase the growth and killing ability of some of the phage we are using. We were hoping to find some phage that would absorb to a virulence determinant on the bacterial so that phage-resistant mutant bacteria would be non-pathogenic. Then if the bacteria became phage resistant during treatment, even though they weren't killed, they would not cause disease. We have studied several phage-resistant bacteria isolated both *in vitro* and in mouse experiments and found that they are still pathogenic.

We have shown in highly acclaimed work that phage active against *V. vulnificus* is able to eliminate bacteria and prevent serious consequences of systemic disease in a mouse model of infection. These results have been submitted for publication; we have been asked to make only several minor modifications to the manuscript so that it should be published shortly. The results have also been presented at four international meetings - the American Society for Microbiology, the Johnson and Johnson Focused Giving Symposium, and two meetings of the International Phage (Evergreen) Biology Group. This work has received a great deal of interest and acclaim wherever we have talked about it. We plan, at some future time, to see whether phage can prevent and/or cure a localized wound infection in a rat model. This established wound model would be directly applicable to human wound infections with *Vibrio vulnificus.*

The work with oysters has proven to be somewhat more refractory. We have found that experimentally infecting oysters with *V. vulnificus* is not as easy as infecting mice. For example, incubating oysters with *V. vulnificus* contaminated artificial seawater did not result in high levels of stable infection (i.e., sustainable infection with fresh seawater rinses/incubations). However, as detailed in Dr. Anita Wright's poster at a recent American Society for Microbiology meeting, it has been shown that with simultaneous treatment of oysters with bacteria and phage, there is a reduction in the number of bacteria recovered from the oysters. This result shows that the phage can PREVENT infection of the oysters, so we are hopeful that with a good method to infect the oysters with *V. vulnificus*, we will be able to show that the phage can kill the bacteria *in situ*. We are currently collaborating

with Dr. Wright on a continuation of this project. We have determined that phage can kill bacteria in oyster homogenates, so that we foresee no reason that they won't be able to kill the bacteria in the oysters, we just have to find a way to stably infect the oysters so that we can study the parameters of *in vitro* killing by phage.

Prior to this work, no one had shown that bacteriophage could be used to prevent or cure *V. vulnificus* disease in animals. There has been, in fact, very little quantitative work done in animals on the killing of bacteria by phage. We feel that our methods and procedures have set a standard by which other animal experiments should be done. We have shown that bacteriophage are very effective *in vitro* in mice, and now hope to be able to show the same thing in oysters. We also have isolated a number of new phages that infect *Vibrio vulnificus*. We have determined that phage lysates may be more stable if grown in protease negative bacteria and that Mg++ and Ca++ can substitute for the requirement of some Vibrio phage for seawater. We have also shown that phage have a potential for differentiating strains of *V. vulnificus*, although we don't as yet know if they will be able to be used in a simple way to differentiate pathogens from non-pathogens. Two graduate and one undergraduate students worked on the project. Two publications are completed or in process and four presentations were made.

4.5 Plan, organize and teach at the 4th Annual Oyster Industry Workshop where industry representatives will be updated on current issues, such as *V. vulnificus*, new regulations and processing options. (Mahan, Otwell)

The Franklin County Sea Grant Agent help coordinate and hosted this year's FL Oyster Industry Meeting at the UF/IFAS Extension Office in Apalachicola in September 2002. The Apalachicola Bay Oyster Dealers Association cosponsored the meeting. The focus of the meeting was current and potential post harvest treatment options that the oyster industry can use to help reduce the illness rate of *Vibrio vulnificus* (*Vv*) in Florida and comply with the Interstate Shellfish Sanitation Conference's goal of reducing the *Vv* illness rate by 40% by 2006. As a result of the workshop, the oyster dealers, Congressman Allen Boyd's District Representative and Franklin County Commissioners were updated on the oyster post-harvest treatment research that UF-IFAS is going to conduct, current post-harvest treatment options and FL's *Vv* educational efforts that target high-risk individuals who may consume raw oysters about the dangers of *Vv.* Twenty oyster dealers from around the state attended the meeting.

4.6 Attend and participate in regional and national Interstate Shellfish Sanitation Conference committee meetings to provide technical support to the local and Gulf of Mexico oyster industry representatives. (Mahan)

The Franklin County Sea Grant Agent was requested by the Franklin County Board of County Commissioners and the local oyster industry to attend the Interstate Shellfish Sanitation Conference's *Vibrio* Management Committee & *Vibrio vulnificus* Subcommittee meetings in Biloxi, MS and provide technical information and support to the Gulf of Mexico's oyster industry representatives and to report back to the board and local industry on the results of the meeting. The committee was meeting to review the *Vv* issue that was sent back to the committee at the end of the ISSC's 2000 Annual Meeting. Thirty-six people from around the U.S. attended the meeting.

The Franklin County Sea Grant Agent was requested by the Franklin Board of County Commissioners and the local oyster industry to attend the ISSC's Gulf & South Atlantic Regional Meeting in Biloxi, MS. to provide technical support for the FL oyster industry representatives as well as industry representatives from throughout the Gulf and Southeast Atlantic region attending the three-day meeting.

As a result of attending the meeting, the Agent was able to provide technical support and assistance to the FL oyster industry representatives as well as industry representatives from throughout the Gulf and Southeast Atlantic region attending the meeting. In addition, when the Agent returned, updates were provided on the meeting to the Board of County Commissioners and the local oyster industry. Forty-five people attended the meeting.

At the request of the oyster industry and the Franklin County Board of County Commissioners, the Franklin County Sea Grant Agent was sent to the ISSC's Annual Meeting in Norfolk, VA, July 21-27, 2001 to provide technical assistance and advice to the two County Commissioners and the Gulf of Mexico oyster industry representatives in attendance. At the meeting the Agent worked with Dr. Steve Otwell (FL Sea Grant) and David Heil (FL Dept. of Ag & Consumer Services) to provide technical assistance and support to the oyster industry representatives and County Commissioners at the meeting so that they could better understand and respond to the technical issues related to *Vibrio vulnificus* issues discussed at the meeting. In addition, the Agent attended and participated in meetings of the two committees (*Vv* Education and Biotoxin) that he was appointed to serve on by the Chairman of the conference for 2001. As a result of attending the conference, the Agent was updated on state, regional, national and international molluscan shellfish/public health issues related to the shipping of shellfish. In addition the Agent has been able to explain to the oyster processors and fishermen how the *Vv* issue adopted by the conference can impact the FL oyster industry. One hundred-ten people from the U.S. (28 states), Canada, Australia, New Zealand, Japan and Korea attended the conference.

4.7 Organize and teach at least two clam aquaculture workshops in support of this potential new industry in North Florida. (Mahan, Sturmer)

The Franklin County Sea Grant Agent worked with Leslie Sturmer (UF/IFAS Aquaculture Agent) to plan, organize and teach a series of four educational workshops for the 47 new clam farming families in Franklin County. The workshops were "The Basics of Buying, Handling and Planting Clam Seed," two sessions, "How to Sieve, Estimate, Stock and Plant Clams," three sessions, "How to Sieve, Estimate, Stock and Plant Clams," two sessions, and "Clam Lease Assessment, Management and Modeling using Remote Sensing (CLAMMRS), two sessions. Results of a written survey completed by the clam farmers during the Seed Clam Workshop had the following results. Twenty-three, 100% of the farmers in attendance, reported increasing their knowledge on clam aquaculture. 100% of the farmers reported that they would use at least 50% of the culturing tips that they learned. All the farmers reported that they were going to share the information that they gained with others. All of the farmers rated the workshop as excellent (8), very good (10) or good (5). Twenty-one (91%) of the farmers reported that the workshop will help them save money in their clam farming operations.

Leslie Sturmer organized and taught in The Basics of Buying, Handling, and Planting Clam Seed Workshops on April 11 at the FSU Marine Laboratory in Carrabelle. These 2 workshops introduced 23 new clam growers in Franklin County to seed suppliers, basic seed descriptors, transportation and handling recommendations, stocking rates, and

planting strategies. A 2-page extension flyer, entitled *Clam Seed Buying, Transporting, and Handling Tips*, was written and distributed at the new growers workshops and training sessions in Franklin County. Five "hands-on" training sessions were held on June 28, June 29, August 23, and August 24 at the FSU Marine Laboratory in Carrabelle during which 20 growers actually sieved seed, estimated numbers by volumetrically subsampling, constructed clam belts, stocked and planted clams. The county marine agent (Bill Mahan) hosted workshops and assisted in sessions.

Leslie Sturmer procured funding for a "real time" water quality monitoring station to be deployed at the Alligator Harbor Aquaculture Use Area in Franklin County. Funding for CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing): Franklin County was acquired through a special research grant by the USDA CSREES for 2002-03. The station was deployed by the DACS Division of Aquaculture project partners on May 7. Funding in this 2-year project also supports educational opportunities for these new growers. The county marine agent (Mahan) is a co-investigator in this project. Organized and hosted CLAMMRS workshops, in conjunction with staff from the DACS Division of Aquaculture, in Carrabelle on October 8. The county marine agent (Mahan) hosted the 2 workshops.

4.8 Organize and recruit members for a Franklin County Aquaculture Task Force that will oversee the development of the clam aquaculture industry in the county. (Mahan)

At the request of the Department of Agriculture and Consumer Services and UF-IFAS Extension, the Alligator Harbor clam farmers selected six clam farmers to represent their interests at an Alligator Harbor Clam Farming Liaison Workgroup in December 2001. During 2002, the workgroup worked with the Franklin County Sea Grant Agent to draft & distribute a “request for proposals” to companies that might be interested in surveying the Alligator Harbor high-density clam lease area. The workgroup also reviewed the survey proposals and coordinated the survey of the area for the farmers. In addition, the workgroup helped the Sea Grant Agent & statewide Clam Aquaculture Extension Agent select workshop topics for 2002 as well as issues related to placing boater education signs in the area. As a result of the workgroup formation the clam farmers are happy to be involved with all the aspects of the developing industry and the Agents are very pleased with the support the workgroup has provided relative to planning and implementation of clam aquaculture programs.

4.9 Continue to work as a member of Florida’s *V. vulnificus* (Vv) Risk Management Work Group to assist with the development and implementation of the statewide management plan to reduce Vv. Oyster related illnesses in Florida. (Mahan)

The Franklin County Sea Grant Agent was invited to attend the DACS' FL *Vibrio vulnificus* Illness Reduction Work Group Meeting on November 30, 2001 in Tallahassee. All ten members of the DACS appointed work group attended the meeting. As a result of the meeting the FL *Vv* Illness Reduction Plan was reviewed and edited to comply with the wording and the spirit of the *Vv* Issue that was adopted by the Interstate Shellfish Sanitation Conference in August and approved by the Food & Drug Administration in October 2001. The FL plan was review by DACS and approved as Florida’s *Vv* Illness Reduction Plan in January 2002.

4.10 Continue as member of the Interstate Shellfish Sanitation Conferences *V. vulnificus* Education subcommittee in the development of a national Vv. Education plan to reduce Vv. Oyster related illnesses in the United States. (Mahan)

The Franklin County Sea Grant Agent was reappointed to two committees by Ken Moore, Executive Director of the ISSC for 2001-2003. The Agent was the only Florida representative appointed to the ISSC's *Vibrio vulnificus* Education Subcommittee and was one of the two Florida representatives appointed to the Biotoxin Committee. The *Vv* Education Subcommittee is charged with developing a national *Vv* education plan to educate at-risk individuals about *Vv* with the goal of reducing *Vv* related illnesses nationwide. The Biotoxin Committee has been charged with looking at several new issues this year related to biotoxins. One issue to be examined in 2001 is if the relaying of aquacultured shellfish out of areas being threatened by hazardous algal blooms should be approved by the ISSC. As a result of these committee appointments, the Agent was able to be much more involved this year with helping the industry at the ISSC meetings. In addition, the Agent was better able to keep the Board of County Commissioners and the local oyster industry up-to-date on ISSC matters because of constant communications with the ISSC and the different committee members throughout the year.

The Franklin County Sea Grant Agent as an appointed member of the Interstate Shellfish Sanitation Conferences *Vv* Education Subcommittee was invited to attend the committee's meeting in Waveland, MS to develop the ISSC's *Vv* Education Publication. As a result of the meeting, the committee finalized the revisions on the updated version of the ISSC publication, "The Risk of Eating Raw Oysters," drafted a series of recommendations to submit to the ISSC's Vibrio Management Committee, and completed its *Vv* Risk Assessment Survey that will be used to help measure the effectiveness of the ISSC's National *Vv* Education campaign to reduce the *Vv* illness rate throughout the Gulf Region and in California. Sixteen members of the committee attended the meeting.

4.11 Develop handbooks to direct development of HACCP and “variances” in retail processing of foods. Six handbooks are expected that will cover the following topics: fresh juice, fresh cut produce, specialty meats, smoked fish, MAP/vacuum packaging, and sushi. (Otwell)

An industry steering committee has been formed and convened to direct the project. Participants include representatives from most major retail supermarket chains (Krogers, HEB, Wal-Mart, Publix, Winn Dixie), various national trade associations (Food Marketing Institute, National Restaurant Association, Association Food & Drug Officials, Conf. Food Protection, and National Food Processors Association), and individual expertise from selected state agencies and academic programs (over 12 universities involved). Six Retail Advisories (Sushi, Smoked Seafood, Reduce Oxygen Packaging, Fresh Juices, Fresh Cut Produce and Specialty Meats) are currently in development through assigned subcommittees. The anticipated products will be made available in text and on the AFDO website for use by all segments of the nation’s retail industry that are processing foods in retail settings, plus for guidance of regulatory programs in every state.

4.12 Assist in the implementation of post-harvest treatments for processing safe oysters in Florida (Otwell)

Trials have been initiated with post harvest treatment (PHT) methods in actual commercial settings in Apalachicola, FL to determine potential utility in Florida. A survey of the entire Florida oyster processing industry has been completed to assess commercial capacity to adopt mandated PHT’s. Methods under investigation include freezing, high pressure, cool pasteurization and irradiation.

4.13 Conduct research and educational programs to verify tempering to control clam survival and reduce *Vibro vulnifucus*. (Otwell)

All collaborative work with the clam processors in Cedar Key has been compiled and submitted to FL Dept. Agriculture and U.S. FDA in consideration to allow tempering which is vital to marketing of live clams produced in Florida's warmer climates. This work has established and advanced recognition of a handling and processing method essential for Florida's aquaculture clam industry.

4.14 Work with other researchers on "controls for Carbon Dioxide applications with fish. (Otwell)

Three processing firms and two major supermarket chains have completed trials to determine use of innovative carbon dioxide release systems in packaging of Florida seafood to maintain product quality and shelf-life. Current results are promising and firms are modifying processing procedures to incorporate a more cost-effective application through use of carbon dioxide impregnated absorbent pads. Potential patents are pending.

4.15 Conduct annual industry training sessions with the assistance of county faculty. (Otwell)

Annual schools completed for Shrimp, Hard Clams, and Oysters. These events are popular, expected and appreciated by Florida processors in excess of 100 attendees per year.

4.16 Conduct domestic and international Shrimp Schools. (Otwell)

The 8th annual Shrimp School included commercial participants from six nations, 25 commercial firms and every federal and state agency governing safety of shrimp processing and importing to the USA. Featured topics addressed concerns for antibiotics in imported shrimp, decomposition analysis, country of origin, labeling and development of recall programs. The overbooked status for the 9th annual Shrimp School scheduled for May 2004 is testimony to the popular status and impacts provided through this program.

4.17 Periodic training schools for HACCP and Sanitation Control Procedures for seafood processing and regulatory inspectors will continue. Schools will be held, as needed, in response to firms, agencies or organizations that insure 25 attendees. (Otwell)

Dr. Otwell maintains his 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.

4.18 Work with FAO/WHO and Smithsonian Institute in website development for ECOPORT "fisheries and seafood safety." (Otwell)

Dr. Otwell serves 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. The next meeting and developments occur in Iceland in June 2003.

4.19 Explore development of an annual lobster school, patterned after the successful shrimp schools. (Otwell)

Lobster School – still under development with expectation to schedule in Fall 2004.

4.20 Explore development of an annual smoked fish school, patterned after the successful shrimp schools. (Otwell)

Smoked Fish School – still under development with expectation to offer in 2005.

4.21 Leadership will continue to be provided for numerous seafood technology organizations. (Otwell)

Work continued on all these activities through 2002, with numerous meetings needed throughout the year.

4.21.1 National Seafood HACCP Alliance, 2001-2003, National Coordinator. (Otwell)

4.21.2 Executive Director, Seafood Science & Technology Society of the America's Annual Conference. (Otwell)

4.21.3 U.S. Representative to the International Association of Fish Inspectors Annual Meeting. (Otwell)

4.21.4 National Academy of Science's Committee on the "Use of Scientific Criteria and Performance Standards for Safe Food." (Otwell)

4.22 Coordinate workshops and seminars at local festivals and boat shows that provide at least 200 home seafood consumers with seafood safety information. (Sweat)

Four workshops were held that covered seafood safety and preparation (2) and fish smoking (2).

4.24 (added) Leslie Sturmer procured funding and served as a liaison among representatives of the Food and Drug Administration (FDA) and the state shellfish regulatory authority (DACS), faculty at the Aquatic Food Products Lab (Steve Otwell, Gary Rodrick, Anita Wright), and shellfish wholesalers in an effort to continue microbiological monitoring, specifically *Vibrio vu*lnificus, of tempered clam product during summer harvest. Funding for this ongoing monitoring project was acquired for 2002-03 through a special research grant awarded by the USDA CSREES. Anita Wright was assisted in conducting 24-hour monitoring studies of the dry tempering method in June, August, and September. Samples of tempered and non-tempered clam product were collected from participating wholesalers in Cedar Key for microbiological analysis. The microbiological results obtained from the monitoring program conducted during the summer harvest months can be used by industry to verify that tempered clam product entering commerce is as safe as non-tempered product and does not pose a public health risk. Over 40% of the certified shellfish wholesalers in the state requested and received results of the tempering monitoring study.

4.25 (added) Leslie Sturmer assisted Steve Otwell in compiling the results of the past six years of research, demonstration, validation, and monitoring of the dry tempering method for post-harvest treatment of clams. The status report was submitted to both the federal (FDA) and state (DACS) shellfish regulatory authorities for their review.

4.26 (added) Leslie Sturmer initiated a discussion on tumbling, or washing, activities with the state regulatory authority (DACS Division of Aquaculture) on October 1 in Cedar Key so growers could have the opportunity to petition their objections to the existing rule. Eight growers and wholesalers, representing large and small-scale operations, participated. In the Big Bend area, where harvesting is restricted to a narrow time frame due to tidal constraints, the current rule limiting tumbling activities creates a "bottleneck" at the processing plant. A proposal to the DACS to license "land-based" washing, or tumbling, facilities was facilitated through the Division's certification program. Further, best management practices were drafted that the certified facility would operate under to ensure product safety during this harvesting operation. This proposal is under review by the state agency.

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

5.4 Florida Sea Grant has a long record of cooperative relationships with agencies in Southwest Florida through joint collaborative research and extension projects in urban boating and small craft management. This current activity will help in conceptualizing, publications, serving as Florid Sea Grant "Ambassador" to elected and appointed officials and monitoring current program staff. (Spranger/Antonini: PD-01-11)

Meetings were held with the Town of Bonita Bay officials, with Collier County, City of Naples and City of Marco Island officials. There is latent interest in future collaborations. Parties agreed that the WCIND/FSG publication of "Vol. 2, Historical Geography of Southwest Florida: Placida Harbor to Marco Island" -- to be released in October 2002 -- will provide a basis for discussing specific future projects. Suggestions from these meetings were used to broaden the treatment of Collier County waterway issues in the study reported in Vol. 2.

Presentations were made to the Charlotte County Marine Advisory Committee on the regional waterway management project. In addition, the project was discussed with the Commissioner for Charlotte County who serves on the WCIND Board. Over the years, Charlotte County has adopted the policy of requesting permits to dredge to a -5 ft mlw. This request has been turned down repeatedly by the state regulatory agency. The presentation and meetings mentioned above spoke about the FSG/WCIND approach, which the State has adopted as a standard for Manatee and Sarasota Counties, and is based on a 'surgical' dredging approach. The county is yet to make a decision on this matter.

In response to a request from the WCIND, discussions included broadening and strengthening the institutional connection with the Southwest Florida Regional Planning Council, establishing a working relationship with the marine industry and environmental waterway citizens associations and focusing on Lee County. Manatee and Sarasota County staff were given advice on future applications of the regional waterway management data bases; for Manatee County this included county-wide channel markings and waterway restoration efforts; in Sarasota County, where staff have created a marine-access overlay district, planning future county-sponsored waterway improvements rests on developing funding mechanisms, multi-site permitting procedures, community involvement, and coordination with WCIND-sponsored public access channel improvements.

Because of the problems encountered with the 8-month delay in the State's adoption of the Notice General Permit for Manatee and Sarasota Counties, and in light of findings from waterway research on Vol. 2, a project concept was developed to improve the navigation/habitat river/waterway management system for the Caloosahatchee River/Okeechobee Waterway. There are some 40 detached, remnant river meanders and oxbows in a state of deterioration due to poor water circulation and upland land use. The system is in a collapse mode due to low water levels in Lake Okeechobee, which have also restricted cross-Florida boat traffic. The Okeechobee is a federal project under the aegis of the U.S. Army Corps of Engineers, but there is no local sponsor. We worked with Lee County staff, and assisted in developing a resolution, which the Board of County Commissioners adopted, calling for Lee County as local sponsor, and requesting the Florida Congressional Delegation to direct the Corps of Engineers to undertake a reconnaissance survey of the waterway. The County has also requested assistance from

FSG and the Southwest Florida Regional Planning Council in coordinating management and institutional networking elements. This effort was undertaken with the collaboration of the Caloosahatchee River Citizens Association (River Watch) and the Southwest Florida Marine Industries Association.

Sarasota County is developing a strategy to surgically dredge non-WCIND improved channels. Both public (WCIND) access channels interior (non-WCIND) waterways form the county's waterway infrastructure. Creation of a marine-access overlay planning district is an important first step in operationalizing such a county waterway management plan. The FSG database provide the foundation of needed scientific information and the WCIND General Permit offers the cost-effective permitting mechanism.

5.5 Legal issues associated with waterway management and recreational boating have been developing and changing rapidly. A seminar will be held that provides legal and technical education to the marine community concerning the issues associated with use of the marine environment. (Ankersen/Hamann: PD-01-12)

The workshop was attended by more than 120 persons (including speakers) from the marine legal and professional community from throughout Florida. According to the Florida Bar's workshop rating form, the workshop rated a 4.0 on a 5.0 scale.

Workshop topics included an update on the nature and status of Manatee settlement agreements, permitting and funding for waterway activities on a regional scale, local government harbor management, and regulation of boating activities, and marine and dock siting and regulation. Although styled as a continuing legal education workshop, about half of the participants were non-lawyer professionals and boaters.

5.6 Participate in efforts to develop a regional economic analysis and impact of the Atlantic Intercoastal Waterway System. (Adams)

A meeting of Atlantic Sea Grant Extension programs was held in Charleston, SC. A proposal was developed that would estimate the economic impact of the Atlantic Intercoastal Waterway. The budget was high and to date a successful funding source has not been identified.

5.7 Work with local marinas and boatyards to assist them in obtaining "clean marina/boatyard designations. (Combs, Crane, Diller, S. Jackson, McGuire, Verlinde)

The Brevard Marine Agent worked with 15 local marinas and 3 boatyards, most of which are members of the Marine Industries Association of Brevard, to assist them in obtaining Clean Marina and/or Clean Boatyard designations. This is an ongoing process, and during 2002, 47 visits (meetings, workshops, walk-throughs) were conducted by the Marine Agent as part of the certification process. Cape Marina (Port Canaveral) earned dual-designation as both a Clean Marina and a Clean Boatyard in a ceremony conducted March 13th. Kennedy Point Marina and Yacht Club (Titusville), and Titusville Municipal Marina were both designated as Clean Marinas on October 9th, in two separate ceremonies.

Approximately 25 marina operators and associated industries attended the Clean Marina Workshop held at the Sandestin Resort in Walton County. The Marine Industries Association of Florida and Florida Department of Environmental Protection sponsored the event. Participants were recruited and offered assistance to individuals interested in getting involved. As of the end of the year, no further activity had occurred.

Two Pensacola Bay area marinas, Island Cove Marina and Santa Rosa Yacht and Boat Club, earned recognition as “Clean Marinas” in the FL Sea Grant sponsored program in 2002. Additionally, the Pensacola Shipyard Complex received the first “Clean Boatyard” designation in northern FL. All of these facilities voluntarily utilize best management practices to reduce on site water pollution.

Assistance was provided to Miami-Dade County’s first designed Clean Marina Waterways and Marina Publications were distributed to boaters regarding 'Clean Boater Habits'. A Clean Marina Workshop with representatives from DEP and DERM for Miami Beach Marina was organized and resource information provided on marine debris and pelicans. In addition, ‘clean boater habits’ information was distributed to boaters at several boat shows and fishing events to heighten their awareness of the program.

In 2001, Clean Marina information for Santa Rosa Yacht and Boat Club was provided. The agent participated in Clean Marina inspection at this facility, and Clean Marina designation was granted in the fall of 2002.

5.8 Serve as project coordinator for Clean Marina/Boatyard Program and assist the Clean Boating Partnership in the development and delivery of educational programs. (D. Jackson)

Four quarterly meetings of the Clean Boating Partnership were held, resulting in approximately 26 workshops statewide. There are now 35 clean marinas and 6 clean boatyards designated. About 150 more marina owner/operators have attended workshops and are working toward certification. The Sea Grant Project Coordinator authored the workshop curricula and trained 25 instructors in 7 “Prepare the Presenter” sessions.

5.9 Provide evaluation and measure effectiveness of “Prepare the Presenter” workshops for Boatyards that were conducted during 2001. (D. Jackson)

A survey titled “Feedback on Prepare the Presenters Workshop” was conducted. Requests for feedback were sent to 168 people who had attended workshops in 2001, resulting in 44 qualified responses. A key piece of information was that 74% of those who had attended a workshop had started the process of certification for their marina or boatyard, and 23% claimed they intended to start in the near future. Results of the survey were distributed to the Clean Boating Partnership and all then-current clean marinas and boatyards.

5.10 Assist in the development of the 2002 National Clean Marina Conference and present paper on Florida’s program. (D. Jackson)

The first National Clean Marina Conference was held in Mystic, CN in September, 2002, coordinated and facilitated by Sea Grant representatives from MarinaNet. Approximately 150 people attended, representing 16 states and several agencies of state and federal government. Plenary sessions highlighted representative state programs, including Florida's Clean Marina Program, and breakout sessions covered all aspects of program evolution. No clear national program or coordination element was identified.

5.11 Secure funding, update and distribute 50,000 new Boater's Guide to Charlotte Harbor. (Novak)

A Boater's Guide to Charlotte Harbor (SGEB-52) was distributed to fishermen, boaters, divers and other marine resource users. The guide was funded through grants from the Charlotte Harbor National Estuary Program, West Coast Inland Navigation District, Gulf of Mexico Program, Department of Environmental Protection and Charlotte County. More than 100,000 copies of the guide were printed and nearly 50,000 have been distributed through marinas, chambers of commerce, marine patrol officers, libraries, tackle shops, visitor contact stations and a variety of other outlets.

5.12 Assist Charlotte County planners with a comprehensive plan for boating and beach access. (Novak)

Updated and maintained, with the Charlotte County Chapter of the Florida Coastal Conservation Association and Parks and Recreation, 15 educational kiosks that were purchased last year with grant funding from Charlotte Harbor NEP. The Kiosks are located at marine access points (piers, beaches and launch ramps) around the County. Served on a five member committee appointed by the Charlotte County Marine Advisory Committee that provided educational information to Charlotte County administrators, planners and the Board of Commissioners. This is an on going process of providing information and data regarding manatees since the state and federal governments are currently determining where to place speed zones, sanctuaries, and refuges. Posted 40 weather proof educational signs for boaters at boat ramps, tackle shops, marinas and other locations in Charlotte and Lee Counties that described proper operating procedures and etiquette around clam leases. Visited tackle shops, marinas, tag offices, visitor contact stations, chambers of commerce and other businesses where marine resource users assemble to set up displays and handout publications. More than 60,000 brochures, fact sheets, boaters guides, fishing regulations and fish ID books were dispersed in 2002.

5.16 Organize an Advisory Council to assist the Urban Boating/Bay Water Management Program to clarify and prioritize issues, develop program objectives, identify and establish partnerships with governmental entities, and evaluate program activities. (Swett)

Potential advisors to the Boating and Waterway Management Program were identified through two workshops held in St. Petersburg and Dania, Florida and include a broad range of individuals that represent numerous entities: federal (U.S. Coast Guard), state (FWCC Law Enforcement, Florida Marine Research Institute), regional (West Coast Inland Navigation District, Southwest Florida Marine Advisory Committee), county (Lee, Manatee, and Sarasota), industry (Florida Marine Industries Association, Southwest Florida Marine Industries Association, INFOLINK), and non-profit (Mote Marine Laboratory).

5.17 Initiate and complete a waterway management analysis of the Braden and upper Manatee Rivers with Manatee County funding. Products will include GIS data layers of boats, depths, signs, derelict vessels, moorings, and trafficsheds; 1:2400-scale neighborhood

waterway analysis showing level of accessibility to open bay water for each boat, with draft restrictions at 0.5' intervals; 1:2400-scale neighborhood waterway analysis showing location and extent of channel depth restriction at 0.5' interval; Regional analysis atlas, 1:24,000-scale, identifying water depth of access channels, feeder canals, basins , open water areas, boating facilities and boats, habitat (sea grass, mangrove). (Swett, Fann)

The waterway management analysis of the Braden and upper Manatee Rivers was completed. Manatee County and the West Coast Inland Navigation District were provided with ArcView GIS data layers and applications, a waterway restriction analysis, and a final report (TD- 6) for approximately 30 miles of navigable waterways, 543 boats, 941 moorings, 239 signs, and channel centerline depths.

5.18 Complete a waterway management analysis for 300+ miles of waterways along the Caloosahatchee River in Lee County with WCIND funding. Products will include GIS data layers of boats, depths, signs, derelict vessels, moorings, and trafficsheds; 1:2400-scale neighborhood waterway analysis showing level of accessibility to open bay water for each boat, with draft restrictions at 0.5' intervals; 1:2400 neighborhood waterway analysis showing location and extent of channel depth restriction at 0.5' interval; Regional analysis atlas, 1:24,000-scale, identifying water depth of access channels, feeder canals, basins , open water areas, boating facilities and boats, habitat (sea grass, mangrove). (Swett, Fann)

The third and final phase of the Lee County Regional Waterway Management System was completed, covering the Caloosahatchee River and adjoining canal systems and tributaries. Lee County and the West Coast Inland Navigation District were provided with GIS applications, information, tables, maps, and a final report (TD-5) for approximately 313 miles of navigable waterways, 14,981 boats, 30,751 moorings, 3314 boating-related signs, and channel centerline depths.

5.19 Provide technical support to local, regional and state governments, in implementing regional waterway management plans. Thirty community leaders will be educated through three workshops, one extension bulletin, five meetings with state and local governments, and 15 individual consultations and meetings. (Swett, Sidman, Fann)

Presented the FSG Regional Waterway Management System at a 'Marina Dredging Planning Meeting' (13 attendees) held at the University of Rhode Island Bay Campus in Narragansett, Rhode Island as part of an effort to create public-private initiative between the U.S. marina industry, represented by the Marina Operators Association of America, and the Sea Grant College Program.

Instructed 15 Florida Department of Environmental Protection personnel on the use of GIS datasets and applications developed by Florida Sea Grant for the Southwest Florida Regional Waterway Management System.

Conducted two workshops, sponsored by the Marine Industries Association of South Florida and the Florida Marine Research Institute, to determine existing data needs and applications for boat and boater information. Attendees (50) represented a wide range of interests that included law enforcement, county and state government (natural resources, tax collectors,) inland navigation districts, the marine industry association, and private data vendors.

The State of Florida added a new administrative code "Chapter 62-341.490 Noticed General Permits for Dredging by the West Coast Inland Navigation District (WCIND)." The rule applies to fifty Manatee and Sarasota county trafficsheds with high priority maintenance dredging needs as identified in four FSG applications of the Regional Waterway Management System: TP-83, TD-1, TD-2, and TD-2a. To qualify for the general permit, the rule explicitly states that environmental restoration or enhancement projects must comply with the science-based procedures and methods of the FSG Regional Waterway Management System (RWMS) outlined in the four FSG technical documents listed above.

Met with the members of the West Coast Inland Navigation District (WCIND) Board to discuss implementation strategies for the Five-Year Strategic Plan developed for the WCIND by Florida Sea Grant.

Presented the methods and benefits of the Regional Waterway Management System to twenty members of the Charlotte County Marine Advisory Committee (MAC). The Regional Waterway Management System has been completed, or is near completion, in all West Coast Inland Navigation District Counties except for Charlotte County.

Two newspaper articles were published in the Sarasota Herald Tribune that discussed applications of the Regional Waterway Management System: “Dredging up the past: A valuable guide to the shaping of southwest Florida,” January 4, 2003 and “Waterfront Values Proposed dredging tax may face opposition," July 9, 2002.

5.20 Provide scientific advisement and program support to the West Coast Inland Navigation District in the implementation of its five-year Strategic Plan. (Sidman)

Completed a Five-Year Strategic Plan for the West Coast Inland Navigation District that presents goals and objectives, for the planning period of 2002-2007, for priority areas (Waterways and Anchorages, Inlets and Beaches, Emergency Management, Infrastructure Maintenance and Improvements, Dredge material Management, Sustaining the Environment, Permitting, and Coordination) that encompass the broad range of the District's responsibilities to the Southwest Florida community as mandated in Florida Statues, Chapter 374 (2000) and Florida Laws 98-526 (1998). Florida Sea Grant will help the District implement strategic plan elements during 2003 and beyond.

5.21 Conduct an in-service training workshop in the utilization of GIS and GPS technology in addressing coastal management issues for 20 local, regional and state government staff. (Swett, Sidman, Fann)

In-service training was cancelled by IFAS due to budgetary constraints.

5.22 Publish Volume 2 of the historical geography series titled “A Historical Geography of Southwest Florida Waterways—Charlotte Harbor to Cape Romano”. This region-based publication provides a historical perspective on Florida’s coastal waterway environment and development history (Fann, Antonini).

This 168 full color document was completed and published as Florida Sea Grant SGEB-56 in cooperation with the West Coast Inland Navigation District. It covers the area from Placida Harbor to Marco Island, covering the following topics: 1) Historical development of Southwest Florida Waterways, 2) Inlet Dynamics, 3) Altering the Caloosahatchee for land and water development and provides scientific, technical and boating related changes on the waterways of Southwest Florida.

5.24 Complete Charlotte Harbor recreational boating characterizations for the Florida Marine Research Institute. Products will consist of the following: 1) an enhanced regression-based model that estimates preferred destinations of recreational boaters, 2) a description and map showing the relationships between boating use intensity, diversity, accidents, and ecological sensitivity, and 3) a CD-ROM that organizes and formats existing data and reports. (Sidman)

Completed a recreational boating characterization of Charlotte Harbor for the Florida Marine Research Institute (FMRI), which involved two research components: 1) an enhanced regression-based approach to estimating preferred recreational boating destinations, 2) development of boating-use trend surfaces used to test the statistical association between use and various environmental and occurrence variables (manatee sightings, manatee deaths, seagrass scarring, and boating accidents). A CD-ROM with existing data and reports was delivered to the FMRI.

5.25 Develop a method to provide a reliable and recurring source of bathymetric data, which meets NOAA standards, for areas where NOAA surveys do not show current conditions. This element is designed to meet the goal of cost sharing for data collection between the federal government and local/regional agencies. The data will provide local and regional agencies with the necessary information to meet resource management needs and provide NOAA supplemental information for nautical charts. (Swett, Fann)

Two Florida Sea Grant publications were completed that outline procedures to collect bathymetric data that are based on NOAA standards and Regional Waterway Management System methods: (1) TP-124, ‘A Manual of Methods and Procedures for the Regional Waterway Management System’ and (2) TP-126, ‘Bathymetric Data for Coastal Resource Management in Southwest Florida Waterways: Enhancement and Standardization of Field Collection Methods Used by the West Coast Inland Navigation District’. Both are available through Florida Sea Grant and TP-126 is available on-line: http://edis.ifas.ufl.edu/SG064.

5.26 Design a GIS-based management application to guide the placement of speed zones in coastal communities. The following supporting objectives will be pursued: 1) assign speed generation capabilities to the boat makes and models that are contained in the southwest Florida boat census conducted by Florida Sea Grant (FSG); 2) conduct a network analysis to determine speed generation profiles and service levels for southwest channel segments surveyed by FSG; 3) correlate speed generation profiles and service levels to existing speed zones; 4) produce an ArcView GIS management application with existing data layers and those spatial data layers developed during the project; 5) conduct a workshop to present results to the southwest Florida Marine Advisory Committee and the Florida Marine Research Institute. (Swett, Sidman)

A Brunswick Corporation monetary donation originally intended for the speed zone application was used instead to complete a survey of 10,000 recreational boats in marinas and waterways in Lee and Manatee County. The speed zone application was included in

an unsuccessful funding request to the Coastal Services Center 2002 broad area announcement.

The survey of 10,000 recreational boats was conducted to support the objective of determining the utility of Florida's Vessel Title Registration System (VTRS) to provide boat and boater information for waterway management applications. The VTRS research project is scheduled for completion in 2003.

Coastal Ecosystem Health and Public Safety

Goal 6: Protect and Enhance Coastal Water Quality and Safety

6.1 A major and rapidly growing source of non-point source contamination in the coastal zone is nutrient loading from septic and other types of on-site disposal systems. This project will develop new approaches to study rates of water and nutrient transport via groundwater from on-site disposal systems. It will simulate both short- and long-term flow rates on St. George Island, Florida. (Burnett/Chanton/Corbett: R/C-E-42)

This research successfully compared several measurement techniques to determine submarine groundwater discharge in different coastal environments. The results compared very well. In addition, the use of multi radium isotopes (identical chemical behavior but different half-lives) appears very promising for estimating the mixing and residence times of waters in embayments. The methodologies developed will be useful for study in other environments. The recognition that the aerobic type on-site disposal system for wastewater performs better than the anaerobic system in terms of nutrient reduction could produce future benefits to Apalachicola Bay if this type of system is implemented on a larger scale.

6.2 In 1987, persistent and widespread phytoplankton and cyanobacterial blooms have coincided with the large-scale decimation of sponge communities in Florida Bay. One hypothesis is that the large-scale loss of suspension feeding sponges has rendered the ecosystem susceptible to these recurring blooms. The goal is to experimentally determine the potential for suspension feeding sponges to control nuisance phytoplankton blooms caused by internal non-point source pollution. (Peterson/Fourqurean: R/C-E-43)

This project has documented the importance of incorporating benthic grazing rates into current ecosystem models of Florida Bay nutrient dynamics. The laboratory and insitu grazing experiments have raised serious concerns about the system-wide loss of the benthic grazers in the north central portion of Florida Bay. It has also provided data for the Florida Keys National Marine Sanctuary for establishing sponging-free zones. Based on preliminary project findings presented at the Greater Everglades Ecosystem Restoration meetings, the lead scientist for the Higher Trophic Levels working group for Florida Bay has asked that the findings of this project be included in the synthesis report to be presented to the Scientific Oversight Panel at the Florida Bay meetings.

6.3 Support travel costs for graduate students presenting papers at the X^{th} International Conference on Harmful Algae.

The X^{th} International Conference on Harmful Algae was held in St. Pete Beach, Florida from October 21-25, 2002. Approximately 850 researchers from the national and international harmful algal bloom research community participated in the conference. Of the total participants, 175 were students. Funding from Florida Sea Grant and matching funds provided partial funding to 20 students who were making either oral or poster presentations of their research at the conference. Seventy-nine students applied for funding.

6.4 The Florida Bay Education Project was established as a five year program effort, but funding by NOAA's National Ocean Service was not provided after year four. This final project was designed to assist in closing out the program. (Spranger: PD-02-04)

Due to lack of funding, the Florida Bay Education Project was terminated in January, 2002. However, a new “South Florida Ecosystem Education Project” was developed with funding and support from number of NOAA units that include the National Sea Grant College Program, the Atlantic Oceanographic and Meteorology Laboratory, Southeast Regional Fisheries Center, and Florida Keys National Marine Sanctuary. This two-year pilot project will serve as a liaison and outreach component, linking NOAA research with marine and coastal users in South Florida.

6.6 Provide stormwater education programs where 80% of homeowners participation will adopt one or more “yard and garden practice” designed to reduce the amount of pollution in runoff entering the Perdido or Pensacola Bay systems. (Diller)

A "Waterfront Living Workshop" was organized with the Bayou Texar Foundation. Stormwater pollution information was presented at Manor Drive homeowners association meeting and consulted with condominium association on Pensacola Beach regarding their stormwater flooding problems. All survey respondants indicated they would try one or more of the methods presented to reduce stormwater pollution.

6.7 Train at least 20 4-H youth in water quality sampling techniques and be able to recognize impacted waterways in the Florida Panhandle through a practical exam. (Diller)

Marine ecology and water quality sampling techniques were taught to 17 youth participating in an environmental summer camp sponsored by Pensacola Junior College. Activities involved learning to use a seine net, secchi disk, plankton tow, salinity refractometer, and sediment dredge. Participants learned how each measurement can relate to water quality.

6.8 Support continued development of volunteer water quality monitoring efforts in Choctawhatchee Bay and the coastal lakes. (S. Jackson)

University of Florida Lake Watch and the Choctawhatchee Basin Alliance (CBA) conducted training at the Walton County Tourist Development Council for both Choctawhatchee Bay and Coastal Dune Lakes. These efforts were supported by helping with logistical support. Throughout the year volunteers were recruited for participation in Lake Watch and CBA during educational programs like “Connecting the Choctawhatchee” and “Guarding our Aquatic Resources”. There are five teams of water quality volunteers for Choctawhatchee Bay. Ten of 17 Coastal Dune Lakes are being monitored under the guidance of a part-time volunteer coordinator compensated through funding secured from United States Fish and Wildlife grant last year.

6.9 Assist in the preparation of a recreational guide and map for the coastal dune lakes for use by residents and tourists. (S. Jackson)

In progress. Work continues with the Walton County Coastal Dune Lakes Committee and Choctawhatchee Basin Alliance to produce this document.

6.10 Coordinate and conduct an in-service training program for extension agents on “a watershed approach to water quality.” (Jacoby)

A Watershed Approach to Management: IST 22028 was offered in conjunction with FL412 Florida’s Comprehensive Water Quality/Drinking Water Program. The IST attracted 22

agents from six diverse areas within extension. It increased participant's knowledge by an average of 25%, and provided useful information to 100% of participants. On average, participants ranked the amount of useful information conveyed as 4.4 out of possible score of 5.0. The new information will be used to create educational programs (88.5%), conduct demonstrations (23.5%) and assist clients with decisions (17.5%). Participants agreed that further ISTs are needed to cover specific topics in more depth.

6.11 Co-author a review of water quality impacts in Florida's watersheds. (Jacoby)

The review of water quality impacts has been delayed awaiting improved coordination with other efforts dealing with watersheds.

6.12 If funded, conduct research on links between water quality and seagrass health. (Jacoby)

This research was not funded.

6.13 Attend national workshop on NEMO (non-point pollution education for municipal officials) to review program and see about its application for water quality educational programs in Florida. (Jacoby)

NEMO-12 was attended to learn more about the NEMO network and approach. The approach is being evaluated to see if it can be made sufficiently realistic and adaptive to have real and lasting value.

6.14 Develop educational programs for Master Gardeners in Flagler, Putnam, St. Johns Duval, Clay and Nassau counties that focus on water quality issues and concerns. (McGuire)

The NE Florida Sea Grant agent developed a PowerPoint presentation, Water and Watersheds, which was used for Master Gardener training (St. Johns, Flagler and Putnam counties). A Jeopardy-style game on water conservation and pollution prevention was also used with the Master Gardeners following the presentation. Surveys given to Master Gardeners trainees from Clay, Baker, Duval and Nassau counties showed that 100% of those responding had learned something new about water conservation and water pollution as a result of their training.

6.15 At request of the Apalachicola National Estuarine Research Reserve's Environmental Program Coordinator, arrange for Dr. Chuck Jacoby, Extension Coastal Estuarine Specialist, to participate in the ANERR's guest lecture program. (Mahan)

Due to scheduling conflicts, the guest lecture was not scheduled. However, Dr. Jacoby did provide program planning support to the ANERR's Environmental Education Program Coordinator in the planning of a Coastal Management Workshop on Water Quality Issues Impacting the Apalachicola River & Bay.

6.16 Maintain membership on the Sarasota Bay National Estuary Program's Technical Advisory Committee. (Stevely)

Five meetings of the Sarasota Bay National Estuary Program Technical Advisory Committee (TAC) were chaired. An active and functioning committee has been maintained and has provided technical assistance in directing the Estuary Program work plan and implementation of the Comprehensive Conservation and Management Plan (CCMP).

6.17 Develop educational programs for Master Gardeners in Hillsborough, Manatee, and Sarasota counties in water quality issues and coastal plant identification and ecology. (Stevely)

Forty seven Master Gardeners in Manatee and Sarasota Co. increased their ability to understand and educate other citizens concerning water quality issues and coastal plant ecology.

6.19 Provide seminars and workshops on the importance of the fragile marine and coastal ecosystems to a minimum of 200 coastal residents in Southwest Central Florida. (Sweat)

Nine workshops and seminars were presented throughout the central west Florida coastal counties. 981 clientele attended these presentations which covered Florida seafood (fish smoking, oysters, bay scallops), marine science, fish venting, fishery ethics and management, coastal properties and artificial reef construction practices.

6.20 Work with Florida Yards and Neighborhood Program to develop educational programs for waterfront communities within the New River district that will provide them with increased knowledge of local water quality issues (debris and stormwater run-off). (Tavares)

Not completed due to resignation of agent.

6.21 Assist volunteers in water quality monitoring activities in local waterbodies. It is anticipated that five Lakewatch programs will be established in area lakes, and that these volunteers will begin monitoring activities along Coldwater and Pond Creeks. (Verlinde)

Participants of the Santa Rosa County Lakewatch program are sampling three sites in the Woodbine Springs area and one site in Santa Rosa Sound. The River Sprites 4-H club participated in the national Water quality Monitoring day at site along Pond Creek.

6.22 Coordinate North Santa Rosa Water Quality Task Force Meetings. (Verlinde)

North Santa Rosa Water Quality Task Force and Bay Area Resource Council Technical Advisory Committee meetings are facilitated on a quarterly basis. These two groups combined meetings in 2002 to address similar concerns, eliminate duplications of efforts and combine forces on issues. This group has actively addressed deer carcass disposal methods and actions to control, litter and high bacteria counts in local waterways. The Santa Rosa County Board of County Commissioners have implemented a plan to offer a $500 reward for anyone convicted of disposing deer carcasses in local waterways.

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

7.1 Stock enhancement and habitat enhancement are methods being used to enhance and conserve estuarine fishes. The variability of environmental factors in known and potential nursery areas for red drum, snook and flounder will be determined by Florida, Texas and North Carolina Sea Grant as a way to improve the success rate of stock enhancement programs. (Leber: R/LR-A-25)

Benefits derived from this project include improved stock enhancement efforts and improved habitat evaluation. In the first case, preliminary analyses show improved survival of snook released in Florida habitats that our model classifies as 'good' growth habitats. Alternatively, poor survival occurs in 'bad' habitats. An unanticipated benefit is the prediction that Japanese flounder were being released in Sendai Bay in numbers that exceed the carrying capacity. The Japanese have reduced releases, but it is too early to quantify the benefits in terms of growth. The project also produced an ordinal classification, based on predicted growth, of the habitat value of all study sites in three states, and determined the relative importance of different environmental factors, which should improve the monitoring, as well as identification, of important habitats.

7.7 Several topical symposium sessions on issues of special relevance to the goals of Florida Sea Grant's Strategic Plan: 2002-2005 will be organized for the 31st National Benthic Ecology Meeting. The event is scheduled for March, 2002, in Orlando. (Levitan/Herrnkind: PD-01-6)

The conference drew ~470 registrants, making it one of the largest BEM. In recognition of Sea Grant's role in support of the meeting and research in marine ecology for management, fisheries and other applications, there were two Sea Grant Special Sessions: Spiny Lobsters and Blue Crab Ecology. Each session was attended by 100 plus participants. The goals of the Sea Grant symposia were to present the latest findings, discuss and exchange ideas, as well as provide examples of how research on basic ecological processes can aid in the practical and sustainable management of lobsters and blue crabs.

7.8 There is limited knowledge and awareness among Florida's citizens about the potential for harmful aquatic bioinvasions. A fact sheet will be developed that defines bioinvasions, explains their ecological and economic impacts, cite avenues of introduction, provide examples of recent introductions to Florida, and justify the necessity for preventative measures. (Walters/Baker: PD-01-7)

A draft fact sheet has been prepared and is in revision.

7.9 Provide assistance to Brevard County annual beach cleanup in September by recruiting 25 volunteers to assist in removal of marine debris. (Combs)

Brevard Marine Agent supported annual Brevard County "Beach Sweep" shoreline cleanup at Melbourne Beach September 21st (19 students + 6 adults).

7.10 Provide assistance in annual Coastal Beach Cleanup in October by recruiting 25 volunteers to assist in removal of marine debris (Combs)

Brevard Marine Agent supported annual Coastal Cleanup in October by removing debris from Indian River Lagoon coastline in south Brevard County near Valkaria (15 students + 15 adults).

7.11 Provide Sea Grant coastal ecosystem publications and information to 10 Brevard County decision-makers in order to assist them in their management and planning decisions. (Combs)

Brevard Marine Agent provided Sea Grant coastal ecosystems publications and information to 30 Brevard County decision-makers to assist them in management and planning decisions, including information on derelict vessel removal procedures, Clean Marine/Boatyard information, boater safety information, invasive exotic species information, seafood safety, and other subjects, by regular participation in meetings of the Brevard Co. Commissioners Marine Advisory Council, monthly meetings of the Marine Industries Association of Brevard Co., individual meetings with County government staff, and in answer to specific information requests from such decision-makers.

7.12 Involve at least 75 volunteers in Annual International Coastal Beach Cleanup which will result in at least 50 bags of marine debris being removed from Miami-Dade County shoreline. (Crane)

Reported under 7.13.

7.13 Develop marine debris educational programs (Stash Your Trash, Keep Your Trash Onboard) for boaters in Miami-Dade County. (Crane)

Over 1,000 "Don't Splash your Trash" brochures (English and Spanish) and 200 "Don't Splash Your Trash" signs were distributed to marinas and other shore-based facilities. Positive feedback from the distribution of these materials has been received from marine users who have visited boat shows, fishing expositions, and marinas where these materials were distributed.

About 200 boaters who participated in the Miami Billfish Tournament received a yellow "Keep your Trash on Board" Bucket. Boaters completed a pledge card promising to use the bucket to collect trash on their boat. Six months later, a post-survey was sent to randomly selected 50% of the boaters (100 people) who received a bucket. From the 18% of surveys that were returned, results indicated 78% (12 boaters) of boaters reported using the bucket to collect marine debris and had increased their knowledge about pelicans. 57% (8 boaters) of them reported to have shared this knowledge with others.

7.14 At least 50% of youth involved in “stash your trash programs” will become better environmental stewards in Miami-Dade County. At least 10% will participate in beach cleanups or participate in other environmental programs (Crane)

About 81% of 158 youth ages K-12 grade that had participated in "Stash Your Trash" program have gained awareness about the different types, sources, and impacts of marine debris. Awareness gained was measured by the number of participants who responded to questions by show of hands and/or by pre and post surveys. At least 33 of those students participated in a beach cleanup as indicated by follow-up survey and/or observation several months after attending educational program.

7.15 At least 50% of teachers who participate in teacher workshop will incorporate marine educational materials into their classroom curricula. (Crane)

Teacher workshop post-survey indicated 100% of the teachers' level of knowledge did increase after attending a presentation on sea turtle biology, behavior, and identification of sea turtles. Follow-up survey was sent to 30 of the teachers two months after the program. From the eight surveys returned, five of them have taught one or more classes on sea turtles reaching at least 150 students or more.

7.16 15 Gulf-front homeowners will be trained to plant dune vegetation to protect and increase dune height between their homes and the Gulf. (Diller)

The first sea oat and dune plant sale sponsored by the Pensacola Beach Leaseholders Association was attended. Escambia County marine extension programming information was presented and discussions began about assisting with dune planting projects on Pensacola Beach after beach renourishment concludes in 2003.

7.17 Develop educational programs and materials on importance of sea grasses to marine ecosystems. 75% of boaters participating in programs will increase their knowledge of sea grasses and how to avoid prop-scarring. (Diller)

A variety of 4-H and youth audiences were taught about seagrasses at marine field days, environmental summer camps, and the Seagrass Awareness Celebration. An article on the Clean Boating Partnership and Clean Marina Program was published in the Bayou Texar Foundation newsletter that described how the program can protect waterways, recognized locally designated facilities, and provided contact information for boaters to receive the Clean Boating Handbook which discusses preventing seagrass scarring.

7.18 10 people will be trained as Master Naturalists in wetland systems to help educate local citizens and visitors of the importance of these systems. (Diller)

Instructor training was completed for the coastal module of the Florida Master Naturalist program in Cedar Key, Florida in October. Agent will offer first coastal course in April, 2003.

7.19 Conduct “Coastal Living Seminars” in Panhandle Counties where local homeowners will learn about recycling, reduction in household chemical usage, shoreline protection and enhancement projects that utilize vegetation. (Diller, S. Jackson, Verlinde)

“Connecting the Choctawhatchee” continues to be an active education program. October and November program participants include approximately 80 participants, conducted in partnership with Florida Yards and Neighborhoods Agent Sheila Dunning and Horticulture Agent Larry Williams. Kelly Plantation (Destin, Fl) was a targeted audience which has shoreline homes located on Choctawhatchee Bay and residential Lakes. In a separate event, the Choctawhatchee Basin Alliance and Audubon members received information they can use as they reach out to their neighbors and families, protecting the surrounding environment o the Choctawhatchee watershed. - - Survey results indicate the 89% of participants rate the program as good or excellent. – Approximately 74% planned to implement changes in their current landscape practices or lawn care.

Diller organized and presented a "Waterfront Living Workshop" for the Bayou Texar Foundation. Information on home, yard, automobile, and boating use and maintenance with regards to impacts on local waterways was presented. Non-point source pollution and ways to minimize its introduction into local waters was explained. The Horticulture agent discussed yardscaping practices to reduce environmental impacts. The Windstorm agent illustrated weak points of homes near water to high winds and suggested ways to protect home and property.

The Santa Rosa County agent participated in a multi-faceted workshop at the Milton Garden Club. A watershed overview and how stormwater impacts our waterbodies was presented. Others presented information about native plants, wildlife, invasive species, butterfly gardening, and plant diagnostics was offered.

7.20 Establish a demonstration site to teach the use of native vegetation and environmental landscaping specific to coastal dune lakes. Also, prepare a native plant guide for at least 5 coastal dune lakes and publish it on the web. (S. Jackson)

The planting guide for five coastal dune lakes was not accomplished this year. There are existing resources available like the Lake Watch plant survey data for some of the coastal dune lakes, “Waterwise”: Florida Water Management Districts Publication, and Restoration of Shoreline in Northwest Florida that have been used to assist property owners. A landscaped demonstration site was completed at Eastern Lake. Approximately 12 residents participated in a multi-day event to restore the shoreline and improve the facilities of a neighborhood park utilizing the nine FYN principals. Participants received hands-on instruction and experienced removal and control of invasive plants from native landscapes. They also learned how to properly install and utilize native plants in their own yards and protect their shoreline on Eastern Lake in Walton County. The model landscape continues to educate visitors daily on many other practices including proper mulching, irrigation, fertilizing, and storm water run-off.

7.21 Develop educational programs on coastal native plants, leading to at least two plantings for restoration, stabilization or preservation in Okaloosa and Walton Counties. (S. Jackson)

Approximately 65 students and teachers participated in the restoration project at Dune Allen. Over 2,000 plants were installed as many of the students met their community service hour requirements for the service organizations they represented. Many thanked us for providing them with this opportunity. Participating teachers also provided positive feed back and asked for future projects like this one. From this experience and last year, a new program was developed with aid and inspiration of local educators to develop coastal dune stewardship and environmental education. “Dunes in Schools” was initiated at Butler Elementary School in South Walton County. Students and Teachers planted panic grass in a classroom activity. The plant materials served as a focal point, weekly guests were invited to teach students about the marine environment. Permission was gained for a field trip so that the plant materials grown in the classroom for six weeks were installed at Dune Allen along with materials previously grown in our master gardener greenhouse. One hundred eleven students, teachers, and parents planted over 1,000 plants in less than one hour. Stewardship and ownership was taken to another level, as students and teachers were able to accomplish sunshine standards in math, science, and social studies. Partners included Walton County Tourist Development Council, Choctawhatchee Soil and Water Conservation District, Topsail Hill State Park, and 4-H.

