

## **2.0 ACCOMPLISHMENTS AND BENEFITS**

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Florida Sea Grant has for many years reported annually its accomplishments and benefits for each research project that is completed during that year. It has also reported the accomplishments of each task planned for the year by the Extension faculty. That process continues in this report.

In addition, beginning for 2006, the National Sea Grant Office is requiring a few impact-related performance measures be submitted at the beginning of the year and reported on for that year. Thus, FSG has organized its annual reporting guidelines (for Principal Investigators) to begin collecting information on: (1) contributions to science and technology, (2) firsts from Florida Sea Grant research, (3) new scientific methods developed and (4) impacts on society, economy and environment. This will allow for a more frequent updating of impacts for future years. The first section contains the 2006 FSG Performance Measures and the impacts achieved. The second section contains each task outlined in the 2006 work plan and what was accomplished for that task.

### **2006 Performance Measures**

#### **1. Economic and societal benefits**

a. An environmentally safe paint additive that will inhibit the biofouling of boat and other marine surfaces will be developed. At least one new patent application will be filed. (Project R/LR-MB-20)

This project was extended into 2007 because of 2005 interruptions to field tests due to hurricanes off the North Carolina coast where the tests were planned. The final benefits will be reported during 2007. The research to date has shown that some synthetic compounds created to mimic natural anti-fouling compounds can be incorporated into experimental marine paints. Field tests of the paints were conducted during summer 2006 and are being analyzed at this time. One patent on the process was issued in March, 2005.

b. A new class of neuropharmacological agents from cone snails will be defined. At least four companies will be contacted to determine interest in the agents and one patent application will be filed. (Project R/LR-MB-21)

Four biotech/pharmaceutical companies (Oceanova, Evotec AOI, iOnGen AG and Solvay) have expressed interest in testing the novel compounds developed in this project on their screening protocols to evaluate the relative efficacy of the compounds when compared to their current products. The new compounds are less costly to produce and could overcome some of the side effects of their current products. A patent has been applied for and the testing with the companies will begin as soon as the patent application process is completed.

c. It is necessary to improve hatchery and offshore grow out technology to expand cobia aquaculture in the US. This technology will be developed and transferred to research/academic institutions and the private sector. (Project R/LR-A-42)

This project was designed to reduce economic losses associated with heavy mortality of cobia fingerlings during shipping to grow out locations. Cobia fingerlings were successfully produced in Florida by the University of Miami Experimental Hatchery (UMEH) and SnapperFarm and shipped and stocked in a new cage in Culebra, Puerto Rico. A total of over 6 million eggs were obtained from natural spawns at the UMEH during the course of the project. Work continues with industry associates and partners such as the Aquaculture Center of the Florida Keys, Great Bay Aquaculture of New Hampshire and Virginia Tech University. Sixteen publications in outlets ranging from scientific journals to trade and industry magazines were published and eight presentations were made at conferences and training workshops. It is clear the technology developed from this project is being incorporated into hatchery protocols for live feeds production and larval rearing of marine fish and cobia eggs, larvae and fingerlings are being shipped to industry and research partners.

d. Innovative waterfront policy and planning techniques will be developed that will enhance continued public access to coastal waters. These tools will be incorporated into state legislation and local government ordinances. (Projects R/C-P-27CC; Boating and Waterways Management Program)

The legal basis to require sellers of real property to notify subsequent purchasers that the property was subject to coastal erosion and environmental constraints was developed. State legislation based on the legal basis was developed and passed and became state law during 2006 as Section 161.57 of the Florida Statutes. Legal education was provided the Cities of Crystal River, Sarasota, St. Augustine, Cedar Key, the town of Bradenton Beach and the community of Panacea on how to participate in the Waterfronts Florida Program. A “waterways and waterfronts” toolkit website is now available for all to use. Local governments in Fort Myers Beach, Sarasota and Venice have adopted harbor management ordinances based on prepared model ordinances.