7.22 Coordinate a workshop on marine invasive species and develop several marine invasive species factsheets. (Jacoby)

A workshop was held on 5 and 6 November 2002 using $13,300 from the Florida Sea Grant College Program, the Pinellas County Environmental Foundation and the Tampa Port Authority, as well as $5,000 of in-kind support from the Tampa Bay Estuary Program. The workshop attracted 75 participants from a variety of organizations. Likely outcomes from the workshop include development of a strategy for dealing with invasive species in Florida's saltwater systems, formation of a statewide working group to drive future work on saltwater invasive species in Florida, development of a primer describing basic characteristics of invasive species for K-12 teachers, and creation of opportunities for funding and partnerships.

7.23 Assist in the development of the coastal module for the Master Naturalist Program. (Jacoby)

Significant input was made to the coastal module of the Florida Master Naturalists Program. The resulting video, presentations and workbooks will be used to train interpreters throughout Florida.

7.24 Continue development of publication "A Citizens' Guide to Florida's Estuaries. (Jacoby)

"A Citizens' Guide to Florida's Estuaries" has been put on hold pending clarification of the audience for such a publication.

7.25 Assist in development of a "Estuaries 101" PowerPoint presentation. (Jacoby)

The "Estuaries 101" presentation has been put on hold pending clarification of the audience for such a presentation.

7.26 Participate in Pollution Prevention Week at Marineland. (McGuire)

The NE Florida Sea Grant agent distributed 200 mouse pads made from recycled tires as part of the 2002 Pollution Prevention week. The mouse pads were printed with information about recycling opportunities in the workplace.

7.27 Advise the City of Fernandina Beach on the best methods for restoring a one-mile section of dunes along the northern part of Fernandina Beach. (McGuire)

The NE Florida Sea Grant agent helped coordinate the planting of 45,000 sea oats seedlings along a ¾ mile stretch of dunes in Fernandina Beach, FL (Nassau County). Recommendations were made to the city of Fernandina Beach about supplies that would be needed for the planting. Coordinated also occurred with the Nassau county horticultural agent to have the Master Gardeners participate in the planting; recruited participation by students and teachers from Fernandina Beach High School and University of North Florida. Fliers which were sent to nine realty companies in the area who handle rental properties along the beachfront. These fliers were designed to educate people about the importance of protecting the dunes, the sea oats planting project, and sea turtle nesting season. The fliers were later requested by the city of Sarasota and by the group "Visit Florida", which plans to include the information in a publication for tourists entitled "Responsible Tourism". Information in the flier was also included in the quarterly Sea Grant newsletter, "aqua notes" which was sent to over 650 people.

7.28 Work with individuals in the development and submission of grant application for seagrass restoration in Charlotte Harbor. If funded, assist in restoration efforts. (Novak)

Wrote and submitted with the CMRT two grant proposals for seagrass restoration/ enhancement. Charlotte County funded ($20,000) one of the grants that involves a seagrass restoration project in Charlotte Harbor. The objective of this project is to try three different "formulas" in the planting of seagrass on prop scarred bottom in Charlotte Harbor. The second proposal was funded by the Charlotte Harbor NEP and involves promoting seagrass growth through two methods.

7.29 Coordinate presentations and teacher training workshops that focus on marine invasive species, as part of a three-state regional educational project. (Spranger)

Funding was received from National Oceanographic and Atmospheric Administration to develop materials and teacher training in-service training programs. An Environmental Education Institute for extension agents was held in March, presentation given at Florida Marine Science Educator Association annual meeting in May, and teacher training workshop conducted in November. Similar programs will be provided in 2003.

7.30 Establish and nurture a "consensus Working Group," borne out of contentious meetings last year that focused on marine protected areas. This workgroup, consisting of ten different stakeholder groups, will investigate problems affecting the Broward County coastline, and increase their knowledge about fisheries and ecosystem management techniques. (Tavares)

Not completed due to resignation of agent.

7.31 Develop educational workshops within Santa Rosa County that will increase citizen's awareness of coastal ecosystems, functions, endangered species and emerging coastal issues. (Verlinde)

The Santa Rosa County agent participated in a multi-faceted workshop at the Milton Garden Club. A watershed overview was presented about how stormwater impacts our waterbodies. Others presented information about native plants, wildlife, invasive species, butterfly gardening, and plant diagnostics was offered.

7.32 Assist in planning and delivery of educational programs and materials at the Sea Grass Awareness Festival. (Verlinde)

The 2002 Seagrass Awareness festival was a great success despite a gray, foggy day. More than 150 children and families attended the Seagrass Awareness Celebration. Local Boy Scouts collected a diverse number of species for the touch pools; including (for the first time in 8 years of providing touch pools at events) a scallop and seahorses, all caught right off the shore in the seagrass beds! This was a great illustration of the diversity of seagrass beds and their importance to marine life. Activities included: kayak demonstration and rides, lessons on throwing a cast net, fishing rod casting, hermit crab races, touch pools, oyster stringing, arts and crafts, groundwater model demonstrations, seine and dip netting, seagrass and safe boating information, food and various arts and crafts projects. The event was covered by the local television station, and newspapers. One family told me later after the event that they take company to the park and teach them how to seine and collect specimens (they release the specimens once all have observed them).

7.33 Assist in the coordination and development of the 2002 Rivers Symposium where attendees will increase their knowledge about local river history, issues, problems uses, and protection and conservation practices. (Verlinde)

The rivers symposium has been combined with the Bay Area Resource Council's annual symposium. In 2002, issues covered were stormwater runoff and impacts and solutions. The agent participated in the coordination and publicity of the event.

7.34 Work with volunteers who will participate in natural shoreline stabilization and habitat enhancement projects that include dune, wetland and submerged aquatic vegetation. (Verlinde)

In December, participated in *Spartina alterniflora* planting at the Project Greenshores restoration site in Pensacola Bay. In June provided community service marsh restoration project for 108 campers for Escambia county 4-H camp at Camp Timpoochee.

7.35 Assist in the development of a Master Naturalist Program for Santa Rosa County where trained naturalists will provide tourists and local residents with information about their local waterbodies and wetlands. (Verlinde)

Attended the 2 day instructor training of the wetlands module of the Florida Master Naturalist Program in Apalachicola.

7.36 Work with individuals involved in the Southwest Florida Feasibility Study (SWFFS) of the Comprehensive Everglades Restoration Program (CERP) that will lead to development of five conceptual models that will be used in establishment of a long-term monitoring and research plan. (Wasno)

Continued to meet and develop conceptual models for the overall Comprehensive Everglades Restoration Program.

Goal 8: Prepare and Respond to Coastal Storms

8.1 Coastal dune stabilization by planting nursery propagated sea oats is the most cost-effective practice to control erosion in the southeast United States. Effects of transporting different plant ecotypes between sites for transplanting is a concern. The goal is to determine the extent of genetic divergence among sea oat populations to determine if transplanting among areas is feasible. (Kane: R/C-S-36, PD-99-6)

This was the first comprehensive genetic analysis of a coastal plant species. Results indicate that genetic differentiation has occurred between Atlantic and Gulf coast populations. Genetic diversity within populations was relatively low with the two Atlantic coast populations exhibiting high degree of similarity. Higher genetic diversity within the Gulf coast populations may be the consequence of increased frequency of tropical storms and hurricanes. This information will provide a framework to elucidate the degree of genetic diversity within and between sea oats populations and opportunities and/or limitations regarding plant translocation for dune restoration.

8.2 Establishment of sea oats on restored beaches is critical for combating erosion losses. However, concerns about genetic diversity have lead to restrictions in harvesting and planting of sea oats. The overall goal is to enhance ecologically sound establishment of micropropagated sea oats by developing compatible plant/mycorrhizal fungus ecotype combinations for out planting onto Florida beaches. (Sylvia/Kane/Alagely/Milman: R/C-S-38)

Significant genetic diversity has been discovered. Arbuscular mycorhizal fungi on the plant roots had a greater impact than host genotype on plant growth and phosphorus uptake. An advanced set of molecular tools to assess genetics has been developed.

8.3 A recently completed Sea Grant project on long-term shoreline position resulted in the identification of previously unrecognized shoreline characteristics which are important to the long-term management of Florida's and the nation's beaches. This project will investigate these characteristics of sand sediment sources and sinks on Florida's east coast, determine the causes of unpredicted shoreline and advancement, develop more rational sediment budgets and disseminate the information to professional and lay audiences for use in decision making and shoreline project planning. (Dean: R/C-S-39)

The results include and have documented concepts which were not considered in the engineering literature regarding sediment transport and sediment budgets along Florida's east coast. The significance is that coastal sediment transport characteristics are the single most important factor in the design of most coastal engineering and management projects. In particular, the results have demonstrated a substantial and long term net onshore sediment transport along portions of Florida's east coast. Additionally, it has been documented that available wave hindcasts are not suitable for calculating longshore sediment transport.

8.4 Rip currents account for 80 percent of beach rescues, accounting for 36,000 rescues in 1997. About 150 drownings (30 in Florida) occur each year due to rip currents. The ability to predict the occurrence of rip currents will reduce this dramatically. A database of rip currents will be developed and a predictive model will be developed and tested. (Hanes/Thieke/Dean: R/C-S-40)

The research determined that rip current channels are relatively stable. Therefore rip currents are commonly present, as confirmed by the rescue records. The rip currents pulse and these pulsations seem related to wave groups. Wave direction and water elevation are strong indictors of the increased occurrence of rip rescues. Based on these results, the National Weather Service's present rip current forecasting technique was modified to include wave direction and tidal stage as predictive parameters. The inclusion of these new parameters and the elimination of two wind parameters resulted in more accurate forecasting of days with a high number of rip current rescues.

8.8 A book for layman that explains how America's beaches work will provide a sound resource for those interested in beaches, including educators and officials. Florida is a leader in many areas of coastal emergency and coastal management. The book will be written for the general public. (Douglas: PD-01-09)

The objective was met by traveling to most of the beaches of the state of Florida, spending numerous days over a 6-week period researching in the Coastal Engineering Archives of the University of Florida and meeting faculty of several Florida Sea Grant institutions. Many of the pictures and many of the examples used in the book are from Florida. The primary advancement of the field of coastal engineering achieved is the first attempt ever at quantifying the total amount of sand removed by works of man from the beaches of America. The sum total is estimated at over one billion cubic yards this century. A book, *Saving America's Beaches: The Causes of and Solutions to Beach Erosion* (World Scientific Press) is in press.

8.10 Participate in the development and implementation of a NOAA Coastal Services Center pilot project, "Coastal Storms Initiative" that will focus on the St. Johns Watershed (St. Johns Water Management District). The purpose is to bring NOAA resources together in a geographic region that will hopefully lead to better storm predictions, and corresponding reduction in storm damage. (D. Jackson, Spranger)

Developed and received grant from NOAA's Coastal Service Center to serve as lead for outreach coordination of "Coastal Storms Initiative" project. Educational materials were developed, and initial meetings were held with stakeholders throughout the St. Johns Water Management District to discuss the project, conduct a needs assessment, and explore development of future educational products and services.

Education and Human Resources

Goal 9: Produce a Highly Trained Workforce

9.1 A minimum of two qualified applicants will be submitted annually to the Sea Grant John A. Knauss Marine Policy Fellowship national competition. Over each five-year period, an average of one Knauss Fellow per year (of 30 nationally) will be from Florida. (Cato: E/ST-24; E/ST-25; E/ST-26; E/ST-27)

For the 2002 Class of Fellows, three applicants were submitted. One was chosen to receive a fellowshop.

Chosen: Nadia Sbeih (UM)
Submitted: David Migut (UF)
Louis Kaufman (UM)

From 1999-2002, a five year period, six Fellows from Florida have been selected, an average of 1.2 per year.

9.2 At least one national Sea Grant Industrial Fellow candidate (of 2-4 per year nationally) will be successful every three years. (Cato)

Two Industrial Fellows were submitted during the 2002 competition. One was selected for a national fellowship. The second was also qualified and was funded by Florida Sea Grant program development funds and funds from the industry partner. The two were the first industry fellows from Florida since 1995.

9.3 At least 25 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students. (Cato)

For 2002, 40 percent of all research funds supported graduate students (see section 7.0).

9.4 A minimum of five graduate students will receive scholarship funding through private funds in cooperation with the Aylesworth Foundation for the Advancement of Marine Science and the Old Salt Fishing Club. (Cato)

A total of five students were on Aylesworth/Old Salt Scholarships during 2002.

9.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship. (Cato)

One high school senior received a one-year scholarship and enrolled as a freshman at Gulf Coast Community College.

9.6 A minimum of $400,000 per year in non-national Sea Grant CORE program funding will be received from extramural funding sources to support Sea Grant programs. (Cato)

A total of $878.0 thousand in non-core Sea Grant funds were received in

9.7 Florida Sea Grant will participate in National Strategic Investment, National Outreach and National NOAA/Sea Grant proposal competitions when available. Funding data will be analyzed to measure the success rate of Florida Sea Grant against the other Sea Grant programs. (Cato)

Number of proposals submitted and funded in National Strategic Investment (NSI) Competitions for environmental biotechnology, technology, fisheries habitat, oyster disease, Gulf of Mexico oysters and aquatic nuisance species, 2002.

	National Level					Florida Level				
Competition	Received	Invited	%	Funded	%	Received	Invited	%	Funded	%
Environmental Technology	131	31	23.7	12	38.7	18	4	22.2	1	25.0
Technology	75	21	28.0	10	47.6	9	2	22.2	1	50.0
Fisheries Habitat	107	22	20.6	7	31.8	14	6	42.9	2	33.3
TOTAL	**313**	**74**	**23.6**	**29**	**39.2**	**41**	**12**	**29.3**	**4**	**33.3**
Oyster Disease	48	33	68.0	15	45.5	1	1	100.0	0	0
GOM Oysters	29	25	86.0	10	40.0	7	7	100.0	3	42.9
Aquatic Nuisance Species	154	73	47.4	30	41.1	6	3	50.0	1	33.3
TOTAL	**231**	**131**	**56.7**	**55**	**42.0**	**14**	**11**	**78.6**	**4**	**4**

NA -- Not Available. Competition decisions pending.

9.8 At least 15 different academic disciplines and six different Florida universities and research laboratories will receive Florida Sea Grant funding in each proposal cycle. This can only be achieved through the encouragement of competitive proposals from many participants because peer review determines actual funding. At least six institutions participating in Florida Sea Grant will be visited each year to meet faculty and students to keep a high level of participation in Florida Sea Grant. Six faculty progress reports will be distributed annually to 800 faculty statewide to inform them of Sea Grant activities and opportunities. (Cato/Seaman)

For the 2002-03 core Florida Sea Grant two-year program, seven of the 15 participating institutions were successful in competing for research funds.

Florida Atlantic University
Florida Institute of Technology
Florida State University
Harbor Branch Oceanographic Institution
Nova Southeastern University
University of Central Florida
University of Florida

A total of 14 different academic departments and about 12 different disciplines are receiving funds.

Agricultural and Biological Engineering (UF)
Biology (UCF)
Biomedical (HBOI)
Chemistry (FAU)
Chemistry and Biochemistry (FAU)
Civil and Coastal Engineering (UF)

Civil Engineering (FIT)
Environmental Horticulture (UF)
Fisheries and Aquatic Sciences (UF)
Food Science and Human Nutrition (UF)
Mechanical and Aerospace (FIT)
Oceanography (NSU; FSU)
Pharmacology and Therapeutics (UF)

Analysis of faculty receiving funding in Florida Sea Grant
Core program research competition, 2002-2003

	2002 - 2003	
	Number	Percent
Total Number of Investigators Receiving Funding	31	
Investigators[a] Receiving Funding in the Previous Two-Year Core Program	11	35
Investigator[a] Profile		
Male	25	81
Female	6	19
Investigator[a] Academic Rank		
Professor or Above	11	35
Associate Professor	4	13
Assistant Professor	10	32
Post-doc	0	0
Other[b]	6	26

[a] Includes Principal Investigators, Co-Principal and Associate Investigators.
[b] Includes such academic titles as senior scientists (at research labs), lawyers and veterinarians (at professional schools, etc.

A total of eight campuses were visited, with the visits ranging from meeting faculty to discussing funded research or potential research to attending FSG seminars or presenting seminars on FSG opportunities. Campuses visited were Florida International University, University of Miami, University Florida, Florida Atlantic University, Florida Institute of Technology, Mote Marine Laboratory, New College and Harbor Branch Oceanographic Institution.

Six bi-monthly faculty progress reports were written and distributed.

9.9 An average of four Florida Sea Grant supported seminars will be funded annually as a way to increase the skills of faculty and students in ocean and coastal related academic disciplines. (Seaman/Cato: PD-02-1)

The following seminars were sponsored during 2002.

Florida Gulf Coast University
Relationship between PCB accumulation and reproductive success in sexually mature and immature oysters exposed via a contaminated algal diet
Fu-Lin E. Chu
VIMS, College of William and Mary

The discovery and development of therapeutic agents from marine invertebrates
Russell G. Kerr
Florida Atlantic University

University of Central Florida
Aquatic exotics: mechanisms for dispersal and successful introductions in coastal waters
Dianna Padilla
SUNY Stony Brook

University of Florida
Ecological models for understanding ocean reefs and managing marine ecosystems
Tony Pitcher
University of British Columbia

9.10 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held. (Cato)

No Florida students applied during 2002 even though the opportunity was advertised statewide.

9.11 Conferences, workshops and travel to conferences and workshops will be supported for Florida Sea Grant researchers and potential researchers and Florida Sea Grant Extension and Communications faculty. The activity will be supported when consistent with priorities in the Florida Sea Grant Strategic Plan: 2002-2005. (Cato/Seaman: PD-02-2)

In 2002, 18 faculty attended eight conferences and other meetings (e.g., Florida Marine Biotechnology Summit III, Urban Boating and Waterway Management Workshop) in order to transfer technical information developed from Sea Grant research.

9.13 Sea Grant Extension County-based faculty will utilize a minimum of six state in-service training days to attend workshops and programs that will support their educational program areas. (All Agents)

Brevard Marine Agent utilized four state in-service training days in support of his educational program areas (IST #22029, Current Issues in Marine Fisheries Management (1 day), IST #22019, FSG Annual Agents meeting (3 days)). (Chris Combs, Brevard Co.). Other training: Time Management (1 day, County training); Defensive Driving (1 day, County training); Van Defensive-Driver Training (1 day, State training). Related meetings and workshops attended by the Brevard Marine Agent: Link Symposium (joint NASA/NOAA technology meeting, Kennedy Space Center, May 20-22); International Shark Conference (Florida Aquarium, Tampa, June 12-14); Blue Crab Workshops (Palm Bay and Cocoa, October 9 & 10); Invasive Species in Florida's Saltwater Systems (Florida Aquarium, Tampa, November 5-6).

Agent Creswell attended several professional, educational programs constituting eight days of in-service training. These include: Sharks in Perspective: From Fear to Fascination, Florida State Horticulture Society, Gulf and Caribbean Fisheries Institute.

Agent Gregory attended several professional, educational programs constituting more than six days of in-service training. These include: What Every CED Needs to Know, NAUI First Aid/CPR, Annual Sea Grant Marine Extension Meeting. Other professional development included: District V All Faculty Meeting, Florida First Meeting, South District All-Faculty Meeting and the Reef Fish Stock Assessment Panel Meeting.

The Franklin County Sea Grant Agent participated in 9 days of in-service training during 2001 - 2002 program years.

Technology _ iPAQ Applications, 1-day
What Every CED Needs to Know _ Basics Part IV, 1.5-days
Nutrients & Coastal Water Quality, Web_based education program, 3-days
22023 _ FL Sea Grant Extension Program Staff Meeting, 3-days
Reactive Attachment Disorder, .5-day

L. Sturmer participated in six state in-service training days to attend workshops and programs to support educational program areas.

Andrew Diller attended the two and one-half day Environmental Education Institute in-service training at Camp Timpoochee in Niceville, Florida. Included marine invasive species, water quality testing, 4-H marine curriculum, and wildlife monitoring. Attended in-service training "A watershed approach to water quality" in Vero Beach, Florida. Attended annual Florida Sea Grant extension program in-service training in Cedar Key, Florida. Attended coastal module instructor training for the Florida Master Naturalist Program in Cedar Key, Florida.

The NE Florida Sea Grant extension agent attended the inservice training "A watershed approach to water quality" and the Annual Sea Grant Extension Meeting. She also received the materials for IST 22025 "Nutrients in coastal waters". Additionally, a continuing education class in Basic Sign Language was completed.

In lieu of in-service training, the central Florida agent attended, as a participant, the National Shellfish Association 94th Annual Meeting, Artificial Reef Coordinator's 6th Annual meeting, International Shark Conference and 6th International Conference on Shellfish Restoration.

The Charlotte County agent did not attend any in-service trainings. With the diminished budget and non-supported travel, it is unlikely this agent will travel out of county other than the SG staff meeting. Perhaps some local training such as CPR, dive training or computer related skills training will be offered.

The Santa Rosa County marine agent attended the following meetings:

Florida Sea Grant annual meeting (2.5 days), Cedar Key, Florida
Master Naturalist Instructor Training (2 days), Apalachicola, FL.
Environmental Education Institute (2.5 days), Camp Timpoochee
Multi-state Natural Resource Program Implementation Team Meeting (2 days) Dothan, AL.
2 District 1 staff meetings (2 days) Quincy, FL., and Marianna, FL.
Promotion and Tenure Workshop (.5) Quincy, FL.
Nutrients and Coastal Water Quality - WEB Based (Completed - 10/1/02)

The Lee County agent attended three workshops which included: Artificial Reefs, Fisheries Design Team, Mote Marine Lab's Southwest Florida Research Workshop.

9.14 Work with NOAA's Ocean Service Center to develop an in-service training program for extension faculty and community leaders on effective meeting management, dealing with conflict and controversy, and facilitation skills. (Spranger)

Twenty county faculty, state specialists, county managers and community leaders attended a workshop in Naples that focused on effective meeting management, dealing with conflict and controversy, and group facilitation skills.

9.15 Coordinate annual in-service training meeting for Florida Sea Grant Extension faculty that provides administrative updates, reviews current Sea Grant research and extension activities, and organizes program planning efforts. (Spranger)

Sea Grant county and state faculty participated in annual in-service training meeting, held in October in Cedar Key where they were provided with administrative updates, discussed program planning process, and focused on future program planning efforts.

9.16 Provide presentations on “Grants Management” and “Sea Grant Extension Organization and Structure” at New Program Leader Training, during the biennial meeting of the Assembly of Sea Grant Extension Program Leaders. (Spranger)

Provided presentation on Grants Management and Sea Grant Extension Organization and Structure at New Program Leader Training meeting, held in conjunction with biennial meeting of the Assembly of Sea Grant Extension Program Leaders, held in Baton Rouge, LA.

9.17 Participate as member of second year class of the IFAS LEAD (Leadership Enhancement and Administrative Development) training program. (Spranger)

Attended programs that focused on organization and management as member of the IFAS LEAD (Leadership Enhancement and Administrative Development) training program. Graduated from the program in October.

9.18 Provide support and presentation on environmental stewardship at Environmental Education Institute, held at Camp Timpochee for extension agents. (Spranger)

Provided funds to support the Environmental Education Institute, held in Spring, 2002 at Camp Timpoochee. Also, provided discussion on marine invasive species.

9.19 Serve as a member of the National Extension Tourism Program Planning Committee to identify speakers for national conference on tourism for extension faculty and staff. (Spranger)

Participated as member of National Extension Tourism (NET) Conference planning committee. Attended conference that was held in Traverse City, Michigan in Fall, 2002. Provided presentation on “Impacts to Florida’s Tourism Industry.” Will be member of 2004 NET conference planning committee. Host site will Kissimmee in September, 2004.

9.20 Participate as a member of pilot International Extension Training Program. (Stevely)

This program was successfully completed by attending the Earth Institute Training in Costa Rica.

9.21 Participate as a member of the University of Florida’s Natural Resource Leadership Institute. (Tavares)

Not completed due to resignation of agent.

9.22 Continue course work toward Master's Degree in Environmental Studies at University of West Florida. (Verlinde)

Masters programs at UWF and UF are being examined as possible programs.

9.23 Continue course work toward Master's Degree in Environmental Studies at Florida Gulf Coast University. (Wasno)

Continued to attend classes at FGCU that will count towards Masters Degree. Currently studying for the MAT test for acceptance into Graduate Program.

Goal 10: Create a Scientifically and Environmentally Informed Citizenry

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

10.1.1 High quality publications that effectively communicate the results of Florida Sea Grant activities to both general and specialized audiences will be produced. This includes Sea Grant Reports, Sea Grant Extension Fact Sheets and brochures, Sea Grant Technical Papers, books, book chapters, staff papers, conference proceedings, newsletters, posters and videos. The exact number will depend on the work plans and research results of faculty. (Kearl/Zimmerman)

These accomplishments are reported in Section 6.0 (Publications).

In addition, with its recent (2001) revisions in publications distribution guidelines in place, the National Sea Grant Depository has encouraged digitization and electronic distribution of all Sea Grant program productions. Florida Sea Grant has capitalized on this prospect to greatly increase the potential distribution of its publications. According to figures supplied by the National Sea Grant library, Florida Sea Grant is among the top 4 leaders in each of the four categories of statistics that the library tracked for 2002, including highest usage in both of the specific electronic categories.

1.Louisiana	79
2.Hawaii	76
3.Maryland	70
4.Florida	64
5.California	61

# of Electronic Documents sent to NSGL

1.Florida	24
2.Oregon	23
3.Alaska	16
4.Ohio	11
5.Virginia	8

# of NSGL Loans

1.Rhode Island	73
2.Washington	44
3.Florida	42
4.Oregon	34
5.Woods Hole	25

of .pdf Downloads

1.Florida	19,730
2.Texas	14,620
3.California	9,188
4.Alaska	6,069
5.Hawaii	6,053

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

These accomplishments are reported in Section 6.0 (Publications).

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

These accomplishments are reported in Section 9.0 (Outreach), web pages, page 9.10.

10.2 Involve 100 minority youth in Brevard County in environmental programs. (Combs)

The Brevard Marine Agent involved more than 100 minority youth in environmental programs during 2002 through participation and instruction in two Summer 4-H Marine Day Camps (25 students + 25 students), participation and instruction in two 4-H Marine workshops entitled, “Consumer Choices, Purchase, Use, and Maintenance of Recreational Fishing Gear” (20 students + 10 students), participation and instruction in three pre-K and elementary-age marine education programs (33 children + 25 children), participation and instruction of 50 Boy Scouts in a variety of field skills, judging and instruction in three different Regional Science Fairs (24 students + 15 students + 24 students), participation and instruction in annual 4-H Marine Ecology Contest (145 students), participation and instruction in annual “Beach Sweep” shoreline cleanup (19 students + 6 adults), participation in annual Coastal Cleanup (15 students + 15 adults), participation and instruction during Sebastian Inlet Blue Water Open fishing tournament (200 fishermen + 100 guests, including 80 youth), participation and instruction during Fishing Frenzy Dolphin Fishing Tournament (150 fishermen + 250 guests, including 125 youth). A concerted effort is always made to achieve parity in all such activities.

10.3 Provide assistance to annual statewide 4-H Marine Ecology Youth Contest. (Combs)

The Brevard Marine Agent participated for ninth consecutive year in the annual Marine Ecology Contest held at Camp Ocala on 23 November, 2002. In 2002, 145 4-H members from 13 Florida counties, including Brevard Co., participated in the competition. Parity was achieved.

10.4 Develop a new Brevard County Sea Grant educational factsheet on manatees. (Combs)

The development of a new Brevard County Sea Grant educational fact sheet on manatees was deferred to year 2003, as the Brevard County Manatee Protection Plan was still under review by the Florida Fish and Wildlife Conservation Commission during 2002. The Brevard Marine Agent spoke before the Brevard Co. Commission, stating that Sea Grant Extension was committed to educational support of the Manatee Protection Plan.

10.5 Participate in Melbourne Harbor Festival and provide Sea Grant coastal and marine information to attendees. (Combs)

The Melbourne Harbor Festival has lost financial support of the city of Melbourne, and was cancelled for 2002. However, similar public exposure and opportunity to provide Sea Grant coastal and marine information to citizens was afforded by participation in two fishing tournaments involving about 350 fishermen and 350 guests, plus 200-300 passers-by, at which information was provided concerning marine invasive exotic species, Clean Boater

practices, Monofilament Recovery and Recycling Program (MRRP), and other information, including personal Q/A opportunities. Additionally, working with 4-H members and parents, Boy Scouts and parents, and commercial clammer educational seminars provided numerous opportunities to provide such information to citizens.

10.6 Participate in summertime Canaveral National Seashore sea turtle survey during the summer nesting season. (Combs)

Increased security measures implemented at Kennedy Space Center following the 9/11 WTC incident has forced a reduction in size of sea turtle nesting survey workforce, thus the Brevard Marine Agent did not participate in Canaveral National Seashore sea turtle nesting surveys during 2002.

10.7 Participate in Merritt Island National Wildlife Refuge sea turtle survey during the summer nesting season, and instruct 25-30 visitors during each “beach walk” about sea turtles. (Combs)

Increased security measures implemented at Kennedy Space Center following the 9/11 WTC incident has also seriously altered the freedom once enjoyed at Merritt Island National Wildlife Refuge (MINWR) in conducting early evening public “beach walks” designed to instruct and permit public observation of sea turtle nesting activities. Thus the Brevard Marine Agent also did not participate in MINWR “beach walks” and associated instructional opportunities.

10.8 Modify, streamline and keep updated the Brevard County Extension Service website, and insure marine and coastal information is included. (Combs)

The Brevard Co. Extension website is online at brevard.ifas.ufl.edu and is periodically updated under the Sea Grant section with marine and coastal information.

10.9 Develop a periodically-issued, limited newsletter, which would be targeted at selected and specific audiences dealing with topical Brevard County issues. (Combs)

The Brevard Co. Extension website is being used in development of an online newsletter.

10.10 Provide 100 boaters and anglers a “brown pelican poster” and information sheet. At least 20% will become more aware and responsible in the impacts of feeding large fish bones to pelicans, measured by pre/post test surveys. (Crane)

About 200 boaters received a yellow bucket which had the pelican poster printed on the side to increase awareness on the problems pelicans have if fed large fish bones. A survey was mailed to 100 randomly selected boaters six months later who received buckets to ask them if they had increased their awareness about feeding pelicans large fish bones. Of the surveys returned, results indicated 78% (12 out of 14) boaters reported they had increased their knowledge on not to feed large fish bones to pelicans.

10.11 Present poster on Miami-Dade County Marine Debris Education Project at Annual Conference of Association of Natural Resource Extension Professionals. (Crane)

A poster presentation titled "Innovative Ways to Bring Marine Stewardship to Diverse Audiences" was presented at the 3rd National Association of Natural Resource Extension Professionals Conference in Naples, Fl.

10.12 Develop quarterly newsletter for local clientele groups that address marine and coastal issues. (Crane, Gregory, McGuire, Novak, Sweat)

The NE Florida Sea Grant extension agent wrote, published and distributed a quarterly newsletter, “aqua notes” to a mailing list of approximately 650 clients.

Six bi-monthly community newsletters were prepared by Miami-Dade County agent for clientele groups that addressed fisheries conservation, coastal habitats, seafood safety, clean boating, endangered marine species, and marine debris. (250 total circulation per newsletter)

The Charlotte County marine agent is presently contributing at least one and usually two articles to the Charlotte County Extension Newsletter. No funding is available for a dedicated marine newsletter. He also contributes to the weekly Waterline and monthly Water Life magazines. Waterlife is an insert to the Thursday edition of the Charlotte Sun Herald.

10.13 At least 100 students attending middle and high schools in St. Lucie County will improve their knowledge of marine science (defined by Florida State Standards) through involvement in Sea Grant sponsored programs and activities. (Creswell)

Indian River Lagoon Series – One hundred and one 7th grade students learned about the Indian River Lagoon, its ecology, flora and fauna, and human impacts which affect its ability to sustain marine life. Students received classroom instruction prior to a field trip to the Lucie County Marine Center and the Smithsonian Marine Ecosystem Exhibit. Students and teachers are provided printed materials to supplement their field trip to the St. Lucie County Marine Center. Teachers incorporated the Indian River Lagoon Series into their course planning.

10.14 Distribute “The Directory of Marine Science Educational Resources on the Treasure Coast” to all St. Lucie County schools. The utility of this resource will be evaluated through a post-distribution survey. (Creswell)

“The Directory of Marine Science Educational Resources on the Treasure Coast” is being incorporated into the UF/IFAS website for St. Lucie County, and will be distributed to Martin, Indian River and Brevard counties. Due to publication costs and the dynamic aspect of marine science education programming along the Treasure Coast, use of a descriptive website, with linkages to the appropriate educational institutions, was determined to be more cost effective and provide more up-to-date information.

10.15 Conduct “Motion in the Ocean” educational program for middle and high schools in St. Lucie County. Performance will be evaluated by teachers through post-testing of instructional materials. (Creswell)

Motion in the Ocean – This program was provided to 1,257 fourth and fifth graders in the St. Lucie County Public School District. The emphasis of “Motion in the Ocean” is the concept of the form and function of marine organisms, that is the relationship between body form, degree of motility, and how these influence an animal’s ability to feed and avoid predation. Fourth and fifth graders have not been introduced to identification of various marine organisms. As a quantifiable measure of the students’ ability to recognize the different taxanomic groups presented, each student had to differentiate between corals,

bivalve and gastropod mollusks, and echinoderms by correctly placing each organism type in the appropriately labeled container. Approximately 70% of the students successfully recognized the types of taxonomic groups.

10.16 Conduct a 4-H Marine Camp that will utilize a watershed approach to understand the water quality of bay systems. 80% of attendees will be able to take water quality samples, recognize impacted waterways, and understand BMPs for agriculture and homeowners. (Diller, S. Jackson, B. Mahan, C. Verlinde)

The Franklin County Sea Grant Agent worked with Sea Grant Agents Andrew Diller, Scott Jackson & Chris Verlinde and 4-H Agents Paula Davis, Kim McDonald, Heather Shultz, Rene Nestle-Quick (AL 4-H) and 4-H Coordinator Jennifer Healy to plan and teach this year's (2002) Northwest District's 4-H Marine/Watershed Camp at 4-H Camp Timpoochee. The Agent helped teach the camper's about marine creatures and the environment during the field trip to the Gulfarium, and taught programs on sharks and plankton. The Agent recruited and sent two 4-H'ers, including a Jr. Counselor to the camp. A camp survey filled out by the campers and adult volunteers documented that in addition to increased knowledge of environmental issues that 71% of the campers (74 of 105) rated the camp as good - excellent and only two campers reported that they would not want to come back to camp next year. A total of one hundred and five youth and adult volunteers from throughout FL and AL attended this camp.

The District 1 marine camp for 79 campers was held. Snorkeling trips were organized and campers taught about seagrasses and their importance, fish identification, and boat safety. Volunteers were coordinated to present a shark program and star gazing. A morning fishing activity was provided to a few campers that wanted to fish from the dock.

10.17 Coordinate and develop a quarterly newsletter on marine and coastal issues for Panhandle residents. (Diller, S. Jackson, Verlinde)

The Panhandle newsletter Emerald Currents was delayed due to other programming efforts including continued development of local marine extension websites by the Escambia and Okaloosa/Walton county agents. Next issue due to be published Spring 2003.

The second issue of Emerald Currents was delayed in 2002 last year due to time restraints.

10.18 200 4-H youth will improve their knowledge of endangered species utilizing local beachers and ways that they can help protect these species. (Diller)

Presented at least nine programs on protecting beach habitat, sea turtles, and other threatened species to various 4-H and youth groups. Taught over 500 children and parents about ways that they could become involved in protecting these endangered animals and the beach habitat they utilize.

10.19 25 teachers and 4-H Leaders will utilize the "Sea Turtle Science" section of the Escambia County Marine Extension website monthly with their students to increase their knowledge and awareness to decrease human impact on turtles during nesting season. (Diller)

More than a dozen teachers and their students from Escambia County schools and the Montessori School of Pensacola participated in sea turtle and beach habitat programs in 2002. Two 4-H clubs and one home-school association also requested programs. Response after the programs indicated that many participants were visiting the Escambia County Marine Extension website for nesting and sea turtle tracking information.

10.20 Assist in coastal beach clean-ups and development of informational materials in Escambia county that will lead to a reduction in marine debris and litter. (Diller)

Assisted with Escambia County's effort during the International Coastal Cleanup at Perdido Key State Recreation Area. After the cleanup, presented marine and coastal information at "Hands Across the Border", a multi-state environmental education fair at the FloraBama Lounge on Perdido Key. Created and manned display for the Earth Day celebration at Big Lagoon State Recreation Area. Displays included educational information on pollution prevention and clean boating.

10.21 Assist in the tagging of loggerhead sea turtles for satellite tracking. (Diller)

Assisted Gulf Islands National Seashore in attaching satellite transmitters to one loggerhead sea turtle and one green sea turtle that emerged to nest on local beaches. The turtle's migrations can be tracked via the Escambia County Marine Extension web site and were utilized in continuing efforts to educate clientele about the importance of protecting beach habitat, endangered species, and water quality.

10.22 Plan and develop a multi-county sea turtle awareness program. (Diller, S. Jackson, Verlinde)

Agent S. Jackson constructed a sea turtle exhibit that was used at the Florida State Fair, Walton County Fair, and in exhibits at Sandestin Resort. The displays shows our Gulf Sea Turtles life cycle and biology. Also, depicted are ways to reduce human impact on these animals. Potential audience was over 800,000.

Agents submitted a proposal to the State of Florida's Marine Turtle Grant Program in the fall of 2002, where waterfront property owners voluntarily adopt practices to improve their beachfront for sea turtle nesting and are designated as providing a "Sea Turtle Friendly Nesting Beach". Proposal was awarded $2750 beginning July 1, 2003 through June 30, 2004 and development is proceeding.

The central Florida agent produced and distributed four quarterly newsletters, "Marine Times" to approximately 600 readers.

10.23 Serve as a technical resource to at least 10 public and private school educators in Okaloosa and Walton Counties, providing age appropriate materials that will assist in the study of marine ecology and coastal resources. (S. Jackson)

Provided natural resource education program and supplied information to four elementary schools, two high schools, and fifteen home school students including marine ecology and careers in marine science. Also participated as a Science Fair Judge for the Walton County School District. Worked closely with four teachers that are implementing natural resource curriculum into their classrooms. We collaborated to identify appropriate sunshine state standards that these learning activities are helping students to meet.

10.24 Assist in development of a fact sheet on marine debris and entanglement. (Jacoby)

A fact sheet dealing with marine debris and entanglement of wildlife was developed and forwarded to the Florida Sea Grant communication group.

10.25 Develop an in-service training module on “nutrients in coastal waters” for Extension agents. (Jacoby)

“Nutrients in coastal waters”, a self-directed in-service training module, was developed and disseminated to nine agents.

10.26 Develop and conduct teacher training and 4-H workshops on marine science in Northeast Florida. (McGuire)

The NE Florida Sea Grant extension agent conducted 10 teacher workshops on estuaries, coral reefs, aquaculture and field studies. She organized and conducted four week-long 4-H summer day camps with a marine theme.

10.27 Assist in development of marine science materials and CD pictorial study guide for statewide 4-H marine ecology contest. (McGuire)

The NE Florida Sea Grant extension agent completed revision of the study guide (PowerPoint presentation on CD ROM) for the 4-H Marine Ecology Judging Event. A total of 104 participants from 13 counties participated in the event; almost twice as many participants as in 2001.

10.28 Provide presentation at League of Environmental Educators of Florida Annual Conference. (McGuire)

The NE Florida Sea Grant extension agent conducted a 4-hour workshop on estuaries at the League of Environmental Educators of Florida annual conference. Ten educators attended the workshop.

10.29 Provide presentation on coral reefs at Florida Marine Educators Association’s Annual Conference. (McGuire)

The NE Florida Sea Grant extension agent conducted a 2-hour workshop on coral reefs at the Florida Marine Science Educators Association annual conference. Twenty-five educators attended the workshop.

10.30 Provide presentation at annual Earth Kinship Conference. (McGuire)

The NE Florida Sea Grant extension agent gave a 1-hour presentation on “Food from the Sea” at the Earth Kinship Conference.

10.31 Recruit at least 10 4-H youth to be involved in one “environmental” community service project in order to learn about environmental issues. (Mahan)

The members of the Eastpoint Wildlife Savers 4-H Club were very active this year in planning and carrying out a number of community service projects this year. These included participating in two coastal cleanup efforts; raising money, purchasing, and

donating 20 "Ouch Bears" to the local ambulance service to give to children who needed to be transported to area hospitals; and designing and installing a ceramic tile sidewalk representing the Apalachicola River and estuary at the Apalachicola National Estuarine Research Reserve. As a result of their community service projects the 4-H club received press coverage on their projects by the local mass media. In addition the Agent nominated the Club Leader Lydia Countyman for a Council for Sustainable Florida Award. for the work she and her 4-H club have been doing over the past few years. She was one of fifteen people statewide and the only 4-H Leader in the state to win the 2002 award. Sixteen club members were involved in planning and carrying-out the community service projects.

10.32 Recruit at least five local youth to attend summer 4-H marine camps. (Mahan)

The Franklin County Sea Grant Agent recruited and sent a total of nine local youth to this year's County and Marine Science/Watershed 4-H Camps. A total of 207 4-H'ers attended the two camps this year. Eight of the nine campers were supported at least in part by a 4-H Camp Scholarship that covered at least part of the camp's cost.

10.33 Provide educational programs to 15-20 civic clubs and organizations in SE Florida that address marine environmental conservation issues. (Novak)

Nine educational programs were held at civic associations, fishing clubs, festivals, fishing tournaments and other events.

10.34 Continue to maintain and update 16 educational kiosks that are located at marine access points throughout Charlotte County. (Novak)

The educational kiosks at marine access points are presently being maintained but the marine agent is teaming with the local CCA chapter to fund some very nice educational displays that will be site specific and low maintenance.

10.35 Continue to write newspaper columns for local papers and a quarterly newsletter on marine and coastal issues. (Novak)

The Charlotte County marine agent is presently contributing at least one and usually two articles to the Charlotte County Extension Newsletter. No funding is available for a dedicated marine newsletter. He also contributes to the weekly Waterline and monthly Water Life magazines. Waterlife is an insert to the Thursday edition of the Charlotte Sun Herald.

10.36 Coordinate the annual St. Petersburg Kid's Fishing Tournament where 250 youngsters and their adult sponsors will be introduced to conservation and fishing ethics. (Sweat)

A highly successful Kid's Fishing Tournament was planned and held at the St. Petersburg Pier. 265 kids participated. Donations funding the tournament were approximately $6500. Over 35 volunteers assisted with registration and fishing "expertise".

10.37 Develop "Don't Splash Your Trash" educational campaign where at least 150 resource users will learn develop an awareness on the impacts of marine debris, which will result in a reduction of marine debris within Broward County. (Tavares)

Not completed due to agent resignation.

10.38 Through a pilot project with the Broward County's Department of Planning and Environmental Protection and local volunteer groups, develop a monofilament recycling program. (Tavares)

Not completed due to agent resignation.

10.39 Develop educational programs to area boaters that encourage best management practices that promote water quality. (Tavares)

Not completed due to agent resignation.

10.40 Conduct workshops and educational fairs on marine science and coastal resource issues for area 4-H members and other school groups. (Tavares)

Not completed due to agent resignation.

10.41 Work with groups such as the Greater Caribbean and Latin Chambers of Commerce to promote marine science programs to minority clientele groups. (Tavares)

Not completed due to agent resignation.

10.42 Develop educational programs and field trips where at least 75 fifth graders will increase their knowledge about the beach ecology system. (Verlinde)

Coordinated and taught at four beach ecology field trips for school and 4-H groups (256 participants). Activities included: sea turtle nesting and habitat needs, fish identification, seining and comparing organisms in brackish tidal pools and seagrass beds, an EnviroScape coastal model, fish prints, kayaking, and marine debris.

10.43 Develop a variety of educational programs on marine debris issues, types, origins, and prevention for at least 750 students. (Verlinde)

Marine debris information was included as an activity in the beach ecology field trips.

10.44 Assist in the coordination of underwater, river, and coastal cleanups in Santa Rosa County that will result in a reduction of debris and litter in the county. (Verlinde)

Participation, coordination and planning for the Santa Rosa Rivers and the International Coastal clean-ups. Developed a Rivers clean-up data sheet for use by canoe liveries to provide to clean-up participants. Participated in local coastal clean-up activity along Boiling Creek. We collected approximately 350 lbs. of trash ranging from a cell phone to discarded military rations (which we reported to Eglin AFB officials).

10.45 Assist in the development and installation of monofilament recycling stations in Santa Rosa County. (Verlinde)

A monofilament recovery and recycling program began in Santa Rosa and Escambia counties. Media coverage for the program has been good, with a half hour television show of the Pensacola Gulf Coast Keepers show dedicated to this program.

10.46 Provide marine science displays and educational activities at the Blackwater River Festival and Navare Fun Fest. (Verlinde)

Displayed marine and environmental exhibits and provided activities at environmental festivals such as: Pensacola Junior college Forestry Conclave, Seagrass Awareness Festival, Eglin Air Force Community Earth Day, Earth day at Big Lagoon State Recreation Area, 4-H expo, Bay Area Resource Council's "State of the Bay" symposium, Navarre Fun Fest, and Coastal Cleanup activities.

10.47 Work with the Environmental Education Coordination Team on local and regional Environmental Education projects. (Verlinde)

The Pensacola Bay System Environmental Education Coordination Team (EECT) has continued the development of the Resource Ranger Club. EECT has also continues to seek funding, received grants from the Florida Coastal Management Program, National Fish and Wildlife Foundation, and US Fish and Wildlife Partners for Fish and Wildlife Program. In addition, EECT has published a seafood cookbook, "From the Estuary" to raise funds.

The group continues to update a community environmental website (eect-barc.org). EECT sponsored an informational forum concerning pros and cons of the proposed Yellow River dam. Representatives from the scientific community and the Yellow River Dam Advisory committee presented information. More than 120 citizens from Escambia, Santa Rosa, Okaloosa and Walton Counties attended.

EECT members have participated in beach ecology workshops, earth day and coastal cleanup events, and seagrass awareness. EECT has provided 4 groundwater models to high schools in Santa Rosa and Escambia counties. Funding has been obtained for a groundwater model for every middle and high school science class in the 2 county area.

10.48 Participate in Southwest Florida Marine Mammal Stranding Network that will assist in the rescuing of injured or entangled marine mammals in the tri-county area of Charlotte, Lee and Collier Counties. (Wasno)

Five fishing tournaments were presented with an overview of manatee protection boat speed zones in order to increase compliance, safety and protection of habitat. A total of 786 people received this information.

10.49 Work with Keep Lee County Beautiful and Florida Gulf Coast University student volunteers to establish a monofilament line recycling project in Lee County. (Wasno)

Work on this project was delayed due to time limitation.

10.50 In cooperation with the Boca Grande Pass Tarpon Fishing Guides Association, develop an underwater marine debris program for the pass. This underwater marine debris project will involve senior, experienced divers. (Wasno)

Received 2002 Keep Florida Beautiful Award of Excellence for community involvement. All participating divers attended an educational workshop presented by Mote Marine Lab on the exotic green mussel identification, documentation and reporting protocol. Over 6000 pounds of debris was recovered from the Pass.

10.51 Provide several guest lectures on marine resources issues in Lee County to Marine Systems Course at Florida Gulf Coast University. (Wasno)

Collaborated with FGCU to create an oyster restoration project with students and volunteers.

10.52 (added) Conduct a statewide 4-H marine program in cooperation with the UF/IFAS 4-H program. This includes a marine ecology event, summer camps, a sport fishing camp and various county-level educational events. (These activities were November 2001 to October 2002.) (Culen)

The ES 237 Federal Report is sent to the USDA for the purpose of reporting 4-H and other youth development activity in the state. The use of a new software program called “Blue Ribbon” is now able to separate activities by program area and to sub classify these activities by grade level and delivery mode. In the past program year (2001) 10,674 project contacts were identified in the Marine/Aquatic Sciences areas. This is a 12% increase when compared to the 2000 program year in which 9,536 project participants were identified. Another program area identified as “Aquaculture” had 228 projects in 2001. A project is defined as a youth participant involved in at least six hours of instructional time in a particular project area. Participant contacts for activities less than six contact hours, such as school enrichment, after school programs and events totaled 30,938 with 6,107 duplications. The county 4-H agents, Sea Grant and other agents involved in youth development activities, provide this information.

The statewide Marine Ecology Event was held at Camp Ocala on November 17, 2001. Approximately 60 4-H youth participated. The Polk County senior team took top honors and the Leon County junior team led that division. Team members received partial scholarships to attend marine camps/programs during the summer of 2001. The program was held November 23, 2002 at Camp Ocala. Interest in the program increased with the introduction of the new CD for plant and animal identification. Approximately 125 CD’s have been distributed to interested counties and individuals. The new study materials are also accessible via the 4-H website www.florida4h.org.

Three weeks of 4-H Summer Marine Camps were held a the Timpoochee 4-H Center near Niceville, FL. 252 youth participants from throughout Florida attended these five-day camps, as compared to 249 the previous year. Camp activities included a trip on a Biloxi schooner. The crew of the schooner provided several activities on sailing and history along with snorkeling in the sea grass beds near the Destin Pass. Other activities included specimen identification, an intro to sea turtles, tackle crafting, fishing, and a trip to DeLeon Springs. Sea Grant agents Bill Mann, Scot Jackson, Chris Verlinde and Andrew Diller assisted with the scheduling and program activities for the weeks at Timpoochee. Attendance by counties is available.

A 4-H Sport Fishing Camp was held at Camp Ocala during July. This was the first year this camp was held with 16 youth enrolled. Activities at the camp included aquatic ecology, tackle crafting, angling ethics, management and regulations. This program is a cooperative effort with the Florida Fish and Wildlife Conservation Commission. With the training of additional volunteers this program is expected to grow. Florida specific information is being developed to supplement the national project materials that are available.

A 4-H artificial reef-building project was continued for local 4-H youth club members. The project also represented a strong partnership between private industry and the 4-H

program through cooperative fund raising and during the construction phase. This effort also benefits the local economy by employing individuals in the construction and placement of the reef structures and by encouraging recreational fishing/tourism.

The Reef Riders 4-H club's growing sea grass experiment, demonstrated to the students that science is learning by trial and error. Attempts at establishing sea grasses in an area were not successful. Another technique to grow sea grasses will be tried in the future.

Approximately 20 4-H members and 12 adults were instructed in field techniques, including methods of beach-seining, and determination of water salinity, water temperature, maximum and minimum air temperature over time, air speed (wind-gauge) and direction (compass), water pH, dissolved oxygen content, and specific location using compass and GPS. The meaning and significance of each of these parameters within the marine environment was described, explained, and demonstrated.

Through investigating a local coastal environmental concern, youth attending a marine science day camp developed two strategies for improving the situation examined. Oral reports given on the last day of each session of camp showed that 97% of the camp participants were able to describe a local, coastal environmental concern and provided two strategies for improving the situation.

Youth participating in a marine science day camp discussed the impact of changing behaviors that would benefit the coastal environment. 10% of participating youth were randomly selected to complete a telephone survey regarding their behavior changes four to six months following the camp sessions. The results from the survey indicated that 57% of the youth questioned changed two behaviors. Furthermore, 71% of those youth surveyed indicated that they changed at least one behavior.

An educational program for middle school students was planned with a local state biologist and the members of a Marine Studies 4-H club. The 4-H members volunteered and received 10 hours of training in designing and planning an educational program, the learning characteristics of middle school students, and a refresher in the scientific method and marine invertebrate identification. The 4-H members presented the program, utilizing marine invertebrates from the state lab, to 100 students as part of an Ocean Awareness program. The program was well received, and the state biologist, skeptical at the onset of the program, was so overwhelmed at the 4-H members enthusiasm, interpretive skills and knowledge, that he has become a champion for the program in promoting mentoring relationships with professionals at his lab. A new community partnership was formed as a result of this program.

Twenty-three students restored dune vegetation at a county park. Hurricanes in previous years destroyed the dunes leaving park infrastructure and adjacent roadways at higher risk for damages in the event of another storm. Students planned nearly 10,000 plants.

Marine Science Special Interest Club 6th grade science completed the Marine Science project. They spent six weeks working on marine projects and the agent did a special presentation with the youth regarding the types of fish they might find in bay, the problems with using boat props in sea grass beds, special turtle issues on our beaches, and marine and aquatic career possibilities. US Fish and Wildlife also provided several shell collections to show the youth.

Florida Coastal Clean Up: 80 4-H members participated in a community service event to help clean up our environment. Each group of five collected trash and recorded items they found. Along with cleaning the beach the participants received a lesson on marine animals. Various animals were found on shore as well in the water, agent used the opportunity to provide information about horseshoe crabs, hermit crabs, sea urchins.

30 4-H members acquired knowledge about various marine life such as: horseshoe crabs, sea cucumbers, sea slugs, star fish, sea urchins, hermit crabs, etc. The older youth participated in manning touch tanks at various events for over 3,000 school aged children during the year.

A 4-H marine club of 16 members and four adults increased knowledge of marine life and fishing through participation in two field trips. One included a video and educational program of the coral reefs and included a snorkeling trip (a new experience for 13 of the members). The second trip provided free rods and reels and instruction for a catch and release fishing experience. This amounted to $555 contributed to this club's marine science program.

Five public programs were conducted with natural resource partners about wildlife resources, sea grass resources, fisheries resources and Florida Bay Ecosystems for a total of 1,015 youth. Youth learned basic principles of ecology through slide presentations and then experienced it through field trips. Sharks - 4-H youth have not only been learning about the environments of South Florida, they have also been involved in service projects to help restore damaged habitats. Members from the Sharks Club have a long-term community service project planning mangroves to help prevent shoreline erosion.

Key to Individual Responsibilities

3.0 PROGRAM FUNDING FROM ALL SOURCES

Funding History

Level federal funding during the 1980s and early 1990s for the National Sea Grant College Program has clearly impacted Florida Sea Grant core programs. While some increased funding has been received in recent years, the level of effort or "buying power" of core program funds is still woefully short of early 1980 levels. When inflation is taken into account, the peak buying power year was 1980. Significant core program increases began in 1997, but buying power for 2002 was still 37 percent below the peak year. With 2002 core program funds at $1,990K, and adding funds awarded to Florida due to national competitions of $535K, the overall 2002 buying power of the program was still 20 percent below the peak year, as noted in Table 1.

The number of full time equivalents (FTEs) budgeted for the core program from 1986 through 1988 ranged from 55 to 58. This is a level much lower than that of the late 1970's and early 1980's. The pattern of decrease has been repeated in faculty and graduate student research and in the extension program. Education programs (other than graduate student support and those conducted within Extension) were virtually eliminated in 1985 with attempts made to obtain funding for that component from other sources. For the last decade, FTEs supported with core program funds are about 45 as shown in Table 2.

While FTEs have declined, the cost of operating research, education and Extension programs per FTE has increased. In terms of current dollars, the cost per FTE has increased from a low of $13,000 in 1976 to a high of $49,000 in 2000. Clearly, level or slowly growing budgets and a higher cost per FTE have driven downward the number of FTEs the program is able to purchase. On a real dollar basis (accounting for inflation), the cost per FTE has risen from a low of $27,000 in 1984 to $41,000 in 2002 as shown in Figure 1.

Florida Sea Grant historically matched federal funds on an approximate 1:1 basis. During 1989 and 1990 this ratio was reduced and since 1991, our core program proposal has been matched on a 2:1 basis as required by federal law. University policy now mandates that matching funds may only be included at the rate prescribed by the granting agency.

Florida Sea Grant's recent funding history indicates an increased reliance on funding other than federal Sea Grant dollars. A comparative analysis of all Sea Grant funding sources for 2000-2001 to 2002-2003 indicates that the federal NOAA Sea Grant core program funds represented from 42 to 44 percent of total Florida Sea Grant program effort as shown in Table 3. Florida Sea Grant's use of federal Sea Grant program funds has consistently met national guidelines that at least 50 percent be used to fund research as shown in Table 4. A listing of all funding sources for the Florida Sea Grant College Program funds for the last three years is shown in Table 5, 6 and 7.

Sea Grant federal funds plus all extramural grants generated 7.9 times the amount of state appropriations received through the Education and General budget of the University of Florida for 2002-03. Including faculty salaries dedicated to the program by UF/IFAS, 3.6 grant dollars were generated per state dollar of 2002 appropriations as shown in Table 8.

Table 1. Federal Sea Grant funding ($1,000's) for Florida Sea Grant College Program, 1972-2001[e]

Current				Real[a]		Percent Below Peak Year	
Year	Core Funding	National Competitions	Total	Core	Total	Core	Total
1972	378			1188		58	
1973	600			1786		37	
1974	740			2022		29	
1975	900			2248		21	
1976	975			2305		19	
1977	1125			2499		12	
1978	1260			2612		8	
1979	1450			2775		3	
1980	1627			2852		0	
1981	1575			2525		11	
1982	1575			2377		17	
1983	1428			2073		27	
1984	1458			2041		28	
1985	1458			1973		31	
1986	1506 [b]			2000		30	
1987	1506			1941		32	
1988	1386 [c]			1728		39	
1989	1489			1788		37	
1990	1530			1769		38	
1991	1652			1843		35	
1992	1652			1799		37	
1993	1500	86	1586	1595	1686	44	41
1994	1500	127	1827	1562	1903	45	33
1995	1620	626	2246	1653	2292	42	20
1996	1620	455	2075	1620	2075	43	27
1997	1880	194	2074	1844	2034	35	29
1998	1780	322	2102	1724	2036	40	29
1999	1846	444	2290	1762	2186	38	23
2000	1907	1125	3032	1784	2836	37	1
2001	1965	463	2428	1796	2219	36	22
2002	1990	535	2525	1798	2282	37	20
2003[e]	2000	504	2504				

[a] Deflated using Gross Domestic Product Price deflator, 1996=100.
[b] Includes MAREP add-on and GRH reduction.
[c] After NOAA overall budget cut of seven percent from base of $1,489K.
[d] Beginning in 1993, total Sea Grant federal funding includes various initiatives and other funds provided through special national competitions.
[e] As of March 2003.

Table 2. Individuals and full-time equivalents (FTEs) supported by federal Sea Grant core program funding 1972-2003.

Research Number					Education		Advisory		Total	
Year	Faculty	Students	Total	FTE	Number	FTE	Number	FTE	Number	FTE
1972	14	25	47	13	0	0	6	1	59	15
1973	29	39	93	32	0	0	10	8	103	40
1974	32	34	17	36	0	0	29	10	136	46
1975	44	55	151	49	8	[b]	4	13	204	62
1976	38	50	109	40	17	12	26	22	152	74
1977	32	54	108	40	24	14	74	27	206	81
1978	28	37	115	42	23	4	59	26	197	77
1979	34	41	99	49	31	2	115	32	245	83
1980	46	38	128	48	7	1	111	28	246	77
1981	53	39	153	46	4	1	120	31	277	78
1982	39	35	91	44	12	3	108	34	211	81
1983	29	30	75	33	1	1	102	32	178	65
1984	48	44	108	39	5	2	102	29	216	70
1985	48	48	118	37	2	[b]	89	26	209	64
1986	39	35	83	30	0	0	90	26	173	55
1987	44	23	86	30	4	4	79	27	181	58
1988	53	30	96	31	0	0	79	27	181	57
1989	48	24	87	28	9	2	37	15	133	44
1990	45	23	81	28	7	1	36	15	133	44
1991	44	26	85	26	0	0	29	22	114	48
1992	43	25	80	25	0	0	29	22	109	47
1993	29	20	61	19	0	0	29	22	90	41
1994	25	14	48	18	0	0	32	22	80	40
1995	38	16	54	19	4	6	22	22	96	45
1996	39	14	53	19	0	0	22	22	97	45
1997	54	24	101	24	0	0	23	19	124	43
1998	46	21	70	20	0	0	34	24	104	44
1999	44	21	68	21	0	0	33	23	101	44
2000	55	24	82	20	0	0	29	19	111	39
2001	65	31	99	26	0	0	28	19	127	45
2002	39	30	71	20	0	0	34	25	105	45
2003	36	27	64	20	0	0	34	25	98	44

Table 3. Florida Sea Grant funding effort by source for fiscal years (1 July - 30 June) 2000-2001 to 2002-2003

Source	2000-01		2001-02		2002-03	
	$000	%	$000	%	$000	%
Federal NOAA Sea Grant Core Program	1,965	41.7	1,990	44.3	2,000	42.6
Federal NOAA Sea Grant National Competitions	463	9.8	500	11.1	504	10.8
Faculty Match (Core + National)[a]	721	15.3	755	16.8	794	16.9
Other Federal Grants	276	5.9	155	3.5	277	5.9
Non-federal Grants	308	6.5	133	3.0	97	2.1
State University System[b]	781	16.6	754	16.8	810	17.3
Florida Counties	203	4.3	205	4.6	208	4.4
Total Program Effort	4,717	100	4,492	100.0	4,690	100.0

[a] This includes all match except state university system appropriations used as match.
[b] This includes state appropriations to Florida Sea Grant via the Education and General budget of the University of Florida and via the UF/Institute of Food and Agricultural Sciences used as match in extension, communications and management.
Source calculated from data in Tables 5, 6 and 7.

Table 4. Percentage of Florida Sea Grant core and total sea grant federal funds used for research, extension, communications and management, 1000-01 to 2002-03.

	2000-01	2001-02	2002-03
Program Function	Core (%)		
Research	51.9	51.1	51.3
Extension	30.8	31.1	31.0
Communications	7.8	8.3	8.3
Management	9.5	9.5	9.5
TOTAL	100.0	100.0	100.0
	Total %		
Research	59.5	55.8	51.6
Extension	26.5	30.0	35.7
Communications	6.3	6.6	5.9
Management	7.8	7.6	6.8
TOTAL	100.0	100.0	100.0

Source: Calculated from data in Tables 5, 6 and 7.

Table 5. Florida Sea Grant College Program funding from all sources, July 1, 2000 to June 30, 2001.

Federal Sea Grant Core:		Federal	Match
Research		$1,020,402	$532,079
Extension		605,277	302,639
Communications		152,496	73,898
Management		186,825	93,413
TOTAL SEA GRANT CORE		**1,965,000**	**1,002,029**
Federal Sea Grant National Competitions:			
E/NS-1	ANS Education	39,000	19,500
E/ST-24	Knauss Fellowship - Yates	38,000	0
E/ST-25	Knauss Fellowship - Alicea	38,000	0
E/ST-26	Knauss Fellowship - Livergood	38,000	0
R/LR-A-32	Caribbean Oyster Genetics	27,787	19,141
R/LR-B-51	Gag Grouper Spawning	102,176	51,088
R/LR-B-52	Artificial Reefs	147,702	82,681
R/LR-Q-20	Bacteriophage	32,500	16,250
TOTAL FEDERAL SEA GRANT NATIONAL COMPETITIONS		**463,165**	**188,660**
Other Federal Grants:			
E/COP-3	FL Bay	30,000	0
E/INT-1	Economic Revitalization	93,532	0
E/INT-2	Shrimp Safety Nicaragua	140,105	0
USDA	S/L Water Quality	12,000	0
TOTAL OTHER FEDERAL GRANTS		**275,637**	**0**
TOTAL FEDERAL GRANTS		**2,703,802**	**1,190,689**
MATCH COVERED BY STATE APPROPRIATIONS			**(469,950)**
NET MATCH			**720,739**
Non-Federal Grants:			
Jupiter Inlet District		14,000	0
WCIND (Lee Co. Phase III)		254,000	0
WCIND (Five-Year comprehensive)		40,000	0
TOTAL NON-FEDERAL GRANTS		**308,000**	**0**
TOTAL GRANT FUNDING		**3,011,802**	**720,739**
Counties		202,755	0
State Appropriations:			
E&G		330,731	0
IFAS		449,947	0
TOTAL SEA GRANT FUNDING		**$3,995,235**	**$720,739**

Table 6. Florida Sea Grant College Program funding from all sources, July 1, 2000 to June 30, 2002.

Federal Sea Grant Core:		Federal	Match
Research		$1,016,000	$518,690
Extension		620,000	310,000
Communications		165,000	85,000
Management		189,000	94,500
TOTAL SEA GRANT CORE		$1,990,000	$1,008,190
Federal Sea Grant National Competitions:			
E/NS-2	ANS Education	$27,000	$13,500
E/ST027	Knauss Fellowship -Sbeih	38,000	0
R/C-E-46	Swamp Eel Biology	91,006	50,235
R/LR-Q-23	Gulf Oyster Products	200,000	100,000
R/LR-Q-21	Oyster Decontamination	144,300	72,150
TOTAL FEDERAL SEA GRANT NATIONAL COMPETITIONS		$500,306	$235,885
Other Federal Grants			
PD-02-04	Florida Bay	$25,000	$0
PD-01-03	US/Japan Natural Resources	10,000	0
PD-01-04	Marine Ornamental ‘02	10,000	0
TBD	Coastal Storms Initiative	109,729	0
TOTAL OTHER FEDERAL GRANTS		$154,729	$0
TOTAL FEDERAL GRANTS		$2,645,035	$1,244,075
MATCH COVERED BY STATE APPROPRIATIONS			($489,500)
NET MATCH			$754,575
Non-Federal Grants			
Florida Keys Sponge Populations		$5,000	$0
Manatee County Waterway Management		39,500	0
WCIND (Five-Year Comprehensive)		40,000	0
FMRI 2002 Blueways Charlotte Harbor		23,340	0
FMRI Vessel Registration Study		25,000	0
TOTAL NON-FEDERAL GRANTS		$138,840	$0
TOTAL GRANT FUNDING		$2,777,875	$754,575
Counties		$205,160	0
State Appropriations			
E&G		$319,440	$0
IFAS (Dedicated to SG)		435,000	0
TOTAL SEA GRANT FUNDING		$3,737,475	$754,575

Table 7. Florida Sea Grant College Program from all sources, July 1, 2002 to June 30, 2003.

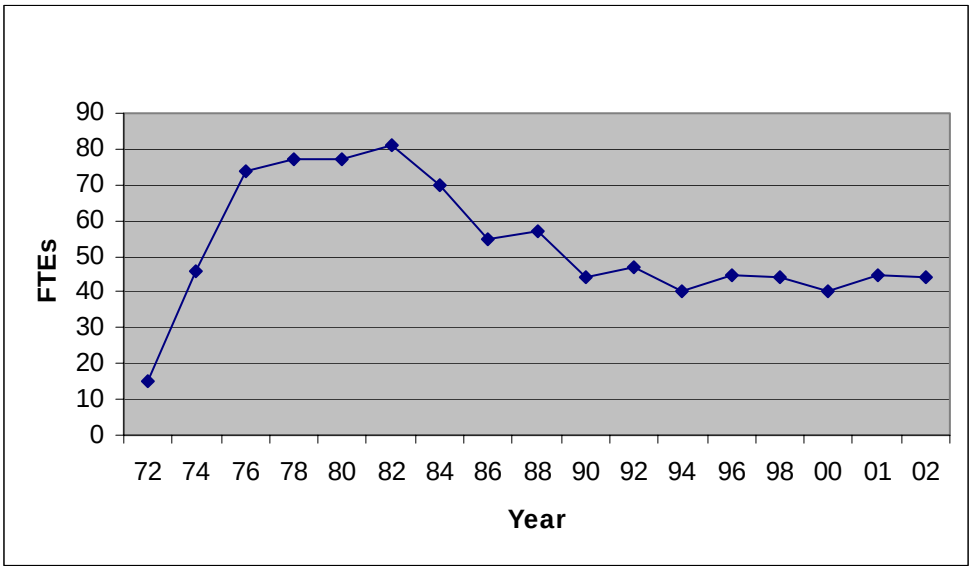
Federal Sea Grant Core:		Federal	Match
Research		1,026,000	504,089
Extension		620,000	310,000
Communications		165,000	87,500
Management		189,000	98,500
TOTAL SEA GRANT CORE		2,000,000	1,000,089
Federal Sea Grant National Competitions:			
E/INDST-2	Industry Fellow	30,000	30,000
E/ST-28	Knauss Fellowship - Childs	38,000	0
E/T-8	Sharks in Perspective	67,426	33,713
R/LR-Q-23	Oyster Market Research	200,000	100,000
R/C-E-46	Swamp Eel Introduction	88,196	42,735
E/FishExt-SA	So. Atlantic Fish Extension	37,608	18,804
E/FishExt-GM	Gulf Fish Extension	27,300	13,650
E/Fish-Ext-FSG	Sea Grant Extension	15,000	7,500
TOTAL FEDERAL SEA GRANT NATIONAL COMPETITION		503,530	246,402`
Other Federal Grants:			
CDI-Fann	Coastal Data Service	50,900	0
E/T-9	So. FL Marine Ecosystem	80,000	0
PD-02-08	Urban Bays & Waterways Mgmt	41,280	0
COSEE	Gulf of Mexico	48,556	0
SEA-COOS	U. of North Carolina	29,500	0
COSEE	Dauphin Island Lab	27,000	13,500
TOTAL OTHER FEDERAL GRANTS		277,236	43,500
TOTAL FEDERAL GRANTS		2,780.766	1,289,991
MATCH COVERED BY STATE APPROPRIATIONS			(496,000)
NET MATCH			793,991
Non-Federal Grants:			
Florida Keys Sponge Population		5,000	0
Oyster Habitats in Southwest Florida		4,830	0
Recreational Boating		69,450	0
FMRI Vessel Registration Study		18,000	0
TOTAL NON-FEDERAL GRANTS		97,280	0
TOTAL GRANT FUNDING		2,870,046	793,991
Counties		208,315	0
State Appropriations			
E&G		363,180	0
IFAS		446,964	0
TOTAL SEA GRANT FUNDING		3,888,505	793,991

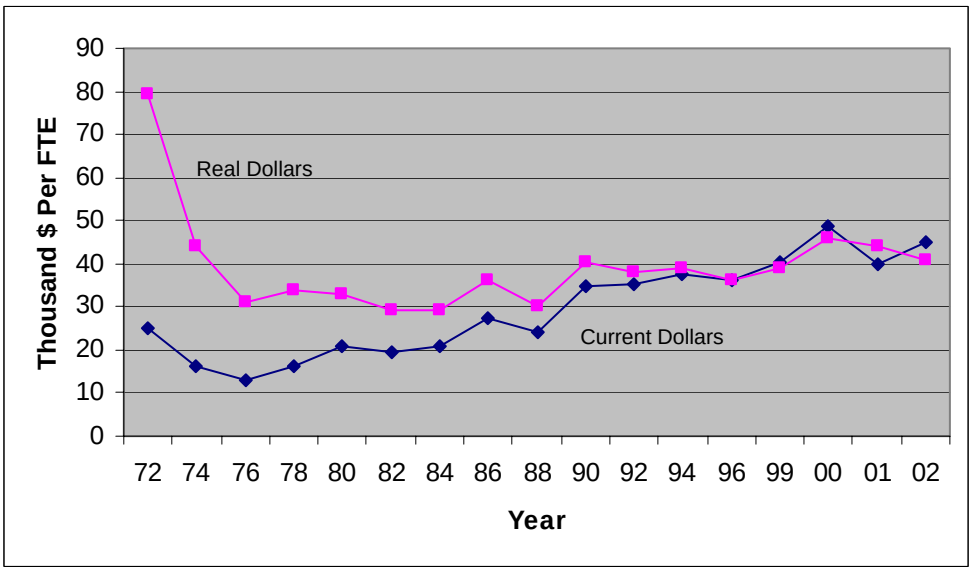
Table 8. Florida Sea Grant total grants generated per dollar of state appropriations, 2001-2002 program year.

	UF Appropriations Through Education and General Budget ($363,180)	UF/IFAS Faculty Dedicated to Sea Grant ($446,964)	Total ($810,144)
Sea Grant Federal Funds ($2,505,530)	6.9	5.6	3.1
All Other Extramural Grants ($374,516)	1.0	0.8	0.5
TOTAL	7.9	6.4	3.6

Source: Calculated from Table 6.

Figure 1. A comparison of Florida Sea Grant core program FTEs and current and real funding per FTE, 1972-2002.





4.0 INSTITUTIONS INVOLVED

Florida has a unique network of public and private marine academic institutions (see Figure 1). Florida's academic institutions are rapidly coming of age. They are finding their niche and are being challenged and are responding to that challenge of providing national leadership. Florida scientists are coming to the forefront in pulling the land, sea, and air sciences together and integrating science and politics to find out what science means to the people. For 2002 nine (of 16) institutions (both public and private) participated through the receipt of Sea Grant funding for annual projects. In addition, ten cooperating institutions and laboratories, four NOAA offices, one state agency, two regional management districts, four foundations, nine private companies or organizations and 38 counties participated. A complete listing is in Table 1.

Table 1. List of Florida Sea Grant program participants in NOAA funded core, national competition and pass-through projects, 2002.

ACADEMIC/RESEARCH

Florida Institutions
Florida Atlantic University
Florida State University
University of Florida
University of Miami
University of South Florida
Florida Institute of Technology
Florida International University
Mote Marine Laboratory
University of Central Florida

Cooperating Institutions
University of Texas
University of Alabama at Birmingham
Louisiana State University
University of North Carolina
University of South Alabama
University of Southern Mississippi
Dauphin Island Sea Laboratory
Clemson University
Naval Postgraduate School
Coastal Carolina University

GOVERNMENT

Districts
South Florida Water Management District
West Coast Inland Navigation District

State
Florida Fish & Wildlife Conservation Commission, Florida Marine Research Institute

Federal
NOAA, National Ocean Service
NOAA, National Marine Fisheries Service
NOAA, Coastal Services Center
NOAA, Strategic Environmental Assessments Division, Office of Ocean Resources Conservation and Assessment
National Cancer Institute
NSF, National Center for Ecological Analysis & Synthesis

Foundations
Gulf and South Atlantic Fisheries Development Foundation
Curtis & Edith Munson Foundation
Harbor Branch Oceanographic
Florida Institute of Oceanography

INDUSTRY

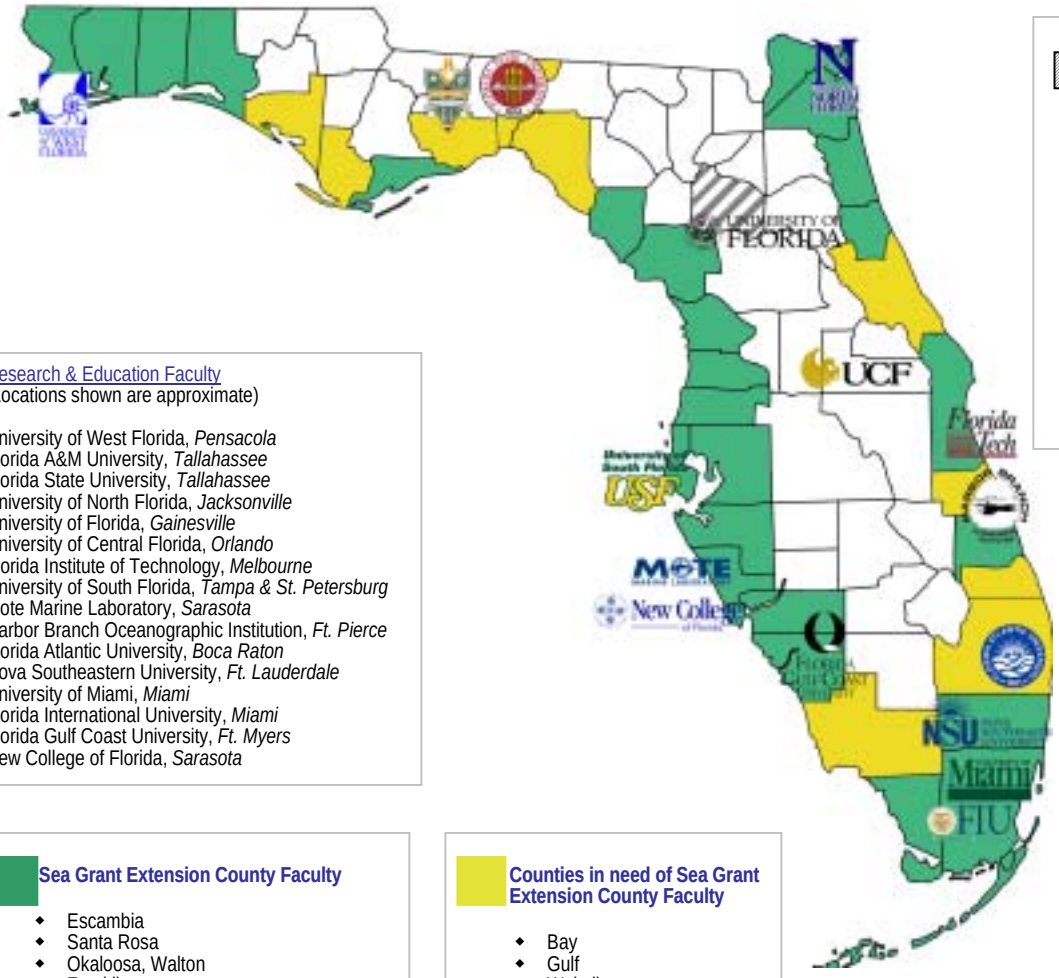
Nereus Pharmaceuticals
Disney Animal Kingdom
Cognetix Biotech Co.
Rohm & Hass Co.
Micro Propagation Laboratories
Northwest National Laboratories
Maritech Inc.
Florida Aquarium
Sea Critters

COUNTY*

Bay	Gulf	Pasco
Brevard	Hernando	Pinellas
Broward	Hillsborough	Putnam
Charlotte	Indian River	St. Johns
Citrus	Jefferson	St. Lucie
Clay	Lee	Santa Rosa
Collier	Leon	Sarasota
Dade	Levy	Taylor
Dixie	Manatee	Volusia
Duval	Monroe	Walton
Escambia	Nassau	Wakulla
Flagler	Okalossa	
Franklin	Palm Beach	

*All coastal counties participate via the Florida Cooperative Extension Service. However, ten lack specific Sea Grant agent coverage.

Figure 1. Florida Sea Grant's Academic Community of Marine Research, Education and Extension



Florida Sea Grant State Specialists

- Economics
- Seafood Technology
- Waterways Boating Management
- Estuaries

Florida Sea Grant Management

- Research
- Extension
- Communication

Research & Education Faculty
(Locations shown are approximate)

University of West Florida, *Pensacola*
Florida A&M University, *Tallahassee*
Florida State University, *Tallahassee*
University of North Florida, *Jacksonville*
University of Florida, *Gainesville*
University of Central Florida, *Orlando*
Florida Institute of Technology, *Melbourne*
University of South Florida, *Tampa & St. Petersburg*
Mote Marine Laboratory, *Sarasota*
Harbor Branch Oceanographic Institution, *Ft. Pierce*
Florida Atlantic University, *Boca Raton*
Nova Southeastern University, *Ft. Lauderdale*
University of Miami, *Miami*
Florida International University, *Miami*
Florida Gulf Coast University, *Ft. Myers*
New College of Florida, *Sarasota*

Sea Grant Extension County Faculty

- Escambia
- Santa Rosa
- Okaloosa, Walton
- Franklin
- Dixie, Levy
- Citrus, Hernando, Levy, Pasco, Pinellas
- Hillsborough, Manatee, Sarasota
- Charlotte
- Lee
- Monroe
- South Florida Ecosystem, Miami-Dade
- Miami-Dade
- Broward
- St. Lucie
- Brevard
- Nassau, Duval, St. Johns, Flagler

Counties in need of Sea Grant Extension County Faculty

- Bay
- Gulf
- Wakulla
- Jefferson
- Taylor
- Collier
- Palm Beach
- Indian River
- Martin
- Volusia

CONTACT

Dr. James C. Cato, Director
Florida Sea Grant College Program
University of Florida
PO Box 110400
Gainesville, FL 32611-0400

(352) 392-5870 x227
Fax: (352) 392-5113
email: jcato@ifas.ufl.edu
www.flseagrant.org

5.0 PROJECTS FUNDED

List of Florida Sea Grant Projects That Were Active During 2002 and Funded by Sea Grant/NOAA and Extramural Sources, in Three Major Categories

I. CORE PROGRAM PROJECTS
(This list includes projects that were completing, in process or starting in 2002)

I.A. Research

R/LR-B-48, Development of Age-Structured Population Models and Risk Analysis for Small Coastal Sharks: An Avenue to Informed Management and Sustainable Fisheries - - Commercial catches of small coastal shark species have increased dramatically in recent years, as large coastal sharks have been over-fished. Management quotas have been set for small coastal sharks. A scientific framework for assessing the current status of small coastal sharks and to access the impact of future harvest strategies will be completed.

R/LR-B-49, Habitat-Mediated Predator Prey Interactions: Implications for Sustainable Production of Gag Grouper in the Eastern Gulf of Mexico - - Gag grouper is among the most valuable fishes in the Southeast U.S. The fishery is under intense management and is a priority of federal managers related to essential fish habitat. This project is designed to test the role of habitat in predator-prey interactions and individual growth of the individual fish. The results will be useful in helping manage the fishery based on available habitat and population dynamics of the fishery.

R/LR-B-50, Management of Spiny Lobsters in South Florida Based on Postlarval Supply and Juvenile Dynamics - - The Florida spiny lobster is the most valuable fishery in Florida, when both the commercial and recreational economic impact of the fishery are considered. The stock relies on continued input of post larvae and the suitability of the habitat. This project builds on previous research investments and will provide Florida spiny lobster managers with an accurate method to predict the fishable lobster population several years in advance and to track the health of the essential nursery habitat. Old Dominium University is participating in this project.

R/LR-B-53, Bioenergetic Response of Gag Grouper to Reef Habitat Configuration - - Gag grouper is a highly prized fish in the Southeast United States. The fishing is under intense management, scrutiny and pressure. This project will link the importance of essential fish habitat to gag grouper population dynamics. This will allow management agencies to make science-based decisions related to essential fish habitat.

R/LR-B-54, High-throughput Molecular Genetic Identification of Shark Body Parts for Forensic Applications in Conservation, Fisheries Management and Trade Monitoring - - Declining shark population 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.

R/LR-B-55, The Effectiveness of Bycatch Reduction Devices on Crab Pots at Reducing Capture and Mortality of Diamondback Terrapins and Enhancing Capture of Blue Crabs - - Diamondback terrapins range along the eastern and Gulf coasts of the U.S. and prefer the same habitat as blue crabs. Large numbers of terrapins enter crab pots and drown as bycatch. Much of the mortality is avoidable with the use of bycatch reduction devices that limit the entrance size of trap funnels. This project is designed to test bycatch devices which can reduce turtle mortality.

R/LR-A-25, Ecophysiological Assessment of Critical Juvenile Fish Habitat: Applications for Stock Enhancement and Habitat Conservation - - Stock enhancement and habitat protection can enhance and conserve estuarine fisheries. In order for these approaches to be effective, methods for determining the "best" habitats for stocking and for protection are needed. This work will develop tools (models and practical survey protocols) through which fish nursery habitats can be quantitatively evaluated. It is a regional project of three Sea Grant programs (i.e., North Carolina, Texas, Florida).

R/LR-A-26, The Feasibility of Sturgeon Culture: An Integrated Market-Driven Evaluation - - Sturgeon is a high value aquaculture species in some regions of the world. Very little is known about the demand for and the value of sturgeon in Florida. Little is known about the production of sturgeon in ponds as opposed to tanks. The performance of sturgeon in ponds will be evaluated, market demand and packaging techniques for the meat will be tested and the economic feasibility of pond growout techniques will be determined.

R/LR-A-27, Enhancing Seed Availability for the Hard Clam, Mercenaria mercenaria, Aquaculture Industry Through Application of Remote Setting Techniques. Adequate seed availability is a major hindrance to the further development of the hard clam culture industry in the southeastern U.S. Critical shortages have occurred, and remote setting will allow nursery operators and growers to become less dependent upon traditional seed sources. Technical procedures will be developed and the economic feasibility determined of transferring remote setting technology from the Pacific Northwest molluscan shellfish industry to the Florida hard clam industry.

R/LR-A-28, Evaluation of the Efficacy of Introducing Hatchery-Spawned Larvae Directly to the Water Column for Stock Enhancement of Hard Clams - - The fishery for naturally occurring hard clams is of major cultural and economic importance to many eastern U.S. states. Landings from the traditional stock have declined in the past due to over harvesting and removal of spawning stock. Stock enhancement in natural settings is an alternative to increasing stock size. The feasibility of introducing hatchery-sponsored larvae directly to the water column as a cost-effective means of stock enhancement for hard clams will be tested in the Indian River Lagoon.

R/LR-A-29, Market Preferences, Wholesale Demand, and Breakeven Prices for Ornamental Fish Cultured an Collected in Florida - - In Florida, marine aquarium species are primarily collected from the wild (about $4 million annually) while farm-level sales of freshwater ornamental fish reached nearly $60 million in 1997. A Sea Grant goal is to increase the culture of marine ornamentals in order to generate economic activity in Florida while protecting the wild-caught stocks. Market information, the acceptability of various marine ornamental attributes, and the overall demand for marine ornamentals will be determined as a way to measure the potential of this culture industry.

R/LR-A-30, Captive Nutritional Management of Herbivorous Reef Fish Using Atlantic Surgeonfish (Acanthurus spp.) as a Model - - Certain marine algal species make up an important part of the natural diet of Atlantic surgeonfish, which have economic importance in Florida, and are traded globally for the aquarium trade. An experimental diet that approximates the natural diet of these fish will be developed and tested. The goal is to develop diets that can be used to improve the health and management of Atlantic surgeonfish and to enhance efforts for captive propagation.

R/LR-A-36, Solving a Bottleneck: Identification and Production of Copepods Suitable for Rearing the Early Life History Stages of Marine Ornamental Fish and Invertebrates - - 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.

R/LR-A-37, Diversification for the Hard Clam Aquaculture Industry Through Investigation of Blood Ark and Ponderous Ark Reduction and Development - - Clam aquaculture is currently focused on a single species. Diversification is needed to allow the industry to grow. This project will help determine the production feasibility of two marine bivalve species. Limited stocks of these species have prevented the development of major fisheries, but aquaculture could provide a source of seed for both species. This project will focus on spawning and larval rearing technologies.

R/LR-A-38, Development of Feeding Kinematics and Performance in Marine Fish Larvae: A Novel Approach to Understanding Food Requirements of Marine Ornamental and Food Fish - - This study uses a novel laboratory and photographic approach to understanding key factors about a major problem in aquaculture. High mortality rates occur during the first feeding stage of hatchery-reared marine fish larvae. Development of techniques that will increase the survival rate is critical.

R/LR-MB-8, Biosynthesis and Enzymology of the Pseudopterosins: Anti-inflammatory Agents from the Soft Coral Pseudopterogorgia elisabethae - - A mixture of pseudopterosins is sold commercially in skin creams and some have potential as anti-inflammatory and analgesic agents. The overall goal of this project is to develop a biotechnological production method of the pseudopterosins and seco-pseudopterosins from the sea whip to test them for their anti-inflammatory activity.

R/LR-MB-9, Bipyridyl Marine Natural Products as Anti-Fouling Compounds - - Protection of marine surfaces against fouling organisms is not only a big business, but it is also a difficult process to make coatings environmentally friendly. The world market for marine paints is over $2 billion annually. A world-wide ban on some paint ingredients will occur in 2003. The goal of this project is to develop nemertine bipyridyls from marine species, which have potential as potent antifouling agents.

R/LR-MB-10, Bioactive Agents Produced by Invertebrate-Associated Marine Microbes - - One solution to increase resistance by humans to pathogen treatment therapy is to identify novel antimicrobial compounds, which can serve as leads in drug discovery programs. Marine microbes are an exciting potential source of compounds. Bacteria will be isolated from several species of Floridian tunicates and sponges that produce bioactive compounds and tested for potential as clinical antimicrobiological agents.

R/LR-MB-14, Development of a Biotechnological Production Method of Elisabethadione -- A Potent Marine Anti-inflammatory Agent - - 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.

R/LR-MB-15, Quantitative Real-time PCR Probes for Pathogenic *Vibrio* Species - - PCR is a quantitative molecular methodology that offers higher throughout potential from current types of analysis, providing results within hours, not days. The goal of the project is to develop a real-time PCR for rapid, quantitative, cost-effective technology for enumeration of *Vibrio* spp. in oyster. The methods will be developed for practical applications in shellfish monitoring and for evaluation of post-harvest treatments.

R/LR-MB-16, Nemertine and Sponge Pyridyl Marine Natural Products as Anti-Fouling Agents - - 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.

R/LR-MB-17, Investigation of the Molecular Target of the Lasonolides, Potent Anti-tumor Agents Isolated from the Marine Sponge *Forcepia* Sp. - - 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.

R/LR-MB-18, Isolation and Characterization of Novel Pharmacological Agents from Atlantic and Panamic Cone Snails - - 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.

R/LR-MB-19, Molecular Basis of Marine Natural Product Function and Production for Improved Utilization of Bioactive Compounds - - This project provides leadership in a new direction to expand and enhance natural products research. It focuses the latest advances in biotechnology to identify and determine the mechanism of action of marine-derived compounds with pharmaceutical potential. It demonstrates the power of cross-species array technology for the development of unconventional model systems, such as marine invertebrates, to address questions in marine, cell and molecular biology.

R/C-E-42, Tracer Techniques to Evaluate Rates of Non-Point Source Pollution from Barrier Islands to Surface Water - - One major and rapidly growing source of non-point source contamination in the coastal zone is nutrient loading from septic and other types of on-site disposal systems. This is particularly true on barrier islands that seldom have centralized sewage treatment facilities. This project aims to develop new approaches to study rates of water and nutrient transport via groundwater, and better tools for evaluating such contaminant loading. The approach will use natural radium isotopes and an artificial tracer to assess long- and short-term average flow rates in the proximity of St. George Island, Florida.

R/C-E-43, The Role of Filter-Feeding Sponges in Controlling Phytoplankton Blooms in Florida Bay and the Concomitant Effect on the Health of Seagrasses - - Persistent and widespread phytoplankton and cyanobacteria blooms have coincided with large-scale decimation of sponge communities in Florida Bay. One hypothesis is that the large-scale loss of suspension feeding sponges has rendered the ecosystem susceptible to these recurring blooms. The goal is to experimentally determine the potential for suspension feeding sponges to control nuisance phytoplankton blooms caused by internal non-point source pollution.

R/C-E-44, Assessment of Sewage Impacts via Groundwater Discharge into Two Coastal bays - - 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 access 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.

R/C-E-45, Impact of Boat Wakes on the Eastern Oyster in the Southeastern U.S.: Maximizing Sustainability and Restoration - - Large human 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.

R/C-S-36, Characterization of Atlantic and Gulf Coast Sea Oats Populations: Implications for Varietal Selection Using Micropropagation Technology - - The genetic differences in populations of sea oats from Gulf and South Atlantic sites will be determined. This will assist in developing

commercially viable alternative propagation procedures for selecting and producing sea oat varieties for revegetating coastal dunes.

R/C-S-38, Compatible Plant/Mycorrhizal Fungus Ecotype Combinations for Micropropagated Sea Oats Planted on Florida Beaches - - Establishment of sea oats on restored beaches is critical for combating erosion losses. However, concerns about genetic diversity have lead to restrictions in harvesting and planting of sea oats. The overall goal is to enhance ecologically sound establishment of micropropagated sea oats by developing compatible plant/mycorrhizal fungus ecotype combinations for out planting onto Florida beaches.

R/C-S-39, Long-term Sediment Budget for Florida's East Coast for Coastal Management - - A recently completed Sea Grant project on long-term shoreline position resulted in the identification of previously unrecognized shoreline characteristics which are important to the long-term management of Florida's and the nation's beaches. This project will investigate these characteristics of sand sediment sources and sinks on Florida's east coast, determine the causes of unpredicted shoreline advancement, develop more rationale sediment budgets and disseminate the information to professional and lay audiences for use in decision making and shoreline project plannings.

R/C-S-40, A Field Study of Rip Currents and the Development of a Predictive Model - - Rip currents account for 80 percent of beach rescues, accounting for 36,000 rescues in 1997. About 150 drownings (30 in Florida) occur each year due to rip currents. The ability to predict the occurrence of rip currents will reduce this dramatically. A database of rip currents will be developed and a predictive model will be developed and tested.

R/C-S-41, Enhanced Commercial Selection and Micropropagation of Sea Oats for Dune Stabilization - - 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.

R/C-S-42, Conditions for the Occurrence and Stability of Rip Current - - 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.

R/C-S-43, Hurricane Wind Gusts Structures: Movement, Characterization and Coastal Damage Mitigation - - 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.

R/C-P-24, Coastal Communities Waterways Management Program - - Intensive boating by over one million boaters in Florida waterways places tremendous environmental pressure on them. 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.

R/C-P-25, A Method to Determine the Utility of the Vessel Title Registration System to Characterize Florida's Boating Population - - The rapid increase in the number of boats in Florida has created environmental issues, while at the same time, boats create huge economic impacts for the

state. Currently, expensive on-the-water surveys are needed to compile data sufficient for boat traffic management use. This project will determine the feasibility of modifying the Florida vessel registration system to make it more usable for research purposes.

R/LR-Q-22, Verification of Science-Based Controls for the Safe Use of Vacuum and Modified Atmosphere Packaging of Seafood - - 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.

I.B. Extension

SGEP-13, Florida Sea Grant Extension Program - - This work will continue to provide effective and responsible extension education programming that promotes the wise use of coastal and marine resources in Florida, with impacts that extend to the Southeast and the nation. Currently, Extension has 17 agents and 4 specialists that serve the 80% of Florida’s population that live in the 36 coastal counties of the state. In cooperation with industry Florida Sea Grant has made a significant impact on improving seafood quality and seafood safety, for example through state, regional and national leadership in development of the Hazard Analysis and Critical Control Point seafood inspection program. This effort has been recognized by the “Hammer Award” of the Vice President of the U.S. for achievement by partnerships. Other efforts include guidance to local government in developing artificial reefs, development of shellfish mariculture, assisting fishers and their families deal with the impacts of the net ban in Florida, and use of rural tourism as an economic development tool.

COMM-5, Florida Sea Grant Communications Program - - Although traditional publication efforts were continued and enhanced, popular communications products were also produced with funding received from other agencies. Recent accomplishments include: the production of more than 50,000 publications; the establishment of an automated radio station in the Keys featuring current research information for Florida Bay; four stories featured by CNN for use in the evening news and Science Desk segments; articles featured in the Washington Post, USA Today, Miami Herald and the Chronicle of Higher Education highlighting Sea Grant research and personnel; and the creation of listserves and homepages in support of regional and national Sea Grant projects.

I.C. Program Management and Development

M/PM-13, Florida Sea Grant Management - - To meet the programmatic goal of Florida Sea Grant, i.e., the use and conservation of the marine resources of Florida and the nation in a way that leads to a sustainable economy and environment, this project works to coordinate and administer the State University System of Florida Sea Grant College Program. Management activities have been judged against quantitative and qualitative performance goals as mandated by the University of Florida and the National Sea Grant College Program Office.

M/PD-11, Coastal Science and Technology Innovation with Limited Funds: The Florida Sea Grant Program Development Portfolio - - This project continues to give Florida’s universities and academic laboratories, through Sea Grant, the unique capability to respond even in the middle of a fiscal year to timely marine issues and demonstrations essential to coastal user groups. Projects are low budget with limited objectives. All proposals are peer reviewed to insure technical merit and relevance. Projects are conducted if they demonstrate a likelihood of rapid success and meet at least one of six criteria: (1) offer solution to clearly defined timely problem; (2) address problem in opportunistic research area; (3) pilot study to see if longer project justified; (4) provide information to attract support elsewhere; (5) Extension demonstration project; (6) timely exchange of scientific information. Recent projects include:

- 02-1 Florida Sea Grant Elise B. Newell Seminar Series
- 02-2 Timely Marine Issues
- 02-3 Biotechnology Business Needs and Opportunities in Florida
- 02-4 Florida Bay Education Project
- 02-5 Florida Master Naturalist Program Coastal Module
- 02-6 Assessing the Market Potential for Sturgeon Products in the Southeastern US
- 02-7 Invasive Species in Florida's Saltwater Systems: Where We Are and Where We're Going
- 02-8 Urban Bays and Waterways Management Program
- 02-9 X^{th} International Conference on Harmful Algae
- 02-10 Florida Marine Biotechnology Summit III

II. ADDITIONAL PROJECTS FROM SPECIAL INITIATIVES AND NATIONAL OPPORTUNITIES

II. A. Research

R/LR-B-51, Fisheries Habitat: Evaluating Gag Spawning Aggregations and Benthic Habitat in the West Florida Shelf - - West Florida shelf-edge reefs are of major importance to reef fish fishery production of the Gulf of Mexico. Almost all the important reef fisheries are overfished and some are threatened. This project will monitor changes in gag grouper spawning aggregations, determine movement patterns, reef fish populations and describe habitat characteristics. These results will allow management to occur using science-based information.

R/LR-B-52, Field Assessment of the Effects of Artificial Reefs and Their Role in Fisheries Management - - Artificial reefs are a potentially powerful management tool that can be used to enhance fish production and divert deleterious impacts away from natural habitat. To date, their use is limited by some interests due to a scientific controversy over attraction-production. Solutions to this problem must quantify the negative effects of attracting fish away from natural reefs, the positive effects of providing new habitat, and the compensatory responses mediated by reducing density-dependence on natural reefs. Impact assessment, experimental design and a statistical framework will be developed for long-term studies of fish dynamics, using important ornamental reef fish species in the Florida Keys. These small reef fishes comprise an emerging fishery, and provide a tractable model system in which to explore the efficacy of artificial reefs.

R/LR-Q-20 [GMO-99-1], Use of Bacteriophage for the Decontamination of Oysters Infected with *Vibrio vulnificus* - - Bacteriophage have proven to be effective in killing pathogenic bacteria in mice and farm animals. *Vibrio vulnificus* are a bacteria present in oysters. *V. vulnificus* is lethal when consumer by people in certain risk categories. Bacteriophage may offer a practical and realistic method for making oysters safe for human consumption. They will be used to test their ability to kill *V. vulnificus* in oysters.

R/LR-Q-23 [FL-GOIP-5], Integrated Oyster Market Research, Product Development and Evaluation, Promotion and Consumer Education for the Gulf of Mexico's Oyster Industry - - 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 techniques and educate medical groups so that human safety risks can be minimized or eliminated while maintaining an industry.

R/LR-Q-24 [FL-GOIP-3], Strategies for the Decontamination of Oysters Infected with *Vibrio vulnificus* - - 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 oysters.

R/C-E-46 [ANS-20], Genetic, Distributional and Ecological Characteristics of Recent Swamp Eel Introduction in Florida - - In the last seven years swamp eels have been discovered in aquatic habitats in Georgia and Florida. These are large amphibious predators capable of dispersal over land with the potential to disrupt ecosystems. The goal of this project is to discover how eels are introduced and how this can be prevented and describe their ecology and life history, etc., and suggest methods to control them.

E/ST-26 Knauss Fellowships - - One student is currently spending one year in Washington, D.C. working in NOAA offices.

E/INDST-2, (Industrial Fellowship) - ABC (Aquaculture, Biology and Conservation) of Marine Ornamental Shrimp - - The great increase in the popularity of saltwater aquaria has dramatically stimulated the worldwide fishery for small, colorful coral reef fishes and invertebrates. People involved in this fishery utilize a variety of techniques, ranging from hand-operated nets to extremely damaging application of toxins and explosives to stun fishes so survivors can be easily caught. All of these techniques can have deleterious effects on the reef ecosystems. The goal of this project is to develop the technologies for culturing more ornamental species in order to minimize wild collection while, sustaining the aquarium industry and creating new commercial opportunities.

E/INDST-3, (Industrial Fellowship) - Captive Nutritional Management of Atlantic Surgeonfish: Effect of Ascorbic Acid Deficiency on Development of HLLES-related Pathology - - The production of freshwater ornamental tropical fish was a $57M industry in Florida in 1997. This figure includes limited farm production of tropical marine fish for the ornamental trade, but does not include collection of free-ranging animals that were sold through Florida's industry into the pet trade. Wild marine fish are harvested throughout the year from the Florida Keys and coastal waters of the southern part of the state and sold as aquarium specimens to public and private aquariums. Head and lateral line erosion syndrome (HLLES) may be the most prevalent disease of captive marine fish. The goal of this project is to determine whether there is indeed a correlation between dietary ascorbic acid and HILLES in acanthurids.

II. B. Extension

E/NS-2, Southeast Regional Aquatic Nuisance Species Education and Outreach Network - - Science education in the U.S. is undergoing fundamental change and reform directed at the kindergarten through high school (K-12) levels or precollege system. This project will focus on nonindigenous species by addressing content and attitudinal needs of classroom teachers and informal education and outreach personnel, who would in turn, incorporate the latest scientific content knowledge in these areas in their classrooms or outreach efforts. Teachers will learn about nonindigenous species, their regional and national impact, and management attempts.

E/T-9, NOAA South Florida Marine Ecosystem Outreach Project - - 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 link between science-based information developed by NOAA agencies and Sea Grant-supported research and the citizenry of South Florida.

E/T-10, Coastal Storms Initiative Outreach Project - - More than half of the population of the U.S. lives in the coastal area. Storms in coastal areas are more severe and are less predictable than in the interior of the country. Coastal storm losses have an economic as well as an environmental impact, with damages estimated at between $10 billion and $50 billion dollars each year. The Florida pilot is the first regional pilot program in what is planned to be a series of national pilot programs. Because of recent storm events, the coastal communities in Florida are highly motivated to see improvements in prediction and tracking of storm paths.

III. MAJOR EXTRAMURAL (NON-SEA GRANT-FUNDED) PROJECTS

A number of other projects indicate the reliance of other organizations upon Florida Sea Grant, and are in addition to the partnerships reflected in the projects listed above. Certain projects supplement salary requirements for Extension. These are projects that are funded from the agency to Florida Sea Grant, but are not funded through NOAA. A brief listing of those projects active during 2002 by funding sources is presented below.

West Coast Inland Navigation District
- Five-Year Comprehensive Plan
- Manatee County Waterway Management System

Florida Fish and Wildlife Conservation Commission
- Keys Sponge Research

Publications of the Florida Sea Grant College Program, 1998 - 2003

CALENDAR YEAR 2003 (January - December)

I. Florida Sea Grant Report

B. In Press

II. Florida Sea Grant Technical Paper

Deyle, R.E., and R.E. Smith. 2003. **The Costs of Hurricane Emergency Management Services: A risk-Based Method for Calculating Property Owners' Fair Share.** TP-121 (R/C-P-21)

B. In Press

III. Books and Book Chapters

Otwell, S. Garrido, V. and Lahsen, A. (2002?) **Validations, Verifications, and Audits.** Rome, Italy: WHO/FAO

B. In Press

Larkin, S. and C. Debodisco. (in press-2003.) **Wholesale and Retail Break-even Prices for MAC-Certified Queen Angelfish (*Holacanthus ciliaris*).** In: *Marine Ornamental Species: Collection, Culture, and Conservation*, chapter 10, p. 125-140 Blackwell Science Press.

C. In Process, Planned, Submitted, etc.

IV. Journal Articles

Lawrence, J.M., Plank, L.R., and A.L. Lawrence. 2003. **The effect of feeding frequency on consumption of food, absorption efficiency, and gonad production in the sea urchin *Lytechinus variegates*.** Comparative Biochemistry a Physiology Part A 134: 69-75 (R/LR-A-21)

B. In Press

Adams, C., D. Sweat, N. Blake, and B. Degner. (in press-2001.) **The Economic Feasibility of Small-Scale, Commercial Culture of Bay Scallops in Florida.** Journal of Aquaculture Economics and Management. 5(1-2) 2001.: Pp. 81-98 (R/LR-A-33)

Benner, R., and S. Otwell. (in press-2001.) **Seafood HACCP, Safety and Quality on the Internet.** Journal of Aquatic Food Product Technology. (E/TP-2)

Burnett, W.C., H. Bokuniewicz, M. Huettel, W.S. Moore, and M. Taniguchi. (in press -2003.) **Groundwater and porewater inputs to the coastal zone.** Biogeochemistry,. (R/C-E-42)

Chanton, J.P., W.C. Burnett, M. Taniguchi, H. Dulaiova, and D.R. Corbett. (in press -2003.) **Seepage rate variability in Florida Bay Driven by Atlantic tidal height**. Biogeochemistry. (R/C-E-42)

[1]The project from which the publication originated is indicated by the code number in parentheses at the right side of the last line of each entry. For each year, titles are listed in order of appearance as FSG Reports, FSG Extension publications, books or book chapters, journal articles, graduate theses and dissertations, FSG Technical Papers, miscellaneous papers including conference proceedings, videos, CD-ROM releases, posters and home pages.

Douady, C.J., M. Dosay, M. S. Shivji, and M. J. Stanhope. (in press-2003.) **Molecular phylogenetic evidence refuting the hypothesis of Batoidea (rays and skates) as derived sharks.** Molecular Phylogenetics and Evolution 26: (xx-xx). (R/LR-B-54)

Gurley, K. and T. Reinhold. (in press-2002.) **Measurement of Ground Level Hurricane Winds.** American Association for Wind Engineering. (R/C-S-43)

Lambert, M.J. and W.C. Burnett. (in Press- 2003.) **Submarine groundwater discharge estimates at a Florida coastal site based on continuous radon measurements.** Biogeochemistry, (R/C-E-42)

Milon, J.W., C.M. Adams, and S.L. Larkin. (in press-2000.) **U.S. Trade of Live Aquarium Products.** Journal of Aquarium Sciences and Conservation. 1 pp. (R/LR-A-23)

Ortiz, M, C. LeGault, and N. Ehrhardt. (in press-1995.) **Alternative Estimates of Bycatch in the Shrimp Trawl Fishery of the U.S. Gulf of Mexico, 1972-1995**. Fishery Bulletin. (R/LR-B-37)

Pomeroy, R.S., and C.M. Adams. (in press-1998.) **Financial Analysis of Hard Clam Grow-Out Methods in the Southeastern United States.** Journal of the World Aquaculture Society. (SGEP-11)

Schofield, O., M.A. Moline, G.A. Vargo, R.G. Steward, and G. Kirkpatrick. (in press-2000.) **Spectral Inherent Optical and Fluorescence Properties of Natural Populations of the Toxic Dinoflagellate, Gymnodinium Breve, in the Gulf of Mexico.** EOS Trans. AGU 79(1)OS161. (R/NCOP-5)

St. Mary, C.M., C.W. Osenberg, T.K. Frazer, and W.J. Lindberg. (in press-2000.) **Stage Structure, Density Dependence, and the Efficacy of Marine Reserves**. Bulletin of Marine Science. 66:675-690. (R/LR-B-46)

Thornton, R.S., and R.G. Kerr. (in press-2002.) **Induction of Pseudopterogorgia Biosynthesis in the Gorgonian *Pseudopterogorgia elisabethae*.** (R/LR-MB-8)

Vanderklift, Mathew A., Jacoby, Charles A. (in press-2002.) **Patterns in fish assemblages 25 years after major seagrass loss.** Marine Ecology Progress Series.

C. In Process, Planned, Submitted, etc.

Ault, J.S., and S.G. Smith. (submitted-2000.) **Extensions to Gear Inter-Calibration Methods for Fishery-Independent Catch-Per-Unit-Effort Data.** Transactions of the American Fisheries Society. (R/LR-B-47)

Baker, B.J., M. Van Ert, A.C. Leonard, and J.E. Grimwade. (awaiting patent clearance-2001.) **Cold-water Marine Invertebrate-Associated Microorganisms as Sources of Drug Leads.** International Journal of Pharmacognosy. (R/LR-MB-4)

Blitch, S.B., T.K. Frazer, K.M. Blitch, M.H. Posey, and T.D. Alphin. (in preparation-2000.) **Growth of Juvenile Blue Crabs (Callinectes Sapidus) in Seagrass and Marsh Channel Habitats Along Florida's Central Gulf Coast.** (R/LR-B-46)

Brennan, K.A., Miller, J.M., Leber, K., and Read, A. (in preparation-2002.) **Comparing the growth of caged and released fish: assessing habitat quality for stocking and relative role of directive factors.** (R/LR-A-25)

Brennan, K.A. and Leber, K.M. (Draft manuscript-in preparation-2002.) **Effects of release micro-habitat on survival and growth of hatchery snook (*Centropomus undecimalis*), in a Florida Estuary.** (R/LR-A-25)

Butler, M.J. IV. (submitted-2002.) **Incorporating ecological process and environemtal change into spiny lobster population models using a spatially-explicit, individual-based approach.** Fisheries Research (R/LR-B-50)

Cerveny, K.E. , DePaola, A., Duckworth, D.H., and P. A. Gulig. (in revision-2002.) **Phage therapy of local and systemic disease caused by *Vibrio vulnificus* an iron-dextran treated mice.** Infection and Immunity. (R/LR-Q-20)

Chapman, D., D. Abercrombie, C. Douady, E. Pikitch, M. Stanhope and M. Shivji.(submitted-2003.) **A streamlined, bi-organelle, multiplex PCR approach to species identification: application to global conservation and trade monitoring of the great white shark, *Carcharodon carcharias*.** Conservation Genetics. (R/LR-B-54)

Cheng, J., and R.G. Dean. (submitted-1998.) **Statistical Distribution of the Standard Deviation of Shoreline Deviations for Florida's Coastline.** Journal of Coastal Research. (R/C-S-35)

Coursey, Y., N. Ahmad, N. Steimel, and M. Kimble. (in preparation -2003.) **Blood cell production begins at stage 18 during embryonic development of the American horseshoe crab, *Limulus polyphemus*.** The Biological Bulletin. (PD-00-8)

Dean, R.G., and J. Cheng. (submitted-1998.) **Shoreline Change Characteristics for Florida: Part 1 - East Coast of Florida.** Journal of Coastal Research. (R/C-S-35)

Dean, R.G., and J. Cheng. (submitted-1998.) **Shoreline Change Characteristics for Florida: Part 2 - West Coast of Florida.** Journal of Coastal Research. (R/C-S-35)

Dean, R.G. (submitted-1998.) **Two Problems Related to Orville Magoon's Coastal Engineering Interests: Sand Rights and Breakwaters**. Shore and Beach. (R/C-S-35)

Dolan, T. W. III and Butler, M.J. IV. (submitted-2002.) **Modeling ontological changes in the social behavior of juvenile Caribbean spiny lobster, *Panulirus argus*.** Animal Behavior (R/LR-B-50)

Ehrhardt, N. (in process-1998.) **Risk Assessment of Adopting BRD Designs to Reduce Shrimp Bycatch to Accomplish Management Actions on Directed Fisheries.** Fishery Bulletin. (R/LR-B-42)

Enright, E., J.V. Lopez, C.L. Peterson, and S.A. Pomponi. (in preparation-2000.) **Cloning and Characterization of Two Cyclin Dependent Kinase from the Sponge Axinella Corrugata.** (R/LR-MB-5)

Franco, A., Moller, C., Mora, D., Cano, H., and Frank Mari. (submitted-2003.) **Size Exclusion HPLC Separation of Complex Mixtures of Marine Neuropeptides.** Journal of Chromatography. (R/LR-MB-18)

Frazer, T.K., S.B. Blitch, M.H. Posey, T.D. Alphin, K. Blitch, and T.P. Glancy. (submitted-2000.) **Use of Shallow-Water Habitats by Juvenile Blue Crabs Along Florida's North Central Gulf Coast: The Potential Influence of Seagrass on Distributional Patterns.** Bulletin of Marine Science. (R/LR-B-46)

Frodyma, M.E., M. Van Ert, B. Furrow, A.C. Leonard, B.J. Baker, and J.E. Grimwade. (awaiting patent clearance-2001.) ***Pseudoalteromonas clarkii*, sp. nov., a psychrotrophic bacterium isolated from the Antarctic nudibranch *Tritoniella belli*.** International Journal of Systematic and Evolutionary Microbiology. (R/LR-MB-4)

Greenawalt, Jaime M., Frazer, Thomas K., Keller, Stephanie R., and Jacoby, Charles A. (in review-2002.) **Abundance and size of bay scallops in heterogeneous seagrass habitats along the Gulf coast of Florida.** Journal of Shellfish Research.