A recreational boating Geographic Information System (GIS) for sustainable Florida waterways has been developed. The GIS is being used by the Florida Fish and Wildlife Conservation Commission (FWC), the Tampa Bay National Estuary Program, the FWC Bureau of Protected Species and Sarasota County to evaluate the placement of waterways signs, determine marine facility siting alternatives, determine the suitability of speed and other boating restriction zones and identify areas for manatee protection.

e. An empirical analysis of the effectiveness of local growth management strategies on reducing damage on coastal residents and structures from natural hazards will be completed. The results will be used to amend state regulations and made available to state planning agencies. (Project R/C-P-26)

Florida’s growth management legislation requires coastal communities to include policies in their comprehensive plans that limit development in and direct populations away from coastal high hazard areas. Project results show that residential development following state approval of local comprehensive plans has been slower and at lower densities within coastal high hazard areas than in areas outside coastal high hazard areas. However, at least a third of coastal communities do not show these trends. Residential development with the coastal high hazard areas has still been substantial. A number of communities have failed to revise their high hazard area definitions to be consistent with 1994 state legislation. The aggregate impacts of numerous small increases in growth may be undermining the state’s goal of protecting and enhancing public safety due to increased evacuation times. Presentations on the results have been made to the Florida Department of Community Affairs which was a partner in the project. Adequate time has not passed for the work to be influence state regulations.

f. The vulnerability of man-made coastal structures to hurricane wind damage will be evaluated. Reductions in risk through the use of retrofits and new construction methods, and a cost-benefit analysis of these mitigation measures will be conducted. (Project R/C-S-45)

A mitigation component has been incorporated into the Florida Public Hurricane Loss Projection model. In particular, the effect of various mitigation measures on the building, vulnerabilities, including roof membrane, higher quality shingles, opening protections, improved roof to wall and wall to foundation connections have been modeled and evaluated. The effect on the damages for typical homes in different regions of Florida on an annual basis was evaluated. The cost effectiveness of the different mitigation packages was mapped for the entire state. A new prototype for wireless sensing of pressure and wind speeds during hurricane landfall was also developed. The comparison of full-scale and wind-tunnel model loads on residential housing is a significant contribution to wind engineering, providing for the first time the ability to validate the American Society of Civil Engineers wind load provisions that were based on wind tunnel tests.

## 2. Issue-based forecast capabilities

a. Three years of new data will be added to the longest and most comprehensive collection of genetic material for lemon sharks. This will allow the prediction of survival and replacement rates for one of NOAA's 39 protected Atlantic species. ((Project R/C-E-47))

Several new techniques were developed in connection with the telemetry-tracking work. Small thermochrons were used to monitor the thermal behavior of juvenile lemon sharks in three Bimini nurseries. Three years of data were added. A small isolated nursery for lemon sharks was discovered and is now intensely monitored. A four-year National Science Foundation project has been funded based in part on the microsatellite techniques developed in this project. The longer-term goal of using the results to support the establishment of a no-take Marine Protected Area in the lagoon at Bimini, Bahamas and to identify the lemon shark nursery area as Essential Fish Habitat has yet to be accomplished.

b. The Caribbean spiny lobster is Pan Caribbean and shows decreasing trends in catches throughout its range. A new forecasting model will be developed to include regional (across nations) considerations that frame stock recruitment changes. (Project R/LR-B-57)

The regional recruitment analyses show that spiny lobster recruitment is much more stable in Florida than in regions upstream. The recruitment variance in Brazil is 9.69 times larger than the variance of recruitment in Florida and the variance observed in Nicaragua and Honduras is 2.99 times as large as Florida. Regional spiny lobster spawner-recruit functions were developed for the first time under standardized data and statistical model implications. The results of the integrated bio-physical simulations and statistical modeling significantly contribute to understanding one of the most dynamic and complex exploited marine population dynamics in the Caribbean. The basic algorithms have been added to the newer HYCOM physical model by other scientists. The results have been provided to the spiny lobster management agencies in Florida and nationally. It will be necessary to conduct follow-on tracking to determine their exact use by the agencies.

c. A new methodology that uses existing state of Florida data-bases will be developed and implemented to estimate regional and primary service areas for boat ramps to delineate land-side market areas for boaters the use public access ramps. (Boating and Waterways Management Program)

It was demonstrated that the Florida Vessel Title Registration System is a reliable and valuable source of information that can be used to map boat locations and their characteristics within coastal residential canals and waterways. Numerous recommendations were made that will lead to improvements in the quality and use of the information. Two workshops were held to demonstrate the viability of the System and changes in the System will be tracked to determine if the State of Florida implements the changes. Implementation can reduce the cost of determining vessel information that is used in waterway management and regulation.

d. A geochemical model will be developed to determine the amount and sources of freshwater into Biscayne Bay. The model will be provided to management agencies to assist in decisions about changing the sources of freshwater flow into Biscayne Bay from a point-source discharge via canals to a more diffuse discharge via the coastal wetlands and groundwater discharge. (Project R/C-E-51)

This project successfully quantified freshwater inputs to Biscayne Bay. Stable isotopes proved to be an inexpensive and effective freshwater tracer for this system. This technique can be applied alone or in a suite of groundwater discharge indicators in area and can be applied to other coastal systems where salinity is reduced from terrestrial and atmospheric inputs. With the knowledge of the background spatial and temporal distribution of freshwater inputs to Biscayne Bay gained from this study, the effects on the Bay's water quality with future changes in freshwater flow deliveries, as projected as a result of Everglades restoration efforts and municipal water use changes, can be discerned. Project results are now being used by the Biscayne National Park and the Miami-Dade Department of Environmental Management to determine future effects of Everglades restoration efforts on Biscayne Bay.

e. A new set of advanced statistical and mathematical models that are essential to integrated ecosystem monitoring and assessment programs in the Florida coral reef ecosystem and that are widely applicable to coral reef ecosystems throughout the US Caribbean, US Pacific and trust territories will be developed. They will be made available to regional, state and federal management agencies. (Project R/C-E-50)

A new suite of advanced statistical and mathematical models essential to integrated ecosystem monitoring and assessment programs in the Florida coral reef ecosystem are available. The work relating habitat characteristics and coral reef fish community structure is the most critical step in providing the transition to ecosystem based management. It will help determine optimal sizes, numbers and location of marine protected areas. The findings have been communicated in various formats to the Florida Governor and Cabinet, Florida Fish and Wildlife Conservation Commission, Florida Keys National Marine Sanctuary, Biscayne, Everglades and Dry Tortugas National Parks, the South Atlantic and Gulf of Mexico Fishery Management Councils and the Florida Department of Environmental Protection.

f. A modeling tool to develop a rip current index will be developed. The index will be the first attempt to predict the likelihood of rip currents that can be used by lifeguards and the National Weather Service to warn beach goers of the dangers of rip currents and save lives. (Project R/C-S-44)

The rip current index has been calibrated and verified as an operational tool that can be used in an advanced warning mode. Collaboration has been established with lifeguards in Melbourne, Florida, taking daily data on wave and beach conditions, and associated rip current activity. This region is the only portion of the Florida east coast served by a dedicated directional wave gage. A collaborative relationship with the National Weather Service to test and improve predictions of rip current activity has been established. This will accommodate the next step of real-time implementation of the new predictive index and incorporation of those results into daily National Weather Service forecasts.

### 3. Percentage, number of tools and technologies

a. Ecosystem management and public stewardship of marine resources will be improved relating to biofouling control, bioremediation, coastal habitat restoration, and environmental monitoring and resource management. This will be accomplished through the development of a website on marine biotechnology and the holding of a statewide marine biotechnology summit connecting scientists, managers and industry. (Project E/T-11; Florida Sea Grant Management)

The marine biotechnology website, [www.marinebiotech.org](http://www.marinebiotech.org) is complete. The site is a one-stop resource for individuals desiring a thorough introduction to the field, and a first stop for those looking to fully become immersed in the field. Over the next few years, it will raise awareness of the general public, it will provide a rich source of information to educators and it will provide options to those interested in pursuing marine biotechnology as a career. The site will reach thousands of people each year.

The Florida Marine Biotechnology Summit V was held concurrently with the annual BioFlorida conference. The summit sessions attracted the largest attendance (up to 85) of any of the concurrent sessions of the BioFlorida event. Governor Jeb Bush participated in the Florida Sea Grant Marine Biotechnology Student Awards presentations.

b. A new generation of Crittercam (an underwater video tracking tool) will be developed. The application of this tool to define habitat requirements for marine species and gear-animal applications will benefit fisheries managers. (Project R/MI-12)

A smaller GenV Crittercam unit (20.2 cm long; 7.6 cm diameter; 47% less volume) was developed. The system is based on solid-state memory instead of video tapes as in earlier units. The unit also allows the tracking of an animal's movement without manually tracking from a vessel. The system was successfully deployed on bull, great hammerhead, nurse and white sharks. The units were also successfully tested to film extruder devices

in the shrimp trawl fishery. The project also produced 12 documentaries including the National Geographic Channel. Dozens of other presentations were made to schools, organizations and in other outreach capacities. The GenV Crittercam developed during this project will be useful to biologists studying marine mammals, marine reptiles, large teleosts, sharks and rays, large seabirds and interactions between fisheries gear and animals. It will help managers define habitat requirements that will aid in management plans.