Jeedigunta, S., H. Fawehinmi, and R.G. Kerr. (submitted-2001.) **An Enzymatic Production of β-Mercaptopyruvic Acid and Its Involvement in Ecteinascidin Biosynthesis.** (R/LR-MB-6)

Kem, W.R., Rittcof, D., and Soti, F. (submitted-2002.) **Synthesis and Chemical –Biological Characterization of All Eight Possible Methyl-2,3'-Bipyridyls.** Department of Pharmacology and Therapeutics, University of Florida College of Medicine (R/LR-MB-9)

Kem, W.R., Soti, F., and Rittschof, D. (submitted 2003.) **Inhibition of barnacle larval settlement and crustacean toxicity of some hoplonemertine pyridyl alkaloids.** Biomolecular Engineering.(R/LR-MB-16)

Larkin, s. and C. Debodisco. (Draft manuscript-in preparation-2003.) **The Value of Ecolabeled Tropical Fish: A Conjoint Analysis of Queen Angelfish.** Journal of Agricultureal and Resource Economics. Pp. 32. (R/LR-A-29)

Larkin, S., S. Hutchinson, and C. Adams. (submitted-2001.) **A Temporal and Spatial Analysis of Fishing Effort and Multi-Species Landings by Fishers in South Florida, 1994-98.** Marine Fisheries Review. 38 pp. (R/LR-E-18A)

Lopez, J.V., C.L. Peterson, R. Willoughby, and S.A. Pomponi. (in preparation-2001.) **Application of Anti-Sense Oligonucleotide (ASO) Technology to Inhibit Cell Cycle Regulating Genes for Sponge Culture Optimization.** (R/LR-MB-5)

Lopez, J.V. C.L. Peterson, R. Willoughby, A.E. Wright, E.J. Enright, S. Stacy, and S.A. Pomponi. (submitted-2001.) **Molecular Genetic Markers for *in vitro* Cell Verification of the Marine Sponge, *Axinella corrugata*.** (R/LR-MB-5)

MacMahan, J., Thieke, R.J., Dean, R.G., Hanes, D.M., and R.A. Holman. (in preparation-2002.) **Analysis of Rip Channel Stability.** Journal of Marine Geology. (R/C-S-40)

MacMahan, J., Reniers, A., Stanton, T., Thornton, E. (in preparation-2002.) **Field Measurements Rip Current Instabilities.** Of Geological Research. (R/C-S-40)

MacMahan, J., Reniers, A., Stanton, T., Thornton, E., Dean R. (in preparation-2002.) **Observations of Rip Current Pulsations.** Of Geological Research. (R/C-S-40)

Mora, D., Pflueger, F., Fields, G. B., and Frank Mari. (submitted-2003.) **First example of □-Hydroxyvaline (ghv) within a polypeptide chain: A novel conopeptide from *Conus gladiator* contains ghv.** J. Amer. Chem. Soc. (R/LR-MB-18)

Peterson, B.J., Chester, C.M., and J.W. Fourquean. (in process-2002.) **The potential role of the sponge community in controlling phytoplankton blooms in Florida Bay.** Marine Ecology Progress Series. (R/C-E-43)

Peterson, B.J., and J.W. Fourquean (in process-2002.) **An experimental manipulation of sponge grazing on seagrass growth dynamics.** Marine Ecology Progress Series. (R/C-E-43)

Peterson, B.J., Boyer, J., Cornwell, J. and J.W. Fourquean. (in process-2002.) **Biogenic inputs of nitrogen by the sponge community into Florida Bay.** OIKOS. (R/C-E-43)

Posey, M.H., T.K. Frazer, T.D. Alphin, and S.B. Blitch. (in preparation-2000.) **Facultative Habitat Use: Does Function Change with Landscape?** (R/LR-B-46)

Posey, M.H., T.D. Alphin, T.K. Frazer, S.B. Blitch, J.A. Hartsell, J. Christian, and T.P. Glancy. (submitted-2000.) **Juvenile Blue Crab Use of Shallow Water Habitats in Southeastern North Carolina: Distribution Among Seagrass, Oyster and Marsh Habitats.** Bulletin of Marine Science. (R/LR-B-46)

Ranamukhaarachchi, D., M.E. Kane, and T.H.M. Mes. (submitted-2003.) **Character Incompatibility: An Approach to Determine Reproduction of Sea-Oats (*Uniola paniculata L.*) Populations.** Molecular Ecology. (R/C-S-36)

Ranamukhaarachchi, D., M.E. Kane, D.W. Crewz, C.L. Guy, and N.P. Philman. (submitted-2000.) **Molecular Analysis of Genetic Diversity in four Florida Sea – Oats (*Uniola paniculata L. poaceae)* Populations: Implications for restoration of dune communities** Journal of Coastal Research. (R/C-S-36)

Reniers, A., MacMahan, J., Stanton, T., Thornton, E. (in preparation-2002.) **Modeling of Infragravity Motions on a Complex Beach.** Of Geological Research. (R/C-S-40)

Sidman C., and T. Fik. (submitted-2002.) **Modeling the Spatial Patterns of Recreational Boaters: Vessel, Behavioral and Geographic Considerations.** Leisure Research. (R/C-P-24)

Soti, F., Rocca, J., and Kem, W.R. (submitted-2002.) **Isolation and Structure Elucidation of Bipyridyl and Dihydroisoquinolyl Alkaloids from a Marine Worm, *Amphiporus Angulatus*.** Department of Pharmacology and Therapeutics, University of Florida College of Medicine (R/LR-MB-9)

Thornton, R., and R. Kerr. (submitted-2002.) **Examination of Stimuli Designed to Induce Pseudopterosin Production in the Soft Coral Pseudopterogorgia Ellsathethae.** (R/LR-MB-8)

Tilghman, G.C., and R. Francis-Floyd. (submitted-2002.) **Nutritional Analysis of Three Algal Phyta of the Florida Keys**. Zoo Biology. (R/LR-A-30)

Valero-Aracama, C., M. E. Kane, S. B. Wilson, and N. L. Philman. (Submitted 2002.) **Genotypic differences of *in vitro* propagated sea oats genotypes (*Uniola paniculata*).** Proc. SNA Research Conference 47:357-360. (R/C-S-41)

Van Ert, M.N., M. Frodyma, B.J. Baker, A.C. Leonard, & J.E. Grimwade. (in preparation-2001.) **Characterization of Bioactive Metabolite Production in Bacteria Associated with Antarctic and Temperate Marine Invertebrates.** Applied and Environmental Microbiology. (R/LR-MB-4)

Van Ert, M., B. Gancarz, M. Frodyma, J. Grimwade, B. Baker, and A. Leonard. (awaiting patent clearance-2001.) **Distribution, Size, and Host-range Specificity of Plasmids Harbored by Bacteria Associated with Antarctic and Temperature Marine Invertebrates.** Applied and Environmental Microbiology. (R/LR-MB-4)

Welt, B.A., Sage, D.S., Berger, K.L. (submitted-2003.) **Performance specification of time-temperature integrators designed to protect against botulism in refrigerated fresh foods.** Journal of Food Science. University of Florida (R/LR-Q-22)

V. Graduate Thesis and Dissertations

B. Pending

Abbasi, H. (pending-2005.) ***Conus dalli*: Isolation and Characterization of Novel Conopeptides from a Panamic Mollusk-hunting *Conus*.** Dissertation. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Abercrombie, D. (pending-2004.) **Molecular Genetic Identification of Sharks Belonging to the Families Sphyrnidae, Alopiidae, and Carcharhinidae using multiplex PCR.** Thesis. Oceanographic Center, Nova Southeastern University. (R/LR-B-54)

Aponte, L. (pending-2005.) **Design of hurricane data collection hardware and real-time data**

transmission. Dissertation. Department of Civil and Coastal Engineering, University of Florida. (R/C-S-43)

Behringer, D. (pending-2001.) **The Ecology of Juvenile Lobsters.** Dissertation. Old Dominion University. (R/LR-B-45)

Benner, R. (pending-2000.) **Shrimp Decomposition Pending.** Thesis. University of Florida. (SGEP-12)

Bernstein, M. (pending-August 2001.) **Determination of Crustacean Age Composition in Landings from Size Frequency Data.** Thesis. Department of Marine Biology and Fisheries, RSMAS, University of Miami. (R/LR-E-18B)

Blitch, S.B. (pending-2001.) **Tentative Project "Growth of Juvenile Blue Crabs (Callinectes Sapidus) in Two Different Habitat Types".** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-46)

Bouwma, P. (pending-2002.) **Title pending.** Dissertation. Florida State University. (R/LR-B-50)

Butler, M. (In progress-2003.) **Determination of metabolic rates of Suwannee Regional Reef gag grouper using electrion transport system (ETS) assay.** Thesis. University of Florida. (R/LR-B-53)

Cano, Herminsul. (pending-2005.) **Novel conopeptides from the venom of *C. purpurascens* and *C. ermineus*.** Dissertation. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Cobb, J.D. (pending-expected 2001.) **A Comparison of the Diets of Inshore and Offshore Populations of *Lytechinus variegatus* and *Arbacia punctulata* on the Central Florida Gulf Coast.** Thesis. (R/LR-A-21)

Coursey, Yvonne (pending-2003.) The goal of Ms. Coursey's research is to determine the source of blood cells in the horseshoe crab. That is, what tissue is responsible for blood cell production? These studies are nearly complete and has begun writing her Dissertation. University of South Florida. (PD-00-8)

DeOliveira, A. (pending-2001.) **Quantification of Quality Attributes of Gulf of Mexico Sturgeon Meat, Including the use of Electronic Nose.** Dissertation. Department of Food Science and Human Nutrition, University of Florida. (R/LR-Q-20)

Dolan, T. (pending-2002.) **A Spatially Explicit Individual Based Model of the Florida Spiny Lobster Fishery.** Dissertation. Old Dominion University. (R/LR-B-50)

Donahue, S. (pending-2002.) **The Ecology of Shallow Water Sponges in the Florida Keys.** Thesis. Old Dominion University. (R/LR-B-50)

Dulaiova, H. (pending-2002.) **Title pending.** Dissertation. Florida State University. (R/C-E-42)

Fiedler, T. (pending-2001.) **Condition of Atlantic Menhaden, *Brevoortia tyranus,* in the South Atlantic Bight.** Thesis. RSMAS, University of Miami. (R/LR-A-17)

Franco, A. (pending-2004.) **Novel conopeptides from the venom of *C. regius* and *C. spurius*.** Dissertation. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Gnanaraj J. (pending-2003.) **Assessing Film Permeability as Controls for Safe Use of Vacuum Packaged Seafood.** Thesis. University of Florida (R/LR-Q-22)

Goldstein, J. (pending – 2002). **Postlarval settlement responses in Caribbean Spiny Lobster.** Theseis. Old Dominion University. (R/LR-B-50)

Hale, J.A. (pending-2001.) **Tentative Project "Abundance and Distribution of Seagrasses Along the Gulf Coast of Florida: A Change Analysis Based on Aerial Photographs Acquired in 1992 and 1999".** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-46)

Heisig, J. (pending-2001.) **Sperm Dynamics and Reproductive Success in Spiny Lobster.** Thesis. Old Dominion University. (R/LR-B-50)

Jha, A. (pending-2003?) (R/C-S-43)

Kaonongbua, W. (pending-expected 12/01.) **Developing Molecular Protocols to Assess Genetic Diversity of Mycorrhizal Fungi Associated with Sea Oats.** Thesis. (R/C-S-38)

Kline, R. (In progress-2003.) **Density-dependent Activity Budgets and Related Swimming Energetics of Gag Grouper.** Thesis. University of Florida. (R/LR-B-53)

Lapilli, C. (pending-2004.) **Title to be determined.** Thesis. (R/C-S-43)

Larsen, S. (In progress-2003.) **Influence of conspecific abundance and refuge availability on anti-predator responses by gag grouper, *Mycteroperca microlepis*.** Thesis. University of Florida.(R/LR-B-53)

Lear, J. (pending.-2002) **Lobster-Octopus Dynamics in the Florida Keys.** Thesis. Old Dominion University. (R/LR-B-50)

MacMahan, J.H. (pending-2002.) **Rip Currents and Development of a Predictive Model.** Dissertation. Department of Civil and Coastal Engineering, University of Florida. (R/C-S-40)

Magnussen, J. (pending-2005.) **Forensic Genetic Assessment of Trade in Shark Products in the Global Marketplace.** Dissertation. Oceanographic Center, Nova Southeastern University. (R/LR-B-54)

Martin, J. (pending 2003.) **Title to be Determined.** Thesis. He is working on the oyster depuration. (R/LR-Q-24)

Matei, E. (pending-2005.) **3D structure and Dynamics of Conopeptides in Solution using Nuclear Magnetic Resonance.** Dissertation. Department of Physics, Florida Atlantic University. (R/LR-MB-18)

Mendoza, T. (pending-2003.) **Verification of Time Temperature Indicators as Science Based Controls for Safe Use of Vacuum Packaged Seafood.** Thesis. University of Florida (R/LR-Q-22)

McDaniel, L. (pending-Fall 2001.) **Evaluation of Marine Bacterial Lysogens for use in a Mutagen Detection (Prophage Induction) Assay.** Thesis. Department of Marine Science, University of South Florida. (R/LR-MB-3)

Michalski, S. (Pending 2003.) **Title to be Determined.** Dissertation. University of Florida. (R/LR-MB-16)

Molina, H. (pending-2001.) **Title to be Determined.** Dissertation. (R/LR-B-47)

Moller, Carolina. (pending-2005.) **Novel conopeptides from the venom of *C. floridanus and C. villepini*.** Dissertation. Department of Biology, Universidad Simon Bolivar, Caracas, Venezuela. (R/LR-MB-18)

Mora, David. (pending-2003) **Novel conopeptides from the venom of *C. gladiator*.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. Currently employed at Ivax Pharmaceuticals, Miami Gardens, Fl. (R/LR-MB-18)

Murray, M. (pending-2001.) **To Optimize the Human Labor Involved With Egg Production We Are Determining If We Can Increase Egg Production by Increasing the Density of Copepods/Culture and Reducing the Number of Cultures That Are Maintained.** Thesis. Department of Biology, Florida State University. (Major professor Nancy Marcus) (R/LR-A-22)

Nagy, B. (In progress-2003.) **Spatio-temporal distribution and abundance of pelagic planktivorous fish**

in relation to benthic habitat. Dissertation . Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-53)

Nagy, B. (pending-2004.) **Title to be Determined.** Dissertation. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-49)

Nielsen, J. (pending-2004.) **Molecular Approaches to Species Identification in Sharks, Stingrays and Billfishes.** Thesis. Oceanographic Center, Nova Southeastern University. (R/LR-B-54)

Pflueger, Fred, C. . (pending-2004.) **Novel conopeptides from the venom of *C. brunneus.*** Dissertation. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Pisarewicz, Katarzyna. (pending-2004**.) Novel conopeptides from the venom of *C. mus*.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University (R/LR-MB-18)

Randall, M.T. (pending-2001.) **Tentative Project "The Ecology of Drift Macroalgae in a Relatively Undisturbed Shallow Water Estuary Along the Gulf Coast of Florida".** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-46)

Richards, V. (pending-2004.) **Population Genetic Structure in Diverse Elasmobranchs.** Dissertation. Oceanographic Center, Nova Southeastern University. (R/LR-B-54)

Ross, P. (pending-2001.) **Histamine in Scrombrotoxic Fish.** Thesis. University of Florida. (SGEP-12)

Rubinstein, W. (pending- 2003.) **An Economic Analysis of Ecofriendly Certification for Marine Ornamentals.** Thesis. Department of Food and Resource Economics, University of Florida.(R/LR-A-29)

Saiter, S. (pending-2001.) **Habitat Complexity Preference of Syngnathids in Tampa Bay and Charlotte Harbor, FL.** Thesis. (R/C-E-39)

Schmitz, C. (pending-2001.) **Title to be Determined.** Thesis. (R/LR-B-47)

Schratwieser, J. (pending – 2002). **Title to be determined.** Dissertation. Florida State University (R/LR-B-50)

Smith, James. (Pending 2003.) **Title to be Determined.** Thesis. (R/LR-Q-24)

Valero-Aracama, Carmen. (Pending 2003.) ***Physiological and Anatomical Basis For Differences in In vitro and Ex Vitro Growth Performance of Sea Oats Genotype***. Dissertation. Physiological and anatomical studies. (R/C-S-41)

Weaver, R. (pending-2003.) **Development of hurricane data analysis software and graphical user interface." Department of Civil and Coastal Engineering**.Thesis. University of Florida. (R/C-S-43)

Weege, S.T. (pending-2001.) **Preliminary Title: Differential Activity Budgets of Gag Grouper on Small and Large Patch Reefs in the Gulf of Mexico.** Thesis. University of Florida. (R/LR-B-49)

Wildeboer, Kristin. (Pending 2003.) **Title to be Determined.** Dissertation. University of Florida. (R/LR-MB-16)

Williams, Orette. (pending-2004.) **Novel conopeptides from the venom of *C. jaspedius*.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Willoughby, R. (pending-August 2001.) **Marine Sponge Cell Culture: Variable Gene Expression in *Teichaxinella morchella (Axinella corrugata***). Dissertation. Florida Institute of Technology. (R/LR-MB-13)

VI. Florida Sea Grants Extension Publications

Florida Sea Grant College Program. 2003. **Internet Directory of Marine Education and Research Organizations in Florida.** SGEF-132. - Revison (SGEP-12)

B. In Press

Jacoby, Charles A. (in review-2002.) **Nutrients in Coastal Waters.** University of Florida: Department of Fisheries and Aquatic Sciences. 42 Pg.

Jacoby, Charles A., Walters, Linda, Baker, Shirley, and Blyler, Karen. (in review-2002.) **Primer on Invasive Species in Florida's Coastal Waters.** University of Florida: Department of Fisheries and Aquatic Sciences. 24 Pg.

VII. Extension Newsletters

VIII. Miscellaneous Staff Papers and Conference Proceeding

Seaman, W.B., B. Smiley, and T. Pitcher. 2003. **Research and monitoring of the marine reefs using volunteer divers** – Proceedings of the North American Practitioners Workshop. University of British Columbia Fisheries Centre. Vol. 11(2). (M/PM-13)

B. In Press

Adams, C. and Larkin, S. (in press-2002.) **The use of Logbooks to Collect Economic Data: A Point-Counterpoint Discussion.** In: First Biennial Conference of the North American Association of Fisheries Economists. (SGEP-13)

Larkin, S., Perruso, L., Lee, D., and Adams, C. (in press-2002.) **An Empirical Investigation of the US Atlantic Longline Fleet: Specification and Estimation of a Multi-Species Cost Function with Suggestions for Missing Data Problems.** In: First Biennial Conference of the North American Association of Fisheries Economists. (SGEP-13)

Moye, H.A. (in press-1997.) **Opportunities for Pesticide Residue Analytical Methods Development: The Potential for Aqueous Extractions of Pesticide Residues from Fruits and Vegetables.** In: Proceedings of the 8th International Congress of Pesticide Chemistry: Options 2000. (R/C-E-38)

Pomponi, S.A., R. Willoughby, A.E. Wright, C. Pecorella, J. Lopez, and G. Samples. (in press-1997.) **Development of an *in vitro* System for Production of the Ecteinascidins, Antitumor Compounds from the Tunicate, *Ecteinascidia turbinata*.** In: Proceedings of the Congress on in vitro Biology. (R/LR-MB-1)

C. Submitted, In Preparation, Planned

Adams, C., Sturmer, L., and J. Suspan. (submitted-2002.) **Enahncing Seed Availability for the Hard Clam, Mercenaria mercenaria, Aquaculture Indusrty Through Application of Remote Setting Techniques: A Trial Run Summary.** Gainesville, FL. 38 Pg. (R/LR-A-27)

Masters, F., Gurley, K. and Reinhold, T. (planned-2003.) **Ground Level Wind Characteristics for Isidore and Lili.** The 11th International Conference on Wind Engineering, June. (R/C-S-43)

McDaniel, L., D.W. Griffin, J. Crespo-Gomez, M.R. McLaughlin, and J.H. Paul. (submitted-2002.) **Evaluation of Marine Bacterial Lysogens for use in a Mutagen Detection (Prophage Induction) Assay.** American Society for Microbiology Meeting, Los Angeles, CA, May 21-25. (R/LR-MB-3)

Subramanian, C., Pinelli, J. P., Buist, L., Jha, A. (planned-2003.) **A Wireless Data Acquisition System for Coastal Wind Monitoring.** The 11th International Conference on Wind Engineering, June. (R/C-S-43)

Pomponi, S.A., R. Willoughby, and C.G. Russell. (in preparation-1997.) **Application of DNA Microarray Technology for Gene Discovery and Expression Analysis in a Non-model Organism.** To be presented: 2001 Congress on In Vitro Biology. St. Louis, MO. June 16-20. (R/LR-MB-13)

Pomponi, S.A. (in preparation-2000**.) Marine Invertebrate Models for In Vitro Production of Bioactive Compounds. International Marine Biotechnology Conference 2000.** Townsville, Australia. September 28 - October 4. (R/LR-MB-13)

Willoughby, R., C.G. Russell, and S.A. Pomponi. (in preparation-2000.) **Application of DNA Microarray Technology to Development of a Marine Sponge Model. International Marine Biotechnology Conference 2000.** Townsville, Australia. September 28 - October 4. (R/LR-MB-13)

IX. Fathom

X. Posters

XI. Videos

XII. CD-ROM Releases

XIII. Software

XIV. Home page

CALENDAR YEAR 2002 (January - December)

I. Florida Sea Grant Reports

Letson, D., and J.W. Milon. 2002. **Florida Coastal Environmental Resources: A Guide to Economic Valuation and Impact Analysis.** SGR-124 (M/PM-13)

II. Florida Sea Grant Technical Papers

Cato, J. 2002. **An Investment in Florida's Future: Sea Grant Sponsored Graduate Education.** TP-117 (M/PM-13)

Florida Sea Grant College Program. 2002. **Florida Sea Grant College Program Year 2001 Work Plan.** TP-119. (M/PM-13)

Florida Sea Grant College Program. 2002**. "Performance Counts."** Annual Progress Report for 2001. TP-118. (M/PM-12)

Fann, D. A., R.A. Swett, L.C. Alexander, G.A. Antonini. 2002. **Regional Waterway Management System for Lee County, Phase 3.** TD-5. (R/C-P-24)

Stephan, K.E., Stein, Taylor V., and Kristianna J. Lindgren. 2002. **Rookery Bay Estuarine Research Reserve Visitor Study.** TP-120. (PD-99-11)

Sidman, C., Fik, C., and Flamm, R. 2002. **Trend Surface Analysis of Boating Use and Tests of Statistical Association Between Use and Various A Environmental and Occurrence Variables.** (Phase 6.) (R/C-P-24)

Sidman, C. and T. Fik. 2002. **Enhancements to a Regression-Based Approach to Estimate Preferred Recreational Boating Destinations in Charlotte Harbor, Florida.** (Phase 5.) (R/C-P-24)

Sturmer, L., M. Zylstra, and C. Adams. 2002. **C.L.A.M. Computer Logbook and Management: A user's Guide for Commercial Hard Clam Growers.** TP-122 (SGEP-13)

Swett, R.A., D.A. Fann, G.A. Antonini. 2002. **Regional Waterway Management System for Manatee County: Bishop Harbor, Tidal Braden River, and Lower Reaches of the Upper Manatee River.** TD-6 (R/C-P-24)

III. Books and Book Chapters

Otwell, S., Garrido, L., Garrido, V., and Benner, R. 2002. **Methods for Improving Shrimp Farming in Central America.** In: Good Aquaculture Practices for Product Quality and Safety. Pg. 169-228.

Cato, J.C. and W. Seaman, Jr. 2002. **Planning, partnerships and progress via marine biotechnology research and outreach in Florida.** In: National Research Council. Marine Biotechnology in the Twenty-First Century National Academy Press, Washington, D.C. Pp. 97-99. (M/PM-13)

IV. Journal Articles

Adams, C. 2002. **Zero-Exchange demonstration Posts Good Results in Nicaragua.** Global Aquaculture Advocate 5/5 2002: Pp. 50-56. (E/INT-1)

Antoine, F.R., Wei, C.I., Otwell, W.S., Sims, C.A., Little, R.C., Hogle, A.D., and Marshall, M.R. 2002. **TVB-N Correlation with Odor Evaluation and Aerobic Plate Count in Mahi-Mahi.** Journal of Food Science. 67(9)

Benetti, D.D., J.A. Matera, O.M. Stevens, J.F. Alarcon, M.W. Feeley, F.J. Rotman, Y. Minemoto, G.Banner-Stevens, J. Fanke, S. Zimmerman, and L. Eldridge. 2002. **Growth, Survival, and Feed Conversion Rates of Hatchery-Reared Mutton Snapper *Lutjanus analis* Cultured in Floating Net Cages.** Journal of the World of Aquaculture Society. 16(3): 349-357 (R/LR-A-35)

Burnett, W.C., M. Lambert, J. Christoff, J. Chanton, M. Taniguchi, W. Moore, L. Smith, S Krupa, E. Kontar, C. Smith, R. Paulsen, and D. O'Rourke. 2002. **Assessing Methodologies for Measuring Groundwater Discharge to the Ocean.** EOS, Transactions, American Geophysical Union. 83 (11), p. 117, 122-123 (R/C-E-42)

Coleman, F.C. and Williams, S.L. 2002. **Overexploiting marine ecosystem engineers: potential consequences for biodiversity.** Trends in Ecology and Evolution. 17 (1): 40-44 (R/LR-B-51)

Collins, T.M., Trexler, J., Nico, L., and T.A. Rawlings. 2002. **Genetic diversity in a morphologically conservative invasive taxon: Multiple introductions of swamp eels to the southeastern United States.** Conservation Biology 16 (4):1024-1035. (R/C-E-46)

Corbett, D.R., K. Dillon, W. Burnett, and G. Schaefer. 2002. **The spatial variability of nitrogen and phosphorus concentration in a sand aquifer influenced by onsite sewage treatment and disposal systems: a case study on St. George Island, Florida.** Environmental Pollution. 117; 337-345(R/C-E-42)

Donaldson, K.A., D.W. Griffin, and J.H. Paul. 2002. **Detection, Quantitation and Identification of Enteroviruses from Surface Waters of the Florida Keys Using Real-Time RT-PCR.** Water Research 36 (2002) 2505-2514 (R/LR-MB-12)

Duckworth, D.H. and Gulig, P.A. 2002. **Bacteriophages: Potential Treatment for Bacterial Infections.** Biodrugs. 16 (1): 57-62 (R/LR-Q-20)

George, S. B. and J. M. Lawrence. 2002. **The effect of carotenoids on egg production and larval development of the edible sea urchin, *Lytechinus variegates*: The role of adult and larval diets.** World Aquaculture. 33: 55-61. (R/LR-A-21)

Kimble, M., Y. Coursey, N. Ahmad, and G.W. Hinsch. 2002. **Behavior of the yolk nuclei during embryogenesis, and development of the midgut diverticulum in the horseshoe crab, *Limulus polyphemus*.** Invertebrate Biology 121(4): 365-377. (PD-00-8)

Lin, J., and P. Shi. 2002. **Effect of Broodstock Diet on Reproductive Performance of the Golden Banded Coral Shrimp *Stenopus scutellatus*.** Journal of the World Aquaculture Society. 33(3): 383-385 (R/LR-A-31)

Lopez, M., Russ, A., and C. Adams. 2002. **Projected Cost Comparison of Semi-intensive Zero-Exchange Culture Systems in Nicaragua.** Global Aquaculture Advocate. 5/6 200: Pp. 88-89. (E/INT-1)

Seaman, Jr. W. 2002. **Unifying trends and opportunities in global artificial reef research, including evaluation.** Journal of Marine Science. 59: S14-S16 (M/PM-12)

Shivji, M.S., S. Clarke, M. Pank, L. Natanson, N. Kohler and M. Stanhope. 2002. **Genetic Identification of Pelagic Shark Body Parts for Conservation and Trade-Monitoring.** Conservation Biology 16(4): 1036-1047. (R/LR-B-54)

Sturmer, L.N., Supan, J.E., and C.M. Adams. 2002. **Enhancing Seed Availability for the Hard Clam Aquaculture Industry Through Application of Remote Setting Techniques.** Journal of Shellfish Research. 21(1), June 2002 385. (R/LR-A-27)

Wirth, F., Garrido, L., Davis, K., and Otwell, S. 2002. **Combining Taste Panels with Focus Groups to Elicit Consumer Preferences Toward a New Shrimp.** Journal of Food Distribution Research 33(1): 151-154 (SGEP-13)

V. Graduate Thesis and Dissertations

Brown, J.J., 2002. **Comprehensive Sediment Budget for the East Coast of Florida**. Thesis. Master of Science, University of Florida. (R/C-S-39)

Cobb, J., 2002. **A Dietary Comparison of Offshore and Near-shore Populations of the Co-occurring Sea Urchins *Lytechinus Variegatus* and *Arbacia Punctulata* (Echinodermata) Along the Central Florida Gulf Coast.** Thesis. Department of Biology, University of Florida. (R/LR-A-21PD)

Garcia, Marco A., 2002. **Market Preferences Toward Farm-Raised Sturgeon in the Southeastern United States: A Conjoint Analysis.** Thesis. Food and Resource Economics, University of Florida. (PD-02-6)

Hart, M.K., 2002. **Habitat-Mediated Direct and Indirect Effects Among Three Serranid Fishes.** Thesis. Fisheries and Aquatic Sciences Department. University of Florida. (R/LR-B-49)

O'Connell, T.J., 2002. **Identification and Genetic Analysis of Marine Invertebrate-Associated Bacteria.** Thesis. Department of Biological Sciences, Florida Institute of Technology, Melbourne, Florida. (R/LR-MB-10)

Ramlakhan, Rani, E., 2002. **Isolation and Characterization of Nevel Cenopeptides from *Conus* nux.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-18)

Stephan, K.E., 2002. **Rookery Bay Recreation Management Strategies: An Exploratory Study.** Thesis. School of Forest Resources and Conservation, University of Florida. (PD-99-11)

VI. Florida Sea Grant Extension Publications

Adams, C., Jacob, S., and S. Smith. 2002. **What Happened After the Net Ban?** FE-123 (R/LR-E-17)

Antonini, G.A., D.A. Fann, and P. Roat. 2002. **A Historical Geography of Southwest Florida Waterways.** Volume Two. SGEB-56. (R/C-P-24)

Florida Sea Grant College Program. 2002. **Science Serving Florida's Coast: Florida Sea Grant Program Directory 2002-2004.** SGEF-145. (SGEP-13)

Jackson, D. 2002. **NOAA Coastal Storms Initiative.** SGEF-147 (E/T-10)

Novak, R. 2002. **Boater's Guide to Charlotte Harbor.** SGEB-52. (Revised) (SGEP-12)

Novak, R. 2002. **Circle Hooks.** SGEF-108. (SGEP-13)

Novak, R. 2002. **Los Ansuelo Circulares.** SGEF-109. (SGEP-13)

Seaman, W., and R. Scott. 2002. **Biotechnology's New Wave in Florida.** SGEF-149 (PD-02-3)

Zimmerman, D. 2002 **Common Sharks of Florida** SGEF-146 (SGEP-13)

VII. Extension Newsletters

Florida Bay Project Staff. 2002. Florida Bay Watch Report. (PD/02-04)

Acquiring a Taste for Florida Bay June 2002.

VIII. Miscellaneous Staff Papers and Conference Proceeding

Adams, C. 2002. **Economic Consequences and Public Awareness of Red Tide Events in Coastal Florida Communities.** In: 3rd Natural Resource Extension Professional Conference Abstracts. p. 64. (SGEP-13)

Adams, C., Larkin, S., Mulkey, D., Hodges, A., and Ballyram, B. 2002. **Measuring the Economic Consequences and Public Awareness of Red Tide Events in Florida.** Gainesville, University of Florida. 150 pg. (SGEP-13)

Adams, C. 2002. **The Commercial Bottom Trawling Industry in Florida: Balancing Environmental Impact with Economic Contribution.** Gainesville, UF IFAS, EDIS FE345. 6 Pg. (SGEP-13)

Adams, C., Andrew, C., and J. Herman. 2002. **2nd Annual FRE Graduate research Symposium.** Gainesville, UF Food and Resource Economics Dept. TLP 02-2328 November 2002.

Adams, C., Larkin, S., and D. Gregory. 2002. **Effect of Import of Caribbean Spiny Lobster on the Dockside Price of Panulirus argus in Florida.** In: International Institute of Fisheries Economics and Trade, Proceedings No. 194. (SGEP-13)

Adams, C.(2002. **Economic Consequences and Public Awareness of Red Tide Events in Coastal Florida Communities.** In: Proceedings of the 18th International Conference of the Coastal Society. 2002: Pp. 1-1. (SGEP-13)

Creswell, R.L.(Editor) 2002. **GCFI Proceedings of the Fifty-Third Annual Gulf and Caribbean Fisheries Institute.** Biloxi, Mississippi, November 2000. (SGEP-13)

Larkin, S. and R. Degner. 2002. **Eco-labeled Marine Ornamentals: Expected Demand and Value from a Conjoint Survey.** IIFET 2002: Fisheries in the Global Economy, Book of Abstracts, No. 191. (R/LR-A-29)

Larkin, S., Adams, C., and S. Hutchinson. 2002. **Multi-Species Fisherman in South Florida: Trends and Management Implications.** In: IIFET Proceedings. No. 194. (R/LR-E-18)

Larkin, S.L., Degner, R., and Rubinstein, W. 2002. **Market Preferences, Wholesale Demand and Breakdown Prices for Marine Ornamental Fish Cultured and Collected in Florida.** Staff Paper SP02-5. Food and Resource Economics, University of Florida, Gainesville, FL. (R/LR-A-29)

Lopez, M., Adams, C., Cato, J., and D. Sweat. 2002. **Cost and Return s Budgets for a Semi-Intensive Shrimp Farm in Nicaragua, 1994-2000.** Gainesville. 63 pg. (E/INT-1)

Lopez, M., Adams, C., and J. Cato. 2002. The **Relative Importance of Nicaraguan Cultured Shrimp Within the Nicaraguan Seafood Industry and US Major Shrimp Import Markets: 1994-2000.** Gainesville. 22 pg. (E/INT-1)

Lopez, M., Adams, C., Cato, J., and D. Sweat. 2002. **Cost and Return s Budgets for an Intensive Zero Water-Exchange Shrimp Culture Demonstration Project in Nicaragua, 2001.** Gainesville. 28 pg. (E/INT-1)

Lopez, M., Adams, C., Cato, J., and D. Sweat. 2002. **Economic Analysis of an Intensive, Zero-Water Exchange, Saltwater Shrimp Culture Demonstration Project in Nicaragua.** Gainesville, UF IFAS EDIS FE 361. (E/INT-1)

Otwell, S. 2002. **Reduced Oxygen Packaging – educational Approach.** Proc. Seafood Science & Technology Society of the Americas

Otwell, S. 2002. **Post Harvest treatments for Oysters – educational Approach.** Proc. Seafood Science & Technology Society of the Americas

Otwell, S. 2002. **SST Society – The Next 25 Years.** Proc. Seafood Science & Technology Society of the Americas

Persuso, Larry, Larkin, Sherry, Lee, Donna, and Adams, Chuck. 2002. **A Dual Production Analysis of a Multispecies Fishery: The Case of the US Atlantic Longline Fleet.** In: IIFET Proceedings. No. 194. (R/LR-E-18)

Swett, R., and C. Sidman. 2002. **A Method to Improve the Utility of the Vessel Title Registration System to Characterize Florida's Boating Population.** Interim Report to the Florida Wildlife Conservation Commission, Florida Marine Research Institute, St. Petersburg, Florida. (R/C-P-24)

IX. Fathom

X. Posters

XI. Videos

XII. CD-ROM Releases

Sturmer, L., M. Zylstra, and C. Adams. 2002. **C.L.A.M. Computer Logbook and Management: A user's Guide for Commercial Hard Clam Growers.** Produced with TP-122 (SGEP-13)

XIII. Software

XIV. Home Page

Florida Sea Grant Home Page.

CALENDAR YEAR 2001 (January - December)

II. Florida Sea Grant Reports

National Seafood HACCP Alliance. 2001. **HACCP: Hazard Analysis and Critical Control Point Training Curriculum.** Seafood HACCP Alliance Course – Fourth Edition for Training and Education. SGR-120. (E/TP-2)

National Seafood HACCP Alliance. 2001. **Fish and Fisheries Products Hazards & Control Guidance: Third Edition.** Seafood HACCP Alliance Course – Third Edition for Training and Education. SGR-121. (E/TP-2)

Philippakos. E., Adams, C., Hodges, A., Mulkey, D., Comer, D., and Sturmer, L. 2001. **Economic Impact of the Florida Cultured Hard Clam Industry.** SGR-123 (SGEP-12)

II. Florida Sea Grant Technical Papers

Adams, C.M., S.L. Larkin, D.J. Lee, R.L. Degner, and J.W. Milon. 2001. **International Trade in Live, Ornamental "Fish" in the U.S. and Florida.** TP-113. (R/LR-A-23)

Ehrhardt, N.M. 2001. **Biological and Economic Modeling and Assessment of Limited Entry Strategies in Multi-Species Fisheries in South Florida.** TP-114. (R/LR-E-18)

Florida Sea Grant College Program. 2001. **Florida Sea Grant College Program Strategic Plan 2002 - 2005**. TP-108. (M/PM-12)

Florida Sea Grant College Program. 2001. **Florida Sea Grant College Program Year 2001 Work Plan.** TP-116. (M/PM-12)

Florida Sea Grant College Program. 2001**. "Performance Counts."** Annual Progress Report for 2000. TP-115. (M/PM-12)

Larkin, S.L., C.M. Adams, R.L. Degner, D.J. Lee, and J.W. Milon. 2001. **An Economic Profile of Florida's Marine Life Industry.** TP-111. (R/LR-A-23)

Larkin, S.L., R.L. Degner, C.M. Adams, D.J. Lee, and J.W. Milon. 2001. **Results and Implications 1999 U.S. Tropical Fish Wholesalers Survey.** TP-112. (R/LR-A-23)

Lawrence, J.M., McBride, S.C., Plank, L.R., and Shpigel, M. 2001. **Ammonia tolerance of the sea urchins *Lytechinus variegatusI, Arbacia punctulata, Stronglocentrotus fanciscanus,* and *Paracentrotus lividus*.** Echinoderm Research 2001. Pg 233-236. (R/LR-A-21)

Seaman, W., Jr., and J.H. Whitehouse. 2001. **Florida Marine Biotechnology: Research, Development and Training Capabilities to Advance Science and Commerce.** TP-110. (M/PM-12)

Sidman, C., and R. Flamm. 2001. **A Survey of Methods for Characterizing Recreational Boating in Charlotte Harbor, Florida.** TP-109. (E/WCIND-1)

Smith, R.A., and R.E. Deyle. 2001. **Simulation Training on Recovery & Mitigation - STORM. An Overview.** TP-96. (R/C-P-22)

Swett, R.A., and D.A. Fann. 2001. **A Manual of Methods and Procedures for the Regional Waterway Management System.** TP-124 (R/C-P-24)

Swett, R.A., D.A. Fann, G.A. Antonini, L.C. Alexander. 2001. **Regional Waterway Management System for Lee County, Phase 2.** TD-4. (E/WCIND-2)

III. Books and Book Chapters

Dean, R.G., and R.A. Dalrymple. 2001. **Coastal Processes with Engineering Applications.** Cambridge University Press. (R/C-S-35)

Lawrence, J.M., and T.S. Klinger. 2001. **Digestion in sea urchins.** In: Edible Sea Urchins: Biology and Ecology. Pp. 103-113. (R/LR-A-21)

Lawrence, J.M. 2001. **Sea-urchin roe cuisine.** In: Edible Sea Urchins: Biology and Ecology: Biology and Ecology. Pp 415-416. (R/LR-A-21)

Lawrence, J.M. 2001. **The Edible Sea-Urchins.** In: Edible Sea Urchins: Biology and Ecology: Biology and Ecology. Pp 1-4. (R/LR-A-21)

Lawrence, J.M., and Y. Agatsuma. 2001. **The Ecology of Tripneustes.** In: Edible Sea Urchins: Biology and Ecology. Pp. 395-413. (R/LR-A-21)

Tajima, K., and J.M. Lawrence. 2001. **Disease in edible sea urchins.** In: Edible Sea Urchins: Biology and Ecology. Pp. 139-148. (R/LR-A-21)

Watts, S.A., J.B. McClintock, and J.M. Lawrence. 2001. **The Ecology of Lytechinus Variegatus**. In: Edible Sea Urchins: Biology and Ecology. Pp. 375-393. (R/LR-A-21)

IV. Journal Articles

Adams, C.M., S.L. Larkin, and D.J. Lee. 2001. **Volume and Value of Marine Ornamentals Collected in Florida, 1990-98.** Aquarium Sciences and Conservation. 3:25-36. (R/LR-A-23)

Arnold, W.S. 2001. **Bivalve enhancement and restoration strategies in Florida, U.S.A.** Hydrobiologia. 465: 7-19. (R/LR-A-28)

Bell, S.S., M.O. Hall, S. Soffian, and K.M. Madley. 2001. **Assessing the Impact of Propeller Scars on Fish and Shrimp Utilizing Seagrass Beds.** Ecological Applications. (R/C-E-39)

Benetti, D.D. 2001. **Mesocosm Systems for Semi-Intensive Larval Rearing of Marine Fish.** The Advocate, Global Aquaculture Alliance Technical Magazine. 3(6):22-23. (R/LR-A-35)

Berger, D.K. and Butler, M.J. IV. 2001. **Octopuses influence den selection by juvenile Caribbean spiny lobster.** Marine Freshwater Reserve. 52,1049-53 (R/LR-B-45)

Brooks, R.A., and S.S. Bell. 2001. **Colonization of a Dynamic Substrate: Factors Influencing Recruitment of the Wood-Boring Isopod, *Sphaeroma terebrans,* onto Red Mangrove (Rhizophora mangle) Prop Roots.** Oecologia. 127:522-532. (AFAMS)

Butler, M.J., IV, T. Dolan, W. Herrnkind, and J. Hunt. 2001. **Modeling the Effect of Spatial Variation in Postlarval Supply and Habitat Structure on Recruitment of Carribean Spiny Lobster.** Marine and Freshwater Research. 52,1243-52 (R/LR-B-50)

Butler, M.J. IV. 2001. **The 6th International Conference and Workshop on Lobster Biology and Management : An Introduction.** Marine Freshwater Reserve. 52,1033-5 (PD-99-8)

Childress, M., and W. Herrnkind. 2001. **The Guide-Effect Influence on Gregariousness of Juvenile Caribbean Spiny Lobster.** Animal Behaviour. 62: 465-472 (R/LR-B-50)

Childress, M., and W. Herrnkind. 2001. **The Influence of Conspecifics on the Ontogenetic Shift of Juvenile Caribbean Spiny Lobsters.** Marine and Freshwater Research. 52: 1077-84 (R/LR-B-50)

Diaz, G.A., S.G. Smith, J.E. Serafy, and J.S. Ault. 2001. **Allometry of the Growth of Pink Shrimp *Farfantepenaeus duorarum* in a Subtropical Bay.** American Fisheries Society. 130:328-335. (R/LR-B-47)

George, S.B., J.M. Lawrence, A.L. Lawrence, J. Smiley, L. Plank. 2001. **Carotenoids in the Adult Diet Enhance Egg and Juvenile Production in the Sea Urchin *Lytechinus variegatus*.** Journal of World Aquaculture Society.199:353-369. (R/LR-A-21)

Herrnkind, W., M. Childress, and K. Lavalli. 2001. **Cooperative Defense and Other Benefits Among Exposed Spiny Lobsters: Inferences From Group Size and Behavior.** Marine and Freshwater Research. 52: 1113-24 (R/LR-B-50)

Kem, W.R., and F. Soti. 2001. ***Amphiporus* Alkaloid Multiplicity Implies Functional Diversity: Initial Studies on Crustacean Pyridyl Receptors.** Hydrobiologia. 456: 221-231 (R/LR-MB-9)

Kim, G., W.C. Burnett, P.W. Swarzenski, and W.S. Moore. 2001. **Measurement of ^{224}Ra and ^{226}Ra Activities in Natural Waters Using a Radon-in-air Monitor.** Environmental Science and Technology., 35, p 4680-4683. (R/C-E-42)

Larkin, S.L., and R.L. Degner. 2001. **The U.S. Wholesale Market for Marine Ornamentals.** Aquarium Sciences and Conservation. 3:13-24. (R/LR-A-23)

Larkin, S. 2001. **MAC Valuation Study at the University of Florida.** *OFI Journal*, Ornamental Fish International, 37(November 2001): 2-3. (R/LR-A-29)

Lin, J., and D. Zhang. 2001. **Effect of Broodstock Diet on Reproductive Performance of the Peppermint Shrimp, *Lysmata wurdemanni*.** Journal of Shellfish Research. 20(1)361-363. (R/LR-A-31)

Lin, J., and D. Zhang. 2001. **Reproduction in a simultaneous hermaphroditic shrimp, *Lysmata wurdemanni*: any two will do?** Marine Biology. 139:919-922 (R/LR-A-31)

Lin, J., M. Sparsis, and R.W. Hagood. 2001. **Growing Giant Clam *(Tridacna derasa)* in Aquaculture Effluent.** Aquarium Sciences and Conservation. 3:225-230. (E/INDST-1)

MacMahan, J. 2001**. Hydrographic Surveying from Personal Watercraft.** Journal of Surveying Engineering.127(1):12-24. (R/C-S-40)

Murray, M. M. 2001. **Survival and Diapause Egg Production of the Copepod *Centropages Hamatus* raised on Dinoflagellate Diets.** Journal of Experimental Marine Biology and Ecology. 270 (2002) 39-56 (R/LR-A-22)

Olave, S., E. Bustos, J.M. Lawrence, and P. Carcamo. 2001. **The Effect of Size and Diet on Gonad Production by the Chilean Sea Urchin Loxechinus Albus.** Journal of World Aquaculture Society. Vol 32(2): 210-214. (R/LR-A-21)

Robertson, D.N., M.J. Butler, and F.C. Dobbs. 2001. **An Evaluation of Lipid- and Morphometric-Based Indices of Nutritional Condition for Early Benthic Stage Spiny Lobsters, *Panulirus argus*.** Marine Freshwater Research. Vol. 33, pp. 161-171 (R/LR-B-50)

Sparsis, M., J. Lin, and R.W. Hagood. 2001. **Growth, Survivorship, and Nutrient Uptake of Giant Clams *(Tridacna)* in Aquaculture Effluent.** Journal of Shellfish Research. 20(1)171-176. (E/INDST-1)

Tilghman, G.C., R. Klinger-Bowen, and R. Francis-Floyd. 2001**. Feeding Electivity Indices in Surgeonfish (Acanthuridae) of the Florida Keys.** Aquarium Sciences and Conservation. 3:215-223. (R/LR-A-30)

Williamson, S.J., M.R. McLaughlin, and J.H. Paul. 2001. **Interaction of the ΦHSIC Virus with Its Host: Lysogeny or Pseudolysogeny?** Applied and Environmental Microbiology. 67(4)1682-1688. (R/LR-MB-3)

V. Graduate Thesis and Dissertations

Benner, R.A. 2001. **Evaluation of Putrescine, Cadaverine, and Indole as Chemical Indicators of Decomposition in Penaeid Shrimp.** Dissertation. Department of Food Science and Human Nutrition, University of Florida. (SGEP-12)

Cerveny, K.E., 2001. **Use of Bacteriophage as Therapy For Disease Caused by *Vibrio Vulnificus* in a Mouse Model and for Decontamination of Experimentally Infected Oysters.** Thesis. Molecular Genetics and Microbiology, University of Florida. (R/LR-Q-20)

Donaldson, K. 2001. **Molecular Evolution of a Coding and Non-Coding Region of the Mithochondrial Genome of Three Transisthmian Species of Fishes *(Centropomidae: Centropomus)*.** Dissertation. Department of Marine Sciences, University of South Florida (R/LR-B-39)

Eakin, S.B. 2001. **Zooplankton Abundance and Community Structure in Florida Bay, USA,** Thesis. Fisheries and Aquatic Sciences, University of Florida (R/C-E-36)

Hays, J.R. 2001. **Examination of a Crenulate Bay and Historic Infilling: Causes and Interpretations.** Thesis. Department of Civil and Coastal Engineering, University of Florida. (R/C-S-39)

Michael, J.R. 2001. **Planning for a Disaster Resilient Community: An Evaluation of Mitigation Planning in Escambia County, Florida.** Thesis. Department of Urban and Regional Planning, Florida State University. (R/C-P-22)

Murray, M. M. 2001. **Survival and Diapause Egg Production of the Copepod *Centropages Hamatus* raised on Dinoflagellate Diets.** Thesis. Department of Oceanopgraphy, Florida State University. (R/LR-A-22)

Osentoski, M. F. 2001. **Population genetic structure and male reproductive success of a Blanding's turtle (Emydoiea blandingii) population in southeaster Michigan.** Dissertation. University of Miami. (R/C-E-46)

Robertson, D. 2001. **The Implications of the Target-Area Hypothesis on the Population Dynamics of the Spotted Spiny Lobster, Panulirus Guttatus.** Dissertation. Old Dominion University. (R/LR-B-45)

VI. Florida Sea Grant Extension Publications

Adams, C., and Lazue, A. 2001. **Economic Considerations for the Prospective Mudminnow Culturist in Florida.** University of Florida, Gainesville. EDIS FE-309 (SGEP-12)

Adams, C., Phillippakos, E., Hodges, A., and Mulkey, D. 2001. **An Overview of the Relative Economic Importance of Florida's Coastal Counties.** University of Florida, Gainesville. EDIS FE-306(SGEP-12)

Corbett, D.R., W.C. Burnett, and J.P. Chanton. 2001. **Submarine Groundwater Discharge.** SGEB-54. (SGEP-12)

Crane, M. 2001. **Turtle Tracks - Sea Turtle Conservation in Miami-Dade County.** SGEF-141. (SGEP-12)

Florida Sea Grant College Program. 2001. **Florida Sea Grant College Program Strategic Plan Executive Summary 2002-2005.** SGEF-140. (M/PM-12)

Florida Sea Grant Extension Program. 2001. **Venting - A Guide to Releasing Reef Fish with Ruptured Swimbladders.** SGEF-46. (SGEP-12)

Hauxwell, J., C. Jacoby, T.K. Frazer, and J. Stevely. 2001. **Nutrients and Florida's Coastal Waters.** SGEB-55. (SGEP-12)

Hodges, A., Mulkey, D., Phillippakos, E., and Adams, C. 2001. **Economic Impact of Florida's Commercial Fisheries and Aquaculture Industries.** University of Florida, Gainesville. EDIS FE-280 (SGEP-12)

Seaman, W., and A. Hoover. 2001. **Artificial Reefs: The Florida Sea Grant Connection.** SGEF-144. (M/PM-12)

Stephan, K. and Adam, C. 2001. **Recreational Fishing License Sales in Florida: 1990-2000.** University of Florida, Gainesville. EDIS FE-302 (SGEP-12)

Tavares, S., and M. Crane. 2001. **Don't Splash Your Trash ... Get a Grip on It!** SGEF-142. (SGEP-12)

VII. Extension Newsletters

Crane, M. 2001. **At the Waters Edge.** October-November, Volume 1, Issue 1. (SGEP-12)

Florida Bay Project Staff. 2001. Florida Bay Watch Report. (SGEP-12)
Mangroves in Florida Bay: Dying-Back (Again)? January 2001.
The Plume and the Bloom. August 2001.
South Florida's "Current" Concerns Require a Global View. October 2001.

Novak, R. 2001. In Charlotte County Extension Newsletter. (SGEP-12)
RedStart. Volume 15, Number 1, Page 5.
New Marine Newsletter. Volume 15, Number 4, Page 3.
Preparing Your Boat for a Hurricane. Volume 15, Number 6, Page 4.
Whales Drawn to Waters off Mississippi River Delta. Volume 15, Number 9, Page 8.
UF Experts Assist Statewide Clean Marina Program. Volume 15, Number 10, Page 8.
Venting Reduces Mortality in Bottom Fish. Volume 15, Number 10, Page 8.

Sweat, D. 2001. **Marine Times.** January-March, Volume 24, Number 1, April-June, Volume 24, Number 2, July-September, Volume 24, Number 3, October-December, Volume 24, Number 4. (SGEP-12)

Verlinde, C., A. Diller, and S. Jackson. 2001. **Emerald Currents.** August, Issue Number 08/01. (SGEP-12)

VIII. Miscellaneous Staff Papers and Conference Proceeding

Adams, C. 2001. **New Approaches to Management and Allocation.** In: RecFish 2000: Managing Marine Recreational Fisheries in the 21st Century. San Diego, CA. 1:85-92 (SGEP-13)

Adams, C. 2001. **Outlook 2001: Seafood.** In: Florida Food and Resource Economics, Number 146. University of Florida, Gainesville, FL. November-December 2000. p. 6. (SGEP-12)

Adams, C., Andrew, C.O., and J.L. Herman. 2001. **1st Annual FRE Graduate Student Symposium.** In: Teaching and Learning Paper Series. TLP 01-7. University of Florida, Gainesville, FL. (SGEP-12)

Ault, J.S., S.G. Smith, G.A. Meester, J. Luo, and J.A. Bohnsack. 2001. **Site Characterization for Biscayne National Park: Assessment of Fisheries Resources and Habitats.** Staff Paper. Final Report. (R/LR-B-47)

Creswell, R.L.(Editor) 2001. **GCFI Proceedings of the Fifty-Second Annual Gulf and Caribbean Fisheries Institute.** Key West, Florida, November 1999. (PD-99-12)

Deas, A., Taylor, T.G., Reynolds, J.E., and C. Adams. 2001. **Information Technology in the U.S. Economy.** In: Teaching and Learning Paper Series. TLP 01-9. University of Florida, Gainesville, FL. (SGEP-12)

Florida Department of Agriculture and Consumer Services. 2001. **New Oyster Product: Processing and Market Research.** Miscellaneous Staff Paper. (R/LR-Q-21A)

Hutchinson, S., S. Larkin, C. Adams, and D. Lee. 2001. **A Comprehensive Analysis of Fishing Effort, Participation, and Landings Data for South Florida Fisheries 1994-98.** Staff Paper SP01-9. Food and Resource Economics, University of Florida, Gainesville, FL. (R/LR-E-18A)

Hutchinson, S., S. Larkin, D. Lee, and C. Adams. 2001. **Economic Assessment of Limited Entry Strategies in Multi-species Fisheries in South Florida.** In: Proceedings of the 53rd Annual Meeting of the Gulf and Caribbean Fisheries Institute, University of Miami, Miami, FL. 393-405: 12pp. (R/LR-E-18)

Kane, M., and N.L. Philman, 2001. **Influence of Stage II Cytokinin Selection on Rooting and Acclimatization of Native Coastal and Wetland Plants.** P-21. In: Invitro Volume 37, #3, Part II: Pg 11-A, St. Louise, Missouri. (R/C-S-36)

Kane, M., and N.L. Philman, 2001. **In Vitro Culture for Habitat Revegetation: Issues & Opportunities.** P-4. In: Invitro Volume 37, #3, Part II: Pg 7-A, St. Louise, Missouri. (R/C-S-36)

Larkin, S.L., Degner, R., Lee, D., and C. Adams. 2001. **Perceptions and Market Opinions of U.S. Marine Ornamental Wholesalers.** In: Second International Conference on Marine Ornamentals: Collection, Culture and Conservation. University of Florida, Gainesville (R/LR-A-29)

Larkin, S.L., Rubinstein, W., and Degner, R. 2001. **Value and Demand for MAC-Certification.** In: Second International Conference on Marine Ornamentals: Collection, Culture and Conservation. University of Florida, Gainesville (R/LR-A-29)

Larkin, S.L., Tucker, J.E., and Degner, R.L. 2001. **Developing an Internet Instrument: Application for Florida Sea Grant Marketing Study.** Staff Paper SP01-8. Food and Resource Economics, University of Florida, Gainesville, FL. (R/LR-A-29)

Larkin, S.L., D.J. Lee, R.L. Degner, J.W. Milon, and C.M. Adams. 2001. **Florida's Ornamental Marine Life Industry.** In: Second International Conference and Exhibition: Marketing and Shipping Live Aquatic Products, ed. B. Paust, University of Alaska Sea Grant, Fairbanks, AK-SG-01-03. (R/LR-A-23)

Rubec, P.J., S.G. Smith, M.S. Coyne, M. White, A. Sullivan, T. MacDonald, R.H. McMichael, Jr., M.E. Monaco, and J.S. Ault. 2001. **Spatial Modeling of Fish Habitat Suitability in Florida.** In: Proceedings of 17th Lowell Wakefield Fisheries Symposium, Spatial Processes and Management of Marine Fish Populations. Alaska Sea Grant College, Fairbanks, Alaska. (R/LR-B-47)

Stein, T.V. 2001. **Developing a Recreation Management Strategy for Rookery Bay National Estuarine Research Reserve**. In: Proceedings of the 12th Biennial Coastal Zone Conference, Cleveland, OH, July 15-19, 200l. (PD-99-11)

IX. Fathom

X. Posters

Adams, C. and Larkin, S. 2001. **Reported Trip Costs and Estimated Earnings for U.S. Atlantic Pelagic Longline Vessels.** Thesis. Marine Economics. (SGEP-12)

XI. Videos

XII. CD-ROM Releases

None

XIII. Software

XIV. Home Page

Florida Sea Grant Home Page.