c. Streamlined DNA techniques and forensic markers that can be used to accurately and rapidly identify shark species and body parts will be developed for 30+ shark species found in US Atlantic and Pacific fisheries and global trade. The technology developed will be used by NOAA's Office of Law Enforcement to enforce fishery management regulations. (Project R/LR-B-56)

The results of this (and previous FSG funded) research continue to be used by NOAA's Office of Law Enforcement (OLE) to identify shark body parts confiscated from fishers and seafood dealers suspected of fishery regulation violations. By early 2006 assistance had been provided to NOAA OLE (SE Division, NE Division and Guam) with 12 cases so far, with seven of these demonstrating prohibited species. One especially large and ongoing investigation has found fins from several, high profile prohibited species (white sharks, basking sharks, sand tiger sharks) in the possession of a U.S. east coast seafood dealer. The forensic results from this case pertaining to white sharks have been published in the journal Conservation Genetics, with the NOAA OLE agent in charge as a co-author.

d. Current methods for evaluation of seafood safety contamination by *Vibrio* species are time-consuming, labor-intensive and expensive. Improved methodology will be developed in collaboration with FDA, other agencies and implemented in industry. (Projects R/LR-Q-26; Sea Grant Extension)

Rapid molecular technologies such as QPCR and PCR-based molecular typing investigated by these studies potentially provide cost effective alternatives for product evaluation and good practices assessment. This first step toward acceptance of QPCR protocols by FDA/ISSC was submission of a draft proposal in 2005. Interim acceptance of this protocol is expected.

An oyster industry laboratory was opened in Apalachicola in 2004. The goal is to certify oysters as safe for consumption prior to entering the market. Methodologies in place at the laboratory can be transferred to the Florida Department of Agriculture and Consumer Services Laboratory for implementation of detection of *V. vulnificus* as needed.

## **Economic Leadership**

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

- 1.1 There is a general lack of understanding of marine biotechnology by non-scientists. The goal of the project is to draw upon Sea Grant's vast national network of research, education and outreach resources to build an effective marine biotechnology website. It will be an effective tool for increasing awareness of this field among government officials, policymakers, students, educators, scientists, journalists, the general public, and industry professionals. (Masterson/Pomponi/Clark/Reed: E/T-11)

Results reported in performance measures section.

- 1.3 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. A new class of conopeptides from snails has been discovered and the goal is to carry out extensive biological assays geared towards the evaluation of these new compounds as potential for therapeutic agents. (Mari/Fields: R/LR-MB-21)

Results reported in performance measures section.

- 1.6 To promote industry education and engagement, and media awareness of Florida marine biotechnology opportunities and constraints, work will continue with BioFlorida and other stakeholders to develop outreach materials and implement a business plan for this subject, and a marine biotechnology development and outreach position will be proposed for a short-term, non-recurring budget item to the UF provost. (Seaman)

Results reported in Outreach Activities, Major Program Activities, and Marine Biotechnology.

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

Results reported in Outreach Activities, Major Program Activities, and Marine Biotechnology.

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

- 2.1 The goal of this project is to provide critical fish habitat information necessary for the conservation and management of a protected, large coastal species, the lemon shark (*Negaprion brevirostris*) and to provide baseline conditions for the planned Marine Protected Area that will protect the mangrove seagrass nursery at Bimini, Bahamas. (Gruber/Hoenig/Feldheim: R/C-E-47)

Results reported in performance measures section.

- 2.2 There is widespread interest in the scientific application of underwater video units from researchers at academic institutions, government agencies, non-profit research foundations and the fishing industry. This project will test the application of CRITTERCAM on nurse, bull and hammerhead sharks. (Heithaus/Marshall/Carrier: R/MI-12)

Results reported in performance measures section.

- 2.3 This is an urgent need for better tracking of shark fisheries and trade on a species and population specific basis to better serve and manage sharks on a worldwide basis. This continues earlier work to develop identification markers for shark species that is already being used by NOAA law enforcement. (Shivji: R/LR-B-56)

Results reported in performance measures section.

- 2.4 The Caribbean spiny lobster is Pan Caribbean because of long larval life span (6-12 mo.) residing in strong ocean currents. In spite of a 50% reduction in traps, the Florida fishery shows a 57.8% decrease in landings during the 1999 to 2002 fishing seasons. Significant catch decreases are observed also in the Bahamas (26%), Cuba (30%) and Nicaragua (35%). No knowledge regarding the origin of these common decreasing trends is available, but regional overexploitation and environmental change are suspected. This proposal investigates the roots of such decreasing trends. (Ehrhardt/Olson: R/LR-B-57)

Results reported in performance measures section.

- 2.9 Conduct an assessment of the economic consequences of potential FDA sanctions on the Gulf oyster industry. In addition, examine the market acceptance of frozen oysters produced via a patented freezing technique to be utilized by Florida processors (Adams/Otwell/Larkin/Degner).

The analysis was completed and a formal presentation developed and given to industry members, agency representatives and other members of the project team at a workshop in Apalachicola on 6 March 06. Findings suggest that a range of potential FDA closure scenarios, if implemented, will create a negative economic impact on the local economy, unless significant volumes of product are further processed as frozen product. The final report is currently being developed. The information developed will be useful regulatory agencies and the industry as they both seek to ensure the continued safety associated with the consumption of raw oysters produced in Florida.

- 2.10 The capability of organizations and technical staff concerned with coastal fisheries to utilize artificial reefs will be enhanced through planning a 2007 training course for an International Centre. (Seaman)

Planning continued in 2006. International program on artificial reefs will be held in Spain in 2007.

- 2.11 Continue to provide guidance to the Florida shrimp industry, via Southeastern Fisheries Association, regarding the eligibility of the industry to benefits of the USDA Trade Adjustment Assistance Program. (Adams)

The dockside price data for Florida-harvested shrimp was analyzed to assess the extent of the vessel-level price decline during 2005. The dockside price data for Florida-landed shrimp (pinks, whites, browns, and royal reds) did not allow the Florida industry to become eligible for relief in 2005-2006. The dockside price decline threshold is 20%. The Florida price decline was less than 10%. This information was communicated to the Southeastern Fisheries Association, who would have submitted the revised petition to USDA.

- 2.12 Continue to serve on the Scientific and Statistical Committee of the Gulf of Mexico Regional Fishery Management Council. (Adams)

Attended two Gulf Council SSC meetings. Various topics were discussed including reef fish management, mackerel stock mixing, and shrimp industry issues. These SSC meetings were held in Tampa, Florida. Comments made by Adams at the meeting can be found in the meeting minutes as published by the Gulf of Mexico Fishery Management.

- 2.13 Continue to work on USDA-funded study to assess the economic consequences of proposed FDA-mandated closures on the harvest of oysters for raw consumption from Apalachicola Bay. (Adams)

Same as 2.9 above.

- 2.14 Assist Lee County representatives with an assessment of the economic consequences associated with changing commercial and recreational fishery activities in the local estuarine waters. (Adams)

This activity was never initiated. Adams attended a meeting with Lee County Extension and resource management staff, as well as regional planners, and a follow up meeting with Sanibel-Captiva Conservation Foundation. It was determined that the necessary information was not available to conduct the required analysis at the level of resolution required by the County funding source. In addition, the time frame required to complete the study was unworkable. An offer was extended to work with the group in the future or provide an intermediate product if data become available.

- 2.15 Continue to serve as Florida Coordinator for the South Atlantic Regional Fisheries Extension Enhancement team. Will conduct follow-up workshop(s) concerning the action items developed during 2005. (Adams)

Plans continued toward conducting a follow-up workshop, with suggestions from the initial workshop held in Savannah, GA during June, 2005. The follow-up workshop is to be a State Fisheries Management Session which will focus on blue crab management issues. State fishery management reps from SC, NC, GA and FL have agreed to attend. The workshop will be held at the Waddell Mariculture Center in SC during Jan '07. In addition, information from the Savannah workshop was utilized at the Regional SG Fisheries Extension meeting held in Georgetown, SC during February, 2006. In particular, waterfront access issues were deemed to be of regional importance, as was also recognized at the Savannah workshop.