I. Florida Sea Grant Reports

National Seafood HACCP Alliance. 2000. **Sanitation Control Procedures for Processing Fish and Fishery Products.** Seafood HACCP Alliance Course - First Edition for Training and Education. SGR-119. (E/TP-1)

National Seafood HACCP Alliance. 2000. **Sanitation Control Procedures for Processing Fish and Fishery Products**. Seafood HACCP Alliance Course - First Edition for Training and Education. Spanish Edition of SGR-119. SGR-122. (E/TP-2)

II. Florida Sea Grant Technical Papers

Antonini, G., N. West, C. Sidman, and R. Swett. 2000. **A Recreational Boater-Based Method for Re-designing the NOS Small-Craft Chart.** TP-107. (E/CSC-4)

Antonini, G.A., R. Swett, S. Schulte, and D. Fann. 2000. **Regional Waterway Management System for South Sarasota County.** TD-1 - Revised. (SAR-1)

Blake, N.J., C. Adams, R. Degner, D. Sweat, S. Moss, and Leslie Sturmer. 2000. **Aquaculture and Marketing of the Florida Bay Scallop in Crystal River, Florida.** TP-106. (R/LR-A-20)

Cato, J.C., and W. Seaman. 2000. **Science Serving Coastal Florida: Florida Sea Grant Delivering Results! 2000. TP**-104. (M/PM-12)

Florida Sea Grant College Program. 2000. **Florida Sea Grant College Program Year 2000 - Implementation Plan.** TP-100 - Revised. (M/PM-12)

Sidman, C., A. Antonini, S. Sauers, G. Jones, and N. West. 2000. **Evaluating Recreational Boating Patterns at Selected Sites in Southwest Florida for Regional Anchorage Management.** TP-105. (E/CSC-3)

Smith, S., S. Jacob, C. Adams, G. Israel, G. Evans, J. Gates, and M. Zacks. 2000. **The Impacts of the Florida Net Ban on Commercial Fishing Families.** TP-101. (R/LR-E-17)

Swett, R.A., D.A. Fann, G.A. Antonini, and L.C. Alexander. 2000 **Regional Waterway Management System for Lee County, Phase 1.** TD-3. (E/CSC-4)

Swett, R.A., G.A. Antonini, and S. Schulte. 2000. **Regional Waterway Management System for North Manatee County.** TD-2 - Revised. (E/CSC-1, E/CSC-2)

III. Books and Book Chapters

Allemand, D., E. Debernardi, and W. Seaman, Jr. 2000. **Artificial Reefs in the Principality of Monaco: Protection and Enhancement of Coastal Zones.** In: A.C. Jensen, K.J. Collins and A.P.M. Lockwood, eds. Artificial Reefs in European Seas. Kluwer Academic Publishers, London. pp. 151-166. (M/PM-12)

Bortone, S.A. 2000. **Seagrasses: Monitoring, Ecology, Physiology, and Management.** CRC Press, Boca Raton, Florida. 318 pp. (PD-98-3)

Butler, M.J., IV, and W.F. Herrnkind. 2000. **Puerulus and Juvenile Ecology.** In: Spiny Lobster Management. B. Phillips, S. Cobb, and J. Kittaka (editors). Blackwell Press, Oxford. 15:276-301. (R/LR-B-50)

Cato, J.C., and C.A. Lima dos Santos. 2000. **Costs to Upgrade the Bangladesh Frozen Shrimp Processing Sector to Adequate Technical and Sanitary Standards and to Maintain a HACCP Program.** In: The Economics of HACCP: New Studies of Costs and Benefits. L. Unnevehr (editor). Eagan Press, St. Paul, MN. pp. 385-402. (M/PM-12)

Seaman, W. Jr. 2000. **Artificial Reef Evaluation – with Application to Natural Marine Habitats.** ISBN 0-8493-9061-3. CRC Press. 246 pp. (M/PM-12)

Seaman, W., Jr., and A.C. Jensen. 2000. **Purposes and Practices of Artificial Reef Evaluation.** In: W. Seaman, Jr., ed. Artificial Reef Evaluation. CRC Press, Boca Raton. pp. 1-19. (M/PM-12)

IV. Journal Articles

Benetti, D.D., and J. Alarcón. 2000. **General Prophylaxis and Quarantine of Marine Brood Fish.** The Advocate, Global Aquaculture Alliance Technical Magazine. 3(5):60-61. (R/LR-A-35)

Corbett, D.R, Kump, L., Dillon, K., Burnett, W., and CHanton, J. 2000. **Fate of wastewater-borne nutrients under low discharge conditions in the subsurface of the Florida Keys, USA.** Marine Chemistry 69: 99-115 (R/C-E-42)

Deyle, R.E., and R.A. Smith. 2000. **Risk-Based Taxation of Hazardous Land Development.** Journal of the American Planning Association. 66(4):421-434. (R/C-P-21)

Dillon, K.S., D.R. Corbett, J.P. Chanton, W.C. Burnett, and L. Kump. 2000. **Bimodal Transport of a Waste Water Plume Injected into Saline Ground Water of the Florida Keys.** Ground Water. 38(4):624-634. (R/C-E-37)

George, S.B., J.M. Lawrence, A.L. Lawrence, and J. Ford. 2000. **Fertilization and Development of Eggs of the Sea Urchin Lytechinus Variegatus Maintained on an Extruded Feed.** Journal of the World Aquaculture Society. 31(2):232-238 (R/LR-A-21)

Jeedigunta, S., J.M. Krenisky, and R.G. Kerr. 2000. **Diketopiperazines as Advanced Intermediates in the Biosynthesis of Ecteinascidins.** Tetrahedron. 56:3303-3307. (R/LR-MB-6)

Larkin, S.L., Adams, C.M., and D.J. Lee. 2000. **Reported Trip Coss, Gross Revenues, and Net Returns for U.S. Atlantic Pelagic LongLine Vessels.** Marine Fisheries Review. 62 (2), 2000 49-60 (SGEP-12)

Lawrence, J.M. 2000. **Conflict Between Somatic and Gonadal Growth in Sea Urchins: A Review.** Workshop on the Coordination of Green Sea Urchin Research in Atlantic Canada Moncton, New Brunswick, Canada. 1-2 June 2000. (R/LR-A-21)

Lawrence, J.M., and J. Herrera. 2000. **Stress and Deviant Reproduction in Echinoderms.** Zoological Studies. 39(3):151-171. (R/LR-A-21)

Lee, D.J., S.L. Larkin, and C.M. Adams. 2000. **A Bioeconomic Analysis of Management Alternatives for the U.S. North Atlantic Swordfish Fishery.** Marine Resource Economics. 15:77-96. (SGEP-12)

Paul, J.H., M.R. McLaughlin, D.W. Griffin, E.K. Lipp, R. Stokes, and J.B. Rose. 2000. **Rapid Movement of Wastewater from On-site Disposal Systems into Surface Waters in the Lower Florida Keys.** Estuaries. 23(5):662-668. (R/LR-MB-3)

Pitcher, T.J., and W. Seaman, Jr. 2000. **Petrarch's Principle: How Protected Human-Made Reefs Can Help the Reconstruction of Fisheries and Marine Ecosystems.** Fish and Fisheries. 1:73-81. (M/PM-12)

Ranamukhaarachchi, D.G., M.E. Kane, C.L. Guy, and Q.B. Li. 2000. **Modified AFLP Technique for Rapid Genetic Characterization in Plants.** Bio Techniques. 29(4):856-866. (R/C-S-36)

Robertson, D.N., M.J. Butler, and F.C. Dobbs. 2000. **An Evaluation of Lipid- and Morphometric-Based Indices of Nutritional Condition for Early Benthic Stage Spiny Lobsters, *Panulirus argus*.** Marine Freshwater Behavioral Physiology. 33:161-171. (R/LR-B-50)

Sharp, W.C., W.A. Lellis, M.J. Butler, W.F. Herrnkind, J.H. Hunt, M. Pardee-Woodring, and T.R. Matthews. 2000. **The Use of Coded Microwire Tags in Mark-Recapture Studies of Juvenile Caribbean Spiny Lobster, *Panulirus argus*.** Journal of Crustacean Biology. 20(3):510-521. (R/LR-B-50)

Willoughby, R., and S.A. Pomponi. 2000. **Quantitative Assessment of Marine Sponge Cells *In vitro*: Development of Improved Growth Medium.** In Vitro Cell Development Biology-Animal. 36:194-200. (R/LR-MB-5)

V. Graduate Theses and Dissertations

Anastasiou, C.J. 2000. **Temporal Effects of Soil PH, Redox Potential, and Elevation on *Spartina patens* Planted at a West Central Florida Salt Marsh Restoration Site.** Thesis. Department of Biology, University of South Florida. (AFAMS-2000)

Andorfer, John. 2000. **Physiological Integration and Translocation of Carbon and Nitrogen in the Seagrass *Thalassia testudinum* Banks Ex König.** Dissertation. Department of Biology, University of South Florida. (AFAMS/OS-2000)

Boswell, M.R. 2000. **Redefining Environmental Planning: Evidence of the Emergence of Sustainable Development and Ecosystem Management in Planning for the South Florida Ecosystem.** Dissertation. Department of Urban and Regional Planning, Florida State University. (R/C-P-21)

Denny, C.B., 2000. **Do They Want To Learn? Investigating Visitors' Preference and Motivations For Recreation Opportunities in the Ocala National Forest, Florida.** Thesis. School of Forest Resources and Conservation, University of Florida. (PD-99-11)

De Oliveira, A.C.M. 2000. **Quality Aspects of Cultured Gulf of Mexico Sturgeon, *Ancipenser oxyrhynchus desotoi* As Potential Food Commodity**. Dissertation. Food Science and Human Nutrition, University of Florida (R/LR-Q-20)

Dolan, T.W. 2000. **Modeling Aggregation of Juvenile Caribbean Spiny Lobster, *Panulirus argus*.** Thesis. Old Dominion University. (R/LR-B-50)

Enright, E. 2000. **cDNA Library Construction in *Axinella corrugata (=T. morchella*).** Non-Thesis agree. Florida Institute of Technology. (R/LR-MB-5)

Glancy, T.P. 2000. **A Comparison of Seagrass, Oyster Reef, and Salt Marsh Edge as Habitat for Decapod Crustaceans.** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-46)

Hepner, T.L. 2000. **Effect of El Niño (1997-98) on the Peninsular Gulf Coast of Florida.** Thesis. Department of Geology, University of South Florida. (PD-98-8)

Hill, S. 2000. **Effects of Abiotic and Biotic Stress on the Energy Budgets of *Arbacia punctualata* and *Lytechinus variegatus* (Echinodermata: Echinoidea).** Dissertation. Department of Biology, University of South Florida. (R/LR-A-21)

Islam, A.K.M. 2000. **Post Storm Model for the Reconstruction of Habitable Coastal Structures.** Thesis. Department of Civil and Environmental Engineering, Florida A&M University. (R/C-D-17)

Jarrell, J.L. 2000. **Use of a Synthetic Polypeptide to Determine the Sex and Reproductive Status of Field-Caught Red Grouper, *Epinephelus morio*.** Thesis. Department of Marine Science, University of South Florida. (AFAMS-2000)

Matera, J.A. 2000. **Open Ocean Cage Aquaculture: An Internship Report.** Thesis. M.A. Marine Affairs, University of Miami. (R/LR-A-35)

McLaughlin, M.R. 2000. **Evaluation of the *Bacteroides fragilis* Phase Assay as an Alternative Indicator of Sewage Pollution**. Thesis. Department of Marine Science, University of South Florida. (R/C-E-41)

Notestein, S.K. 2000. **Physical, Chemical, and Vegetative Characteristics of the Chassahowitzka River.** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-B-46)

Plank, L.R. 2000. **The Effect of Dietary Carotenoids on Carotenoid Profiles and Gonad Growth, Development and Color in *Lytechinus variegatus* (Lamarck) (Echinodermata: Echinoidea).** Thesis. Department of Biology, University of South Florida. (R/LR-A-21)

Ranamuka Arachchi, D. 2000. **Molecular Analysis of Genetic Diversity in Four Florida Sea-Oats *(Uniola paniculata)* Populations: New Approaches to Generate and Analyze Molecular Data.** Dissertation.. Department of Environmental Horticulture, University of Florida. (R/C-S-36)

Ross, M.P. 2000. **The Influence of Exposure to Carbon Monoxide on the Quality Attributes for Yellowfin Tuna Muscle.** Thesis. Department of Food Science and Human Nutrition, University of Florida. (SGEP-12)

Sherman, R.L. 2000. **Studies on the Roles of Reef Design and Site Selection in Juvenile Fish Recruitment to Small Artificial Reefs.** Dissertation. Department of Oceanography, Nova Southeastern University. (AFAMS-00)

Thornton, R.S. 2000. **Aquaculture of Pseudopterogorgia Elisabethae and Induction of Pseudopterosins.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-8)

Tilghman, G. Christopher. 2000. **Feeding Electivity Indices and Nutritional Values of Forage Items of Surgeonfish (Acanthuride) of the Florida Keys.** Thesis. Department of Fisheries and Aquatic Sciences, University of Florida. (R/LR-A-24)

VI. Florida Sea Grant Extension Publications

Adams, C., P.S. Vega, and A.G. Alvarez. 2000. **An Overview of the Cuban Commercial Fishing Industry and Recent Changes in Management Structure and Objectives.** Food and Resource Eonomics , University of Florida, Gainesville, FL. EDIS Document FE 218. 12 pp. (SGEP-12)

Adams, C. 2000. **Since the Net Ban: Changes in Commercial Fishing in Florida.** SGEF-117. (R/LR-E-17)

Antonini, G., N. West, C. Sidman, and R. Swett. 2000. **A Recreational Boater-Based Method for Re-designing the NOS Small-Craft Chart.** Executive Summary. SGEF-139. (E/CSC-4)

Antonini, G. 2000. **Forks of the Loxahatchee River.** Photomap. SGEF-136. (E/CSC-1)

Antonini, G. 2000. **Jupiter Inlet Vicinity.** Photomap. SGEF-137. (E/CSC-1)

Antonini, G. 2000. **Jupiter Inlet Vicinity Boating Infrastructure.** Photomap. SGEF-138. (E/CSC-1)

Antonini, G. 2000. **Loxahatchee River Central Embayment.** Photomap. SGEF-135. (E/CSC-1)

Crane, M.G. 2000. **Sea Turtle Nesting Season.** SGEF-131. (SGEP-12)

Florida Sea Grant College Program. 2000. **Florida Sea Grant Publication and Communication Support Guidelines.** SGEF-133. (M/PM-12)

Florida Sea Grant College Program. 2000. **Internet Directory of Marine Education and Research Organizations in Florida.** SGEF-132. (SGEP-12)

Florida Sea Grant College Program. 2000. **Science Serving Coastal Florida: Florida Sea Grant Program Directory 2000-2002.** SGEF-122. (SGEP-12)

Novak, R. 2000. **Boater's Guide to Charlotte Harbor.** SGEB-52. (SGEP-12)

Novak, R. 2000. **Release Techniques for Marine Fishes.** SGEF-121. (SGEP-12)

Philippakos, E., A.W. Hodges, D. Mulkey, and C.M. Adams. 2000. **The Manatee and Sarasota County Economies: An Overview.** Food and Resource Economics, University of Florida, Gainesville, FL. EDIS Document FE 178. (SGEP-12)

Seaman, W., Jr., and J. Whitehouse. 2000. **A Resource for Marine Educators.** SGEF-123. (M/PM-12)

Stevely, J., and D. Sweat. 2000. **The Biology and Fishery of Florida's Commercial Sponges.** SGEF-119. (SGEP-12)

Sweat, D.E. 2000. **Fish Facts for Florida Consumers - Blue Crab.** SGEF-120. (SGEP-12)

VII. Extension Newsletters

Florida Bay Project Staff. 2000. Florida Bay Watch Report. (SGEP-12)
Destructive Urchin Grazing in a Seagrass Bed in Western Florida Bay: When Should Resource Managers Intervene? May 2000.
Florida Bay's Murky Past. July 2000.
Rust and Rotten Eggs: Iron and Sulfur in Florida Bay. August 2000.
The Plume and the Bloom. August 2001.

Florida Bay Project Staff. 2000. **Seahorse Sentinel.** Winter, Volume 2, Number 3, Spring, Volume 2, Number 4, Summer, Volume 3, Number 1, Volume 3, Number 2. (SGEP-12)

Novak, R. 2000. In Charlotte County Extension Newsletter. (SGEP-12)
Coastal Trees Falling Victim to Saltwater Exposure. January, Volume 14, Number 1, Page 3.
Attention Boaters! January, Volume 14, Number 1, Page 13.
National Symposium on Catch and Release in Marine Recreational Fisheries. February, Volume 14, Number 2, Page 13.
Bay Scallops. April, Volume 14, Number 4, Page 4.
1998 Aquaculture Census Catches Nearly $1 Billion in U.S. Sales. Volume 14, Number 4, Page 12.
Crevalle Jack: More than a Good Fighter! Volume 14, Number 5, Page 3-4.
Waste Not, Want Not!! Volume14, Number 8, Page 8-9.
Sharks!! Volume 14, Number 9, Page 6.
Marine Update. Volume 14, Number 9, Page 8.
Tis' the Season for Seafood. Volume 14, Number 11, Page 5.
Oyster Stuffing and Roasted Oysters. (Holiday Recipes) Volume 14, Number 11.

Stevely, J.M. 2000. **The Marine Scene.** January-February, Volume 41, Number 1. (SGEP-12)

Sweat, D. 2000. **Marine Times.** January-March, Volume 23, Number 1, April-June, Volume 23, Number 2, July-September, Volume 23, Number 3, October-December, Volume 23, Number 4. (SGEP-12)

VIII. Miscellaneous Staff Papers and Conference Proceedings

Adams, C. 2000. **An Overview of the Cuban Commercial Fishing Industry and Implications to the Florida Seafood Industry of Renewed Trade.** International Working Paper IW93-3. Food and Resource Economics. University of Florida, Gainesville, FL. EDIS Series FE 162. 12 pp. (SGEP-12)

Adams, C., P.S. Vega, and A.G. Alvarez. 2000. **An Overview of the Cuban Commercial Fishing Industry and Recent Changes in Management Structure and Objectives.** In: Proceedings of the International Institute of Fisheries Economics and Trade Conference, Corvallis, OR. 7 pp. (SGEP-12)

Adams, C.M., D. Mulkey, A. Hodges, and J.W. Milon. 2000. **Development of an Economic Impact Assessment Methodology for Occurrence of Red Tide.** Staff Paper SP 00-12. Food and Resource Economics, University of Florida, Gainesville, FL. (SGEP-12)

Adams, C., P.S. Vega, and A.G. Alvarez. 2000. **Recent Changes in Management Structure and Strategies of the Cuban Fishing Industry.** In: Proceedings of the Annual Meeting of the Association for the Study of the Cuban Economy. 8 pp. (SGEP-12)

Frazer, T.K., S.B. Blitch, M.H. Posey, T.D. Alphin, and T.P. Glancy. 2000. **Habitat Use by Juvenile Blue Crabs Along Florida's North Central Gulf Coast.** Miscellaneous Staff Paper presented at the 29th Annual Benthic Ecology Meeting, University of North Carolina, Wilmington, 9-12 March. (R/LR-B-46)

Hutchinson, S., S.Larkin, W. Milon, D. Lee, and C. Adams. 2000. **Economic Assessment of Limited Entry Strategies in Multi-Species Fisheries in South Florida.** Abstract In: Proceedings of the Gulf and Caribbean Fisheries Institute, 53rd Annual Meeting, November 6-10. (SGEP-12)

Philippakos, E., A.W. Hodges, D. Mulkey, and C.M. Adams. 2000. **The Economy of Manatee and Sarasota Counties.** Staff Paper SP 00-1. Food and Resource Economics, University of Florida, Gainesville, FL. 60 pp. (SGEP-12)

Posey, M., T. Alphin, T. Frazer, S. Blitch, and T. Glancy. 2000. **Juvenile Blue Crab Habitat Use in Southeastern North Carolina.** Miscellaneous Staff Paper presented at the 29th Annual Benthic Ecology Meeting, University of North Carolina, Wilmington, 9-12 March. (R/LR-B-46)

Seaman, W. 2000. **Evaluating Human-Made Marine Reefs for Economic, Engineering and Ecological Performance.** In: Soon Kil Yi, ed. Proceedings of the International Symposium on Marine Ranching Toward 21st Century, Ministry of Marine Affairs and Fisheries, Republic of Korea, Seoul. November 20-26, 2000. pp. i-xiv. (M/PM-12)

IX. Fathom

X. Posters

None

XI. Videos

None

XII. CD-ROM Releases

None

XIII. Software

None

XIV. Home Page

Florida Sea Grant Home Page.

I. Florida Sea Grant Reports

Milon, J.W., S.L. Larkin, and N.M. Ehrhardt. 1999. **Bioeconomic Models of the Florida Commercial Spiny Lobster Fishery.** SGR-117. (R/LR-E-16)

II. Florida Sea Grant Technical Papers

Ankersen, T.T., and R. Hamann. 1999. **Anchoring Away: Government Regulation and The Rights of Navigation in Florida.** TP-99. (R/C-P-23)

Florida Sea Grant College Program. 1999. **1999 Revision - 1998-1999 Implementation Plan.** TP-100. (M/PM-12)

Grantham, S., and D. Jacobs. 1999. **Internet Conference - Strategic Planning Report: Second Sea Grant Web Meeting.** TP-97. (COMM-4)

Grantham, S., and M. Barrett-O'Leary. 1999. **Invasive Species and Ballast Water Management in the Gulf of Mexico Region**. Workshop Proceedings. TP-102 (A/ZM-2)

Swett, R.A., G.A. Antonni, and S. Schulte. 1999. **Regional Waterway Management System for North Manatee County.** TD-2. (E/CSC-1, E/CSC-2)

Tomerlin, A.T., and C. Adams. 1999. **Economics of Harmful Algal Blooms (HABs): An Annotated Bibliography.** TP-98. (SGEP-12)

III. Books and Book Chapters

Cato, J.C., and C.M. Adams. 1999. **Economic Significance of the Gulf of Mexico Related to Population, Income, Employment, Minerals, Fisheries and Shipping.** Chapter 2. In: The Large Marine Ecosystems of the Pacific Rim: Large Marine Ecosystems Series. Blackwell Science. Malden, MA. pp. 14-32.

Hartt, W.H. 1999. **The Slope Parameter Approach to Marine Cathodic Protection Design and Its Application to Impressed Current Systems.** In: Designing Cathodic Protection Systems for Marine Structures and Vehicles, STP 1370, H.P. Hack, Editor. Book Chapter, 16 pp. American Society for Testing amd Materials, West Conshohocken, PA. (R/C-D-16)

Herrnkind, W.F., M.J. Butler, and J.H. Hunt. 1999. **A Case for Shelter Replacement in a Disturbed Spiny Lobster Nursery in Florida: Why Basic Research Had to Come First.** In: Proceedings of the Sea Grant Symposium on Fish Habitat: "Essential Fish Habitat and Rehabilitation", Lee R. Benaka, Editor. Book Chapter, American Fisheries Society, Bethesda, MD. 22:421-437. (R/LR-B-45)

IV. Journal Articles

Acosta, C.A., and M.J. Butler, IV. 1999. **Adaptive Strategies that Reduce Predation on Caribbean Spiny Lobster Postlarvae During Onshore Transport.** Limnology and Oceanography. 44(3):494-501. (R/LR-B-45)

Adams, C.M., D.W. Mulkey, and A. Hodges. 1999. **Economic Importance of the San Carlos Shrimp Processing Industry to the Lee County Economy.** In: SGR-124: Florida's Coastal Environmental Resources: A Guide to Economic Valuation and Impact Analysis. Pg. 131-144. Food and Resource Economics. University of Florida, Gainesville. (SGEP-13)

Adams, C. 1999. **Flounder Management Plan - Economics of Industry.** Gulf States Marine Fisheries Commission. Ocean Springs, MS. (in press.)

Adams, C. 1999. **Seafood Outlook.** Food and Resource Economics No. 144. University of Florida, Gainesville.

Adams, C. 1999. **Spotted Seatrout Management Plan - Economics of Industry.** Gulf States Marine Fisheries Commission. Ocean Springs, MS. (in press.)

Andrade, P., R. Willoughby, S.A. Pomponi, and R.G. Kerr. 1999. **Biosynthetic Studies of the Alkaloid, Stevensine, in a Cell Culture of the Marine Sponge *Teichaxinella morchella*.** Tetrahedron Letters. 40:4775-4778. (R/LR-MB-6)

Ault, J.S., G.A. Diaz, S.G. Smith, J. Luo, and J.E. Serafy. 1999. **An Efficient Sampling Survey Design to Estimate Pink Shrimp Population Abundance in Biscayne Bay, Florida.** North American Journal of Fisheries Management. 19:696-712. (R/LR-B-47)

Benetti, D.D. 1999. **Marine Finfish Commercial Hatchery in the Florida Keys Reports on First Production Trials of Mutton Snapper.** The Advocate, Global Aquaculture Alliance Technical Magazine. 2(6):56. (R/LR-A-35)

Boswell, M.R., R.E. Deyle, R.A. Smith, and E.J. Baker. 1999. **A Quantitative Method for Estimating Probable Public Costs of Hurricanes.** Environmental Management. 23(3):359-372. (R/C-P-21)

Butler, M.J., IV, A.B. MacDiarmid, and J.D. Booth. 1999. **The Cause and Consequence of Ontogenetic Changes in Social Aggregation in New Zealand Spiny Lobsters.** Marine Ecology Progress Series. 188:179-191. (R/LR-B-45)

Chapman, R.W., G.R. Sedberry, C.C. Koenig, and B.M. Eleby. 1999. **Stock Identification of Gag, Mycteroperca microlepis, Along the Southeast Coast of the United States.** Marine Biotechnology. 1:137-146. (R/LR-B-32)

Corbett, D.R., J. Chanton, W. Burnett, K. Dillon, C. Rutkowski, and J. Fourqurean. 1999. **Patterns of Groundwater Discharge into Florida Bay.** American Society of Limnology and Oceanography. 44(4): 1045-1055. (R/C-E-37)

Dillon, K.S., D.R. Corbett, J.P. Chanton, W.C. Burnett, and D.J. Furbish. 1999. **The Use of Sulfur Hexaflouride (SF6) as a Tracer of Septic Tank Effluent in the Florida Keys.** Journal of Hydrology. 220:129-140. (R/C-E-37)

Donaldson, K.A., and R.R. Wilson, Jr. 1999. **Amphi-Panamic Geminates of Snook (Percoidei: Centropomidae) Provive a Calibration of the Divergence Rate in the Mitochondrial DNA Control Region of Fishes.** Molecular Phylogenetics and Evolution. 13(1):208-213. (R/LR-B-39)

Hill, S.K., and J.M. Lawrence. 1999. **Effects of Food and Temperature on the Energy Budget of *Arbacia punctulata* and *Lytechinus variegates*.** Echinoderm Research 1998. pp. 73-78. (R/LR-A-21)

Lapointe, B.E. 1999. **Simultaneous Top-Down and Bottom-Up Forces Control Macroalgal Blooms on Coral Reefs.** Limnology and Oceanography. 44(6):1586-1592. (R/C-E-34)

McBride, S.C., J.M. Lawrence, A.L. Lawrence, and T.J. Mulligan. 1999. **Ingestion, Absorption, and Gonad Production of Adult *Strongylocentrotus franciscanus* Fed Different Rations of a Prepared Diet.** Journal of the World Aquaculture Society. 30(3):364-370. (R/LR-A-21)

Pomponi, S.A. 1999. **The Bioprocess--Technological Potential of the Sea.** Journal of Biotechnology. 70::5-13. (R/LR-MB-5)

Rubec, P.J., J.C.W. Bexley, H. Norris, M.S. Coyne, M.E. Monaco, S.G. Smith, and J.S. Ault. 1999. **Suitability Modeling to Delineate Habitat Essential to Sustainable Fisheries.** American Fisheries Society Symposium. 22:108-133. (R/LR-B-47)

Rutkowski, C.M., W.C. Burnett, R.L. Iverson, and J.P. Chanton. 1999. **The Effect of Groundwater Seepage on Nutrient Delivery and Seagrass Distribution in the Northeastern Gulf of Mexico.** Estuaries. 22(4):1033-1040. (R/C-E-37)

V. Graduate Theses and Dissertations

Andrade, P. 1999. ***In Vitro* Biosynthetic Studies of Stevensine, a Natural Product from the Sponge *Teichaxinella morchella*.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-6)

Fawehinmi, H.A. 1999. **An Efficient Preparation of β-Mercaptopyruvic acid, a Putative Intermediate in Ecteinascidin Biosynthesis.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-6)

Jeedigunta, S. 1999. **Synthesis and Testing the Intermediacy of Diketopiperazines as Intermediates in the Biosynthesis of Ecteinascidins.** Thesis. Department of Chemistry and Biochemistry, Florida Atlantic University. (R/LR-MB-6)

Luzuriaga, D.A. 1999. **Application of Computer Vision and Electronic Nose Technologies for Quality Assessment of Color and Odor of Shrimp and Salmon.** Dissertation. Department of Food Science and Human Nutrition, University of Florida. (R/LR-Q-20)

MacDonald, J.S. 1999. **Comparison of Risk-Based and Ad Valorem Taxes to Fund Local Hurricane Emergency Management Services in Lee County, Florida.** Thesis. Department of Urban and Regional Planning, Florida State University. (R/C-P-21)

McClellan, R.D. 1999. **Method of Estimating the Nearshore Sea Severity at the Time of Hurricane Landing as Applied to the Florida Coast.** Thesis. Department of Coastal and Oceanographic Engineering, University of Florida. (R/C-S-37)

Schratwieser, J.E. 1999. **The Impact of Resident and Transient Predators on the Population Dynamics of Juvenile Caribbean Spiny Lobster *(Panulirus argus)* in Florida Bay, Florida.** Thesis. Department of Biology, Old Dominion University. R/LR-B-45)

Stevens, P. 1999. **The Vacillation Between Saltmarsh and Mangrove Communities at the Transition Between Temperate and Subtropical Climate in Florida.** Thesis. Department of Environmental Engineering Sciences, University of Florida. (AFAMS-1999)

Swett, R. 1999. **Spatial and Temporal Characteristics of Runoff Processes on a Puerto Rican Watershed Representative of the Humid Montane Tropics.** Dissertation. Department of Geography, University of Florida. (R/C-P-17)

Van Ert, M. 1999. **Analysis of Genetic Diversity and Antimicrobial Substance Production in Microorganisms Cultured from Antarctic and Subtropical Marine Invertebrates.** Thesis. Department of Biological Sciences, Florida Institute of Technology. (R/LR-MB-4)

Wood, M.V. 1999. **The Effects of Allyl Isothiocyanate on *Listeria monocytogenes*.** Thesis. Department of Food Science and Human Nutrition, University of Florida. (AFAMS-1999)

VI. Florida Sea Grant Extension Publications

Antonini, G., R. Novak, W. Sheftall, and J. Stevely. 1999. **A Guide to Anchorages in Southwest Florida - Second Edition.** SGEB-48. (E/URB-3)

Antonini, G.A., D.A. Fann, and P. Roat. 1999. **A Historical Geography of Southwest Florida Waterways.** Volume One. SGEB-47. (E/URB-1/2/3)

Antonini, G. 1999. Nautical Chart 11425 - **Intracoastal Waterway - Florida - Charlotte Harbor to Tampa Bay**. SGEF-89. (E/CSC-3)

Antonini, G. 1999. **Sarasota Bay Blueways: Recreational Opportunities for the Boater.** SGEF-88. (SGEP-12)

Bresee, H. 1999. **Ansuelo Circulares.** SGEF-109. (SGEP-12)

Bresee, H. 1999. **Brown Pelicans.** SGEF-94. (SGEP-12)

Bresee, H. 1999. **Circle Hooks.** SGEF-108. (SGEP-12)

Bresee, H. 1999. **Pelicanos Marrones.** SGEF-107. (SGEP-12)

Clarke, M., and J. Halusky. 1999. **Marine Education Center at Marineland, Florida.** SGEF-95. (SGEP-12)

Claro, R., and J.P. García-Arteaga. 1999. **Perspectives on an Artificial Habitat Program for Fishes of the Cuban Shelf.** SGEB-49. (COMM-4)

Florida Bay Project Staff. 1999. **Algal Bloom Maps of Florida Bay.** SGEF-98. (E/COP-1)

Florida Bay Project Staff. 1999. **Carbonates and Nutrients in Florida Bay.** SGEF-103. (E/COP-1)

Florida Bay Project Staff. 1999. **Contour Map of Florida Bay.** SGEF-100. (E/COP-1)

Florida Bay Project Staff. 1999. **Florida Bay: An Overview.** SGEF-101. (E/COP-1)

Florida Bay Project Staff. 1999. **Florida Bay Connections.** SGEF-106. (E/COP-1)

Florida Bay Project Staff. 1999. **Gamefish Populations in Florida Bay.** SGEF-102. (E/COP-1)

Florida Bay Project Staff. 1999. **Grazing by Zooplankton in Florida Bay Waters.** SGEF-97. (E/COP-1)

Florida Bay Project Staff. 1999. **Hurricanes and Tropical Storms in Florida Bay.** SGEF-114. (E/COP-1)

Florida Bay Project Staff. 1999. **Juvenile Fish Populations in Florida Bay.** SGEF-99. (E/COP-1)

Florida Bay Project Staff. 1999. **Marine Turtles in Florida Bay.** SGEF-104. (E/COP-1)

Florida Bay Project Staff. 1999. **Mercury in Fish from Eastern Florida Bay.** SGEF-105. (E/COP-1)

Florida Bay Project Staff. 1999. **Mollusks as Indicator Species in Florida Bay.** SGEF-111. (E/COP-1)

Florida Bay Project Staff. 1999. **Nutrient Exchange between the Wetlands and Florida Bay.** SGEF-112. (E/COP-1)

Florida Bay Project Staff. 1999. **Overgrazing in a Seagrass Meadow by Urchins.** SGEF-96. (E/COP-1)

Florida Bay Project Staff. 1999. **Phosphorus in Florida Bay Sediments.** SGEF-113. (E/COP-1)

Florida Bay Project Staff. 1999. **Pink Shrimp Production in Florida Bay.** SGEF-115. (E/COP-1)

Florida Bay Project Staff. 1999. **Sediment Resuspension in Florida Bay.** SGEF-93. (E/COP-1)

Florida Bay Project Staff. 1999. **Tracking Florida Bay Water Across Hawk Channel.** SGEF-91. (E/COP-1)

Florida Sea Grant College Program. 1999. **Fishery Conservation - A Guide to Releasing Reef Fish with Ruptured Swimbladders.** SGEF-46 - Revised. (SGEP-12)

Jackson, D. 1999. **Panic Preventer File.** Second Edition. SGEB-45. (E/T-7)

VII. Extension Newsletters

Florida Bay Project Staff. 1999. **Seahorse Sentinel.** Summer, Volume 2, Number 1, Fall, Volume 2, Number 2. (SGEP-12)

Mahler, S.W. 1999. **Turning the Tide.** Winter, 34th Issue, Summer, 35th Issue, Summer, 36th Issue, Fall, 37th Issue. (SGEP-12)

Novak, R. 1999. In Charlotte County Extension Newsletter. (SGEP-12)
Marine Report. January, Volume 13, Number 1, Page 2.
Marine Update. February, Volume 13, Number 2, Page 7.
Mangroves? March, Volume 13, Number 3, Page 10.
Artificial Reef Update. June, Volume 13, Number 6, Page 3.
Preparing Your Boat for a Hurricane. June, Volume 13, Number 6, Page 14.
Charlotte County Artificial Reef Update. July/August, Volume 13, Number 7, Page 6-7.
Try Some Clams Today! September, Volume 13, Number 7, Page 11.
Marine Update. October, Volume 13, Number 9, Page 11.
Red Tide, The Little Criter That Creates Some Big Problems! Volume 13, Number 10, Page 6.
Strange Creature Lurks in Charlotte County Waters. Volume 13, Number 10, Page 14-15.
Marine Update. Volume 13, Number 11, Page 10.

Stevely, J. 1999. **The Marine Scene.** January-February, Volume 35, Number 1, March-April, Volume 36, Number 2, May-June, Volume 37, Number 3, July-August, Volume 38, Number 4. (SGEP-12)

Sturmer-Taiani, L. 1999. **Shellfish Aquaculture.** July, Volume III, Number II. (SGEP-12)

Sweat, D. 1999. **Marine Times.** April-June, Volume 22, Number 2, July-September, Volume 22, Number 3, October-December, Volume 22, Number 4. (SGEP-12)

VIII. Miscellaneous Staff Papers and Conference Proceedings

Blitch, S.B., T.K. Frazer, M.H. Posey, and T.D. Alphin. 1999. **Habitat Use by Juvenile Blue Crabs Along Florida's North Central Gulf Coast.** Miscellaneous Staff Paper presented at the 28th Benthic Ecology Meeting, Baton Rouge, LA, March, 1999. (R/LR-B-46)

Hartsell, J., M. Posey, T. Alpin, T. Frazer, and S. Blitch. 1999. **Habitat Choice by Juvenile Blue Crabs in the Presence and Absence of Predators.** Miscellaneous Staff Paper presented at the 28th Benthic Ecology Meeting, Baton Rouge, LA, March, 1999. (R/LR-B-46)

Larkin, S.L., and D.J. Lee. 1999. **Quantity and Economic Value of Commercially Harvested Marine Life in Florida, 1990 to 1996.** Fact Sheet - as part of the working paper presented at the Southern Agricultural Economics Association Annual Meeting in Memphis, TN on 3 February 1999. (R/LR-A-23)

Lee, D.J., S.L. Larkin, C.M. Adams, and R.L. Degner. 1999. **Limited Entry in Florida's Ornamental Marine Life Industry.** This working paper was presented at the Southern Agricultural Economics Association Annual Meeting in Memphis, Tennessee on 3 February 1999. (R/LR-A-23)

Luzuriaga, D.A., and M. Balaban. 1999. **La "Nariz Electrónica": un Nuevo Sistema Para el Control de Calidad de Mariscos.** In: Pesca Blanca Internacional. (R/LR-Q-17)

Milon, W., S. Larkin, C. Adams, and N. Ehrhardt. 1999. **Bioeconomic Analysis of Effort Reductions in the Florida Spiny Lobster Trap Fishery.** In: Proceedings of the Gulf and Caribbean Fisheries Institute 52nd Annual Meetings. (accepted.)

Moss, S., B. Degner, C. Adams. 1999. **Aquaculture and Marketing of the Florida Bay Scallop in Crystal River, Florida.** FAMRC 99-1. UF Florida Agricultural Market Research Center (FRE), Gainesville.

Posey, M.H., T.D. Alphin, T.K. Frazer, and S.B. Blitch. 1999. **Habitat Use by Juvenile Blue Crabs Along the Coast of Southeastern North Carolina.** Miscellaneous Staff Paper presented at the 28th Benthic Ecology Meeting, Baton Rouge, LA, March, 1999. (R/LR-B-46)

Posey, M.H., T.K. Frazer, T.D. Alphin, and S.B. Blitch. 1999. **Regional Comparison of Juvenile Blue Crab Habitat Use.** Miscellaneous Staff Paper presented at the Estuarine Research Federation Conference, New Orleans, LA, September, 1999. (R/LR-B-46)

Seaman, W., and J.C. Cato. 1999. **Economic and Scientific Development of Florida's Marine Ornamental Aquarium Species Sector.** In: Proceedings of the Marine Ornamentals '99, Waikoloa, Hawaii, November 16-19, 1999. 4 pp. (PD-99-2)

IX. Fathom

X. Posters

None

XI. Videos

None

XII. CD-ROM Releases

None

XIII. Software

None

XIV. Home Page

Maintain University of Puerto Rico Sea Grant Home Page.

Maintain Southern Regional Home Page (Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina) not released.

Maintain the Southwest Florida Non-Regulatory Anchorage Management Program Home Page.

Maintain the National Sea Grant Display Calendar.

Florida Sea Grant Home Page.

Florida Bay Home Page.

CALENDAR YEAR 1998

I. Florida Sea Grant Reports

Milon, J.W., S.L. Larkin, D.J. Lee, K.J. Quigley, and C.M. Adams. 1998. **The Performance of Florida's Spiny Lobster Trap Certification Program.** SGR-116. (R/LR-E-16)

Otwell, W.S., and M. Haby. 1998. **Twenty-First Annual Conference Tropical and Subtropical Seafood Science and Technology Society of the Americas.** SGR-118. (SGEP-12)

II. Florida Sea Grant Technical Papers

Antonini, G.A., T. Ankersen, D. Burr, K. Dugan, R. Hamann, C. Listowski, G. Lytton, C. Sidman, H. Stafford, J. Stevely, and W. White. 1998. **A System for Evaluating Anchorage Management in Southwest Florida.** TP-84. (E/URB-3)

Antonini, G.A., R. Swett, S. Schulte, and D. Fann. 1998. **Regional Waterway Management System for South Sarasota County.** TD-1. (SAR-1)

Antonini, G., P. Box, D. Fann, and M. Grella. 1998. **Waterway Evaluation and Management Scheme for the South Shore and Central Embayment of the Loxahatchee River, Florida.** TP-92. (EJB-1)

Cato, J., and W. Seaman. 1998. **Creating a Sustainable Coastal Economy and Environment Through Research and Education- Strategic Plan 1998-2001.** TP-90. (M/PM-12)

Cato, J., and W. Seaman. 1998. **Creating a Sustainable Coastal Economy and Environment Through Research and Education - Implementation Phase of Four-Year Strategic Plan 1998-2001.** TP-91. (M/PM-12)

Cato, J.C. 1998. **Economics of Hazard Analysis and Critical Control Point (HACCP) Programmes. FAO Fisheries Technical Paper 381. Rome: Food and Agriculture Organization of the United Nations.** TP-94. (M/PM-12)

Milon, J.W., C.M. Adams, and D.W. Carter.1998. **Floridians' Attitudes About the Environment and Coastal Marine Resources.** TP-95. (R/LR-E-15A)

Seaman, W., and C. Adams. 1998. **Florida Marine Aquaculture Research and Extension Issues - Including the Florida Sea Grant Long Range Plan.** TP-93. (M/PM-12)

Suman, D.O., and M.P. Shivlani. 1998. **Characterization of the Commercial Dive Operator Industry in the Florida Keys National Marine Sanctuary.** TP-103. (COMM-3)

III. Books and Book Chapters

Deyle, R.E., S.P. French, R.B. Olshansky, and R.G. Paterson. 1998. **Hazard Assessment: The Factual Basis for Planning and Mitigation.** In: R.J. Burby (editor.) Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities. 5:119-166. Joseph Henry Press, Washington, D.C. (R/C-P-21)

Pomponi, S.A., R. Willoughby, A.E. Wright, C. Pecorella, S.H. Sennett, J. Lopez, and G. Samples. 1998. ***In vitro* Production of Marine-Derived Antitumor Compounds.** In: Gal, Y.L. and H.O. Halverson, ed. New Developments in Marine Biotechnology. Phenum Press. New York, NY. pp. 73-76. (R/LR-MB-1)

Smith, R.A., and R.E. Deyle. 1998. **Hurricane Case Study: Opal in the Florida Panhandle.** In: Planning for Post-disaster Recovery and Reconstruction. J. Schwab, editor. American Planning Association, Planning Advisory Service Report 483/484, Chicago, Illinois. 10:235-259. (PD-95-4)

IV. Journal Articles

Adams, C.M., and P.J. van Blokland. 1998. **Economic and Financial Considerations Regarding the Small-Scale Commercial Culture of Hard Clams in Florida.** Journal of Applied Aquaculture. 8(1):19-37. (SGEP-11)

Adams, C.M. 1998. **Selected Factors Affecting Seafood Markets in the United States.** Journal of Food Distribution Research. 29(1):8-17.

Cato, J.C., and C.A. Lima dos Santos. 1998. **European Union 1997 Seafood-Safety Ban: The Economic Impact on Bangladesh Shrimp Processing.** Marine Resource Economics. 13(3):215-227. (M/PM-12)

Erdogdu, F., M.O. Balaban, and K.V. Chau. 1998. **Modeling of Heat Conduction in Elliptical Cross-section: II. Adaptation to Thermal Processing of Shrimp.** Journal of Food Engineering. 38: 241-258 (R/LR-Q-17)

Fonseca, M.S., and S.S. Bell. 1998. **Influence of Physical Setting on Seagrass Landscapes Near Beaufort, North Carolina, USA.** Marine Ecology Progress Series. 171:109-121. (R/EHRP-3)

Kim, J., W-X. Du, W.S. Otwell, M.R. Marshall, and C-I. Wei. 1998. **Nutrients in Salmon and Red Grouper Fillets as Affected by Chlorine Dioxide (ClO_2) Treatment.** Journal of Food Science. 63(4):629-633. (SGEP-12)

Kirsten, J.H., C.J. Dawes, and B.J. Cochrane. 1998. **Randomly Amplified Polymorphism Detection (RAPD) Reveals High Genetic Diversity in *Thalassia Testudinum* Banks *ex* Konig (Turtlegrass).** Aquatic Botany. 61(4):269-287. (R/EHRP-2)

Knowles, L., and S.S. Bell. 1998. **The Influence of Habitat Structure in Faunal-Habitat Associations in a Tampa Bay Seagrass System, Florida.** Bulletin of Marine Science. 62(3):781-794. (R/EHRP-3)

Koenig, C., and F. Coleman. 1998. **Absolute Abundance and Survival of Juvenile Gags in Sea Grass Beds of the Northeastern Gulf of Mexico.** Transactions of the American Fisheries Society. 127(1):44-55. (R/LR-B-32)

Otwell, W.S. 1998. **Seafood HACCP Alliance Past, Present and Future.** Journal of the Association of Food and Drug Officials. 62(1):15-20. (E/TP-1)

Wilson, R.R., Jr., and K.A. Donaldson. 1998. **Restriction Digest of PCR-Amplified mtDNA from Fin Clips is an Assay for Sequence Genetic "Tags" Among Hundreds of Fish in Wild Populations.** Molecular Marine Biology and Biotechnology. 7(1):39-47. (R/LR-B-39)

Zhang, D., J. Lin, and R.L. Creswell. 1998. **Effect of GABA and Seagrass, *Thalassia* on Metamorphosis and Survivorship of Larvae of the Golden Banded Coral Shrimp, *Stenopus scutellatus*.** Journal of World Aquaculture Society. 16 pp. (R/LR-A-19)

Zhang, D., and J. Lin. 1998. **Effects of Food and Temperature on Survival and Development in the Peppermint Shrimp *Lysmata wurdmanni*.** Journal of the World Aquaculture Society. (R/LR-A-19)

Zhang, D., J. Lin, and R.L. Creswell. 1998. **Ingestion Rate and Feeding Behavior of the Peppermint Shrimp, *Lysmata wurdmanni*, on Artemia Nauplii.** Journal of the World Aquaculture Society. 29(1):97-103. (R/LR-A-19)

Zhang, D., J. Lin, and R.L. Creswell. 1998. **Mating Behavior and Spawning of the Banded Coral Shrimp *Stenopus hispidus* in the Laboratory.** Journal of Crustacean Biology. 18(3):511-518. (R/LR-A-19)

V. Graduate Theses and Dissertations

Cheng, J. 1998. **Statistical Characteristics of Shoreline Changes for Florida's Coast.** Thesis. Department of Coastal and Oceanographic Engineering, University of Florida. (R/C-S-35)

Dillon, K.S. 1998. **The Use of Sulfur Hexafluoride as a Groundwater Tracer in the Florida Keys.** Thesis. Department of Oceanography, Florida State University. (R/C-E-37)

Kellogg, Christina A. 1998. **Genetic Diversity and DNA Repair of Marine Vibriophages.** Dissertation. Department of Marine Science, University of South Florida. (AFAMS-1998)

Kusek, Kristen M. 1998. ***Gymnodinium breve* in the Field, in the Lab, and in the Newspaper -- A Scientific and Journalistic Analysis of Florida Red Tides.** Thesis. Department of Marine Science, University of South Florida. (AFAMS-1998)

Lore, E.L. 1998. **Modified Aqueous Extractions of Pesticides from Marine Tissues with Solid-Phase Extraction Devices.** Thesis. Department of Food Science and Human Nutrition, University of Florida. (R/C-E-38)

Newman, D.J. 1998. **Automation of Quality Evaluation of Raw Tuna.** Thesis. Department of Food Science and Human Nutrition, University of Florida. (R/LR-Q-20)

Ortiz, M. 1998. **Shrimp Bycatch in the US Gulf of Mexico: Review and Evaluation of Bycatch Effects on Exploited Fish Stocks.** Dissertation. Department of Marine Biology and Fisheries, RSMAS, University of Miami. (R/LR-B-37)

Peters, S.M. 1998. **Public Information, Education and Outreach Needs Assessment for the Indian River Lagoon Comprehensive Conservation and Management Plan: A Focus on Water and Sediment Quality Issues.** Thesis. Department of Environmental Education, Florida Institute of Technology. (AFAMS-98)

Rasmussen, L.L. 1998. **Groundwater Flow, Tidal Mixing and Haline Convection in Coastal Sediments.** Thesis. Department of Oceanography, Florida State University. (R/C-E-37)

Rutkowski, C.M. 1998. **Groundwater Seepage, Nutrients, and Seagrasses in the Northeastern Gulf of Mexico.** Thesis. Department of Oceanography, Florida State University. (R/C-E-37)

Sidman, C. 1998. **A Water Use Zoning Strategy to Reduce Bio-Physical and Social Stress in Three Southwest Florida Anchorages.** Dissertation. Department of Geography, University of Florida. (E/URB-1)

Stengard, F.J. 1998. **Lactate Dehydrogenase Isozyme Patterns of Paracanthopterygians (Osteichthyes: Teleostei): Evaluation of a Putative Gadiform Synapomorphy, with Comments on Implications for Sister Group Relationships and Phylogenetic Position of Gobiesociformes.** Thesis. Department of Marine Science, University of South Florida. (R/LR-B-39)

Willoughby, R. 1998. **Development of Multiwell Assays to Monitor *In vitro* Responses of Dissociated Marine Sponge Cells.** Thesis. Department of Biological Sciences, Florida Institute of Technology. (R/LR-MB-5)

VI. Florida Sea Grant Extension Publications

Antonini, G. 1998. **Accessibility Zones for Boats with 1-foot Draft.** Photomap. SGEF-64A. (EJB-1)

Antonini, G. 1998. **Accessibility Zones for Boats with 2-foot Draft.** Photomap. SGEF-64B. (EJB-1)

Antonini, G. 1998. **Accessibility Zones for Boats with 3-foot Draft.** Photomap. SGEF-64C. (EJB-1)

Antonini, G. 1998. **Accessibility Zones for Boats with 4-foot Draft.** Photomap. SGEF-64D. (EJB-1)

Antonini, G. 1998. **Boca Grande/Grande Bayou Anchorage, Charlotte Harbor.** Photomap. SGEF-55. (EJB-1)

Antonini, G. 1998. **Buttonwood Harbor, Sarasota Bay.** Photomap. SGEF-50. (EJB-1)

Antonini, G. 1998. **Matanzas Pass/Ft. Myers Beach Anchorage.** Photomap. SGEF-56. (EJB-1)

Antonini, G. 1998. **Resource Inventory Photomap.** Photomap. SGEF-65. (EJB-1)

Antonini, G. 1998. **Roosevelt Channel/Tween Waters Anchorage.** Photomap. SGEF-58. (EJB-1)

Florida Bay Project Staff. 1998. **Documenting Water Clarity with Satellite Imagery.** SGEF-76. (E/COP-1)

Florida Bay Project Staff. 1998. **Environmental Monitoring Stations in the Florida Keys.** SGEF-85. (E/COP-1)

Florida Bay Project Staff. 1998. **Florida Bay Circulation and Exchange Study.** SGEF-81. (E/COP-1)

Florida Bay Project Staff. 1998. **Florida Bay Ecosystem History Database.** SGEF-78. (E/COP-1)

Florida Bay Project Staff. 1998. **Fresh Water Effects on Aquatic Plant Communities.** SGEF-70. (E/COP-1)

Florida Bay Project Staff. 1998. **Groundwater and Nutrients in Florida Bay.** SGEF-82. (E/COP-1)

Florida Bay Project Staff. 1998. **Increased Salinity in Florida Bay - Nature or Man?** SGEF-80. (E/COP-1)

Florida Bay Project Staff. 1998. **Mapping the Florida Bay Bottom.** SGEF-79. (E/COP-1)

Florida Bay Project Staff. 1998. **Modeling the Currents of Hawk Channel and Beyond.** SGEF-77. (E/COP-1)

Florida Bay Project Staff. 1998. **Salinity Fluctuation Experiments on Plants.** SGEF-69. (E/COP-1)

Florida Bay Project Staff. 1998. **Salinity Trends in Florida Bay During the Past 100 Years.** SGEF-87. (E/COP-1)

Florida Bay Project Staff. 1998. **Seagrass Bed Changes in Florida Bay: 1995-1997.** SGEF-72. (E/COP-1)

Florida Bay Project Staff. 1998. **Seagrass Dieoff in Florida Bay.** SGEF-67. (E/COP-1)

Florida Bay Project Staff. 1998. **Sponge Populations in Florida Bay.** SGEF-90. (E/COP-1)

Florida Bay Project Staff. 1998. **Survival of Aquatic Plant Transplants in Florida Bay.** SGEF-68. (E/COP-1)

Florida Bay Project Staff. 1998. **The Making of a Salinity vs Plant Community Model.** SGEF-71. (E/COP-1)

Florida Bay Project Staff. 1998. **Water Quality Study by TNC BayWatch Volunteers.** SGEF-83. (E/COP-1)

Florida Sea Grant College Program. 1998. **Could Your Boat and Motor be in Trouble?** SGEF-74. (A/ZM-2)

Florida Sea Grant College Program. 1998. **Don't Release Non-native Species - Aquarium Hobbyists.** Joint publication of the program. (A/ZM-2)

Florida Sea Grant College Program. 1998. **Don't Release Non-native Species - Water Gardeners.** Joint publication of the program. (A/ZM-2)

Florida Sea Grant College Program. 1998. **Florida Sea Grant Research Projects 1998-2000.** SGEF-66 . (M/PM-12)

Florida Sea Grant College Program. 1998. **What Responsible Boaters Can do to Keep Florida's Waters Clean.** SGEB-27 - Revised. (E/T-7)

Florida Sea Grant College Program. 1998. **Zebra Mussel Alert.** SGEF-75. (A/ZM-2)

Florida Sea Grant College Program. 1998. **Zebra Mussels - A Florida Perspective.** SGEF-73. (A/ZM-2)

Jackson, D. 1998. **Panic Preventer File.** SGEB-45. (E/T-7)

Otwell, W.S., and V.M. Garrido. 1998. **Mandatory HACCP Inspection for Seafood & Aquaculture Importers.** SGEF-48. (E/TP-1)

Otwell, W.S., and V.M. Garrido. 1998. **Mandatory HACCP Inspection for Seafood & Aquacultured Products.** SGEF-47 (Revised). (E/TP-1)

Seaman, W. 1998. **A Description of Extension Design Team FL-316: Coastal Environmental and Water Quality.** Florida Sea Grant Fact Sheet No. 86. (SGEP-12)

Wingrove, P. 1998. **1999 Florida Bay Research and Education Resource Directory.** SGEB-46. (E/COP-1)

VII. Extension Newsletters

Florida Bay Project Staff. 1998. **Seahorse Sentinel.** Autumn, Volume 1, Number 1, and Winter, Volume 1, Number 2. (SGEP-12)

Mahler, S.W. 1998. **Turning the Tide.** Summer, 32nd Issue, and Fall, 33rd Issue. (SGEP-12)

Novak, R. 1998. In Charlotte County Extension Newsletter. (SGEP-12)
What's Happening in the Marine World? July-August, Volume 12, Number 7. Page 3.
Don't Release Non-native Species! September, Volume 12, Number 8. Page 3.
Aquaculture? October, Volume 12, Number 9. Page 3.

Stevely, J. 1998. **The Marine Scene.** September-October, Volume 33, Number 5. (SGEP-12)

Sweat, D. 1998. **Marine Times.** January-March, Volume 21, Number 5, April-June, Volume 21, Number 6, July-September, Volume 21, Number 7, and October-December, Volume 21, Number 8. (SGEP-12)

VIII. Miscellaneous Staff Papers and Conference Proceedings

Adams, C.M., and A. Lazur. 1998. **A Preliminary Assessment of the Costs and Earnings of Commercial Small-Scale, Outdoor, Pond Culture of Tilapia in Florida.** SP 98-16, Food and Resource Economics, University of Florida, Gainesville.

Adams, C.M. 1998. **An Overview of the Cuban Commercial Fishing Industry and Implications to the Florida Seafood Industry of Renewed Trade.** IW 98-3, In: International Agricultural Trade and Development Center, Food and Resource Economics, University of Florida, Gainesville. (SGEP-12)

Adams, C.M. 1998. **Food and Resource Economics Research.** In: Waterworks Newsletter, Fisheries and Aquatic Sciences. 2(4):5.

Adams, C.M. 1998. **Seafood Outlook 1999.** In: Florida Food and Resource Economics Newsletter, Number 142, Food and Resource Economics, University of Florida, Gainesville.

Adams, C.M. 1998. **Soft Crab Shedding Training Continues.** In: Waterworks Newsletter, Fisheries and Aquatic Sciences. 2(1):4.

Balaban, M.O., W.S. Otwell, F. Erdogdu, and D.A. Luzuriaga. 1998. **How Do You Define Cooking of Shrimp? The 'Opacity' Approach.** In: Proceedings of the 23rd Annual Conference of Tropical and Subtropical Seafood Science and Technology Society of the Americas. St. Croix, U.S. Virgin Islands. (SGEP-12)

Cato, J.C., and C.A. Lima dos Santos. 1998. **Bangladesh Seafood Exports - Safety, Hygiene and the EU Ban.** In: INFOFISH International 6/98:52-56. (M/PM-12)

Cato, J.C., and C.A. Lima dos Santos. 1998. **Bangladesh: Shrimp Processors Invest in Plant Upgrades and HACCP to Produce Safe Products.** In: INFOFISH International 5/98:51-56. (M/PM-12)

Cato, J.C., and C.A. Lima dos Santos. 1998. **Bangladeshi Shrimp Processors Invest in Safer Products.** In: European Retail Buyers Guide, 1998/99. London: Kensington Publications Limited. pp. 48-51. (M/PM-12)

Dean, R.G., J. Cheng, and S. Malakar. 1998. **Characteristics of Shoreline Change Along the Sandy Beaches of the State of Florida: An Atlas.** University of Florida, Department of Coastal and Oceanographic Engineering. Report No. UFL/COEL-98/015. (R/C-S-35)

Garrido, L., W.S. Otwell, and R. Benner.1998. **Preliminary Observations concerning Phosphate Utilization with Shell-on Penaeid Shrimp.** In: Proceedings of the 23rd Annual Conference of Tropical and Subtropical Seafood Science and Technology Society of the Americas. St. Croix, U.S. Virgin Islands. (SGEP-12)

Garrido, V.M., and W.S. Otwell. 1998. **TQA - Total Quality Assurance Program for the Oyster Industry.** In: Proceedings of the 23rd Annual Conference of Tropical and Subtropical Seafood Science and Technology Society of the Americas. St. Croix, U.S. Virgin Islands. (SGEP-12)

Larkin, S.L., D.J. Lee, and C.M. Adams. 1998. **Costs, Earnings, and Returns to the U.S. Atlantic Pelagic Longline Fleet in 1996.** SP 98-9, Food and Resource Economics, University of Florida, Gainesville.

Larkin, S., D. Lee, and C. Adams. 1998. **Improved Management of the U.S. North Atlantic Swordfish Fishery.** SP 98-7, Food and Resource Economics, University of Florida, Gainesville.

Lee, D., S.L. Larkin, and C.M. Adams. 1998. **A Bioeconomic Analysis of the Proposed Regulations in the U.S. North Atlantic Swordfish Fishery.** SP 98-10, Food and Resource Economics, University of Florida, Gainesville.