- 2.16 Assist the Florida FWC develop a storm damage assessment methodology in cooperation with NOAA, Monroe County, Monroe County Commercial Fishermen Association, and the University of Miami. The effort will provide a methodology for determining commercial trap fishery losses due to storm events in Monroe County, and allow for an initial assessment of the information needed to forecast storm damages. (Adams)

A proposal was developed and submitted to NMFS on 23 August 06. Proposal participants included UF/Sea Grant (Adams, Gregory), U Miami (Shivlani), and Tom Murray. A letter of endorsement was obtained from FWC DMFM (Robson) and sent directly to Bill Hogarth's office per request of NMFS. The proposed work team is currently awaiting word on funding from NOAA.

- 2.17 Assist in the organizing and conducting of the W1004: Marketing, Trade, and Management of Fisheries and Aquaculture Resources Workshop in Cedar Key, FL. The workshop will be attended by individuals from the Pacific, Atlantic and Gulf of Mexico regions. (Adams)

The workshop was held in Cedar Key, FL during 19-21 April 06. Approximately 20 persons were in attendance. The workshop addressed on-going research topics related to fisheries/aquaculture marketing, trade and management. A proposed case study project, led by faculty at Oregon State Univ., was discussed. UF involvement in project will include FRED faculty. Follow-up meetings to the case study effort have occurred and work on this project will commence in early 2007. The case study will address methods to enhance the competitiveness of domestic seafood producers in an increasingly global and sustainably-conscious market.

- 2.18 Conduct an In-service training session at the Statewide In-Service Workshop in Gainesville, FL. The session will focus on the use of various methods to reduce release mortality in recreationally caught fish. (Adams)

The In-Service Training Workshop was held on the UF Campus in the Harn Art Museum 15 May 06. Approximately 30 persons attended. Presentations were given by several individuals on methods to enhance the survival of recreational catch and released fish. Methods included the use of venting tools, circle hooks, release handling tools, and resuscitation tanks. In addition, a representative from ARC, Aquatic Release Conservation, demonstrated the use of various release tools that can be used in a variety of recreational and commercial settings.

- 2.19 Conferences and Professional Presentations: (Adams)

2.19.1 Present Paper at the Gulf of Mexico Summit, Corpus Christi, TX

The paper was given at the Gulf of Mexico Summit and addressed the economic activities associated with industries that derive their value and existence from the Gulf of Mexico as a large marine ecosystem. Approximately 100 persons in attendance.

2.19.2 Present Paper at the International Institute of Fisheries Economics and Trade, Portsmouth, England

Two papers were given in different sessions at the Semi-Annual Meetings of the International Institute of Fisheries Economics and Trade. One paper addressed the various state and local financial relief responses to the 2004 and 2005 hurricane events in Florida and how these efforts applied to the commercial fishing/aquaculture industries. The other paper addressed the recently completed study on the proposed buyback program for commercial shark vessels in the Gulf and Atlantic regions. Approximately 20 persons were present for each presentation.

A presentation at the Annual Meeting of the American Fisheries Society in Anchorage, AK described the economic impact of the renewed recreational scallop season on the Citrus County economy. The paper was given in a session which focused on the economic consequences of stock enhancement activities. Approximately 20 persons in attendance.

2.19.3 Attend the Annual Southeastern Fisheries Association Meetings, Key Largo, FL

Did not attend due to schedule conflicts.

2.20 Conduct ethical angling workshops/displays and teach at least 30 fishermen the importance of venting fish, using circle hooks, proper handling skills, and proper length measurements. (Cameron)

Presented material to 100 charter and recreational fishermen regarding venting tools, circle hooks, proper handling skills, and proper length measurements. Distributed over 100 venting tools and demonstrated proper use and techniques to reduce fishing mortality of red snapper and red grouper. Had one radio appearance, two television appearances, and a display at the Fort Walton Florida Sportsman Show, to speak about ethical angling, reaching an estimated 15,000 individuals.

2.21 Continue to increase awareness of fisheries management regulations through the exchange of information among non-governmental agencies, governmental agencies, local media, and the fishing industry. (Cameron)

Increased awareness of fisheries management regulations by presenting materials to 300 recreational fishermen going on charter fishing trips in 2006. Provided information for charter fishermen regarding fisheries management regulation changes coming from the Gulf Council.

2.22 Conduct educational programs to the public and provide assistance on methods of deployment and maintenance of artificial reefs and continue to work towards the development of an artificial reef program in Bay County. (Cameron)

Presented materials on deployment material, proper deployment, permitting, reef design, and public reef locations at a local fishing show and on the Bay County Sea Grant website.