Luzuriaga, D.A., and M.O. Balaban. 1998. **Electronic Nose Odor Evaluation of Salmon Fillets Stored at Different Temperatures.** In: Proceedings of the 5th Symposium on Olfaction and Electronic Nose, Hunt Valley, Maryland, September 27-30, 1998. (R/LR-Q-20)

Luzuriaga, D.A., and M.O. Balaban. 1998. **Evaluation of the Odor of Decomposition in Raw and Cooked Shrimp Correlation of Electronic Nose Readings, Odor Sensory Evaluation and Ammonia Levels.** In: Proceedings of the 5th Symposium on Olfaction and Electronic Nose, Hunt Valley, Maryland, September 27-30, 1998. (R/LR-Q-20)

Luzuriaga, D.A., and M. Balaban. 1998. **Nuevas Tecnologías Para el Control de Calidad en Mariscos de Exportación.** In: Proceedings of the XXIII International Convention of the Panamerican Agriculture School, Quito-Ecuador, July 22-26. (R/LR-Q-20)

Newman, D.J., D.A. Luzuriaga, and M.O. Balaban. 1998. **Odor and Microbiological Evaluation of Raw Tuna: Correlation of Sensory and Electronic Nose Data.** In: Proceedings of the 5th Symposium on Olfaction and Electronic Nose, Hunt Valley, Maryland, September 27-30, 1998. (R/LR-Q-20)

Otwell, W.S. 1998. **Developing and Implementing a HACCP Plan - Record-keeping Procedures.** In: A Short Course Co-sponsored by Food Science and Human Nutrition Department, University of Florida, Gainesville, Florida. (E/TP-1)

Otwell, S. 1998. **HACCP Programs - Implementation and Operational Criteria.** In: Aquaculture Brazil '98. (E/TP-1)

Otwell, S. 1998. **Seafood Education Alliance (SEA) and Standard Sanitation Operating Procedures (SSOP).** In: Proceedings of the 23rd Annual Conference of Tropical and Subtropical Seafood Science and Technology Society of the Americas. St. Croix, U.S. Virgin Islands. (E/TP-12)

Posey, M.H., T.D. Alphin, T.K. Frazer, and S.B. Blitch.1998. **Oyster Beds as Essential Habitat for Decapods and Fish.** International Conference on Shellfish Restoration, Hilton Head Island, South Carolina, USA, November 18-21, 1998. (R/LR-B-46)

Zajicek, P., D. Zimet, C.M. Adams, and A. Lazur. 1998. **Live Bait: Market Analysis and Farm Enterprise Budget.** Bureau of Seafood and Aquaculture, Florida Department of Agriculture and Consumer Services, Tallahassee.

IX. Fathom

X. Posters

None

XI. Videos

None

XII. CD-ROM Releases

None

XIII. Software

None

XIV. Home Page

Maintain University of Puerto Rico Sea Grant Home Page.

Maintain Southern Regional Home Page (Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina) not released.

Maintain the Southwest Florida Non-Regulatory Anchorage Management Program Home Page.

Maintain the National Sea Grant Display Calendar.

Florida Sea Grant Home Page.

Florida Bay Home Page.

I. Florida Sea Grant Reports

None

II. Florida Sea Grant Technical Papers

Antonini, G.A., F. Bell, E. Kampert, C. Sidman, R. Swett, and H. Tupper. 1997. **Planning for Public Boating Access: A Geographic Information Systems Approach to Evaluate Site Suitability for Future Marinas, Ramps and Docks.** TP-87. (SGEP-11)

Lindberg, W.J. 1997. **Florida Big Bend Coastal Research Workshop: Toward a Scientific Basis for Ecosystem Management.** TP-88. (PD/97-4)

Milon, J.W., D.O. Suman, M. Shivlani, and K.A. Cochran. 1997. **Commercial Fishers' Perceptions of Marine Reserves for the Florida Keys National Marine Sanctuary.** TP-89. (M/PD-10)

III. Books and Book Chapters

Adams, C.M., E.M. Thunberg, and W.R. Keithly. 1997. **Resource Economics Issues Concerning Molluscan Fisheries in the United States.** In: The History, Present Condition and Future of the Molluscan Fisheries of the North and Central America and Europe - Volume 2, Pacific Coast and Supplemental Topics. NOAA Technical Report NMFS 128.

Balaban, M.O., and D.A. Luzuriaga. 1997. **Automated Sensory Procedures for Shrimp.** In: Fish Inspection, Quality Control, and HACCP: a Global Focus. Edited by: R.E. Martin, R.L. Collette, and J.W. Slavin. Technomic Publishing Company, Lancaster, PA. pp. 509-520. (R/LR-Q-17)

Barnett, M.R., and D.W. Crewz. 1997. **Common Coastal Plants in Florida: A Guide to Planting and Maintenance.** SG-3. Revised Edition of SGR-97. Gainesville: University Press of Florida. 110 pp. (SGEP-12)

Williams, J.M., and I.W. Duedall. 1997. **Florida Hurricanes and Tropical Storms.** Revised Edition. SG-2. Gainesville: University Press of Florida. 146 pp. (COMM-3)

IV. Journal Articles

Acosta, C.A., and M.J. Butler, IV. 1997. **Role of Mangrove Habitat as a Nursery for Juvenile Spiny Lobster, *Panulirus argus,* in Belize.** Marine Freshwater Research. 48:721-727. (R/LR-B-44)

Acosta, C.A., T.R. Matthews, and M.J. Butler, IV. 1997. **Temporal Patterns and Transport Processes in Recruitment of Spiny Lobster *(Panulirus argus)* Postlarvae to South Florida.** Marine Biology. 129:79-85. (R/LR-B-38)

Bell, F.W. 1997. **The Economic Valuation of Saltwater Marsh Supporting Marine Recreational Fishing in the Southeastern United States.** Ecological Economics. 21:243-254. (R/C-E-25)

Bell, S.S., and M.O. Hall. 1997. **Drift Macroalgal Abundance in Seagrass Beds: Investigating Large-Scale Associations with Physical and Biotic Attributes.** Marine Ecology Progress Series. 147:277-283. (R/EHRP-3)

Bohnsack, J.A., A.M. Ecklund, and A.M. Szmant. 1997. **Artificial Reef Research: Is There More Than the Attraction-Production Issue?** Fisheries. 22(4):14-16. (R/LR-B-36)

Butler, M., and W. Herrnkind. 1997. **A Test of Recruitment Limitation and the Potential for Artificial Enhancement of Spiny Lobster *(Panulirus argus)* Populations in Florida.** Canadian Journal of Fisheries and Aquatic Science. 54:452-463. (R/LR-B-38)

Butler, M.J., IV, J.H. Hunt, W.F. Herrnkind, M.J. Childress, R. Bertelsen, W. Sharp, J.M. Field, and H.G.Marshall. 1997. **Cascading Disturbances in Florida Bay, USA: Cyanobacteria Blooms, Sponge Mortality, and Implications for Juvenile Spiny Lobsters *Panulirus argus*.** Marine Ecology Progress Series. 129:119-125. (R/LR-B-38)

Butler, M., W. Herrnkind, and J. Hunt. 1997. **Factors Affecting the Recruitment of Juvenile Caribbean Spiny Lobsters Dwelling in Macroalgae.** Bulletin of Marine Science. 61(1):3-19. (R/LR-B-38)

Chapman, F.A., S.A. Fitz-Coy, E.M. Thunberg, and C.M. Adams. 1997. **United States of America Trade in Ornamental Fish.** Journal of the World Aquaculture Society. 28(1):1-10. (SGEP-12)

Grossman, G.D., G.P. Jones, and W. Seaman, Jr. 1997. **Do Artificial Reefs Increase Regional Fish Production? A Review of Existing Data.** Fisheries. 22(4):17-23. (M/PM-11)

Heffner, R.A., C.K. Reilly, and M.J. Butler, IV. (1997.) **Pseudoreplication Revisited.** Journal of World Aquaculture. 32(2): 210-214. Ecology. (R/LR-B-38)

Herrnkind, W.F., M.J. Butler IV, and J.H. Hunt. 1997. **Can Artificial Habitats that Mimic Natural Structures Enhance Recruitment of Caribbean Spiny Lobster?** Fisheries. 22(4):24-27. (R/LR-B-38)

Herrnkind, W.F., M.J. Butler IV, J.H. Hunt, and M. Childress. 1997. **Role of Physical Refusia: Implications from a Mass Sponge Die-off in a Lobster Nursery in Florida.** Marine Freshwater Research. 48:759-769. (R/LR-B-44)

Jackson, J.K., R.L. Murphree, and M.L. Tamplin. 1997. **Evidence that Mortality from *Vibrio vulnificus* Infection Results from Single Strains among Heterogeneous Populations in Shellfish.** Journal of Clinical Microbiology. 35(8):2098-2101. (R/LR-Q-19)

Jensen, S.L., B.D. Robbins, and S.S. Bell. 1997. **On the Use of the Reconstructive Technique: Criticisms, Comments and Questions.** Marine Ecology Progress Series. 146:305-309. (R/EHRP-3)

Lapointe, B.E. 1997. **Nutrient Thresholds for Bottom-up Control of Macroalgal Blooms on Coral Reefs in Jamaica and Southeast Florida.** Limnology and Oceanography. 42(5, part 2):1119-1131. (R/C-E-34)

Luzuriaga, D.A., M.O. Balaban, and S. Yeralan. 1997. **Analysis of Visual Quality Attributes of White Shrimp by Machine Vision.** Journal of Food Science. 62(1):113-130. (R/LR-Q-17)

Robbins, B.D. 1997. **Quantifying Temporal Change in Seagrass Areal Coverage: The Use of GIS and Low Resolution Aerial Photography.** Aquatic Botany. 58:259-267. (R/EHRP-3)

Seaman, W., Jr. 1997. **What if Everyone Thought about Reefs?** Fisheries. 22(4):4-5. (M/PM-11)

Wilkens, L., B. Schmitz, and W. Herrnkind. 1997. **Antennal Responses to Hydrodynamic and Tactile Stimuli in the Spiny Lobster *Panulirus argus.*** Biological Bulletin. 191:187-198. (R/LR-B-38)

Wilson, R.R., Jr., K.A. Donaldson, M.E. Frischer, and T.B. Young. 1997. **Mitochondrial DNA Control Region of Common Snook and its Prospect for use as a Genetic Tag.** Transactions of the American Fisheries Society. 126(4):594-606. (R/LR-B-39)

Zhang, D., J. Lin, and R.L. Creswell. 1997. **Effect of Eyestalk Ablation on Molt Cycle and Reproduction in the Banded Coral Shrimp, *Stenopus hispidus* (Oliver).** Journal of Shellfish Research. 16(2):363-366. (R/LR-A-19)

Zhang, D., J. Lin, and R.L. Creswell. 1997. **Larviculture and Effect of Food on Larval Survival and Development in Golden Coral Shrimp, *Stenopus scutellatus*.** Journal of Shellfish Research. 16(2):367-369. (R/LR-A-19)

Zheng, J. and R.G. Dean. 1997. **Numerical Models and Intercomparison of Beach Profile Evolution.** Journal of Coastal Engineering. 30(3-4):169-201. (R/C-S-35)

V. Graduate Theses and Dissertations

Acosta, C.A. 1997. **Ecology and Early Life History of the Caribbean Spiny Lobster, *Panulirus argus*: Recruitment, Predation, and Habitat Requirements.** Dissertation. Department of Ecological Sciences, Old Dominion University. (R/LR-B-38)

Box, P.W. 1997. **Bottom-Up Simulation for Evaluation of Recreational Boat Traffic Monitoring.** Dissertation. Department of Geography, University of Florida. (R/URB-1)

Brooks, R.A. 1997. **Facilitated Dispersal of Seagrass Dwelling Amphipods with the Use of Drift Macroalgae.** Thesis. Department of Biology, University of South Florida. (R/EHRP-3)

Cochran, P.K. 1997. **Environmental Factors Affecting Lysogeny in the Marine Environment.** Thesis. Department of Marine Science, University of South Florida. (R/C-E-41)

Hugus, D. 1997. **Cathodic Polarization Behavior of Mild Steel Exposed to Selected Flow Velocities and Slope Parameters in Natural Seawater.** Thesis. Department of Ocean Engineering, Florida Atlantic University. (R/C-D-16)

Jackson, J.K. 1997. **Genotypic and Phenotypic Diversity of Clinical and Environmental *Vibrio vulnificus* Strains.** Dissertation. Department of Microbiology and Cell Science, University of Florida. (R/LR-Q-19)

Legault, C.M. 1997. **Management of a Multigear Fishery Exploiting a Highly Migratory Stock: Spanish Mackerel, *Scomberomorus maculatus*, in the Eastern Gulf of Mexico.** Dissertation. Department of Marine Biology and Fisheries, University of Miami. (R/LR-B-31)

Lovegrove, S. 1997. **Assessment of the Ecological Effects of Propellor Damage from Motor Boats on a *Thalassia testudinum* (Bankes ex Koenig) Bed in Charlotte Harbour, FL, USA.** Thesis. University of North Wales, Bangor. (R/C-E-39)

Madley, K. 1997. **Factors Affecting the Movement of Drifting Macroalgae *(Gracilaria verrucosa)* in Seagrass *(Halodulew wrightii)* Beds.** Thesis. Department of Biology, University of South Florida. R/C-E-39)

Moyer, M.A. 1997. **The Reproductive Ecology of the Calico Scallop, *Argopecten gibbus* (Linnaeus), and Mass Mortality Linked to a Protistan.** Dissertation. Department of Marine Science, University of South Florida. (AFAMS(OS)-1997)

Quigley, K. 1997. **Valuation and Consolidation of Trap Certificates Under the Florida Spiny Lobster Trap Certificate Program.** Thesis. Department of Food and Resource Economics, University of Florida. (R/LR-E-16)

Rains, Clare Elise. 1997. **Rapid Histamine Determination in Decomposed Mahi-Mahi, *(Coryphaena hippurus)*.** Thesis. Department of Food Science and Human Nutrition, University of Florida. (AFAMS-1997)

Rodriguez, L.C. 1997. **Chemoenzymatic Synthesis of 9,11-Secosteroids Using an Enzyme Extract from a Marine Coral.** Thesis. Department of Chemistry, Florida Atlantic University. (AFAMS-1997)

Sherman, R.L. 1997. **Fine Structure of the Gill Vasculature of the Yellow Stingray *(Urolophus jamaicensis)*.** Thesis. Department of Oceanography, Nova Southeastern University Oceanographic Center. (AFAMS-97)

Stone, G.L. 1997. **Microplankton Biomass and Composition in Relation to the Gulf Stream Front Off Southeast Florida.** Thesis. Department of Marine Biology, Nova Southeastern University Oceanographic Center. (R/LR-B-29)

Zhang, D. 1997. **Spawning and Larval Culture of Three Ornamental Marine Shrimp, *Stenopus hispidus, Stenopus scutellatus* and *Lysmata wurdemanni*.** Thesis. Department of Biology, Shanghai Fisheries University. (R/LR-A-19)

VI. Florida Sea Grant Extension Publications

Adams, C., and M. Oesterling. 1997. **Does a Florida Small-Scale Soft Crab System Pay?** SGEB-38. (E/DACS-1)

Antonini, G.A. 1997. **Big Pass/Otter Key Anchorage, Sarasota Bay.** Photomap. SGEF-51. (E/CSC-1)

Antonini, G.A. 1997. **Emerson Point and Desoto Point Anchorages, Manatee River.** Photomap. SGEF-52. (E/CSC-1)

Antonini, G.A. 1997. **Longbeach/Longboat Pass Anchorage, Sarasota Bay.** Photomap. SGEF-49. (E/CSC-1)

Antonini, G.A., F. Bell, E. Kampert, C. Sidman, R. Swett, and H. Tupper. 1997. **Planning for Public Boating Access: A Geographic Information Systems Approach to Evaluate Site Suitability for Future Marinas, Ramps and Docks.** Executive Summary. SGEB-35. (SGEP-11)

Antonini, G.A. 1997. **Sarasota Bay Boating Environment.** Photomap. SGEF-54. (E/CSC-1)

Antonini, G.A. 1997. **Sarasota Island Park Anchorage, Sarasota Bay.** Photomap. SGEF-53. (E/CSC-1)

Antonini, G.A. 1997. **Workshop Summary on Boating in Sarasota Bay: Planning for Tomorrow.** SGEB-37. (E/URB-1)

Jackson, D., and D. Sweat. 1997. **Crab Shedding-System Designs.** SGEB-40. (E/DACS-1)

Lawlor, F., B. Fisher, and M. Oesterling. 1997. **Model HACCP Program for Soft Shell Blue Crab.** SGEB-42. (E/TP-1)

Oesterling, M., and C. Adams. 1997. **Economic and Business Considerations for Small-Scale Soft Crab Production.** Joint Sea Grant Extension Bulletin with Virginia Sea Grant. (E/DACS-1)

Otwell, S., and F. Lawlor. 1997. **Harvest and Identification of Peeler Crabs.** SGEB-39. (E/DACS-1)

Otwell, S., V. Garrido, and P. Simmons. 1997. **Penaeid Shrimp: Dockside Operations.** (For illustrative purposes only). HACCP Program. SGEB-43. (E/TP-1)

Pybas, D.W. 1997. **Atlas of Artificial Reefs in Florida - Fifth Edition.** SG-1. (SGEP-11)

Seaman, W., Jr., and N.G. Diersing. 1997. **The Science of Florida Bay.** Accompanying video. SGEB-36. (SGEP-11)

VII. Extension Newsletters

Not listed until 1998.

VIII. Miscellaneous Staff Papers and Conference Proceedings

Adams, C.M. 1997. **Alternative Enterprises for Fishermen Adversely Affected by the Net Ban.** In: Cooperative Extension Service Rural Economic Development, University of Florida, Gainesville.

Adams, C.M., A.M. Lazur, and P. Zajicek. 1997. **An Assessment of the Market for Live, Marine Baitfish in Florida.** Project Final Report: Project DEP MR195, Bureau of Seafood and Aquaculture, Florida Department of Agriculture and Consumer Services, Tallahassee.. (SGEP-11)

Adams, C. 1997. **Indicators of Economic Value and Activity in the Florida Big Bend Region.** In: Proceedings of Florida Big Bend Coastal Research Workshop: Toward a Scientific Basis for Ecosystem Management. TP-88. pp. 91-92. (SGEP-12)

Adams, C. 1997. **Seafood Outlook.** In: Florida Food and Resource Economics. No. 139. Gainesville: University of Florida. 1 pp. (SGEP-10)

Adams, C.M. 1997. **The Status of the Commercial Fishing Industry in Cuba.** In: Cuba in Transition, Proceedings of the Sixth Annual Meetings of the Association for the Study of the Cuban Economy (ASCE), Volume 6, Washington, D.C.

Lapointe, B.E., M.M. Littler, and D.S. Littler. 1997. **Macroalgal Overgrowth of Fringing Coral Reefs at Discovery Bay, Jamaica: Bottom-Up Versus Top-Down Control.** Proceedings of 8th International Coral Reef Symposium, Panama. 1:927-932. (R/C-E-34)

Otwell. S. 1997. **Time, Temperature, Travel -- A Quality Balancing Act.** In: Seafood International. 4 pp. (SGEP-11)

Pomponi, S.A., R. Willoughby, A.E. Wright, M.E. Kaighn, and P. Linley. 1997. **Development of Techniques for *in vitro* Production of Bioactive Marine Natural Products from Marine Sponges.** In: Proceedings of the 1996 World Congress on *in vitro* Biology. (R/LR-MB-1)

Pomponi, S.A. 1997. **Marine Resources---Sustainable Use for Drug Discovery Research.** Sea Technology. 38(9):19-25. (R/LR-MB-1)

Seaman, W. 1997. **Does the Level of Design Influence Success of an Artificial Reef?** In: Proceedings of the 1st European Artificial Reef Research Network Conference, A.C. Jensen, ed. Southampton Oceanography Centre, Southampton, United Kingdom. pp. 359-376. (M/PM-11)

Seaman, W. 1997. **Frontiers that Increase Unity: Defining an Agenda for European Artificial Reef Research.** In: Proceedings of the 1st European Artificial Reef Research Network Conference, A.C. Jensen, ed. Southampton Oceanography Centre, Southampton, United Kingdom. (M/PM-12)

Zheng, J., and R.G. Dean. 1997. **Shoreline and Dune Recession Variability and Cross-Shore Modeling.** In: Proceedings of the 10th National Conference on Beach Preservation Technology, St. Petersburg, Florida. (R/C-S-35)

IX. Fathom

Special Issue: Florida's Marine Biotechnology. SGEB-34. March, 1997. Florida Sea Grant College Program. Gainesville: University of Florida. 21 pp. (COMM-4)

Special Issue: Florida's Sharks. SGEB-41. December, 1997. Florida Sea Grant College Program. Gainesville: University of Florida. 21 pp. (COMM-4)

X. Posters

None

XI. Videos

The Science of Florida Bay (SGEP-11)

XII. CD-ROM Releases

None

XIII. Software

None

XIV. Home Page

Maintain University of Puerto Rico Sea Grant Home Page.

Maintain Southern Regional Home Page (Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina) not released.

Maintain the Southwest Florida Non-Regulatory Anchorage Management Program Home Page.

Maintain the National Sea Grant Display Calendar.

Florida Sea Grant Home Page.

Florida Bay Home Page.

7.0 STUDENTS

An Investment in Florida's Future Through Sea Grant Sponsored Graduate Education

Introduction

Florida Sea Grant has been serving the people of Florida for 31 years. Its mission is to enhance the practical use and conservation of coastal and marine resources in Florida to create a sustainable economy and environment. Florida Sea Grant operates through a statewide university-based research, education and extension partnership of state and federal agencies, businesses and citizens. This partnership involving university faculty and the public was created nationally in 1966 with the passage of federal legislation that created the National Sea Grant College Program. The U.S. Secretary of Commerce designated the State University System of Florida as a Sea Grant College in 1976, and the program is hosted by the University of Florida. Today, 31 Sea Grant programs, based within the academic structures of their states, together form the national program.

The Florida Sea Grant College Program focuses on marine and coastal issues across research, education and extension activities. Florida Sea Grant programs are also multi-disciplinary in nature. Research is funded on a statewide, competitive basis. Education programs focus on funding graduate students using public and private funds and in educating citizens. An organized extension outreach program, using both on-campus and off-campus faculty, combines faculty and student research results into formats the public can us, and it provides stakeholder needs in research to the faculty and students. No other academic department or single university has this breadth and depth of focus on multi-disciplinary marine and coastal issues statewide.

At the heart of Florida Sea Grant's program are the scientific investigations that it supports. On an annual basis, at least 50 percent of Florida Sea Grant's core federal funding is used to support research. An annual goal is that at least 25 percent of research funds are used to support graduate student assistantships and other direct student involvement in research activity.

Education and Human Resources

Investment in the future of Florida's coastal resources requires both capital and labor. It is critical that the labor force be highly trained and skilled. As a university- and issue-based research and education program, Florida Sea Grant draws upon its partnership of people, universities, governments and businesses to ensure that Florida has a technically trained work force and scientifically and environmentally informed citizens.

Through support to graduate education, Florida Sea Grant produces highly trained scientists, social scientists, engineers and other professionals that increase Florida's economic competitiveness both nationally and internationally, and who devise and lead creative management concepts to keep Florida's coastal environment sustainable for future generations.

The opening of new viewpoints and perspectives is one of the most important challenges to higher education. In addition to gaining scientific knowledge and research skills, students need to engage interdisciplinary and multidisciplinary perspectives, use multiple contexts in solving problems, and communicate complex ideas well in work group settings.

Fostering these important skills requires a diversification of learning opportunities at the college or university level. Florida Sea Grant participates in various fellowship and scholarship programs and traditional research assistantships that serve to broaden the experiences of graduate students, and in some cases, undergraduates. Florida Sea Grant has provided substantial support to educating Florida's

future marine scientists and environmental professionals by giving selected graduate students the opportunity to develop their research and analytical skills by assisting scientists with Sea Grant projects. These graduate students are then prepared to assume prominent positions where they can impact directly on the continued wise use, sustainable development, and conservation of marine and coastal resources. Florida Sea Grant will also continue to invest in its faculty and staff so they have the necessary skills and training to meet the long-term needs of the organization.

Florida Sea Grant funded graduate students apply their skills and training from over 30 disciplines in research on:

- Aquaculture
- Marine Biotechnology
- Fisheries
- Seafood Safety and Quality
- Water Dependent Businesses
- Coastal Water Quality
- Coastal Habitats
- Coastal Storms and Hazards

Florida Sea Grant Student Programs

Florida Sea Grant does not "teach" or "graduate" students in the tradition of an academic department. However, funding and support for graduate students in many academic departments statewide is provided through Florida Sea Grant research projects and with other student fellowship and scholarship programs. Students receive Florida Sea Grant support through both public and private sources of funds.

Florida Sea Grant Student Programs

Public Funds	Private Funds
! Research Assistantships	! Aylesworth Foundation for the Advancement of Marine Sciences
! Dean John A. Knauss Marine Policy Fellowships	! Old Salt Fishing Club Scholarship
! Sea Grant Industrial Fellowships	! Charles Skoch Sea Grant Scholarship
! National Marine Fisheries Service/Sea Grant Fellows in Marine Economics and Population Dynamics	
! NOAA Coastal Service Center Coastal Management Fellowship	

Beginning in the early-1980s, a decline occurred in the number of students supported by federal Florida Sea Grant funds. This decline began and continued during the "tough" federal budget years for Sea Grant when overall federal Sea Grant appropriations were cut (1981) with recovery not really beginning until the mid-1980s. University funding in Florida also suffered during that time and faculty writing Sea Grant (and other granting agency) proposals included summer salaries to protect employment, at the expense of funding that was formerly used for graduate students. Because of the high priority within Florida Sea Grant for student support, corrective action was taken to reverse the decline in student support.

Beginning in 1993, Florida Sea Grant adopted the policy that, at minimum, 25 percent of the Florida Sea Grant federal research budget would be used to support graduate students. Beginning in 1998, Florida Sea Grant research project funding guidelines indicated that the inclusion of graduate students in proposals would give the proposal a competitive edge, assuming all other review criteria were satisfactory. This policy has been followed since, and funding has been short of the goal only one time, in 1996 (see Table 1). In fact, student funding reached 1993 percentage levels in 2002 and was the highest ever in 2003 at <3 percent.

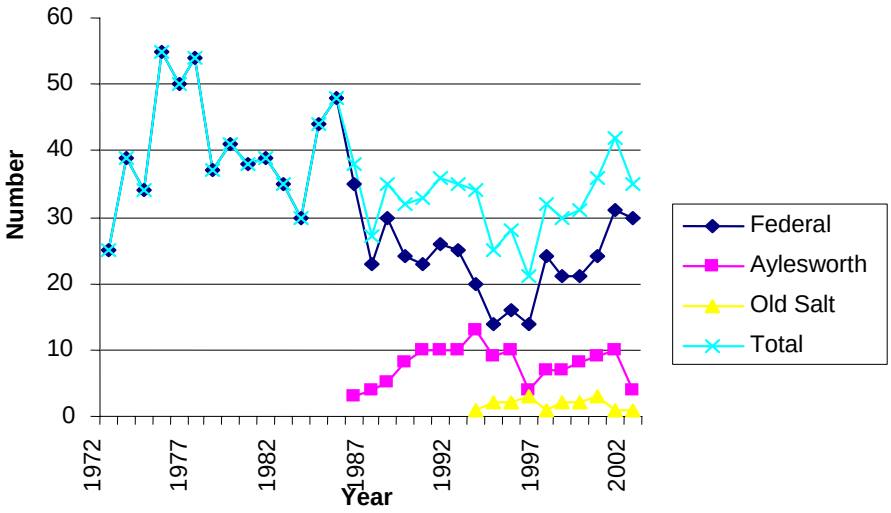
Table 1. Florida Sea Grant core federal funds used for graduate student support, 1993-2002.

Graduate Student Funding	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
As Percent of Research Funds	40	31	31	24	27	36	30	30	27	40	43
As Percent of All Funds	19	13	13	12	13	17	15	14	14	21	22

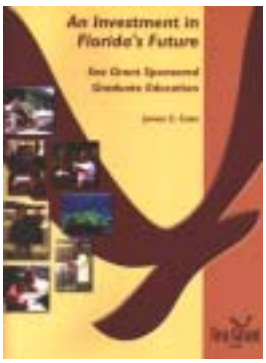
Beginning in 1986, Florida Sea Grant also initiated private support for Sea Grant sponsored students. The Aylesworth Foundation for the Advancement of Marine Sciences was formed with a major portion of its funding devoted to Florida Sea Grant scholarships. The Old Salt Fishing Club also created a scholarship program for students with both scholarship programs conducted in partnership with the Florida Sea Grant Program. By early 2003, a total of $439,000 had been spent since 1986 from those private sources for Sea Grant student scholarships.

The overall impact of these efforts has been to cause an increasing trend in the total number of graduate students supported since 1996 (the lowest year ever). For 2002, a total of 34 graduate students are receiving some support (see Figure 1).

Figure 1. Students receiving full or partial support.



Student Program Analysis



An exhaustive tracking student and analysis of Florida Sea Grant student programs was begun in early 2001, completed during 2002 and the results published in November 2002. Preliminary results were included in the 2001 Performance Counts! In summary, since 1986, a total of 169 students have completed a degree or other academic program with financial assistance from Florida Sea Grant, involving students from 13 Florida universities and four out-of-state universities. Sixty-one percent have been M.S. degrees, 26 percent Ph.D. degrees and 13 percent undergraduate, non-thesis or post-doctoral fellowship work. Each of them worked on the solution to a current Florida coastal resource issue or opportunity. Fifty-five percent are now

employed in Florida, and another 43 percent are employed in 23 different states in the U.S. The rest are employed in 7 other countries. Twenty-four percent are now involved in university teaching or research (e.g., assistant professor); 23 percent are working for industry or non-governmental organizations (e.g., coastal engineer in a civil engineering firm); 15 percent are in federal or state agencies (e.g., scientist at the Florida Marine Research Institute); 10 percent are pursing an additional degree (e.g., a Ph.D. after the completion of a M.S.); 24 percent were in the process of completing their degree and 4 percent were unable to be tracked. Since early 2002 when our most recent tracking study was completed, an additional 88 students have been added to our database due to Florida Sea Grant support of various types. Our tracking data will be updated in 2004.

Sea Grant's multidisciplinary approach also gives students scientific knowledge with interdisciplinary perspective; they use multiple contexts to solve problems; and they learn to communicate complex ideas. This is apparent in that students have graduated from over 20 different academic degree tracks. These include biology, engineering, marine science, food science and human nutrition, fisheries/aquatic sciences and oceanography, among others.

Also of particular note, 26 graduated students are now working in various government agencies. Thirteen are working in NOAA: at a National Estuarine Research Reserve (7); National Weather Service (1); National Marine Fisheries Service (4); Office of Global Programs (1). Six are at other federal agencies including the U.S. Geological Service, Army Corps of Engineers, U.S. Navy, Food and Drug Administration and the National Cancer Institute. The other 13 are working in state or county governments, various regional management districts or in foreign government agencies.

Thirteen of Florida Sea Grant's Knauss Fellows are now working in NOAA. Four are in the National Ocean Service: Special Projects Office (1); Coastal Ocean Program (1); National Marine Sanctuary Program (1); International Programs Office (1). Three are working in the National Marine Fisheries Service: Office of Protected Resources (1); Office of Global Programs (2).

8.0 PROGRAM AWARDS

The following awards represent a sample of the awards presented to various Florida Sea Grant affiliated faculty during 2002.

Local Awards

Chris Combs	Received Certificate of Appreciation from Bayside High School, Palm Bay.
Andrew Diller	Received two Bronze Telly Awards for the documentary video "The Lost Island: Perdido Key". One was in wildlife/nature and one in public relations.
Scott Jackson	Received Educational Technology Award along with Kimberly McDonald.
	Received fourth place award for Smaller Florida County Exhibits for Florida State Fair Exhibit – "Come out and Play" along Sharon Maxwell.
	Received first place – excellent award for the Walton County Fair Exhibit "Light Facts About Sea Turtles in Walton County".
William Mahan, Jr.	Elected by the members of the Bay, Franklin Gulf Healthy Start Coalition to represent Franklin County on the Coalition's Board of Directors for the next two years.
John Stevely	Elected Florida Association of Natural Resource Extension Professional, District Director, South Central District.
	Received Gulf Guardian Award, First Place from the Environmental Protection Agency Gulf of Mexico Program.
	Received two awards for *Paddle Manatee: A Guide to Area Canoe and Kayak Trails* - Florida Planning and Association Outstanding Project Award and Outstanding Innovation Award.
Donald Sweat	Received Certificate of Appreciation from the St. Petersburg Pier Aquarium Board of Directors.

Statewide Awards

The State of Florida conducts an annual Davis Productivity Award which is a statewide Competition for employees that achieve excellence in increasing productivity for their agency or program. Three Florida Sea Grant faculty/staff earned statewide awards in 2002.

Ed Harvey	Certificate of Commendation for creating a new and money-saving accounting and data system to manage the 125 federal grants managed by the Florida Sea Grant College Program.
Leslie Sturmer	Certificate of Commendation for Recognition of the CLAMMRS team for providing important and timely water quality information to the clam aquaculture industry.
Dorothy Zimmerman	Certificate of Commendation for increasing the computer networking efficiency of the Florida Sea Grant College Program Office.

9.0 OUTREACH ACTIVITIES

This section contains a brief description of outreach activities organized into four areas: (1) major program activities, (2) major program plans of work, (3) workshops, conferences, displays and signage, (4) web pages and (5) quarterly and bi-monthly monthly summaries. The reader should note that this section reports activities, not impacts. Impacts are noted in section 2.0 of this document as accomplishments and benefits, and are reported under specific goals and tasks. This section contains only summary information to highlight major areas of outreach activity.

Major Program Activities

Many of the most successful outreach activities represent "programs" of work. That is, they are much more than one major workshop or conference. The "program" may utilize research faculty or research findings, may involve several methods of outreach technology or may represent a series of workshops. All these elements are reflected during major activities ongoing during 2002. Several examples follow.

Marine Biotechnology

In contrast to many other subjects addressed by university outreach and extension efforts, in which the audiences and client groups are large, widespread, and established, marine biotechnology is relatively small and young. But its promise to contribute socially and economically significant health and industry-related products and processes from living ocean resources is great. Thus, Florida Sea Grant has found itself in a unique role of educating decision-makers with focused needs, including business executives, legislators and their staffs, and scientists -- in contrast to broad and general public audiences. In 2001, FSG (1) presented technical information to committees of the Florida Legislature concerning proposed legislation to create a Sea Grant-administered marine biotechnology research, development and education fund; (2) took the results of the Marine Biotechnology Summit II it organized and began planning for the next such event, in 2002; (3) presented an invited review of outreach to a National Academy of Science marine biomedical workshop; (4) participated on the national Sea Grant network "theme team" for marine biotechnology to develop greater coordination and resources; and (5) participated on the board of directors of BIOFlorida, the statewide trade association for this field. In each case, "elites" received science-based information to use in deciding on investments and levels of effort. The sum of these decisions is building a foundation for Florida biotechnology to achieve national leadership for the ocean sector.

Florida Ocean Alliance

The Florida Ocean Alliance is now into its fourth year. This is a non-partisan organization dedicated to bringing together government, academia and private sectors in Florida to protect and embrace Florida's ocean and coastal resources for continued social and economic benefits. It is an indirect outgrowth of Governor Chiles Commission on Ocean Policy for Florida. Governor Bush did not implement most recommendations of that group. The FOA is an outgrowth of one of the recommendations. Members in 2002 were:

Florida Ports Council
Florida Sea Grant
Harris Corporation
Hubbs-Sea World Research Institute
FAU/Cantanese Center for Urban and Environmental Problems
Florida Institute of Oceanography
University of Miami/RSMAS

Arvida Corporation
Mote Marine Laboratory
IGFA, Fishing Hall of Fame and Museum
Carnival Cruise Line
Royal Caribbean Cruise Line
The Nature Conservancy

The Alliance conducts an annual conference, assists with Ocean Day in Tallahassee, and provides other educational services.

Marinas and Boatyards

Florida Sea Grant is a full partner in the Florida Clean Boating Partnership, the original clean marina program in the nation. Contributions have included writing the curriculum for workshops on clean marinas and clean boatyards, participating in presentation of these workshops, and chairing committees on the partnership. The result to date of this collaboration between Florida Department of Environmental Protection (funding) and the industry lead partnership is 56 clean marinas and 12 clean boatyards, with about 150 more "in the pipeline." Ten other states are now involved in clean marina programs and six more are contemplating startup. Most of these programs have used elements of the Florida Clean Marina model.

Florida Sea Grant also continues to work with the Marina Education and Research Committee (MERC), an outgrowth of the successful Sea Grant MarinaNet project. As an outshoot of this project, Florida Sea Grant received a grant to deploy 10 low power radio units at various marinas to demonstrate the effectiveness of technology to convey information to boaters. Additionally, Florida Sea Grant has been involved in the planning of a Clean Marina Program National Conference where industry, agency and Sea Grant personnel can gather to share information and explore standardization of state activities. This conference is scheduled to take place in September 2002.

Sustainable Marine Fisheries

FSG believes that effective fisheries extension requires use of research, extension and communication faculty and staff in the preparation and delivery of information. Sometimes this involves a research in presenting results to a management agency. Other times it is solely an extension activity, for example, meeting with a group of fishers to explain a proposed management regulation or a new business practice. Often it is packaging technical information in a communications context that can be understood by a lay audience. Some examples make these points clear.

Science-based Management.--During 2000-02, a total of ten faculty receiving Sea Grant research [Murie (UF), Milon (UCF), Coleman (FSU), Koenig (FSU), Ehrhardt (UM), Lindberg (UF), Burgess (UF), Butler (ODU)] or extension [Adams, Gregory (UF) funding served on the scientific and statistical committee or an advisory panel of either (and both for some individuals) the Gulf of Mexico Fishery Management Council (GMFMC) or the South Atlantic Fishery Management Council (SAFMC). This ensures that the latest research results or requested information feeds directly and without delay into the NOAA fishery management process.

Commercial Fishing.--The most important fishing county in Florida is Monroe County (Florida Keys) where about one-fifth of the state's commercial fishing activity occurs. The four leading species groups are king mackerel, spiny lobster, snapper/grouper and stone crabs. FSG economists and biologists have completed an analysis of these fisheries that are targeted by the same fishers on a seasonal basis. This has produced framework information that will allow the managers to estimate the impact in one of the fisheries when management regulations are changed in another. Using innovative modeling techniques, FSG scientists are predicting the health of the spiny lobster fishery and have

completed an economic analysis of the State's trap certificate program. These results have been presented to the state commission and federal councils that regulate and manage the fishery. The results of all recently completed spiny lobster research projects will be presented to spiny lobster fishers, and their input sought on future priorities, during a spring 2003 workshop in the Florida Keys. FSG scientific involvement during 2001 suggested that proposed options for reducing shrimp by-catch in the pink shrimp fishery in the Dry Tortugas would not work if existing by-catch reduction devices (BRDs) were used. FSG provided testimony on fisheries issues at four meetings of the Florida Fish and Wildlife Conservation Commission (FWC).

Recreational Fishing.--During 2001, Florida Sea Grant organized a regional artificial reef workshop for 35 participants, including 18 artificial reef coordinators from 10 coastal counties, and in 2002 the state's artificial reef coordinators to track progress. The latest scientific findings were presented along with training in the latest technology on evaluation, design, planning, permitting, management and monitoring. Local radio was used in 2001 by FSG in one county to teach residents about artificial reefs and the biology, regulations, fishing ethics and opportunities for local coastal fish species. The audience was measured at 12,000 listeners. Meanwhile, federal fishery managers indicate the recreational catch rate in some grouper fisheries is composed of 85% undersized fish. The mortality rate of these released fish brought from depths is high. FSG anticipated this need and in response, funded research to develop techniques vent gases from these fish and increase the survival rate. The techniques have been made available in articles in sport fishing magazines, to local fishing column writers in newspapers, and in workshops. The use of circle hooks to reduce the catch of undersized fish is being promoted and a venting tool has been developed with over 5,000 distributed. A commercial vendor is now interested in the latter. Over 90% of participants in some workshops say they will use the tools. The tools have been distributed in over 12 states and five countries.

2002-2003 Fisheries Mandate.--FSG is an active participant in regional fisheries extension activities as mandated by the FY02 federal appropriation for Sea Grant. These projects include the South Atlantic Regional Fish Extension Project to design, develop and evaluate educational materials on marine protected areas (MPAs) and essential fish habitat. The Gulf of Mexico Regional Fish Extension Project is on derelict fishing gear, alternative shrimp gear technology, methyl-mercury and ciguatera in fish and the sustainability of the Gulf of Mexico shrimp industry. Finally, to respond to a direct request from the U.S. Department of Commerce and the NOAA/NMFS director, Dr. William Hogarth, SGEP on quick notice organized a national conference on "Sharks and Safety" in June 2002, for the media, educators and resource managers. This was in direct response to the "shark attack frenzy" during 2001 and in anticipation of similar 2002 events. Over 150 people from 15 states attended.

SGEP has a long history of interacting with NOAA/NMFS and state and federal fishery managers. The NOAA/NMFS/SEFC in Miami and the Southeast Regional Office (SERO) in St. Petersburg have been long-time partners in many projects (e.g., SEFC/AOML/FSG current South Florida Ecosystem Project and recent Florida Bay Outreach Project). Involvement with the SAFMC and GMFMC is at a high level as shown above. Several faculty have close working relationships with the FWC. These interactions have been cultivated by the more senior SGEP agents. Having several agents dedicated to fishery management issues will strengthen the diversity of SGEP with interactions and collaborative efforts with fishery managers at local, state and federal levels, and they will also provide leadership to SGEP in becoming more involved in fishery issues.

Florida Sea Grant management conducted a thorough needs assessment in preparing this proposal. Between 21 November 2002 and 15 January 2003, about 75 management and research agency staff and industry personnel were contacted. These meetings were organized and attended principally by Jim Cato (FSG Director) and Chuck Adams (FSG Fisheries Economics Specialist and

Design Team Leader), with assistance from Steve Kearl (FSG Communications), Mike Spranger (FSG Assistant Director for Extension) and Bill Seaman (FSG Associate Director)[1]. In addition, the National Sea Grant Theme Team Fisheries document and the proceedings of RecFish 2000 were reviewed. The similarity among needs pointed out by these groups and during these meetings was profound in at least four ways. First, there is a critical need for additional fishery extension assistance that can be provided by Florida Sea Grant. Second, the demands on many newer Florida Sea Grant agents are so diverse, due to the diverse stakeholder groups they serve, that many are not as trained in fisheries issues as they need to be. Third, the needs were strikingly similar in the types of extension programs needed. Fourth, these groups stand ready to partner with FSG to accomplish our common goals. It is difficult to cover in detail the needs in the limited space in this proposal, but the following brief summary makes that attempt, and provides the critical needs assessment on which Florida Sea Grant submitted its 2003 Fish Extension Enhancement Proposal.

Summary of critical extension education needs and organizations that expressed the need determined during November 2002 to January 2003 comprehensive needs assessment.

Critical Extension Needs	GMFMC	SAFMC	FWC	NMFS/ SERO	NMFS/ SEFC	NMFS/ PCL	SFA/ Industry
Better Communication (a)	X	X	X	X	X	X	X
Conservation Education (b)	X	X	X	X	X	X	X
Conflict Resolution (c)	X	X	X	X	X	X	X
Spanish Language (d)	X	X	X	X			
Research Feedback (e)				X		X	X
Management Techniques (f)	X	X					

(a) There is a critical need for enhanced communication with fishers at the county or port level.
(b) There is a critical need for fisheries conservation measures information, in particular for recreational use of artificial reefs and trap removal in commercial sector.
(c) There is a critical need to reduce conflicts among user groups and better information and education would help.
(d) There is a critical need for Spanish language educational materials in South Florida, particularly for the commercial sector.
(e) Fishers need direct feedback on research results.
(f) Educational programs on specific management techniques such as ITQs, MPAs and ecosystem management are needed.

Florida Bay Outreach

Florida Sea Grant as a major partner, managed a four-year Florida Bay Education project that ended in 2002. Over the life of the project, the five million residents of South Florida were educated

[1] Gulf of Mexico Fishery Management Council. 21 November 2003. Tampa, Florida. GMFMC: Swingle, Leard, Goode, Lamberte, Hood; FSG: Cato, Adams. South Atlantic Management Council. 7 January 2003. Charleston, SC. SAFMC: Cupka, Mahood, Waugh, Iverson, Pugliese, Kitner, Murphy, O'Malley; FSG: Cato. Florida Fish and Wildlife Conservation Commission. 26 November 2002. Gainesville, FL. FWC: Roy Crabtree (Division of Marine Resources Director and future NMFS, SERO, Director); FSG: Cato, Adams, Seaman, Spranger, Kearl. NMFS Southeast Regional Office. 17 December 2002. St. Petersburg, FL. SERO: Patrae, Dalton, Weaver, Grimes, Holiman, Freselli, Ingles, Eldridge, Godcharles, Moore; FSG: Cato, Adams. NMFS Panama City Laboratory. 15 January 2003. PCL: Sheridan, Cortes, Fable, Fitzhugh, Kumpf, Allman, Collins, David, Carlson, Lombardi-Carlson, DeVries, Baremore, Palmer, Brusher ; FSG: Cato, Adams. NMFS Southeast Fisheries Science Center and Atlantic and Oceanographic Laboratory Scientists, Miami, FL. 3 December 2002. SEFSC/AOML: About 30 attendees; FSG: Cato seminar with discussion on cooperative fishery research and extension opportunities. Southeastern Fisheries Association, Board of Directors bi-annual meeting. 12 December 2002. Tampa, FL. SFA: About 35 industry members; FSG: Cato, Adams, Otwell presentations.

using the scientific findings of the 100+ ongoing research projects in Florida Bay. NOAA was key partner and funded much of the research. Project profiles were completed and distributed in English and Spanish. A resource directory, a quarterly newsletter and a series of Florida Bay Watch synthesis and analysis reports were completed with partners. The project assisted with the organization, structure, and published proceedings of the Florida Bay Science Conferences in 1999 and 2001.

The Florida Bay Education Program was terminated during late 2001, and the office closed. This was originally intended to be a five-year fully funded program by NOAA, (NMFS and NOS) and other project partners. Although the program was highly successful and received praise from the sponsors, continued funding became problematic. It gradually declined in years four and five, and the program was terminated, with final closeout of the program in process. For details on project accomplishment and benefits, see Section 2.0, Task 6.4.

NOAA Coastal Storms Initiative

Florida Sea Grant is conducting the outreach and extension component of the NOAA Coastal Storms Initiative, a study of the St. Johns River Watershed. This first pilot project involves several other agencies within NOAA for research and data cataloging. The result will be a smaller footprint of prediction for storms, amelioration of effects of storms, and better planning efforts based on knowledge of potential for storm surges, flooding, and vulnerability to contaminant release during storms.

SEA-COOS

Florida Sea Grant is in the start-up stage as a partner in the Southeast Coastal Ocean Observing System (SEA-COOS) project in identifying stakeholders, providing information on the various projects and presenting results of the studies that will take place over the next months and years. This integrated effort, in cooperation with Sea Grant programs in North Carolina, South Carolina, Georgia and Florida, and a host of universities and agencies, is the Southeast U.S. contribution to create a national coastal ocean observing system.

Urban Boating, Small Craft Navigation and Waterway Development

Florida Sea Grant continues to develop the urban boating and small craft navigation program into a nationally recognized program. This program uses research and extension to teach boaters, marina operators, and citizens how to regulate themselves using science-based maps and Geographic Information System technology. The goal is to avoid costly regulations and maintain economically viable industries. Currently, three positions are fully grant funded. During 2001, 5 FTE permanent funding for one position (Sea Grant Community Development Program) and a $25,000 donation was secured from the Brunswick Corporation (the manufacturer of about one-third of the recreational boats in the U.S.). The Florida legislature in 2002 authorized a pilot program in two Florida counties that allows general waterway/canal dredging permits if they follow Florida Sea Grant scientific guidelines. The end result is environmentally friendly permitting at lower cost in less time.

Florida Sea Grant and the West Coast Inland Navigation District have published two volumes on the Historical Geography of Southwest Florida Waterways. The area of coverage is from Anna Maria to Lemon Bay (Volume 1) and Charlotte Harbor to Cape Romano (Volume II). The documents provide a historical perspective on Florida's coastal waterway environment and development history. Volume II was completed during 2002. During 2002, a $1.5 million payment from Carnival Cruise Lines was made to the University of Florida as the result of a federal court case involving environmental monitoring of ocean pollution laws. A Florida Sea Grant endowment has been established with the funds with the

revenue from the endowment to be used in supporting the boating and waterway management program.

Marine Ornamentals '01

Florida Sea Grant was the lead sponsor and organizer of the second international conference on marine ornamental species, Marine Ornamentals 2001: Collection, Culture & Conservation. Building on the first conference organized by Hawaii Sea Grant, 19 sponsors including nine Sea Grant programs, joined to create a program that attracted 336 participants from 23 countries attended the November 2002 conference. Program evaluations showed that 67% of the attendees would attend a subsequent conference and 91% indicated that the conference should be continued as is or expanded. A book containing 26 chapters developed from papers given at the conference will be published in May 2003, by Iowa State Press, a Blackwell Publishing Company. Florida Sea Grant has continued to emphasize this area, and the Florida Sea Grant Director has agreed to serve on the organizing committee for MO '04, to be held in Hawaii in March 2004, in conjunction with the World Aquaculture Society. In addition, Florida Sea Grant initiated two Sea Grant Industrial Fellowships in 2002 focused on marine ornamentals. One partners with the Living Seas at Walt Disney World, Orlando, Florida, and the second partners with Maritech, Inc., Vero Beach, Florida.

International Activities

Florida Sea Grant is a strong believer in international programs, even though our funding source is domestic and the federal enabling legislation does not give us a specific international mandate to conduct international projects. We encourage our faculty to become involved internationally when the activity will (1) be helpful to Florida residents and students (have an impact at home), (2) provide future opportunities to Florida residents, and (3) when there is sufficient (sometimes new extramural) funding to support the activity. Florida is such an international state we must be involved. The 2000 report listed the types of international projects in which Florida Sea Grant has been engaged (e.g., seafood safety) and the countries of involvement (e.g., Nicaragua) for the last three years. The 2001 report provided program-wide data, based on a Spring 2001 survey by UF/IFAS, where the FSG management office, Extension program and Communications program is located.

Sea Grant associated faculty members (mostly those in UF/IFAS) are principally involved in technical assistance programs in other countries, hosting international visitors for meetings or conferences, and to a lesser extent, conducting research and advising international graduate students.

Sea Grant associated faculty involvement in international programs

For 2002, a few key international activities are highlighted:

a. Co-organizer of "Research and Monitoring of Marine Reefs Using Volunteer Divers, A North American Workshop," 20-22 June 2002, at Institute of Ocean Sciences, Sidney, Canada. Also moderated sessions and took leadership to edit proceedings. This meeting was the first of its kind, and exceeded expectations of many attendees. (Seaman)

b. Invited member of organizing committee for "Second International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Sciences," 3-7 September 2002, at University of Sussex, England. Also session moderator. This meeting advanced geospatial techniques for science and management. (Seaman)

c. Invited seminar, “Human-made Reefs in Ocean Fisheries and Ecosystems: Using Suspicion and Science to Define Their Roles,” University of British Columbia Fisheries Centre. (Seaman)

d. Forthcoming (May 2004) -- World Fisheries Congress, Vancouver, Canada. Invited to organize session “*Achieving the Reconciliation of Fisheries with Conservation Through Habitat Improvement in Marine Ecosystems,”* and present opening paper. (Seaman)

e. Ongoing contact and exchange of information with reef development and research interests. Hosted colleague from Korea National Fisheries Research and Development Institute. (Seaman)

f. Executive Director, “Seafood Science and Technology of the Americas.” Professional association of scientists and commercial interests from academia, government and private sectors addressing basic and applied science relative to seafood and aquacultured product quality and safety. Members are from North, Central and South America. 2002 meeting was held in Florida. (Otwell)

g. Certified HACCP courses were arranged and taught in Jamaica, Honduras, Guatemala, Ecuador, Costa Rico, Turks and Caicos Islands, Nicaragua and Guyana during recent years. (Otwell)

h. Development committee member with FAO/World Health Organization and Smithsonian Institute and University of Florida. Participating in website development to represent the world source for fisheries and seafood safety information from over 500 experts and 22,000 species or topics. (Otwell)

i. Presented paper on the impact of renewed spiny lobster tail imports (during Florida closed season) on dockside price. International Institute of Fisheries Economics and Trade Conference, Wellington, New Zealand. (Adams)

j. Team members for UF/Cuba project on the effects of renewed trade with Cuba on Florida aquacultural and natural resources based industries. A project funded by the McArthur Foundation. This effort provides a direct link with counterparts at the University of Havana and allows a means to maintain an open dialogue with Cuban scientists. (Adams)

k. FSG research funded faculty made presentations at the following international events based on work in their Florida Sea Grant projects:
    - Colloquium on Marine Natural Products, Bremerhaven, Germany. (Kerr)
    - Euro Conference on Marine Natural Products, Elmau, Germany. (Kerr)
    - Fourth International Conference on Molluscan Shellfish Safety, Santiagode Compestella, Spain. (Anita Wright)
    - North Atlantic Fisheries Organization Scientific Symposium, Spain. (Simpfendorfer/Burgess).
    - Second International Symposium on Stock Enhancement and Sea Ranching, Kobe, Japan. (Lindberg). (Brennan/Leber). (Miller/Walters)
    - Larvae, 2002. Vigo, Spain. (Arnold, et al.)
    - Evolution and Ecological Ethnology of Fishes. Quebec City, Canada. (Vigliola/Osenberg/St. Mary)
    - International Workshop on Restoring and Sustaining Diversity of Tropical Pacific Coral Reef Fish, Mo’orea, French Polynesia. (Osenberg/St. Mary)

- International Conference on Coastal Engineering, ASCE. Cardiff, Wales. (MacMahan, et al.)

Major Program Plans of Work

The long range planning of the Florida Sea Grant Extension Program is carried out under the University of Florida Extension Service's four-year plan of work. Every four years, this planning process defines the future needs of the Extension Service (ES). This four-year plan is then updated annually through the annual plan of work. In the fourth year, a new Four Year Plan of Work is developed.

FSGEP proposals are developed as a part of the overall Florida Sea Grant College omnibus proposal. Two, three or four-year proposals are developed as appropriate. Much of the material for the proposal is taken from the Extension Service Planning effort. FSGEP faculty plans are also integrated into the overall Florida Sea Grant College Program's long range planning process, which helps link research and extension program priorities and programs.

Florida Sea Grant Extension relies heavily on local county and regional advisory committees for identifying program needs, strategic planning and priority setting. Each off-campus faculty has one or more advisory committees to guide the development of their Annual County Plan of Work (CPOW). These CPOWs are then compiled into a State Major Program, which is coordinated by each program design team. The design team is usually chaired by an on-campus Sea Grant specialist with expertise in this subject area. The process is:

- Sea Grant County or Regional Advisory Committees provide needs evaluation.
- Sea Grant County Plans of Work are developed.
- Sea Grant County Plans of Work are integrated into Sea Grant State Major Programs.
- State Major Programs are coordinated/implemented by Sea Grant Program Design Teams.
- County faculty and specialists report quarterly reports of accomplishment.
- Annual Narrative Reports of Accomplishment are submitted for each faculty member.
- State Major Program Reports are developed for CE and Sea Grant.
- Sea Grant County or Regional Advisory Committees give feedback on accomplishments.

Six State Major Programs (SMPs) are in effect for 2002-05. The Marine Education Program has been integrated into the University of Florida 4H Program's Environmental Education Program. This will give the program effort additional resources and a broader base from which to develop programs. The six SMPs in effect during 2002 are below.

- Seafood and Aquaculture Product Quality and Safety
- Coastal Environmental and Water Quality
- Coastal/Marine Recreation/Tourism & Waterway Management
- Sustainable Marine Fisheries
- Marine Aquaculture
- Marine and Coastal Environmental Education

These major program areas have statewide coverage and represent about 65 percent of the educational effort of faculty. The goals and tasks relating to outreach in Section 2.0 result from the planning efforts described above. The remaining 35 percent of faculty time is used for emerging issues, responding to stakeholder questions and dealing with important marine issues that arise outside

the six major program planned areas. SMPs are evaluated, updated and annual objectives are planned at the annual staff meeting in October each year.

Workshops, Conferences, Displays and Signage

Workshops and Conferences

In addition to the major outreach activities reported in this section and in Accomplishments and Benefits (Section 2.0), a list of workshops and conferences is presented. The information lists specific workshop and conferences (and presentations if applicable) made by Sea Grant Extension faculty and FSG program managers during 2002. In most cases, the workshop or conference was held to accomplish one of the tasks in Section 2.0. The data includes only those with programmatic content made by management, and does not include administrative presentations. The data came from a new Faculty Activity System (FAS) being implemented at the University of Florida. It also includes presentations made by research faculty funded by Florida Sea Grant as obtained from annual research project reports.

Displays and Signage

More than 25 posters and displays were produced in support of Florida Sea Grant faculty in their leadership and participation with programs including international conferences, state and regional workshops, and Florida coastal education events at the community level. These ranged in complexity from the technical summary of research results for invited poster presentations to programmatic support involving multiple presentations across the state to the production and statewide distribution of posters for a university student audience. A sample of display production for 2002 is indicated below.

Theme	Event	Location
Coastal hazards	Sharks: From Fear to Fascination	Tampa, FL
Ocean resource conservation	Ocean Day in the Capitol	Tallahassee, FL
Florida sponge research	VI International Sponge Conference	Rapallo, Italy
Florida Clean Marina Program	Miami Boat Show	Miami, FL
Support to aquaculture research	2002 Florida Aquaculture Association	Tampa
Support to graduate education	Florida Sea Grant Scholarships and Fellowships	statewide
Urban boating and waterway management	Florida Outdoor Writers Association	Panama City Beach

Signage production for the year included weatherproof outdoor signs to support a monofilament fishing line recycling program at multiple sites in more than a dozen counties, revision and reproduction

of signs in Spanish and English alerting coastal visitors to the dangers to pelicans of feeding them fish scraps and bones, and a boater alert to protect shellfish aquaculture lease areas in the vicinity of Pine Island Sound.

Web pages

With its web presence firmly established, Florida Sea Grant outlined an expanded design for the site that would incorporate new material, increase interactivity with web visitors, and enhance accessibility for users with disabilities.

The expansion of the site will present information organized according to programmatic areas, as well as more 'static' information related to administration of the Sea Grant program in Florida. The content will parallel ten areas of emphasis outlined in Florida Sea Grant's strategic plan -- marine biotechnology, aquaculture, fisheries, seafood safety, graduate education, marine education, boating and waterways, water quality, coastal habitat, and coastal storms. Work began to re-organize existing information and pages under the new topical areas, as well as create content to augment available content under the programmatic areas.

In addition, web staff began building the site's first real-time, web-based submission page to streamline Florida Sea Grant's biennial Request for Proposal and Review process for the 2004-2005 funding cycle. The end product, which is scheduled to go live on the first day of the research proposal cycle in February, 2003, is expected to make the proposal process easier for researchers, reviewers, and Sea Grant administrative staff alike. Researchers will be able to submit their statements of interest online to a centralized database. Reviewers will be able to not only review the full text of pre-proposals online, but submit their reviewers comments and project scores online as well. Sea Grant administrative staff will be able to monitor the submission and review process from a series of user-friendly, web-based report screens. The construction process is in its initial stages to determine the scope of the process and identify pertinent deadlines, but once functional, Florida Sea Grant will be one of just a handful of Sea Grant programs that offer its proposal submission process online.

Staff also has been involved in a series of training to ensure that all electronic information on its site is accessible to people with disabilities, in adherence with federal accessibility standards. Staff attended live demonstrations of software that facilitates this upgrade, and followed up with training through a national online initiative to become familiar with specific details of compliance. Features are being gradually implemented. The goal is for the entire website to be fully compliant by mid 2003.

Additional publications were made available to the Sea Grant website, either by uploading web-optimized versions of publications, or by linking to html documents that reside on other servers. Publications have already been re-organized by programmatic theme areas to dovetail with the conversion of the site to its new design. To facilitate the availability of all new information through its website or the national Sea Grant depository website, communications staff have adopted the policy of obtaining from printers and service bureaus the web-optimized version of publications at the time publications come off the press.

Quarterly and Bi-Monthly Summaries

All outreach activities are too extensive to report in this document. In fact, it is a real accomplishment to maintain communication among our far-flung off-campus outreach faculty, who are separated by almost 1,000 miles at the extreme of the range (Pensacola – Key West). As an internal communication tool, each Sea Grant Extension faculty member provides highlights of their past activities as well as future planned activities. This is done on a quarterly basis. These reports are then

compiled and placed on the Florida Sea Grant web page. Past quarterly reports can be found at this website: www.flseagrant.org.

A bi-monthly Faculty Progress Report is also completed an emailed via campus coordinators to about 800 faculty members located statewide. This document announced funding opportunities for faculty and students and provides other information of interest. It can also can be found at the Florida Sea Grant website.

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Goal 1: Create Products and processes from Florida's Coastal Resources Using Marine Biotechnology						
Abbasi, Husam; Ramlakhan, Rani; Mari, Frank	Florida Marine Biotechnology Summit III		*Conus dalli*: Isolation and characterization of novel conopeptides from a panamic mollusk-hunting *Conus*	October, 2002		Ft. Pierce, Florida
Campbell, Mark; Wright, Anita C.	Abstracts of the American Society for Microbiology, 102nd General Meeting		Real-time PCR assay for detection and enumeration of *Vibrio vulnificus*.	May, 2002		Salt Lake City, Utah
Campbell, Mark; Wright, Anita C.	Southeastern American Society of Microbiology		Real-time PCR assay for detection and enumeration of *Vibrio vulnificus* in oysters	November, 2002		Gainesville, Florida
Cano, Herminsul; Mari, Frank	Florida Marine Biotechnology Summit III		*Conus purpurascens*: Isolation and characterization of novel conopeptides from the only Panamic fish-hunting *Conus*	October, 2002		Ft. Pierce, Florida
Franco, Aldo; Swanson, Michelle; Mari, Frank	Florida Marine Biotechnology Summit III		*Conus regius*: Isolation and characterization of novel conopeptides from a Western Atlantic worm-hunting *Conus*	October, 2002		Ft. Pierce, Florida
Kem, Michalski, Wildeboer, and Soti	Florida Marine Biotechnology Summit III		Nemertine natural products	October, 2002		Ft. Pierce, Florida
Kem, Michalski, Wildeboer, and Soti	Florida Marine Biotechnology Summit III		Hoplonemertine pyridyl alkaloids: interactions with nicotinic receptors	October, 2002		Ft. Pierce, Florida
Kerr, Russell		Gordon Research Conference on Marine Natural Products	The pseudopterosins -- elucidation of the biosynthetic origin, discovery of anti-inflammatory intermediates and proposal of a biotechnological production method.	Feb, 2002		Ventura, California
Kerr, Russell		Colloquium on Marine Natural Products	Biosynthesis of marine diterpenes	2002		Bremerhaven, Germany
Kerr, Russell		Euro Conference on Marine Natural Products	On the biosynthesis of the pseudopterosins	2002		Elmau, Germany
Kerr, Russell		The Society for Industrial Microbiology	Pseudopterosin biosynthesis: pathway elucidation and enzymology	2002		Hawaii
Mari, Frank; Fields, Greg	Florida Marine Biotechnology Summit III		Drugs from the sea: Atlantic and Panamic cone snail species are a rich source for novel neuropharmacological agents	October, 2002		Ft. Pierce, Florida
Matei, Elena; Pflueger, Fred; Mari, Frank	Florida Marine Biotechnology Summit III		Structural analysis of nanomolar quantities of conopeptides using 2D-NMR methods	October, 2002		Ft. Pierce, Florida
Moller, Carolina; Pisarewicz, Katarzyna; Lauer-Fields, Janelle; Fields, Gregg B.; Mari, Frank	Florida Marine Biotechnology Summit III		Evaluation of the neuromodulatory effects of conopeptides of Atlantic and Panamic origin	October, 2002		Ft. Pierce, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Mora, David; Mari, Frank	Florida Marine Biotechnology Summit III		First example of *γ*-Hydroxyvaline (ghv) within a polypeptide chain: A novel conopeptide from *Conus gladiator* contains ghv	October, 2002		Ft. Pierce, Florida
Pflueger, Fred; Mari, Frank	Florida Marine Biotechnology Summit III		*Conus brunneus*: Isolation and characterization of novel conopeptides from an Eastern Pacific worm-hunting *Conus*	October, 2002		Ft. Pierce, Florida
Ramlakhan, Rani; Mari, David	Florida Marine Biotechnology Summit III		Isolation of a novel *ω*-conotoxin from the venom of *Conus nux*	October, 2002		Ft. Pierce, Florida
Wright, Anita C.	Seafood Science and Technology		To probe or not to probe: molecular methods for detection of vibrios in oyster meats	October, 2002		Orlando, Florida
Wright, Anita C.	Southeastern American Society of Microbiology		To probe or not to probe: molecular detection of pathogens in molluscan shellfish	November, 2002		Gainesville, Florida
Wright, Anita C.; Campbell, Mark		Fourth International Conference on Molluscan Shellfish Safety	Rapid detection of *Vibrio vulnificus* in oysters.	June, 2002		Santiago de Compestella, Spain
Goal 2: Determine Production and Management Techniques Which Make Florida's Fisheries Sustainable and Competitive						
Abercrombie, D.; Chapman, D.; Pikitch, E.; Shivji, M.	Florida Marine Biotechnology Summit III		A novel, bi-organelle PCR approach to forensic identification of shark body parts: Application to great white shark conservation and trade monitoring on a global scale	October, 2002		Ft. Pierce, Florida
Abercrombie, D.; Chapman, D.; Pikitch, E.; Shivji, M.		American Elasmobranch Society 18th Annual Meeting	Rapid detection of great white shark tissues for international conservation and trade monitoring using streamlined, nuclear (ITS2) and mitochondrial (*cyt b*) bi-locus, multiplex PCR approach	July, 2002		Kansas City, Kansas
Adams, Charles	Representative group of spiny lobster and stone crab fishermen		The benefits of cooperative organization	February, 2002		Marathon, Florida
Adams, Charles	In-Service Training Workshop		Florida's sustainable marine fisheries for Sea Grant marine agents	September, 2002		Long Key, Florida
Adams, Charles	Springs Coast Workshop		The economic activities associated with marine resource useage in the Springs Coast multi-county area	March, 2002		Homosassa, Florida
Adams, Charles	Florida Fish and Wildlife Conservation Commission, FMRI, Harmful Bloom Task Force Symposium		The economic consequences associated with red tide events in the panhandle and southwest regions of Florida	April, 2002		St. Petersburg, Florida
Adams, Charles	Longboat Key Chamber of Commerce		The consequences of red tide events in their area. The development of a data collection program for local businesses affected by red tide events.	April, 2002		Longboat Key, Florida
Adams, Charles	IFAS In-Service Training Retreat		Using follow-through to make it happen	April, 2002		Gainesville, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Adams, Charles	Englewood Chamber of Commerce		The consequences of red tide events in their area. The development of a data collection program for local businesses affected by red tide events.	May, 2002		Englewood, Florida
Adams, Charles		The Coastal Society 2002 Conference	The economic consequences and demographic attributes of red tide events in Florida	May, 2002		Galveston, Texas
Adams, Charles		Southeastern Fisheries Association 50th Annual Meeting	The Economic impacts associated with the bottom trawling sector of the commercial fishing industry in Florida	May, 2002		Jacksonville, Florida
Adams, Charles		Association of Natural Resource Extension Professional Conference	The Economic consequences of red tide events in Florida	June, 2002		Naples, Florida
Adams, Charles		International Institute of Fisheries Economics and Trade Conference	Effects of imports of Caribbean spiny lobster on the dockside price of *Panulirus argus* in Florida	August, 2002		Wellington, New Zealand
Adams, Charles	Faciliated Blue Crab Management Workshops			August - December, 2002	300	17 different Florida locations
Adams, Charles	Keys Marine Lab		In-service training re: various issues related to Florida fisheries management, markets and harvesting	September 16-18, 2002		Long Key, Florida
Adams, Charles	Mid-Year Southeastern Fisheries Association Board of Directors Meeting		Economic issues relevant to the Gulf shrimp industry	December 12, 2002		Tampa, Florida
Adams, Charles		2002 Biennial Meetings of the International Institute of Fisheries Economic and Trade	A dual production analysis of a multispecies fishery: The Case of the US Atlantic longline fleet	August, 2002		Wellington, New Zealand
Adams, Charles; Hutchinson, S.		55th Annual Meeting of the Gulf and Caribbean Fisheries Institute	Supply response and resource rent changes in South Florida fisheries	November, 2002		Xel Ha, Mexico
Brennan, N.P.; Leber, K.M.		Second International Symposium on Stock Enhancement and Sea Ranching	Effects of release micro-habitat on survival and growth of hatchery snook (*Centropomus undecimalis*) in a Florida estuary	2002		
Butler, J.A.; Heinrich, G.L.; Valerio, S.M.		87th Annual Meeting of the Ecological Society of America	Effectiveness of excluder devices on crab pots at reducing capture and mortality of diamondback terrapins	August, 2002		Tucson
Cato, James	Southeastern Fisheries Association, Board of Directors		Current Sea Grant activities in fisheries and seafood Sea Grant/NMFS	December, 2002	35	Tampa, Florida
Cato, James; Adams, C.	National Marine Fisheries Service Southeast Region Office		Opportunities in fisheries extension	December, 2002	20	St. Petersburg, Florida
Cato, James; Adams, C.	Gulf of Mexico Fishery Management Council		Opportunities in fisheries extension	November, 2002	10	Tampa, Florida
Coleman, F.C.	Symposium on Effects of Fishing Activities on Benthic Habitats		Habitat engineering by red grouper	November, 2002		

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Combs, C.	Sebastian Inlet Blue Water Open (weighmaster)			May, 2002	300	Sebastian, FL
Combs, C.; Creswell, R.L.	Fishing Frenzy Dolphin Tournament (weighmaster)			May, 2002	400	Ft. Pierce, Florida
Crane, Marella	Florida Sportsmen Boating and Fishing		Fish venting and circle hooks	September, 2002		Miami, Florida
Crane, Marella	South Florida Fishing Extravaganza		Provided training and distribution of venting tools, circle hooks brochure, and other fisheries information	May, 2002		Miami, Florida
Crane, Marella	Miami Rod and Reel Club		Provided training and distribution of venting tools, circle hooks brochure, and other fisheries information	February, 2002	25	Miami, Florida
Crane, Marella	Capt. Bob Lewis Fishing Tournament		Provided training and distributed venting tools, circle hook, and fisheries information	February, 2002	25	Miami, Florida
Crane, Marella	Ladies Let's Go Fishing!		Provided training and distributed venting tools, circle hook, and fisheries information	March, 2002	20	Ft. Lauderdale, FL
Crane, Marella	International Game and Fishing Hall of Fame		Provided training and distributed venting tools, circle hook, and fisheries information		15	Ft. Lauderdale, FL
Crane, Marella	Yamaha Miami Billfish Tournament Conservation Night		Fish venting and circle hooks	November, 2002	100	Miami, Florida
Crane, Marella	Youth Fishing Tournament		Presented to youth fish identification and fisheries conservation	January, 2002	42	Miami, Florida
Creswell, R.L.		55th Gulf and Caribbean Fisheries Institute	Conference chairman		200	
Gregory, D.	Six Gulf of Mexico and South Atlantic Fishery Management Scientific and Statistical Council Meetings (invited participant)(6)					Tampa, New Orleans, Miami
Gregory, D.	Commercial Lobster Diving Workshop				15	
Grizzle, R.	Pensacola Recreational Fishermen's Assoc (Fish Venting)				29	Pensacola, FL
Hoenig, J.; Shivji, M.	Elasmobranch Symposium		Estimating species composition of shark catches from DNA assays: group testing reduces the number of laboratory tests	September, 2002		Spain
Koenig, C.C.	Gulf of Mexico Fishery Management Council		Presentation to local fishermen re: Progress in the northeastern Gulf of Mexico MPAs	May, 2002		Panama City, Florida
Koenig, C.C.	Gulf of Mexico Fishery Management Council		Presentation to local fishermen re: Progress in the northeastern Gulf of Mexico MPAs	May, 2002		Tampa, Florida
Koenig, C.C.	Gulf of Mexico Fishery Management Council		Presentation to local fishermen re: Progress in the northeastern Gulf of Mexico fishery reserves	May, 2002		
Koenig, C.C.		American Fisheries Society Annual Meeting	Law enforcement issues in marine protected areas	August, 2002		Baltimore, MD

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Lindberg, W.J.		Second International Symposium on Stock Enhancement and Sea Ranching	A managed open range for conserving free-ranging reef fishes.	January-February, 2002		Kobe, Japan
Mahan, William	Bay & Oyster Issues Workshop			December, 2002	24	Apalachicola, Florida
Mason, Doran M.	University of Michigan Fall seminar series		Habitat-mediated predator production dynamics in the Gulf of Mexico Institute of Fisheries Research	November, 2002		
Miller, J.M.; Walters, C.J.		Second International Symposium on Stock Enhancement and Sea Ranching	Experimental ecological tests with stocked marine fish	2002		
Nagy, B.; Butler, M.W.; Marcinek, D.M.; Mason, D.M.; Murie, D.J.; Lindberg, W.J.		132nd AFS Annual Meeting	Reef size mediated pelagic fish distributions on an artificial reef system in the Gulf of Mexico	August, 2002		Baltimore, MD
Nielson, J.T.; Shivji, M.	Florida Marine Biotechnology Summit III		Development of a high-density multiplex PCR assay for rapid identification of non-ridgeback shark species.	October, 2002		Ft. Pierce, Florida
Novak, Rich		World Recreational Fishing Conference		May, 2002	180	Darwin, Australia
Novak, Rich		Sharks: From Fear to Fascination		June, 2002	100	Tampa, Florida
Osenberg, C.W.	Department of Biology, University of California		Invited Seminar	March, 2002		Santa Cruz, CA
Osenberg, C.W.	National Marine Fisheries Servic		Invited Seminar	May, 2002		Seattle, WA
Osenberg, C.W.	Restoring and Sustaining Diversity of Tropical Pacific Coral Reef Fish		Density-dependence in reef fishes: results of meta-analysis	April, 2002		Mo'orea, French Polynesia
Osenberg, C.W.	Restoring and Sustaining Diversity of Tropical Pacific Coral Reef Fish		Density dependence and its effects on the efficacy of alternative management strategies	April, 2002		Mo'orea, French Polynesia
Simpendorfer, C.A.; Burgess, G.H.		NAFO Scientific Symposium	Assessement of the status of the Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) using an age-structured population model	September, 2002		
Spranger, Michael; Burgess, G.H.		Sharks In Perspective: From Fear to Fascination		June, 2002	125	Tampa, Florida
Stevely, John		2002 International Sponge Biology Conference	The long-term recovery of sponge population in Florida Keys, USA following a widespread sponge mortality	September, 2002	200	Rapallo, Italy
Stevely, John		2002 International Sponge Biology Conference	Sponge biomass estimates in the Upper and Middle Florida Keys, USA	September, 2002	200	Rapallo, Italy

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Stevely, John	5 Bait and Tackle Stores		Provided training and distributed venting tools, brochures, and fisheries information			Sarasota, Florida
Stevely, John	Bradenton Herald Fishing College		Provided training and distributed venting tools, brochures, and fisheries information	February, 2002	202	Bradenton, Florida
Stevely, John	Fishing the Islands		Provided training and distributed venting tools, brochures, and fisheries information	June, 2002	150	Sarasota, Florida
Stevely, John	DeSoto Fishing Tournament		Provided training and distributed venting tools, brochures, and fisheries information	July, 2002	150	DeSoto, Florida
Stevely, John	Sport Fishing Radio Show - Fishing with Capt. Tom Smith		Fish venting	August, 2002		Manatee, Sarasota and Pinellas Counties
Stevely, John	Manatee County Environmental Management Department		Fish identification			Manatee County
Stevely, John	Cortez Commercial Fishing Festival		Assisted in all aspects of organizing the Festival	February, 2002	5,000	Cortez, Florida
Stevely, John	Cortez Commercial Fishing Festival		Presented 12 talks on commercial fishing practices and marine resource issues	February, 2002	5,000	Cortez, Florida
Stevely, John	Florida Institute for Saltwater Heritage		Participated in four Board of Directors meetings to plan fund raising and community events	Jan-Oct, 2002		Sarasota, Florida
Stevely, John	Florida Institute for Saltwater Heritage		Participated in ten meetings with the planning committee to develop a management plan. Wrote and produced the plan based on input and review of the committee	March - June, 2002		Sarasota, Florida
Stevely, John	Manatee County Audubon Board of Directors		Presentation on FISH Preserve	March, 2002		Sarasota, Florida
Stevely, John	Great Outdoors Conservancy		Conducted tour of FISH Preserve	May, 2002		Sarasota, Florida
Stevely, John	Manatee County Environmental Summit		Presented FISH poster exhibit	October, 2002		Sarasota, Florida
Stevely, John	Tampa Bay Agency on Bay Management		Presentation on FISH project			Sarasota, Florida
Sturmer, Leslie	Oyster Industry Alternatives Discussion			October, 2002		Cedar Key, Florida
Sturmer, Leslie	Eastern U.S. Interstate Shellfish Seed Transport Workshop			February, 2002		Charleston, South Carolina
Sweat, Donald	Recreational Scalloping			June, 2002	35	Homosassa, Florida
Sweat, Donald		VI International Sponge Conference		September, 2002	200	Rapallo, Italy
Sweat, Donald	Old Salts Fishing Club		Fish venting	October, 2002	125	
Sweat, Donald		6th International Shellfish Restoration Conference		November, 2002	210	Charleston, South Carolina
Sweat, Donald	Southeast Atlantic Coastal Observation System (SEACOOS)			December, 2002	40	Charleston, South Carolina
Tavares, Sacheen	Ladies Let's Go Fishing!		Fish venting	March, 2002	16	Fort Lauderdale, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Tavares, Sacheen	Broward County Schools Marine Fisheries Workshop			April, 2002	10	Fort Lauderdale, Florida
Vigliola, L: Osenberg, C.W.; St. Mary, C.M.		Evolution and Ecological Ethology of Fishes	The relative importance of larval settlement and juvenile migration on colonization of artificial reefs by coral reef fishes	August, 2002		Quebec City, Canada
Wasno, Bob	REDstart			April, 2002	24	Florida Gulf Coast
Wasno, Bob	REDstart			May, 2002	8	Sanibel, Florida
Wasno, Bob	Fishing Workshop			August, 2002	12	Ft. Myers, Florida
Wasno, Bob	Summer Slam Workshop			August, 2002	167	Captiva Island, Florida
Wasno, Bob	Sanibel Fish Club Presentation			November, 2002	56	Sanibel, Florida
Goal 3: Develop the Food and Hobby Segments of Florida's Marine Aquaculture Industry						
Adams, Charles	St. Johns Water Management District Office		Economic feasibility of mandating recirculation standards for aquaculture operations in NE Florida			
Adams, Charles		Southern Agricultural Economics Association Meeting	Poster presented on the economic impact of the hard clam culture industry to the Florida economy			Orlando, Florida
Adams, Charles		8th Annual Public Interest Environmental Conference	Marketing channels and economic values associated with the hard clam culture industry in Florida			Gainesville, Florida
Adams, Charles	FDACS Shrimp Culture Workshop		The use of intensive, lined ponds for the culture of shrimp in Florida.	March, 2002		Bartow, Florida
Adams, Charles		2002 Florida Aquaculture Association Fall Conference	Economic impact of hard clam farming on the economy of Florida and introduction of hard clam culture business management software	November, 2002		Tampa, Florida
Arnold, W.S.; Frisher, M.; Hitchcock, G.; Sheng, P.; Wanninkhof, P.	Larvae 2002		Tracking a cohort of invertebrate larvae in coastal lagoon	2002		Vigo, Spain
Arnold, W.S.; Frisher, M.; Peters, S.	Larvae 2002		Tracking marine inverebrate larvae: Comparision of short-term and long-germ tags	2002		Vigo, Spain
Creswell, R.L.	Aquaculture opportunities in Florida					
Creswell, R.L.		Florida State Horticulture Society	The marriage of aquaculture and hydroponics	28		
Creswell, R.L.	Shrimp Aquaculture (Distance Learning, St. Lucie School District)					Ft. Pierce, FL
Creswell, R.L.		Florida Aquaculture Review Council	Shrimp farming opportunities in Florida	17		
Creswell, R.L.	Small Farm Days (Aquaculture)			35		Okeechobee, FL
Diller, Andrew	Oystershell Sport Device Test Day					Pensacola, FL
Diller, Andrew	Waterfront Living Workshop					
Diller, Andrew	Seagrass Awareness Celebration					Gulf Breeze, FL

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Francis-Floyd, R.		Fourth International symposium on Aquatic Animal Health	Natural history of Atlantic surgeonfish and implications for nutritional management in captivity	September, 2002		New Orleans, LA
Jackson, Scott	4-H Special Project on growing tilapia					
Jackson, Scott		Florida Association of Extension Professsionals	Utilizing Internet technology to support an aquaculture program for youth	September, 2002	15	Panama City, Florida
Jackson, Scott	Prawn Production in Northwest Florida with Yellow River SWCD and Alabama Extension			2002	4	Crestview, FL
Leverone, Jay R.		National Shellfisheries Association 94th Annual Meeting	Effects of the toxic dinoflagellate, *Karenia brevis* , on larval mortality and juvenile feeding behavior in the bay scallop, *Argopecten irradians*	April, 2002		
Mahan, William; Kearl, Steve	Florida Outdoor Writer's Association Meeting			September, 2002	75	Panama City, Florida
McGuire, Maia	Aquaculture/Aquapoinics			April, 2002		Jacksonville, Florida
Morales, F.; Irlandi, E.; Arnold, W.; Herber, S.		31st Annual Marine Benthic Ecology Meeting	Hard clam (*Mercenaria spp* .) restocking efforts via larval injection	March, 2002		Orlando, FL
Sturmer, Leslie	Introduction to CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing)			April, 2002		Cross City, Florida
Sturmer, Leslie	Introduction to CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing)			April, 2002		Cedar Key, Florida
Sturmer, Leslie	The Basics of Buying, Handling and Planting Clam Seed			April, 2002		Carrabelle, Florida
Sturmer, Leslie	Introduction to CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing)			May, 2002		Wabasso, Florida
Sturmer, Leslie	Introduction to CLAMMRS (Clam Lease Assessment, Management, and Modeling using Remote Sensing)			May, 2002		Cocoa, Florida
Sturmer, Leslie	DACS Harmful Algae Bloom Seminars for Clam Producers			June, 2002		Cocoa, Florida
Sturmer, Leslie	DACS Harmful Algae Bloom Seminars for Clam Producers			June, 2002		Port Charlotte, Florida
Sturmer, Leslie		UF 8th Annual Public Interest Environmental Conference	Clam culture: The economic and environmental impacts of Florida's successful aquaculture industry	January, 2002		Gainesville, Florida
Sturmer, Leslie	Florida Chapter Meeting of American Water Resources Association		Hard clam aquaculture in Florida	March, 2002		Steinhatchee, Florida
Sturmer, Leslie			Status of clam farming in Florida and economic potential	March, 2002		Goodland, Florida
Sturmer, Leslie		94th Annual Meeting of the National Shellfisheries Association	Remote setting in hard clam seed production	April, 2002		Connecticut
Sturmer, Leslie		World Aquaculture 2002	Hard clam aquaculture in Florida, USA: A model for small-scale business development	April, 2002		Beijing, China

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Sturmer, Leslie	Oyster Industry Alternatives Discussion			October, 2002		Cedar Key, Florida
Sturmer, Leslie	Eastern U.S. Interstate Shellfish Seed Transport Workshop			February, 2002		Charleston, South Carolina
Sturmer, Leslie; Mahan, William	Clam Aquaculture Workshop			April, 2002	42	Tallahassee, Florida
Sturmer, Leslie; Mahan, William	Clam Aquaculture and Seed Clams Workshop			June, 2002	23	Tallahassee, Florida
Sturmer, Leslie; Mahan, William	Clam Aquaculture Workshop			August, 2002	10	Tallahassee, Florida
Wasno, Bob	CLAMMERS Workshop			July, 2002	15	Matlacha, Florida
Goal 4: Improve the Product Quality and Safety of Florida's Seafood Products						
Adams, Charles	Avendra (major seafood co.)		Advancing seafood safety and quality	October, 2002		Gainesville, Florida
Gulig, Paul A.		Southeast Branch American Society for Microbiology	Pathogenesis of *Vibrio vulnificus* disease and use of bacteriophage as therapy	2002		
Gulig, Paul A.		Eastern Pennsylvania Branch American Society for Microbiology	What's eating you? Molecular pathogenesis of *Vibrio vulnificus*	2002		
Gulig, Paul A.		102nd Annual Meeting of the American Society for Microbiology	What's eating you? Molecular pathogenesis of *Vibrio vulnificus* - a flesh eating bacterium	2002		
Otwell, W.S.	Shrimp School 2002		Chairman for entire conference; specific presentations on phosphates product recallas and good aquaculture practices	April, 2002	30	Gainesville, Florida
Otwell, W.S.	Annual Extension Training School - Oyster Processors		Post harvest treatments for raw oysters		20	Apalachicola, Florida
Otwell, W.S.	Annual Extension Training School - Clam Processors		Advancing tempering for live hard clams		40	Cedar Key, Florida
Otwell, W.S.	HACCP Training		Standard training curriculum	February, 2002	30	Miami, Florida
Otwell, W.S.	HACCP Training		Standard training curriculum	September, 2002	30	Gainesville, Florida
Otwell, W.S.	Advancing the Understanding of Seafoods		Three day hands-on training for employees of Avendra	October, 2002	40	Gainesville, Florida
Otwell, W.S.	Alligator Processing School		Two day lecture and hands-on demonstrations	August, 2002	60	Gainesville, Florida
Otwell, W.S.	Seafood Science and Technology Conference		Chairman for entire conference; and presentations of PHT's for raw oysters; reduced oxygen packaging for seafoods; and use of CO to influence color in seafoods	November, 2002	175	Orlando, Florida
Otwell, W.S.	HACCP Training		Standard training curriculum	2002	50	Guayaquil, Ecuador
Otwell, W.S.	HACCP Training		Standard training curriculum	2002	50	Tequcigalpa, Honduras
Otwell, W.S.	HACCP Training		Standard training curriculum	2002	50	Rio de Janeiro, Brazi
Otwell, W.S.	HACCP Training		Standard training curriculum	2002	50	Los Angelos, CA
Goal 5: Increase the Economic Competitiveness and Environmental Sustainability of Coastal Water-Dependent Businesses						
Combs, C.	Clean Marina/Clean Boatyard designation			March, 2002		Port Canaveral, FL

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Combs, C.	Clean Marina Designation Ceremony			March, 2002		Sebastian, FL
Crane, Marella	Clean Marina Designation Ceremony			January, 2002	45	Aventura, Florida
Crane, Marella	Clean Marina Workshop			April, 2002	5	Miami Beach, Florida
Creswell, R.L.	Clean Marina Workshops (3					
Diller, Andrew	Clean Marina Designation Ceremon					Pensacola, FL
Diller, Andrew	Santa Rosa Yacht Club Clean Marina Certification					Pensacola, FL
Diller, Andrew	Clean Boatyard Designatior				24	Pensacola, FL
Diller, Andrew	West Florida Canoe Club Coastal Dune Habitats					Pensacola, FL
Flamm, R.; Sidman, C.	Charlotte Harbor Watershed Summit		An explanation of methods for characterizing recreational boating in Charlotte Harbor, Florida	Feb, 2002		Punta Gorda, FL
Jackson, Donald	Clean Marina		Basic Workshop	September, 2002	6	Cedar Key, Florida
Jackson, Donald		FAEP	Florida's Clean Marina Program (poster presentation)	September, 2002	300	Panama City, Florida
Jackson, Donald	National Clean Marina		Facilitator	September, 2002	155	Mystic, CT
Jackson, Donald		National Marina & Boatyard	Florida Clean Marina Program	October, 2002	250	Ft. Lauderdale, FL
Jackson, Donald	N.E. Florida Marine Industries Association		Clean Marina Program	November, 2002	45	Jacksonville, Florida
McGuire, Maia	Boat Camp		Clean marinas and clean boating habitats	July, 2002		Duval County
McGuire, Maia	Marina Site Visits (13)		Assistance with various phases of the Clean Marina process			
McGuire, Maia	Clean Marina Workshop		Clean Marina display at Jacksonville Boat Show			Jacksonville, Florida
McGuire, Maia	Clean Marina Workshops (2)		Fire in your marina			Nassau, Duval, Clay, St. Johns, Flagler and Putnam Counties
Stevely, John	Recreational Boating, Waterway Management and the Environment		Conference was organized by UF Center for Governmental Responsibility and was based on a proposal for an Anchorage Mgt. Conf the marine agent presented to the SW Florida Reg. Harbor Bd.	January, 2002		Ft. Myers, Florida
Stevely, John	Anna Maria Power Squadron		Florida Sea Grant activities	March, 2002		Anna Maria, Florida
Stevely, John	Sarasota Coast Guard Auxillar		Florida Sea Grant activities	April, 2002		Sarasota, Florida
Stevely, John	Bradenton Herald Fishing College		Distributed copies of "Paddle manatee: A guide to area canoe and kayak trails"		550	Bradenton, Florida
Goal 6: Protect and Enhance Coastal Water Quality and Safety						
Adams, Charles		Southeastern Fisheries Association 50th Annual Meeting	The economic impacts associated with the bottom trawling sector of the commercial fishing industry in Florida	May, 2002		Jacksonville, FL

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Adams, Charles		Association of Natural Resource Extension Professional Conference	The economic consequences of red tide events in Florida	June, 2002		Naples, Florida
Burnett, W.C.	Apalachicola Reserve Nature Center		Submarine groundwater discharge into coastal environments	December, 2002		
Crane, Marella	Florida Master Naturalist Coastal Module Video		Water quality and marine debris	May, 2002		Miami, Florida
Diller, Andrew	Manor Drive Homeowners Association Stormwater Pollution				24	Pensacola, FL
Jacoby, Charles	Invited Presentation to Save the Bays Association, Inc.			April, 2002	13	Naples, Florida
Jacoby, Charles	Annual Meeting of volunteers in Project COAST (Bay County)			July	13	Panama City, Florida
Jacoby, Charles	Annual Meeting of volunteers in Project COAST (Walton, Okaloosa, Washington, Escambia, Santa Rosa, Franklin, Gulf and Holmes counties)			July, 2002	25	Freeport, Florida
Jacoby, Charles	IST 22028: A Watershed Approach to Water Quality			August, 2002	28	Vero Beach, Florida
Jacoby, Charles	Annual meeting of volunteers in Project COAST (Monroe County)			December, 2002	19	Marathon, Florida
Mahan, William	Water Quality Workshop			December, 2002	42	Apalachicola, Florida
McGuire, Maia	Water Education Festival		Interactive display	February, 2002		Jacksonville, Florida
McGuire, Maia	Legacy Program		Water sampling techniques and experimental design			St. Johns and Volusia Counties
McGuire, Maia	St. Augustine Shores Garden Club		Water conservation			St. Augustine, Florida
McGuire, Maia	Buds and Blossoms 4-H Club		Water conservation			St. Augustine, Florida
Sturmer, Leslie	Clam Hatchery Water Quality Forum			July, 2002		Palm Bay, Florida
Verlinde, Christina	Navarre and Milton Garden Clubs		Stormwater programs for Navarre Beach leaseholder and renters associations			Santa Rosa County, Florida
Verlinde, Christina	Multi-state Stream Restoration Workshop				45	Santa Rosa County, Florida
Wasno, Bob	Green Mussel Education Program			April, 2002	17	Port Charlotte, Florida
Goal 7: Protect, Restore, and Enhance Coastal Ecosystem Habitats						
Adams, Charles		Symposium on Effects of Fishing Activities on Benthic Habitats	Moderated economics session	November, 2002		Tampa, Florida
Collins, T.M.		Society for the Study of Evolution	Phylogenetics and Invasive species: The case of synbranchid eels in the southeastern U.S.	July, 2002		Urbana-Champaign, Illinois
Combs, C.	Marine Protected Area Workshop for Stakeholders (invited participant)			June, 2002	12	Cocoa Beach, FL
Crane, Marella	Workshop & Presentation, Sea Turtles, Endangered Species Workshop for Teachers			March, 2002	30	Miami, Florida
Crane, Marella		Association of Natural Resource Extension Professional Conference	Innovative ways to bring marine stewardship to diverse audiences	June, 2002		Naples, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Crane, Marella	Marine Debris Presentation		Presentations for boaters and for K 12 grades		922	
Crane, Marella	Coastal Clean-Up		Site coordinator	September, 2002	160	Miami, Florida
Crane, Marella	Monofilament Recycling Workshop		14 bait/tackle and marine supply stores implemented fishing line recycling		13	
Crane, Marella	Sea Turtle Biology and Behavior (4		Presentations for K-12 grades		1230	
Crane, Marella	Seagrass Exhibit at Miami Dade County Fair			March, 2002	400	Miami, Florida
Crane, Marella	Mangrove Maintenance Short Cours		Presented on mangrove biology	July, 2002	100	Miami, Florida
Creswell, R.L.	Indian River Lagoon Series (St. Lucie County Schools)				101	Ft. Pierce, Florida
Creswell, R.L.	Motion in the Ocean (St. Lucie County Schools)				1,257	Ft. Pierce, Florida
Creswell, R.L.	Lagoon Days (St. Lucie County Schools				395	Ft. Pierce, Florida
Creswell, R.L.	Ecology of the Indian River Lagoon (4-H				130	
Creswell, R.L.	Seagrass of the Indian River Lagoon (St. Lucie District Learning)					
Creswell, R.L.	Seagrasses in the Indian River Lagoon (Marine Naturalist)				16	
Creswell, R.L.	Nutrients and the Indian River Lagoon				62	
Diller, A.; Jackson, S.; Verlinde, C.	Northwest Florida Community Earth Day (Eglin AFB)			April, 2002	2,000	Niceville, Florida
Diller, Andrew	Pensacola Beach Leaseholders Assn. Dune Plantings					Pensacola, FL
Diller, Andrew	Pensacola Junior Environmental Camp					Pensacola, FL
Diller, Andrew	Brownsville Family Christian Academy (Sea Turtles)					Pensacola, FL
Diller, Andrew	Boy Scouts (Sea Turtles)				70	Pensacola, FL
Diller, Andrew	NB Wok Elementary School (Sea Turtles)				70	Pensacola, FL
Diller, Andrew	Marine Field Day (beach habitat					Opal Beach, FL
Diller, Andrew	Escambia County Public Library (sea turtles)				65	Pensacola, FL
Diller, Andrew	Grove United Methodist Church (endangered species)					Pensacola, FL
Diller, Andrew		Florida Association of Extension Professsionals	Utilizing sea turtle biology and habitat to educate clientele on coastal resources			Pensacola, FL
Diller, Andrew	University of West Florida Seminar		Biology and conservation of sea turtles: from DNA to satellites			Pensacola, FL
Diller, Andrew	Barrineau Park 4-H Club (sea turtles					Pensacola, FL
Diller, Andrew	Montessori School of Pensacola (sea turtles)					Pensacola, FL
Grizzle, R.		Third Biennial Mosquito Lagoon Conference	Changes in Mosquito Lagoon intertidal oyster reefs potentially caused by boating activities: an analysis of aerial photographs from 1943-2000.	August, 2002		

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Grizzle, R.		National Shellfisheries Association 94th Annual Meeting	Long-term changes in intertidal oyster reefs in a Florida lagoon potentially caused by boating activities: an analysis of aerial photographs from 1943-2000.	April, 2002		
Grizzle, R.	Marine Benthic Ecology Meeting		Long-term changes in intertidal oyster reefs and the potential effects of boating activities.	March, 2002		
Jackson, Scott	New County Reef Regulations			May, 2002	40	Destin, FL
Jackson, Scott	Okaloosa County Artificial Reef Advisory Committee			April, 2002		Valparaiso, FL
Jackson, Scott	Artificial Reefs (Radio, 4H Clubs)			October, 2002	10,000/25	Walton County
Jackson, Scott	Eglin Dive Club (Artificial Reef Monitoring)			November, 2002	20	Eglin Air Force Base, FL
Jackson, Scott	Walton High School (dunes, habitat, ecology)			May, 2002	25	Santa Rosa Beach, FL
Jackson, Scott	Freeport High School (dunes, habitat, ecology)			May, 2002	25	Santa Rosa Beach, FL
Jackson, Scott	Destin Elementary School (sea turtle biology)			September, 2002	100	Destin, FL
Jackson, Scott	Invasive Plant Workshop for Wetlands and Uplands			October, 2002	25	Crestview, FL
Jackson, Scott	Walton County Coastal Dune Lakes Advisory Board					Santa Rosa Beach, FL
Jackson, Scott	Construction of demonstration site for FYN principles and shoreline restoration for Eastern Lake, a coastal dune lake			September, 2002	15	Seagrove Beach, FL
Jackson, Scott	Connecting the Choctawhatchee (Stewardship and Protection of our Bay)			Sept-Oct, 2002	80	Niceville and Destin, FL
Jackson, Scott		Florida Association of Extension Professsionals	Dune restoration projects for schools and community groups	September, 2002	15	Panama City, Florida
Jackson, Scott	Dunes in Schools - Butler Elementary (Restoration and Classroom Program)			Oct-Dec, 02	120	Santa Rosa Beach, FL
Jackson, Scott	Butler Elementary School Learning Project (dunes)					
Jackson, Scott	4-H Special Project on growing tilapia					
Jacoby, Charles	South Atlantic Fishery Management Council Workshop: Marine Protected Areas			June, 2002	40	Melbourne, Florida
Jacoby, Charles		Regional Ocean Conference for Students: Invasive Species		April, 2002	80	Tampa, Florida
Jacoby, Charles	Invasive Species Workshop			November, 2002	35	Tampa, Florida
Jacoby, Charles			Presentation of invasive species at K 12 educator's workshop	November, 2002	75	Tampa, Florida
Levitan; Herrnkind		31st National Benthic Ecology Meeting	Two Sea Grant sessions on spiny lobsters and blue crab ecology	March, 2002	200	Orlando, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Martinez, N.		Third Biennial Mosquito Lagoon Conference	Shell movement and juvenile survival of the oyster *Crassostrea virginica* on intertidal reefs adjacent to waters with intense boating activity in the Indian River Lagoon, Florida	August, 2002		
McGuire, Maia	Statewide Monofilament Recycling Workshops (2) (facilitator)					
McGuire, Maia	4-H Leader Training			January, 2002		Duval County
McGuire, Maia		LEEF Conference	Bringing the estuary into your classroom	April, 2002		
McGuire, Maia	St. Johns County Inservice day		Bringing the estuary into your classroom	April, 2002		Marineland
McGuire, Maia		FMSEA Conference	Coral reefs	April, 2002		Marathon, Florida
McGuire, Maia	Flagler County Inservice Day		Bringing the estuary into your classroom	May, 2002		Marineland
McGuire, Maia	Florida School for the Deaf and Blinc		Introduction to field studies	May, 2002		St. Augustine, Florida
McGuire, Maia	Teacher Workshop		Collecting and identifying aquatic invertebrates	June, 2002		Rose Bay, Florida
McGuire, Maia	Harbor Shuttle Pontoon Boat		Applied field studies	October, 2002		St. Augustine, Florida
McGuire, Maia	Florida School for the Deaf and Blind		Introduction to field studies	October, 2002		St. Augustine, Florida
McGuire, Maia	St. Johns Grammer School Summer Camp		Manatees, coastal birds, turtles and estuaries	August, 2002		Switzerland, Florida
McGuire, Maia	Marine Ecology Judging Workshops (series)		4-H competition preparation	October, 2002		
McGuire, Maia	Local clubs and fishing groups (1 presentation on monofilament recycling)					
Nico, L.		American Society of Ichthyoligists and Herpetologists 82nd Annual Meeting	Status and history of introduction of synbranchid eels	July, 2002		Kansas City, Missouri
Nico, L.		American Society of Ichthyoligists and Herpetologists 82nd Annual Meeting	Mixing faunas: An overview of introduced non-indegenous fishes, amphibians, and reptiles	July, 2002		Kansas City, Missouri
Nico, L.	Undergraduate course on Bioligical Invaders in the Agronomy Dept @ UF		Introduced swamp eel	October, 2002		Gainesville, Florida
Novak, Rich	Green Mussel Workshop			March, 2002	15	Port Charlotte, Florida
Osenberg, C.W.	Restoring and Sustaining Diversity of Tropical Pacific Coral Reef Fish		Marine protected areas: a critique of current assessment approaches	April, 2002		Mo'orea, French Polynesia
Osenberg, C.W.; St. Mary, C.M.	Florida Chapter of the American Fisheries Society		Marine reserves: a tentative and cautionary evaluation of a powerful tool	February, 2002		Brooksville, Florida
Osenberg, C.W.; St. Mary, C.M.	Workshop at the National Center for Ecological Analysis and Synthesis		Extending, synthesizing and applying recent advances in competition theory.	April, 2002		Santa Barbara, CA

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Seaman, W.; Sargent, W.		Second International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Sciences	Geographic information systems in assessment of human-made reefs in Florida, USA	September, 2002		Sussex, England
Sidman, Charles		Charlotte Harbor Watershed Summit	A survey of methods for characterizing recreational boating in Charlotte Harbor	February, 2002	200	Punta Gorda, FL
Spranger, Michael	Florida Marine Science Educators Association		Florida's marine and aquatic invasive species	April, 2002	20	Ft. Pierce, FL
Spranger, Michael; Berger, Debbie	Marine and Aquatic Invasive Species Teacher Workshop			November, 2002	28	Tampa, Florida
Stevely, John	Florida Artificial Reef Coordinators Workshop		Technical training	May, 2002		Sarasota, Florida
Stevely, John	Manatee County Marine Extension Artificia Reef Advisory Committee		Held two meetings to plan reef building activities and designs			Sarasota, Florida
Stevely, John	Sarasota Bay National Estuary Program Technical Advisory Committee		Chaired five meetings	February - October, 2002		Sarasota, Florida
Stevely, John	Sarasota Bay Estuary Program Management and Policy Committee		Participated in three meetings in the role of Chair of the Technical Advisory Committee	March-December, 2002		Sarasota, Florida
Swett, Robert			Application of the Regional Waterway Management System in Charlotte County Florida	February, 2002	20	Charlotte County, FL
Swett, Robert	Marina Dredging Planning Meeting		The Florida model for waterway management	September, 2002	13	Narragansett, RI
Swett, Robert			The Regional Waterway Management System in Southwest Florida	November, 2002	25	Gainesville, Florida
Swett, Robert; Sidman, Charles; Fann, David	Determining Existing Data Needs for Boat and Boater Information			June, 2002	26	St. Petersburg, Florida
Swett, Robert; Sidman, Charles; Fann, David			Florida Sea Grant and the Boating and Waterway Management Program	June, 2002	7	Marine Industries Assoc of South Florida
Swett, Robert; Sidman, Charles; Fann, David	Assessing the applicability of Florida's Vessel Title Registration System to Florida's Waterway Management needs			October, 2002	24	Dania, Florida
Tavares, Sacheen	Master Naturalist Program			March, 2002	5	Fort Lauderdale, Florida
Tavares, Sacheer	Clean Marina Workshop			April, 2002	16	Fort Lauderdale, Florida
Tavares, Sacheer	Clean Marina Designation Ceremon			April, 2002	57	Fort Lauderdale, Florida
Tavares, Sacheen	Regional Artificial Reef Coordinator's Meeting			May, 2002	13	Fort Lauderdale, Florida
Tavares, Sacheer	Clean Marina Workshop			May, 2002	5	Fort Lauderdale, Florida
Tavares, Sacheer	Clean Marina Workshop			June, 2002	6	Fort Lauderdale, Florida
Tavares, Sacheer	Mangrove Maintenance Short Cours			July, 2002	93	Miami, Florida
Tavares, Sacheen	Greater Fort Lauderdale Chamber of Commerce: Beach Council			September, 2002	71	Fort Lauderdale, Florida
Verlinde, Christina	West Florida Regional Library		Manatee and sea turtle presentations		48	Navarre, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Verlinde, Christina	Beach Ecology Field Trips (4)		Hosted activities including: sea turtle nesting and habitat needs, fish identification, seining and comparing organisms		256	Santa Rosa County, Florida
Verlinde, Christina	2nd Annual Seagrass Awareness Celebration		Various hands-on marine activities		150	Santa Rosa County, Florida
Verlinde, Christina	Camp Timpoochee Education Camps		Hosted marsh ecology activities	Summer, 2002	39	Niceville, Florida
Verlinde, Christina	Camp Timpoochee Education Camps		Community service marsh restoration	Summer, 2002	108	Niceville, Florida
Wall, L.		Third Biennial Mosquito Lagoon Conference	Recruitment of the oyster *Crassostrea virginica* on intertidal reefs in areas with intense boating activity in Mosquito Lagoon.	August, 2002		
Wall, L.		National Shellfisheries Association 94th Annual Meeting	Recruitment of the oyster *Crassostrea virginica* on intertidal reefs in areas with intense boating activity in Mosquito Lagoon.	April, 2002		
Wall, L.		Marine Benthic Ecology Meeting	Recruitment of the oyster *D127* on intertidal reefs in areas with intense boating activity in Mosquito Lagoon.	March, 2002		
Walters, L.		National Shellfisheries Association 94th Annual Meeting	Shell movement and juvenile survival of the oyster *Crassostrea virginica* on intertidal reefs adjacent to waters with intense boating activity in the Indian River Lagoon, Florida	April, 2002		
Walters, L.		Marine Benthic Ecology Meeting	Shell movement and juvenile survival of the oyster *Crassostrea virginica* on intertidal reefs adjacent to waters with intense boating activity in the Indian River Lagoon, Florida	March, 2002		
Wasno, Bob	Manatee Speed Zones			June, 2002	245	Sanibel, Florida
Wasno, Bob	Clean Marina Workshop			June, 2002	17	Cape Coral, Florida
Wasno, Bob	Clean Marina Workshop			August, 2002	12	Fort Myers, Florida
Wasno, Bob	Monofilament Recycling Workshop			August, 2002	42	Orlando, Florida
Wasno, Bob	Coastal Clean-Up			September, 2002	175	Bunche Beach, Florida
Wasno, Bob	Clean Marina Workshop			October, 2002	9	Rookery Bay, Florida
Wasno, Bob	Green Mussel Education Program			April, 2002	17	Port Charlotte, Florida
Wasno, Bob	SEACOOS Meeting			December, 2002	45	Charleston, South Carolina
Goal 8: Prepare and Respond to Coastal Storms						
Crane, Marella	Hurricane Prepardness for Marinas		Presentation on hurricanes	August, 2002	60	Homestead, Florida
Crane, Marella	Skywarm Training Seminar			July, 2002	55	Miami, Florida
Crane, Marella	Hurricane Prepardness Semina		Presentation on hurricanes	June, 2002	45	Miami, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Douglass, S.L.		Texas Coastal Issues Conference	Saving America's beaches: the causes of and solutions to beach erosion	February, 2002		Corpus Christi, TX
Douglass, S.L.	4th Annual Southern and Caribbean Regional meeting of NOAA OCRM Coastal Program and NERR managers		Saving America's beaches	February, 2002		Point Clear, AL
Douglass, S.L.	American Coastal Coalition annual meeting		Dr. Douglass's excellent coastal adventure	May, 2002		Washington, DC
Engle, Jason		Florida Shore and Beach Preservation Association Technical Conference	Formulation of rip current predictive index using rescue data	2002		
Gurley, K.; Reinhold, T	3rd Joint Workshop of Task Committee D (Wind Engineering) of the US-Japan Cooperative Program on Natural Resources		Measurement and analysis of ground level hurricane wind fields	October, 2002		Seattle, WA
Jackson, Donad	SEA-COOS		Poster on Coastal Storms Initiative	December, 2002	150	Charleston, South Carolina
Jackson, Donald	Coastal Storms Initiative		The Sea Grant connection	February, 2002	63	Jacksonville, Florida
Jackson, Donald	Coastal Storms Initiative		Outreach for CSI in Florida & plan outreach in Pacific Northwest	July, 2002	30	Silver Spring, MD
Jackson, Donald	St. Johns River Summit		Coastal Storms Initiative	September, 2002	35	Jacksonville, Florida
Jackson, Donald	Sea Grant Extension Workshop		Introduction to Coastal Storms Initiative and update on Clean Marina	October, 2002	35	Cedar Key, Florida
MacMahan, J.; Thornton, E., Stanton, T.; Reniers, A.; Dean, R.G.		ASCE International Conference on Coastal Engineering 2002	RIPEX - rip pulsation measurements	2002		
MacMahan, Jamie		28th International Conference on Coastal Engineering	RIPEX - rip pulsation measurements	2002		Cardiff, Wales
Reniers, A.; Thornton, E.; Stanton, T.; MacMahan, J.		ASCE International Conference on Coastal Engineering 2002	RIPEX - rip pulsation measurements	2002		
Valero-Aracama, C.		SNA Conference	Genotypic differences of in vitro propagated sea oats genotypes (*Uniola paniculata*)	August, 2002		Atlanta, GA
Goal 9: Produce a Highly Trained Workforce						
Seaman, W.; Pitcher, T.	Florida Sea Grant Seminar Series		Ecological models for understanding ocean reefs and managing marine ecosystems	April, 2002		Gainesville, FL
Spranger, Michael	Assembly of Sea Grant Extension Program Leaders Annual Meeting		Effective grant-writing and administration	March, 2002	30	Baton Rouge, FL
Spranger, Michael	Florida Sea Grant Annual Meeting			October, 2002	24	Cedar Key, FL

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Tolley, G.; Chu, Fu-Lin E.	Florida Sea Grant Seminar Series		Relationship between PCB accumulation and reproductive success in sexually mature and immature oysters exposed via a contaminated algal diet	March, 2002		Ft. Myers, FL
Tolley, G.; Kerr, R.	Florida Sea Grant Seminar Series		The discovery and development of theapeutic agents from marine invertebrates	March, 2002		Ft. Myers, FL
Vargo, S.		10th International Conference on Harmful Algae	Partial funding for 20 student presenters	October, 2002	850	St. Petersburg, FL
Walters, L.; Padilla, D.	Florida Sea Grant Seminar Series		Aquatic exotics: Mechanisms for dispersal and successful introductions in coastal waters	March, 2002		Orlando, FL
Goal 10: Create a Scientifically and Environmentally Informed Citizenry						
Combs, C.	Statewide Marine Ecology Contest			November, 2002	145	Ocala, FL
Combs, C.	Ocean Odyssey			May, 2002	38	Merritt Island, FL
Combs, C.	Under the Sea			June, 2002	31	West Melbourne, FL
Combs, C.	Marine Enviornmental Sampling Techniques			June, 2002	35	Cocoa, FL
Combs, C.	Marine Enviornmental Sampling Techniques			June, 2002	35	Port Canaveral, FL
Combs, C.	Marine Enviornmental Sampling Techniques			June, 2002	35	Titusville, FL
Combs, C.	Environmental Awareness Training for Clammers (Series)			May, 2002	160	Titusville, FL
Combs, C.	Environmental Awareness Training for Clammers (Series)			May, 2002		Palm Bay, FL
Combs, C.	Environmental Awareness Training for Clammers (Series)			June, 2002		Palm Bay, FL
Combs, C.	Environmental Awareness Training for Clammers (Series)			November, 2002		Cocoa, FL
Combs, C.	Environmental Awareness Training for Clammers (Series)			November, 2002		Titusville, FL
Combs, C.	Beach Sweep			September, 2002	25	Brevard, FL
Combs, C.	Mangrove Education			March, 2002	12	Cocoa Beach, FL
Combs, C.	Brevard Intracoastal Regional Science Fair (invited judge)			February, 2002	24	Merritt Island, FL
Combs, C.	South Brevard Regional Science Fair (invited judge)			February, 2002	15	
Combs, C.	Space Coast Regional Science Fai			April, 2002	24	Port St. John, FL
Combs, C.	Summer 4-H Marine Day Camp			June, 2002	35	Titusville, Cocoa, Merritt Island
Crane, Marella	Tropical Ag. Fiesta		Presented information on marine science and conservation	June, 2002		Miami, Florida
Crane, Marella	Assistant Superintendent of Nature Center for Miami-Dade County Fair (invited judge)			March, 2002		Miami, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Crane, Marella	NOAA Deep Sea Ocean Exploration		Presented information for research or deep sea exploration	February, 2002	20	Miami, Florida
Crane, Marella	Career Day Marine Science (3 schools)		Introduction to marine science careers		200	
Crane, Marella	4-H Beach Collection			July, 2002	12	Key Biscayne, Florida
Culen, G.	Statewide Marine Ecology Contest			November, 2002	145	Ocala, FL
Culen, G.	4-H Sportfishing Camp			July, 2002	16	Ocala, FL
Culen, G.	4-H Summer Marine Camps (3)			Summer, 2002	252	Niceville, FL
Jackson, Donald	Career Day		Marine Extensior	April, 2002	75	Waldo, FL
Jackson, Donald	Extension Agent Orientation		Introduction to Sea Grant College Program	October, 2002	65	Gainesville, FL
McGuire, Maia	Nassau County 4-H Marine Discoveries Camp		Supervised activities for junior 4-H members on manatees, marine pollution and estuaries	May, 2002		Callahan, Florida
McGuire, Maia	Duval County 4-H Marine Discoveries Camp			June, 2002		Jacksonville, Florida
McGuire, Maia	St. Johns County 4-H Camp		Supervised activities for junior 4-H members on bats and beaches	June, 2002		St. Augustine, Florida
McGuire, Maia	Marine Science 4-H Camp		Supervised science research projects for 11 senior 4-H members from Duval and St. Johns Counties	June, 2002	11	Duval and St. Johns Counties
McGuire, Maia	Marine Explorer Program		4 month pilot explorer program to teach about marine related careers	March-June, 2002		Flagler and St. Johns Counties
McGuire, Maia	4H Day Camps (3)		Various activities to teach youth about bats and beaches			Nassau, Duval and Flagler Counties
Spranger, Michael	Public Issues and Conflict Management Workshop			February, 2002	20	Naples, FL
Spranger, Michael	U.S. Commission on Ocean Policy		Florida's coastal challenges and opportunities	February, 2002		St. Petersburg, FL
Spranger, Michael	Environmental Education Institute for Extension Professionals		Nurturing environmental stewardship in Extension programs	March, 2002	34	Camp Timpoochee, FL
Spranger, Michael	Florida Master Wildlife Conservationists Graduation and Commissioning		Volunteerism and environmental stewardship: Putting it together	June, 2002	50	Sopchoppy, FL
Spranger, Michael	Korean Association of Marine Environmental Educators		Implementing a marine ethic: From awareness to action	July, 2002	64	Seoul, Korea
Spranger, Michae	Korean Sea Grant Program		The Florida Sea Grant Program	July, 2002	14	Seoul, Korea
Spranger, Michael		National Extension Tourism National Conference	The economic impact and University of Florida/IFAS Extension's response to 9/11 terrorist events	September, 2002	110	Traverse City, MI
Spranger, Michael	NOAA Climate Prediction Workshop		Climate Extension: An opportunity for NOAA and Sea Grant collaboration and partnership	October, 2002	46	Alexandria, VA
Spranger, Michael	U.S. Climate Change Science Program National Stakeholders Meeting		Climate change education and outreach	December, 2002	36	Washington, DC
Verlinde, Christina	Oyster Gardening Program		Held oyster shell stringing events		43	Santa Rosa County, Florida
Verlinde, Christina	Santa Rosa County 4H Expo		Watershed and watercycle concepts		35	Santa Rosa County, Florida

Agent/Specialist	Workshop	Conference	Presentation	Date	Attendance	Location
Verlinde, Christina	Santa Rosa County Association for Retarded Citizens(2)		Watershed and watercycle concepts		54	Santa Rosa County, Florida

10.0 SELF EVALUATION

One of the requirements of the new National Sea Grant College Program "Performance Benchmarks for Evaluation" is that Sea Grant College programs conduct an ongoing program assessment or "self evaluation" on an annual basis. Florida Sea Grant has conducted an on-going and annual self-evaluation for many years.

Since the late 1980s, the then Provost and Vice President for Academic Affairs (to whom Sea Grant reports) required an annual self-evaluation of each academic unit at the University of Florida. Each year, both programmatic and administrative goals were established and agreed upon by the Provost and Sea Grant Director. At the end of each year, progress toward meeting each goal was measured and reviewed by the Provost. Copies of this document were always sent to the National Sea Grant Office (NSGO).

In 1996 a new UF Provost was appointed and the evaluation procedure was revised. Another new Provost was appointed in 1999, and the process was partially revised again. Now, each year the Provost meets with the management staff of each program or academic unit under the direction of the Provost (e.g., Sea Grant). Prior to the meeting, the Provost requests a ten-page summary (due one week prior to the meeting) with a focus on topics as requested by the Provost (e.g., student programs, international activities, goals for the next year). The topics and any issues are discussed during the meeting. About ten people are involved. Florida Sea Grant is represented by the director, associate director, assistant director for extension, director of communications, fiscal officer and administrative assistant. The Office of the Provost is represented by the provost, associate provost, associate provost for distance education, budget director and others, depending on the topics to be discussed.

During 1997, the NSGO published its "Performance Benchmarks for Evaluation," requiring an annual report. Many of the former measures of performance used for the Provost and the new reporting process are now incorporated into the annual report to NSGO. Others remain and are still used internally by Florida Sea Grant to self evaluate certain functions. These are included as one part of the self-evaluation section of this document. The entire annual NSGO progress report is also now given to the Provost and other university administrators to assist in the annual evaluation of Florida Sea Grant.

Other opportunities are also used to evaluate Florida Sea Grant. This includes participating in University of Florida exercises that "connect" to Sea Grant and using a University of Florida evaluation process to evaluate administrators.

The following sections include self-evaluation criteria for 2002 that are not included in other sections of this "Performance Counts" report.

1. Programmatic Measures of Performance
2. Administrative Measures of Performance

Programmatic Measures of Performance

1. Earn a larger percentage increase in our biennial federal Sea Grant budget than the average increase for all 30 Sea Grant Programs.

A. The National Sea Grant Office changed the way budgets were allocated among the Sea Grant Programs in 1997. 1997-2000 budgets were "frozen" at 1996 prorated levels. Future funding allocations were to be based on "competitive" program evaluations instead of the summation of "individually competitive" research project and extension proposal competitions. The process is now implemented and the first competitive program allocation for Florida Sea Grant occurred in

2002, at the beginning of our February 2001, two year Omnibus Grant, based on a spring 2000 Program Assessment Team visit. The overall evaluation of the National Sea Grant Office was to place Florida Sea Grant in Category I, the highest ranking possible. This allowed Florida Sea Grant to maintain its original merit allocation of $100K, plus receive an additional merit increase of $25K for 2002-2005.

In addition, after the first four-year cycle of program assessment team reviews, all 29 Sea Grant programs in place at the beginning of the cycle had been reviewed for producing significant results, connecting with users, organizing and managing for success and effective long-range planning. Florida Sea Grant was one of only five programs of the 29 that received the top score of excellent in each of the four categories.

B. National Sea Grant Initiatives – Florida Sea Grant also measures its success in national competitions. These normally alternate with some occurring every other year, and others annually. Success rates are presented below to compare success rates against the national average for competitions completing in 2002 and for those beginning in 2003 and completing in 2003. An analysis is also presented across the years 1999-2003.

Number of proposals submitted and funded in National Strategic Investment (NSI) Competitions for environmental biotechnology, technology and fisheries habitat in 2002 and oyster disease, Gulf of Mexico oysters and aquatic nuisance species in 2003.

Competition	National Level					Florida Level				
	Received	Invited	%	Funded	%	Received	Invited	%	Funded	%
- - - 2002 - - -										
Environmental Technology	131	31	23.7	12	38.7	18	4	22.2	1	25.0
Technology	75	21	28.0	10	47.6	9	2	22.2	1	50.0
Fisheries Habitat	107	22	20.6	7	31.8	14	6	42.9	2	33.3
TOTAL	**313**	**74**	**23.6**	**29**	**39.2**	**41**	**12**	**29.3**	**4**	**33.3**
- - - 2003 - - -										
Oyster Disease	48	33	68	15	45.5	1	1	100.0	0	0.0
GOM Oysters	29	25	86.0	10	40.0	7	7	100.0	3	42.9
Aquatic Nuisance Species	154	73	47.4	30	41.1	6	3	50.0	1	33.3
TOTAL	**231**	**131**	**56.7**	**55**	**42.0**	**14**	**11**	**78.6**	**4**	**36.4**

Summary of recent Florida faculty submissions and project funding in NSG national competitions, 1999-2002.

Round of Competition	Level and Number of Items							
	National, All Sources			Florida				
	Pre-	Full	Funded	Pre-	Invited	Full	Funded as # and % National	Total*
1999	401	186	98	41	21	17	10	(10.2%)
1999	319	90	?	23	7	7	3	(?)
2001	542	225	98	58	23	21	7	(7.1%)
2002	313	74	29	41	--	12	4	(13.8%)
2003	231	131	55	14	11	11	4	(7.2%)

*This column indicates that Florida is securing roughly 10% of “National Strategic Investment” funding, significantly above its rate of “Core Program” biennial support (about 4.3% average 2000-2002).

Success of Florida proposals relative to national level of proposals submitted and funded in NSG competitions.

	Florida Submissions as Number and % of National Total		Number and % of Preproposals Ultimately Funded		Funding of Projects as Number and % of Full Proposals	
Year	Unsolicited Preproposals	Invited Full Proposals	National	Florida	National	Florida
1999	41/401 9.8%	21/186 11.3%	98/401 24.4%	10/41 24.4%	98/186 52.7%	10/17 58.8%
1999	23/319 7.2%	7/90 7.8%	?/319 ?	3/23 13.0%	?/90 ?	3/7 42.9%
2001	58/542 10.7%	23/225 10.2%	98/542 18.1%	7/58 12.1%	98/225 43.6%	7/21 33.3%
2002	41/313 13.1%	12/74 16.2%	29/313 9.3%	4/41 9.8%	29/74 39.2%	4/12 25.0%
2003	14/231 6.1%	11/131 8.4%	55/231 23.8%	4/14 28.6%	55/131 42.0%	4/11 36.4%
Notes	These two columns indicate that Florida scientists are submitting very roughly about 10% of all preproposals nationally, and that they are invited to submit proposals at about or slightly over that same rate.		These two columns indicate that funding of preproposals nationally and those submitted by Florida scientists ranges from about 10 to 29%.		These two columns indicate that funding of full proposals is about 40-50% nationally, with Florida's rate at about 25-60%.	

2. Ensure that all Florida Sea Grant competitions are open and transparent and that maximum participation is achieved by all eligible institutions.

During 2002 national competitions, all 15 of Florida Sea Grant's participating institutions submitted a proposal. In addition, a number of other institutions or organizations not listed as "participants" submitted proposals.

Florida Sea Grant institutional participation rates for National Strategic Investment (NSI) Competitions for environmental technology, technology and fisheries habitat in 2002 and aquatic nuisance species, oyster disease, and Gulf of Mexico oysters, 2002-03.

	Preproposals	Full Proposals		
	Submitted	Invited	Received	Funded
UWF	0	0	0	0
UNF	2	0	0	0
UCF	.5	.5	.5	1.0
FGCU	.25	.25	.25	0
FIU	1	.5	.5	0
FSU	0	0	0	0
FAU	.25	.25	.25	0
FAMU	1	0	0	0
FIT	2.75	1.5	1.5	0
USF	4.75	2	1.5	1.33
MML	6.5	1	1	.5
NSU	0	0	0	0
HBOI	5	3.25	3.25	1
UM	4	1.5	1.5	1
UF	9.5	2.83	2.83	.33
Other	17.5	9.42	9.92	2.84
Total	**55**	**23**	**23**	**8**

Fractions indicate joint proposals from two or more institutions.
NA -- Not Available. Competition decisions pending.

Recent success rates for national Fellows competitions.

Year (Class of Service)	National Level Submitted	National Level Funded	From Florida Submitted	From Florida Funded
Sea Grant Industry Fellows				
1999			0	0
2000				
2001	6	4	0	0
2002			2	2 [a]
NMFS/Sea Grant Fellows				
2000	16	4	0	0
2001	11	6	0	0
2002	7	4	0	0
2003	11	4	1	0
Knauss Fellows[c]				
1999	55	30	4	1
2000	50	(37) 31	2	1
2001	42	(32) 30	4	3
2002	76	(41) 37	3	1
2003	69	(38) 33	5	1
NOAA Coastal Services Center Fellows[d]				
2000	20	(14) 5	2	0
2001	20	(14) 6	2	0
2002	14	(10) 5	0	0
2003	NA	NA	1	NA

[a] One Fellow funded from FSG program development funds due to “cash” contribution by matching funds partner.
[b] Competition currently open to January 31, 2003.
NA - Proposal review currently in process.
[c] Numbers in parenthesis indicate those invited for interview but withdrew during or after interview week.
[d] Number in parenthesis indicate those semi-finalists invited for interview.

For core program competitions, 13 of the 15 participating institutions submitted proposals.

Florida Sea Grant core program research competition
Proposal submission data, 2002-03.

	Preproposals Sent	Preproposals Accepted	Full Proposals Submitted	Projects Funded
FAMU	1.5	.5	1	0
FAU	4	3.5	3.0	2
FGCU	1	1	1	0
FIT	8	6	4.5	.5
FIU	2	1.5	1.5	0
FSU	5	4	3.5	2
HBOI	15.5	5.5	4.5	1
MML	2	.5	.5	0
NSU	1	1	1	1
UCF	2	2	2	1
UF	26	15	15.0	6.5
UM	5.5	1.5	1.5	0
UNF	1	1	1	0
USF	3	2	2	0
UWF	2	0	0	0
Other	3.5	1.5	1.5	0
TOTAL	83.0	46.0	43.0	14.0

3. Develop Florida's position of leadership in ocean and coastal subject areas to promote the flow of information for marine resource development and management and expand the funding base to build a responsive marine academic resource capability.

Florida Sea Grant continued during 2002 to build academic capability and to create statewide expertise in marine biotechnology, and also initiated broader working relations with industry and allied interests. Efforts included:

- Membership on the board of directors for BIOFlorida (the statewide trade association). Contact with two national life sciences trade groups, BIO (the Biotechnology Industry Organization, and PhRMA (Pharmaceutical Manufacturers Association) at meetings held at their Washington, D.C. headquarters. (We invited the National Sea Grant biotechnology program specialist, Linda Kupfer, and the leader of the Sea Grant national theme team, Jonathan Kramer, to attend.) This led to a proposal for a BIO annual meeting session on marine biotechnology. Determination of the extent of interest and effort devoted to marine biotechnology by the 40 core business members of BIOFlorida. Findings of limited effort but greater interest are in a publication now used to communicate with users.
- Continuation of the Florida Marine Biotechnologies ListServe Internet network to facilitate communication among 77 listees. Principal sponsor of the Florida Marine Biotechnology Summit III, co-organized by faculty at Florida Atlantic University, and conducted at Harbor Branch Oceanographic Institution. Eight plenary review presentations, a commercialization session and 26 posters were attended by 74 individuals, a sign of growing interest over the 2000 Summit attended by 45. Organized a national team of experts to participate in a National Sea Grant "national strategic investments" proposal in environmental biotechnology, entitled "Marine Biotechnology Executive Education for Leadership Success." This was rejected. Reviewers' scores were "good," "very good," and "excellent." Organized an ad hoc science panel to provide assistance in revision of FSG strategic plan and call for proposals in 2003.

As a result of this effort, there is an emerging “virtual department” of marine biotechnology for Florida faculty and students, and industry is working on behalf of academia to help develop funding sources. FSG has achieved national visibility and prominence for its leadership in this area, and in-state faculty express trust in the effort on their behalf.

During 2002, a $1.5 million commitment from Carnival Cruise Lines was made to the University of Florida as the result of a federal court case involving environmental monitoring of ocean pollution laws. UF/FSG was not involved in the case, but was chosen as one recipient of $9 million paid by Carnival to a public service ocean/environmental research and education organization based on its track record of achievement. A FSG endowment has been established with the funds and the revenues from the endowment to be used in support of the boating and waterways management program.

4. Fully engage in regional and national projects.

A. During 2002, Florida Sea Grant was an active participant in at least seven different research or extension projects or activities in which each participant was investing funds. These are presented below in summary form.

Regional Sea Grant projects or activities in which Florida Sea Grant research, extension and communications faculty are involved during 2002.

	Project	Sea Grant Partner/Agency Partner/Industry Partner
1	Book for Layman on Beaches: Florida Collaboration (ongoing in 2002)	Florida (FSG); University of South Alabama (USA)
2	Management of Spiny Lobster in South Florida Based on Post larval Supply and Juvenile Dynamics (ongoing in 2002)	Florida (FSU); Virginia (ODU); Florida Marine Research Institute (FMRI)
3	SEA-COOS: Southeast Atlantic Coastal Ocean Observing System	University of North Carolina (UNC), University of South Carolina (USC), University of South Florida (USF), University of Miami (UM), Skidaway Institute of Oceanography (SIO), Sea Grant (Florida, Georgia, South Carolina, North Carolina), South Carolina Department of Natural Resources
4	Fish Extension Programs for the Gulf of Mexico	Texas, Mississippi/Alabama, Louisiana and Florida Sea Grant
5	Fish Extension Program for the South Atlantic	Florida, Georgia, South Carolina, North Carolina Sea Grant
6	Regional Center for Ocean Science Education Excellence (COSEE) - Gulf of Mexico	University of Southern Mississippi, Dauphin Island Marine Laboratory, University of Texas Marine Science Institute, Louisiana Marine Science Consortium, Mississippi State University, University of Florida (SG)
7	Coastal Storms Initiative Outreach Project (Florida Pilot)	NOAA Coastal Services Center (a national project)

Measures of Accountability: Administrative

Certain administrative objectives will be met which will ensure that the overall administrative goal can be achieved. They are:

1. Long range planning documents in both research and extension will be maintained/updated as appropriate, to enable the development of highly competitive proposals and insure that Sea Grant programs do not duplicate other academic programs.

A. The Florida Sea Grant Strategic Plan: 1998-2001, guided two two-year Florida Sea Grant research proposal competitions for 1998-99 and 2000-01 projects. It also guided four-year proposals for Extension, Communications and Management. The call for two-year research proposals (for 2002-03) and the need for new four-year Extension, Communications and Management proposals (for 2002-05) was issued at the beginning of 2001. This required the development of a new four-year Strategic Plan for 2002-2005. This plan was developed during 2000, used in the 2002-03 request for core proposals, and formally printed in early 2001. A new strategic planning process will be initiated in 2004 for the 2005-08 Plan.

B. Florida Sea Grant also continued its noted annual work plan for 2002 (called Implementation Plan prior to 2001). This is the fifth year of this process. The program accomplishments and benefits section of this 2002 Annual Progress Report is based on the 2002 work plan. Specific objectives scheduled for completion in 2002 are contained in section 2.0, and accomplishments and benefits under each goal are reported.

2. Enhance the visibility of Sea Grant, the University of Florida, and the State University System and provide service statewide, regionally and nationally by participation on boards of both academic and non-academic interests.

Selected Examples
(of Director, Associate Director and Assistant Director for Extension)

A. International

1. Organizing Co-chair of the 2nd International Conference on Marine Ornamentals 2001: Collecting, Culture and Conservation, scheduled for Orlando, Florida in November 2001. Continued international leadership as co-editor of book based on conference forthcoming from Iowa State Press in May 2003. (Cato)

B. National

1. Chair, External Relations Committee, Sea Grant Association. (Cato)
2. Member, Sea Grant National Theme Team: Biotechnology (Seaman)
3. Member, Sea Grant National Theme Team: Coastal Communities and Economies (Spranger)
4. Member, Sea Grant National Theme Team: Education and Human Resources (Spranger)
5. Member, Editorial Board - “Fundamentals of a Sea Grant Extension Program” Assembly of Sea Grant Extension Program Leaders. (Spranger)
6. Member, Executive Committee, National Marine Educators Association (Spranger)

C. State

1. Member, Board of Directors, Florida Institute of Oceanography, USF. (Cato)
2. Member, Board of Directors and Executive Committee of BOD, The Florida Aquarium, Tampa. (Cato)
3. Member, Board of Directors and Treasurer, Florida Ocean Alliance. (Cato)

4. Member, Board of Directors, Aylesworth Foundation for the Advancement of Marine Sciences, St. Petersburg. (Cato)
5. Member, Board of Directors, BIO+Florida. (Seaman)
6. Member, Florida Clean Marina Partnership. (Spranger)
7. Member, Education Advisory Committee, The Florida Aquarium (Spranger)

3. Provide faculty and cooperators with an efficient, understandable and streamlined administrative structure in order to expedite research, education, and extension programs.

A. A Faculty Progress Report is written bi-monthly and distributed via our campus coordinators at 16 locations to about 800 faculty members. The report is also available on our web page (www.flseagrant.org) and covers faculty and student funding opportunities and other items of information for faculty and students. For several years, all national and Florida Sea Grant funding opportunities have been advertised via our web page and all proposal guidelines and forms are available there for faculty use and downloading. For the last three funding cycles, Florida Sea Grant has accepted pre-proposals and interim and final reports via email.

B. A quarterly Sea Grant Extension report is also published and distributed statewide. This document provides accomplishments during the preceding quarter and plans for the next quarter, for each of the Sea Grant Extension major program areas, e.g., marine aquaculture. The report also highlights major activity in communications, marine education, legislative and government interactions and staff development. Finally, new faculty (to Extension) are highlighted and upcoming workshops and conferences are announced. This document is distributed electronically and via the website at www.flseagrant.org.

4. Work closely with the National Sea Grant Office, NOAA, to insure that Florida's program is competitive and responsive to national priorities.

A. Florida Sea Grant continues to evaluate NSGO drafts of program evaluation guidelines and other documents. Constructive comments are always provided. During proposal preparation, Florida Sea Grant develops a detailed "proposal notebook" for our NSGO program monitor and reviews that information with the monitor on an ongoing basis, both by telephone and through personal visits to Washington, D.C.

5. Maintain personal professional skills and reputation by publishing, making presentations or organizing academic activities. At least two each will be performed by the Director, Associate Director and Assistant Director for Extension.

Cato

Cato, James C. and Christopher L. Brown, editors. In Press. *Marine Ornamentals: Collection, Culture and Conservation*. Ames, Iowa: Iowa State Press.

Corbin, John, James C. Cato and Christopher L. Brown. In Press. Marine Ornamentals Industry 2001: Priority Recommendations for a Sustainable Future. In *Marine Ornamentals: Collection, Culture and Conservation*. Ames, Iowa: Iowa State Press.

Lopez, Mayra, Russ Allen, Charles Adams and James C. Cato. 2002. Zero-Exchange Demonstration Posts Good Results in Nicaragua. *Global Aquaculture Advocate*. Volume 5, Issue 5. St. Louis, Missouri: Global Aquaculture Alliance. Pp. 50-53.

Lopez, Mayra, Charles Adams, James C. Cato and Donald Sweat. 2002. Cost and Returns Budgets for an Intensive Zero Water-Exchange Shrimp Culture Demonstration Project in Nicaragua, 2001. Final Florida Sea Grant Report on USAID project. Gainesville: University of Florida. 28 pp.

Lopez, Mayra, Charles Adams, James C. Cato and Donald Sweat. 2002. Cost and Returns Budgets for a Semi-Intensive Shrimp Farm in Nicaragua, 1994-2000. Final Florida Sea Grant Report on USAID project. Gainesville: University of Florida. 67 pp.

Lopez, Mayra, Charles Adams and James C. Cato. 2002. The Relative Importance of Nicaragua Cultured Shrimp Within the Nicaragua Seafood Industry and U.S. Major Shrimp Import Markets: 1994-2000. Final Florida Sea Grant Report on USAID project. Gainesville: University of Florida. 22 pp.

Cato, James C. 2002. An Investment in Florida's Future: Sea Grant Sponsored Graduate Education. Sea Grant Technical Paper 117. Gainesville: University of Florida. 38 pp.

Cato, J.C. and W. Seaman, Jr. 2002. Planning, partnerships and progress via marine biotechnology research and outreach in Florida. Pp. 97-99 in: National Research Council. Marine Biotechnology in the Twenty-First Century. National Academy Press, Washington, D.C.

Seaman

Research and Monitoring of Marine Reefs Using Volunteer Divers, A North American Workshop, Co-organizer and moderator, lead editor of proceedings. (Sidney, Canada.)

Florida Marine Biotechnology Summit III, Member of organizing committee.

Second International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Systems. **Invited** member of organizing committee. (Brighton, England.)

Seaman, W. 2002. Unifying trends and opportunities in global artificial reef research, including evaluation. ICES Journal of Marine Science 59: S14-S16.

Seaman, W., B. Smiley and T. Pitcher, eds. in press. Research and monitoring of marine reefs using volunteer divers – Proceedings of the North American Practitioners Workshop. University of British Columbia Fisheries Centre.

Cato, J.C. and W. Seaman, Jr. 2002. Planning, partnerships and progress via marine biotechnology research and outreach in Florida. Pp. 97-99 in: National Research Council. Marine Biotechnology in the Twenty-First Century. National Academy Press, Washington, D.C.

Spranger

Walters, H., John Dindo, Mike Spranger and Sharon Walker. 2002. Leveraging Partnerships as a Resource for Environmental Education: The Southeast Regional Aquatic Nuisance Network. *Current: The Journal of Marine Education*, Volume 18, Number 2, Ocean Spring, MS.: National Marine Educator Association. pp. 25-30.

Spranger, M. 2002. "Public Issues and Conflict Management Workshop." Coordinator. February, 2002, Naples, FL.

Spranger, M. 2002. "Florida's Coastal Challenges and Opportunities." Testimony. U.S. Commission on Ocean Policy, February 22, 2002. St. Petersburg, FL.

Spranger, M. 2002. "Nurturing Environmental Stewardship in Extension Programs" at Environmental Education Institute for Extension Professionals. March 13, 2002, Camp Timpoochee, FL.

Spranger, M. 2002. "Effective Grant-Writing and Administration." Assembly of Sea Grant Extension Program Leaders, Annual Meeting, March 16, 2002. Baton Rouge, LA.

Spranger, M. 2002. "Florida's Marine and Aquatic Invasive Species." Florida Marine Science Educators Association. Annual Meeting. April 26, 2002. Ft. Pierce, FL.

Spranger, M. 2002. "Volunteerism and Environmental Stewardship: Putting it Together." Keynote Speaker. Florida Master Wildlife Conservationists Graduation and Commissioning. June 8, 2002. Sopchoppy, FL.

Spranger, M. and George Burgess. 2002. "Sharks In Perspective: From Fear to Fascination." National Conference Coordinator. June 12-14, 2002, Tampa, FL.

Spranger, M. 2002. "Implementing a Marine Ethic: From Awareness to Action." Keynote Speaker, Korean Association of Marine Environmental Educators. July 22, 2002. Seoul, Korea.

Spranger, M. 2002. "The Florida Sea Grant Program." Presentation for the Korean Sea Grant Program . July 24, 2002. Seoul, Korea.

Spranger, M. 2002. "The Economic Impact and University of Florida/IFAS Extension's Response to 9/11 Terrorist Events." National Extension Tourism National Conference, September 18, 2002. Traverse City, MI.

Spranger, M. 2002. Florida Sea Grant Extension Annual Meeting. Coordinator. October 21-23, 2002. Cedar Key, FL.

Spranger, M. 2002. "Climate Extension: An Opportunity for NOAA and Sea Grant Collaboration and Partnership." NOAA Climate Prediction Workshop, October 22-30, 2002. Alexandria, VA.

Spranger, M. 2002 and Debbie Berger. "Marine and Aquatic Invasive Species Teacher Workshop." November 22-24, 2002. The Florida Aquarium, Tampa, FL

Spranger, M. 2002. "Climate Change Education and Outreach." Invited Panelist. U. S. Climate Change Science Program National Stake-holders Meeting, December 3, 2002. Washington. DC.

6. Develop an Investigator Profile to ensure that Florida Sea Grant funded faculty represent diversity and all academic ranks and that at least 25 percent of the research faculty in each biennial core program proposal did not receive funds during the preceding two years.

For 2002-03, 64% of the funded faculty did not receive funds in the previous cycle.

Florida Sea Grant Investigator Profile for Core Program Projects for the Three Most recent Two-Year Funding Cycles.

	1998 - 1999		2000-2001		2002-2003	
	Number	Percent	Number	Percent	Number	Percent
Total Number of Investigators Receiving Funding	40	NA	44	NA	3	NA
Investigators[a] Receiving Funding in the Previous Two-Year Core Program	8	20	12	27	11	35
Investigator[a] Profile						
Male	31	77	35	80	25	81
Female	9	23			6	19
Investigator[a] Academic Rank						
Professor or Above	16	40	12	27	11	35
Associate Professor	8	20	13	30	4	13
Assistant Professor	5	13	7	16	10	32
Post-doc	1	3	2	5	0	0
Other[b]	10	25	10	23	6	26

[a] Includes Principal Investigators, Co-Principal and Associate Investigators.

[b] Includes such academic titles as senior scientists (at research labs), lawyers and veterinarians (at professional schools), etc.

Florida Sea Grant core proposal competitions also remain highly competitive. During 2001, for projects beginning in February 2002, a total of 83 proposals reviewed resulted in 14 funded projects as shown below.

Number of proposals submitted and funded, core proposal competition, 2000-2001 two-year cycle.

Regular (core) proposal competition	1998-1999	2000-2001	2002-2003
Preproposals received	65	88	83
Full proposals requested	32	39	46
Full proposals received	28	36	44
Proposals funded	15 (23%)	17 (19%)	14 (17%)

7. Conduct an ongoing evaluation process to determine the effectiveness of Sea Grant management.

Florida Sea Grant participates in a formal University of Florida process that evaluates administrators using input from both inside and outside the university. Every three years an

evaluation form is sent to 30-50 individuals who rank the administrator. The responses are then summarized and reviewed by the administrator and their supervisor. Positive evaluations are reinforced and suggested areas for improvement are discussed and plans made for improvement in these areas. The forms focus on leadership skills, communication skills, management of personnel and resources and overall performance in fulfilling the mission and goals of the organization, i.e., Florida Sea Grant.

11.0 ADVISORY PROCESS

The Florida Sea Grant College Program uses a multi-layered advisory process involving a number of advisory committees. These committees, both permanent and ad-hoc, provide valuable advice on both programmatic direction and administrative function and processes. Each committee will be described along with a list of the members of each committee. In addition, Figure 1 provides a schematic representation of how these committees provide input into the research, Extension and communications functions of Florida Sea Grant. Figure 2 provides detail on their advisory input according to the administrative level of Florida Sea Grant.

Programmatic (State Level)

Overall Strategic Planning/Priority Setting

Every four to six years, Florida Sea Grant engages in an in-depth strategic planning process. This provides overall programmatic guidance to Florida Sea Grant research, communications and extension priorities and ultimately results in the Florida Sea Grant strategic plan. The strategic plan is then adjusted each two years based on the input of leaders of the overall strategic planning process, until it is time to repeat the in-depth process once again.

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. This process created the 1998-2001 strategic plan. The priorities developed for 1998-2001 were updated for the 2002-20005 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. 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. 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. This 2002 annual performance report represents the first report under the 2002-2005 strategic plan.

Advisory Board/Campus Coordinators

The Florida Sea Grant College Program is established as a Type I Center of the Florida Board of Education. Type I Centers are created when at least two of the ten public universities in the State University System are involved in an academic program with statewide coverage. Each Type I Center is managed by a host campus on behalf of the participating universities in the Center. The Director of each Center reports to the Vice President for Academic Affairs of the host campus. Each Type I Center has an advisory board with a member from each university appointed to the board by the President of each institution. For Sea Grant, several private universities and non-profit laboratories participate in the program. Thus, at the invitation of Florida Sea Grant, each private university also nominates a member to the advisory board.

Florida Sea Grant calls this group its "Campus Coordinators". They meet depending on the need and advice of the group (a meeting will be held in early 2003 and reported on in the 2003 Annual Report). The Campus Coordinators provide programmatic direction as well as administrative direction regarding the way the Sea Grant program is operated. Florida Sea Grant Management requests their input on such major issues as whether to do annual or biennial proposals, how the review process is organized, and on operational issues including how best to communicate with 700-800 faculty statewide interested in Sea Grant. All maintain on-campus e-mail or hard mail mailing lists for communicating with faculty regarding calls for proposals and distributing Florida Sea Grant's bi-monthly Faculty Progress Report. The membership at the end of 2002 is given below. New College of Florida (Florida's 11th public university) was added in 2002.

Florida A&M University - Larry Robinson
Florida Gulf Coast University - Greg Tolley
Florida Atlantic University - Russell Kerr
Florida Institute of Technology - Junda Lin
Florida International University - James Fourqurean
Florida State University – Richard Iverson
Harbor Branch Oceanographic Inst. - Dennis Hanisak
Mote Marine Laboratory - Ken Leber
New College of Florida - Sandra Gilchrist
Nova Southeastern University – Andrew Rogerson
University of Central Florida - Linda Walters
University of Florida - William Seaman
University of Miami - Nelson Ehrhardt
University of North Florida - Kelly Smith
University of South Florida - Norman Blake
University of West Florida - William Huth

Aquatic Food Products Laboratory

Based on a private fund raising effort throughout the early 1990s, led by the Florida Sea Grant seafood extension specialist and Sea Grant Director, private funds and state matching funds provided enough construction capital to build a new Aquatic Food Products Laboratory at the University of Florida. The lab opened in 1997. The laboratory provides research lab space and teaching space for industry workshops on seafood safety, quality and technology. The lab is managed by the Florida Sea Grant seafood extension specialist with an advisory committee established to guide its programs and activities. The 50-member industry committee with both domestic and international members met several times in 1997 and 1999, to advise in the programmatic start-up of the lab. The complete membership is listed in the 2001 annual progress report. The process for using the committee is currently being reviewed.

Marine Biotechnology

Based on the 1996-1997 strategic planning process, marine biotechnology became a priority for Florida Sea Grant. Not only did the research faculty express a high level of interest, they advised Florida Sea Grant to engage in more marine biotechnology outreach and extension. They also identified the need for a Florida-wide assessment of needs and limiting factors for overall research and education capabilities in marine biotechnology. In April 1997, Florida Sea Grant organized a half-day roundtable discussion of invited academic and agency representations. The consensus was that Florida Sea Grant initiate efforts to build capabilities statewide.

The first priority for follow-up to the roundtable was formation of the six-member Committee to Advance Florida Marine Biotechnology Research and Education. This group was convened by FSG and drafted a prospectus for building financial sponsorship of academic programs, thereby establishing a pool of independent funds for the most meritorious research (including matching Sea Grant budgets) and training. This was the first such effort in Florida, in order to raise the state's international capabilities, profile and credibility. As appropriate, we seek to emulate the few states where funding is dedicated to academic marine biotechnology programs, from legislative or industry sources. This committee included Peter Anderson, University of Florida; James Fiore, Life Science Group; Russell Kerr, Florida Atlantic University; Shirley Pomponi, Harbor Branch Oceanographic Institution; William Seaman, Florida Sea Grant College Program/University of Florida. In September 1998 the committee concluded its work with the report “Promoting Commerce and Job Growth in Florida through Collaborative Research and Training in Marine Biotechnology: A Statewide University -Industry Initiative.” This report was presented to the fairly new statewide trade association, BIOFlorida, was used to build awareness of opportunities statewide, and contributed to development of legislation proposed in the Florida Senate and House of Representatives.

A larger group to continue momentum in this field was convened in June 2000 as the Florida Marine Biotechnology Research and Development Committee. Its membership reflects wider campus participation and has addressed issues of long-term funding in this field. Members include:

Peter Anderson, University of Florida
Richard Dodge, Nova Southeastern University
Kenneth Haddad, Florida Marine Research Institute
Wade Jeffrey, University of West Florida
Russell Kerr, Florida Atlantic University
Kenneth Leber, More Marine Laboratory
Nancy Marcus, Florida State University
John Paul, University of South Florida
Shirley Pomponi, Harbor Branch Oceanographic Institution
Patrick Walsh, University of Miami
James C. Cato, University of Florida/Florida Sea Grant
William Seaman, University of Florida/Florida Sea Grant

Marine Ornamental Fish

During 1998 the Sea Grant Programs nationwide endorsed aquaculture as a high priority area. Within that, marine ornamental aquaculture is receiving extra attention. Because of the potential for this industry in Florida, and due to the fact that Florida is the nation's leading freshwater tropical fish state, marine ornamentals are a high priority. Florida Sea Grant was a co-sponsor of the November 1999, Marine Ornamentals ‘99 Conference in Hawaii and sponsor and organizer of Marine Ornamentals ’01 in Florida. Accordingly, and following the success achieved with a focused advisory group in marine biotechnology, during late 1998 discussions began with interested individuals from the tropical fish industry in establishing an industry advisory committee. The committee was established and first met twice in 1999 and again during 2000 and 2001. This advisory committee provides the roots for Florida Sea Grant to aid in the development of the marine ornamental culture industry while at the same time ensuring the environmental compatibility of the wild captive segment of this industry. The members are:

Ilze Berzins, Curator of Animal Health & Research, Florida Aquarium,Tampa, FL
Ray Davis, Curator, Sea World, Orlando, FL
Roy Herndon, President, Sea Critters, Dover, FL
Martin Moe, Green Turtle Publications, Islamorada, FL

Ken Nedimyer, Sea Life, Inc., Tavernier, FL
Denise Petty, Veterinarian, Segrest Farms, Gibsonton, FL
Marty Tanner, President, Aquatica Tropicals, Inc., Plant City, FL 33566
Jeff Turner, President, Oceans, Reefs and Aquariums, Inc., Ft. Pierce, FL

Sea Grant Extension Advisory Committees Programmatic (County Level)

Each Sea Grant Extension off-campus faculty member at the county level has an advisory committee. These committees usually meet at least twice each year. They provide direct input into the faculty members annual work plan and program direction. They also provide guidance in assisting the faculty members in evaluating the success or impact of the educational effort for the previous year. Each faculty member's plan of work then provides input into the state major programs designed for the statewide Sea Grant Extension Program. The state major programs then become the priority educational themes of the Sea Grant Extension Proposal as part of the overall Florida Sea Grant College Program. While a major proposal for Sea Grant Extension is developed every four years, the plan within Florida is revised every year to take advantage of the advisory committee input.

The off-campus faculty and their advisory committees are listed below.

Chris Combs (Brevard County)

Mr. David Bates - President, Fleet Marine, Inc., Port Canaveral, FL
Mr. Robert Day - Project Scientist, Indian River Lagoon National Estuary Program, St. Johns River Water Management District, Melbourne, FL
Mr. Clarry Edwards - Chairman, Brevard Marine Advisory Committee, West Melbourne, FL
Mrs. Sandra Hines - Park Ranger, U.S. National Park Service, Canaveral National Seashore Headquarters, Titusville, FL
Mr. Doug Jaren - President, Banana River Marine Services & Marina, Merritt Island, FL
Mrs. Andrea Leibzeit - IMCOPEX America, Inc., Melbourne, FL
Mr. Frank Sewell - President, Tropical Seafood/Aquaculture, Cocoa, FL
Mr. Rodney Thompson - President, Cape Canaveral Shrimp Co., Inc., Dixie Crossroads Seafood Restaurant, Titusville, FL
Paul Williams - Wilbro U-Pic Farms, Palm Bay, FL

Marella Crane (Dade County)

Mike Brescher, Pelican Harbor Marina, Miami, FL
Eva Berman, E & R International Seafood, Miami Beach, FL
Ronald Dalton, Dalton Marine, Homestead, FL
Phil Everingham, Merrill-Stevens Boatyard, Miami, FL
Sallye Jude, Miami River Inn, Miami, FL
Theo Long, Biscayne Nature Center, Miami, FL
Henry McCary, Shrimping Business (Commercial Fishing), Miami, FL
Capt. Gerald C. McGinley, Jr., Admiral Oil, Coral Gables, FL
Don Pybas, County Extension Directory, Homestead, FL
Joan Vernon, Greater Miami Billfish Tournament, Key Biscayne, FL

LeRoy Creswell (St. Lucie County)

Dr. Sabine Alshuth, Indian River Community College, Ft. Pierce, FL
Michael Ednoff, St. Lucie County Dept. of Economic Development, Ft. Pierce, FL

Jan Fogt, Sports Fishing Magazine, Stuart, FL
Pat Gostel, South Florida Water Management, Stuart, FL
Mary Gregory, St. Lucie County Public School District, Ft. Pierce, FL
Dr. Dennis Hanisak, Harbor Branch Oceanographic Inst., Ft. Pierce, FL
Dean Kubitschek, Marina Manager, Ft. Pierce City Marina, Ft. Pierce, FL
Robert Pelosi, IRREC/IFAS, Ft. Pierce, FL
Dr. Mary Rice, Smithsonian Institution Marine Station, Ft. Pierce, FL
Mary Tamblyn, Florida Inland Navigation District, Jupiter, FL
Ferdinand Wirth, IRREC, Ft. Pierce, FL

Andrew Diller (Escambia County)

Neil Richards – Pensacola, FL
Richie Ann Marple – Pensacola, FL
Stuart Reynolds, RMI, Inc. - Pensacola, FL
Steve Brown, Seville Harbor Marina – Pensacola, FL
Les Westerman, Marina Industry Association – Pensacola, FL
Eleanor Godwin, Bayou Texar Foundation – Pensacola, FL
Becky Breeding, Gulf Islands National Seashore – Pensacola, FL
Amanda Grissom, Gulf Islands National Seashore – Pensacola, FL
Deborah Magyarosi, Covenant Hospice – Pensacola, FL
Lynn Fisher – Pensacola Beach, FL

Doug Gregory (Monroe County)

Richard Hanson - Islamorada, FL
Karl Lessard - Gulf of Mexico Fishery Management Council, Marathon, FL
John Magursky - Islamorada Charter Boat Association, Key Largo, FL
Ron Meyers - Little Torch Key, FL
George Niles - Summerland Key, FL
Bennett Orr - Marathon OFF Chapter, Marathon, FL
Greg DiDomenico, Monroe County Commercial Fishermen, Marathon, FL
Mike Sands - Bama Sea Products, Key West, FL
Capt. Jim Sharpe - Summerland Key, FL
Simon Stafford - Lower Keys OFF Chapter, Key West, FL
Bill Wickers - Key West Charter Boat Asociation, Key West, FL

L. Scott Jackson (Okaloosa/Walton counties)

Ross Hamilton, Niceville, FL
Capt. Tommy Braden, Destin, FL
Mark Christy, Destin, FL
Stanley Cook, Baker, FL
Lockey Goodwin, Santa Rosa Beach, FL
Edwin Goodwin, Santa Rosa Beach, FL
Beverly Kraska, Santa Rosa Beach, FL
Sharon Maxwell, Niceville, FL
Jim Moyers, Seagrove Beach, FL
Mike Nunley, Ft. Walton Beach, FL
Jim Robertson, Ft. Walton Beach, FL
Scott Robson, Destin, FL
Laura Sparks, Once De Leon, FL

Brittany Stark, Ponce De Leon, FL
Bob Walker, Niceville, FL

William T. “Bill” Mahan (Franklin County)

Polly Edmiston, Apalachicola High School Science Department
Anita Gregory, Executive Director, Apalachicola Bay Chamber of Commerce
Van Johnson, Director, Franklin County Solid Waste Department
Woody Miley, Director, Apalachicola National Estuarine Research Reserve

Maia McGuire (Nassau, Duval)

Mary Duffy, Amelia Island Sea Turtle Watch, Inc, Fernandina Beach
Tamara Duncan, Fernandina Beach
Mike Hollingsworth, Jacksonville
Pete Johnson, SJRWMD, Jacksonville
Bronson Lamb, III, Lamb’s Yacht Center, Jacksonville
Scott Moye, City of Fernandina Beach, Fernandina Beach
Steve Nichols, Metropolitan Park & Marina, Jacksonville
Kelly Smith, UNF Dept. of Natural Sciences, Jacksonville
Lex Waters, Jacksonville

Maia McGuire (Flagler and St. Johns)

Jackie Alligood, St. Augustine
Chris Benjamin, St. Augustine
Jan Brewer, Environmental Planner, St. Johns County, St. Augustine
Jerry Full, Palm Coast
Rick Gleeson, GTM NERR, St. Augustine
Carl Hampp, St. Augustine
Richard and Carole McCleery, Palm Coast
Kevin Micieli, Flagler County Public Works, Bunnell
Renee Paolini, Washington Oaks State Gardens, Palm Coast
Bonnie Simms, Palm Coast
Howard Sklar, Flagler Bridge Boatworks and Marina, Flagler Beach

Rich Novak (Charlotte County)

Bruce Laishley – Partner in SWD which donated aquaculture equipment, Partner in Palm Yamaha, Owns Laishley’s Marine World, Active in the artificial reef programs
Chuck Listowski – Executive Director of the West Coast Inland Navigational District
Michael Heller – Editor, Water Life (Monthly fishing/boating magazine
Frank Hommema – Owns Fishin’ Franks Bait and Tackle Shop, Has a weekly fishing show on cable television – “Wishin I Was Fishin’ with Fishin’ Frank
Jim Joseph – Owns Fantasea Scuba, Teaches 1st Aid, CPR and O2 Provider classes
Stan Swast – Owner of Shoal Marine-boat part sales and repair, Commercial Fisherman-Blue and stone crab, shrimp, and lobster guide, Clam farmer, Member of OFF
Pete McLewin – President of Punta Gorda Fishing Club, Active as a volunteer in the artificial reef program

John Stevely (Manatee, Sarasota & Collier Counties)

Buddy Watts - City of Bradenton Beach

Bill Ireland - Coastal Conservation Association
Pat Wilcox - Trailer Estates
Charlie Hunsicker - Ecosystems Manager
Jonathan Davis - Fishing Guide
Larry Borden - Scuba Diver
Clayton Robertson - Conservation Consultants, Inc.
Gary Raulerson - SBNEP
Jim Cutway - Scuba Quest
Greg Fagan - Manatee County Parks and Recreation
Gail Cole - Mayor, Bradenton Beach
Kevin Lausman - Coastal Conservation Association
Joe Burnhard - Manatee County Sheriff's Department
Jack Gorseman - Manatee County Environmental Management Department
James Zacharis - Fishing Guide
Karen Bell - Bell Fish Company
Rick Meyers - Manasota Fish & Game Association
Todd Barber - Reef Balls, Inc.
Sheila Mora - Sigma Inc.
Bob Fluke - Manatee County Environmental Management Department
Wayne Hamblen - Trailer Estates
Jack Wieler - Boaters World

Leslie Sturmer (Multi-County Aquaculture)

Ricky Cooke, Cooke's Oysters and Seafood, Cedar Key, Clam Farmer, Project OCEAN Graduate, Nursery Operator, Wholesaler, Retailer
Pam Colson, Suwannee, Clam Farmer, Project OCEAN Graduate, Member of Dixie County Aquaculture Task Force
Bill Delaino, Cedar Key, Clam Farmer, Nursery Operator
Jerry Fulford, Cross City, Clam Farmer, Treasurer of Hidden Coast Shellfish Producers Association
Paul Ridaught, Old Town, Clam Farmer, Member of USDA/FSA Advisory Committee
Harriet Smith, Harriet Smith Clams, Cedar Key, Clam Farmer, Project OCEAN Graduate, Wholesaler, Member of Levy County Aquaculture Task Force
Dan Solano, Cedar Key Aquaculture Farms, Inc., Cedar Key – Clam Farmer, Hatchery & Nursery Operator, Seed Supplier, Wholesaler
Shawn Stephenson, Yankeetown, Clam Farmer
Carole Strobach, Bag Lady, Inc., Suwannee, Clam Farmer, Project OCEAN Graduate, Equipment Manufacturer, FL Aquaculture Association Board Member
Rick Viele, Rick's Seafood, Inc., Cross City, Shellfish Dealer & Wholesaler
Anna White, Steinhatchee - Clam farmer, Project OCEAN Graduate

Don Sweat (Citrus, Hernando, Pasco and Pinellas Counties)

Citrus/Hernando

Jeff Carter – Marina Owner, Homosassa
Brian Thompson - Scallop Aquaculture Participant
Bob/Cathy Gill - Owners, Shrimp Landing Fish House
Gary Maidof - Citrus County Planning Department
Andy Rose - Sumter County Cooperative Extension Service
Sam Lyons - Charter Dive Shop Owner
Pat Purcell - Director, Marine Science Center
Walter Wynn - Retired

Kelly Tyler - County School System
Kevin Cunningham - Local Businessman
Bobby Witt - Scallop Aquaculture Participant

Pasco/Pinellas

Blake Longacre - Businessman, Sport Fisherman/Boater
Dr. Norm Blake - Dept. Of Marine Science, USF, St. Petersburg, FL
Jarvis Everett - Suncoast Tarpon Roundup Committee, St. Petersburg, FL
Dr. Larry Doyle - Dept. Of Marine Science, USF, St. Petersburg, FL
Dave Zalewski - Charter Boat Service Owner/Captain, Largo, FL
Terry Newkirk - Boat/Yacht Broker, St. Petersburg, FL
Phil Steele – National Marine Fisheries Service, St. Petersburg, FL

Sacheen Tavares (resigned)

Chris Verlinde (Santa Rosa County)

Dr. Eleanor Williams, Go Native Plant Nursery, Milton, FL
Mr. and Mrs. Charles D'Asaro, Bagdad, FL
Marty and Brenda Stokes, Navarre Beach Marine Sanctuary, Navarre, FL
Dave Barker, Blue Dolphin Kayak Tours, Navarre, FL
Junior and Gloria, Gloria's Seafood, Milton, FL
Jack Marion, Marion's Bait and Tackle, Navarre, FL
Jim Robey, Air Products, Milton, FL
J.D. Brown, Bream Fishermen Association, Pensacola, FL
Harold Kelker, Aquaculture, Milton, FL
Deborah Holland, NW FL Aquatic Preserve Office, Milton, FL
Bud and Lana Allen, Bud Allen Landscaping, Bagdad, FL
Capt. Wayne Smith, Pier One Marina, Gulf Breeze, FL
Martha Szmoniak, West Florida Canoe Club, Milton, FL
Capt. Robert Turpin, Gulf Breeze, FL

Bob Wasno (Lee County)

Chuck Listowski, WCIND, Venice, FL
Rudy Busch, Keep Lee County Beautiful, Inc., Ft. Myers, FL
Dennis Henderson, Trico Shrimp Co.,Ft. Myers Beach, FL
George Gala, Trico Shrimp Co., Ft. Myers Beach, FL
Dr. Tom Fraser, Dex Bender and Assoc. Environmental Consultants, Ft. Myers, FL
Dr. Rob Loflin, City of Sanibel, Natural Resources, Sanibel, FL
Capt. Denis Grealish, Florida Fish & Wildlife Conservation Commission SW Region, Ft. Myers, FL
Commissioner Ray Judah, Lee County Board of Commissioners, Ft. Myers, FL
Jack Waldock, Ohio Sea Grant (Retired), Ft. Myers, FL
Ken Stead, SW Florida Marine Trades Association, N. Ft. Myers, FL
Heather Stafford, FDEP-Estero Bay Aquatic Preserve Office, Ft. Myers Beach, FL
Rich Novak, Charlotte County Marine Sea Grant Program, Port Charlotte, FL
Dr. Greg Tolley, Florida Gulf Coast University, Ft. Myers, FL
Dave Ceilley, Environmental Biologist, Conservancy of SW Florida, Naples, FL
Dr. Steve Bortone, Executive Director, Conservancy of SW Florida, Naples, FL
Tomma Barnes, Environmental Scientist, South Florida Water Management District, Ft. Myers, FL
Betsy Clayton, News Press, Ft. Myers, FL

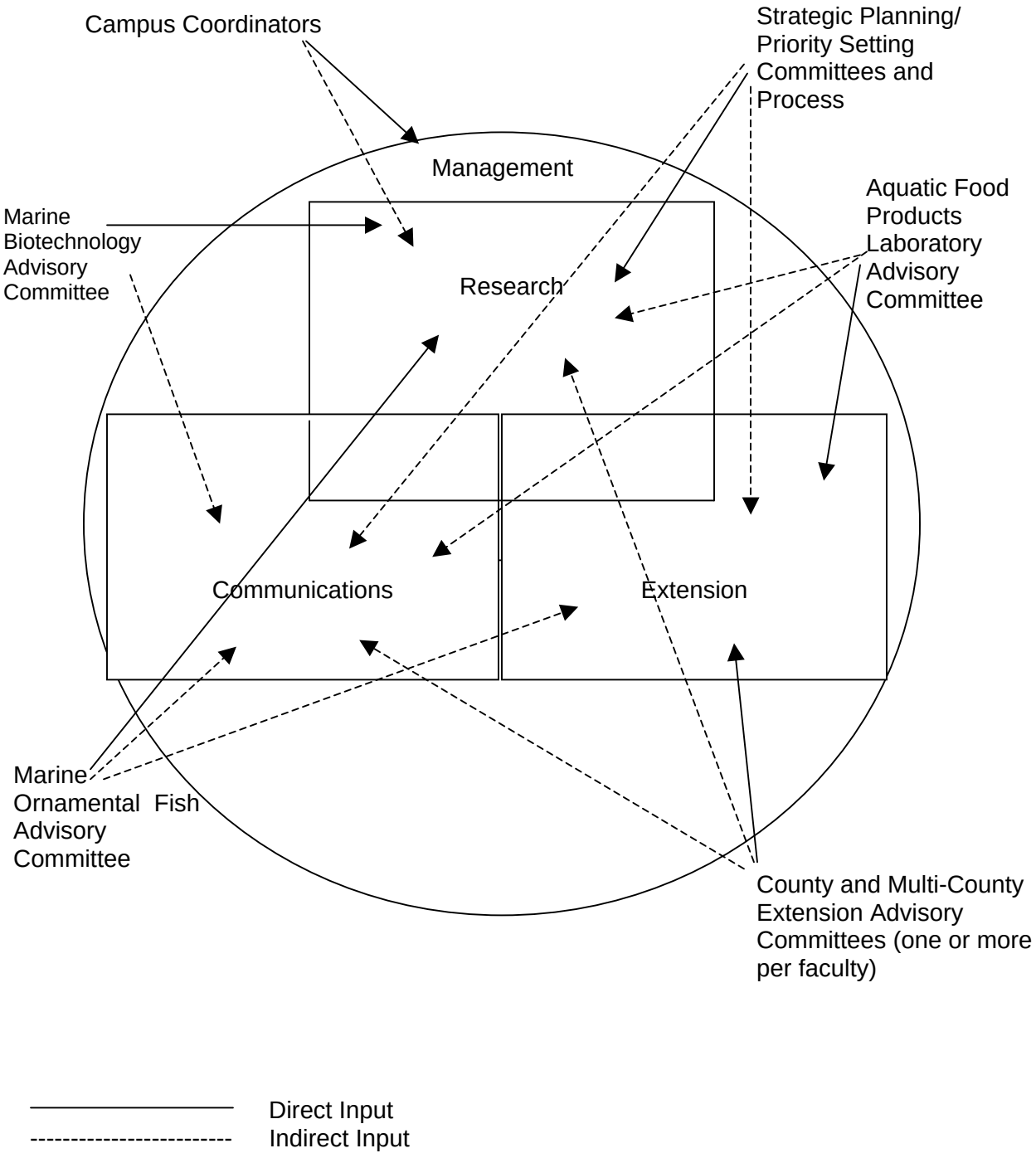


Figure 1. The input of advisory committees into research, extension and communications functions of Florida Sea Grant.

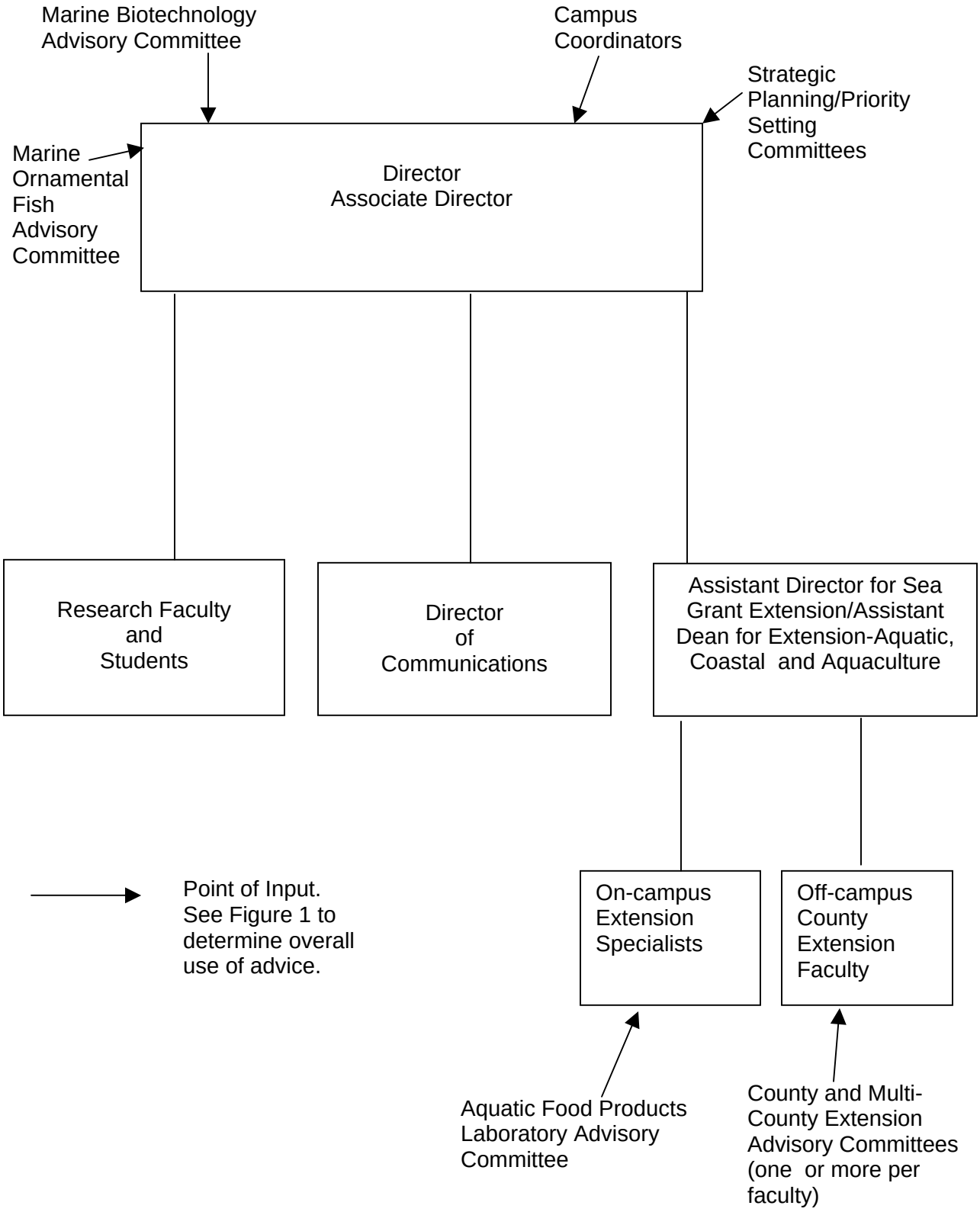


Figure 2. The point of first contact or direct input of advisory committees into the administrative structure of Florida Sea Grant.