2.23 Conduct kids fishing clinics with local agencies and businesses to increase the number of youth getting involved in fishing and other outdoor activities. (Cameron)

Conducted three fishing clinics with local tackle shops, Florida Fish and Wildlife Commission, NOAA Fisheries, and other local agencies to educate over 500 youth on proper fishing etiquette. Educated youth about tying knots, proper fish handling, casting, and provided 20 youth with the experience of catching their first fish.

- 2.24 Promulgate and distribute the 57<sup>th</sup> Proceedings of the Gulf and Caribbean Fisheries Institute and disseminate it to members, libraries, universities, and computer databases. (Creswell)

Edited, published and distributed the 57<sup>th</sup> Proceedings of the Gulf and Caribbean Fisheries Institute to its members and 49 libraries, universities, and scientific databases throughout Florida, the United States, and internationally.

- 2.25 Serve as chairman of the Steering and Program Committees for the 50<sup>th</sup> Gulf and Caribbean Fisheries Institute and publish its Book of Abstracts. (Creswell)

Served as chairman of the Steering and Program Committees for the 50<sup>th</sup> Gulf and Caribbean Fisheries Institute, held in Belize City, Belize and compiled, edited, published, and distributed its Book of Abstracts.

- 2.26 Serve as Program Chairman for the National Shellfisheries Association 99<sup>th</sup> annual meeting. (Creswell)

Served as Program Chairman for the 99<sup>th</sup> annual meeting of the National Shellfisheries Association, held in Monterey, California, attended by 280 scientists, educators, and students.

- 2.27 Conduct two-day youth fishing tournament. (Creswell)

Creswell and J.P. Gellerman (natural resource agent for St. Lucie County) were awarded a grant from the Fish Florida Foundation (\$2,675) to conduct a fishing tournament and educational event for disadvantaged youth. The event will be co-sponsored by Big Brothers/Big Sisters of St. Lucie County and held in March, 2007.

- 2.28 Conduct educational programs for the public and provide assistance to the Escambia County Marine Resource Division in the monitoring, maintenance, and development of artificial reefs off the northwest Florida coastline. (Diller/Verlinde)

Escambia and Santa Rosa County agents hosted the first Florida Panhandle Artificial Reef Workshop at the Escambia County Extension Office. Fifty-two people attended the workshop representing artificial reef programs throughout Florida as well as several out-of-state programs and organizations. Evaluations indicated 92% of participants were committed to using information learned during the workshop.

- 2.29 Conduct fish survival workshops for recreational fishermen, charter boat operators, and fishing tournament organizations that address such topics as fish venting, circle hooks, proper handling and release, and fishery management issues. (Diller)

Catch-and-release and fisheries management information was provided to recreational fishermen and community groups including the Pensacola Recreational Fishermen's Association and Pensacola Power Squadron.

- 2.30 Continue local fish extension activities that may include topics such as derelict fishing traps, by-catch, mercury in fish, shrimp TAA program, marine protected areas, essential fish habitat, and fish management. (Diller)

A display that included information on seafood safety and mercury in fish was presented at the annual Escambia County Safety and Wellness Fair. Several hundred Escambia County employees attended the event and visited the display.

The Reef Fish Restoration Association (RFRA) was supported through educational activities. The RFRA plans to produce marine protected areas with artificial reefs to provide fish habitat and allow fish stocks to increase without recreational or commercial fishing pressure.

Florida did not qualify for shrimp TAA program funds in 2006 so no programming was conducted in this area

2.31 Continue to provide scientific advice to the various fishery regulatory agencies. (Gregory)

Fisheries Regulatory Agencies: Participated in 10 different fisheries regulatory scientific advisory meetings from Mobile, Alabama to Atlantic Beach, North Carolina.

1. Invited participant as non-voting scientific advisor to the Gulf of Mexico Fishery Management Council's Ad Hoc Grouper Individual Fishing Quota Advisory Panel that met three times during the year. This panel was formed as a direct result of my efforts with the grouper industry Limited Access Buyout Committee during 2005. No management action has resulted to date but this effort is expected to result in significant management changes in 2007 or 2008.
2. Invited participant, and Vice Chair, of the Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC) that met four times during the year. My involvement strengthened the role of scientific advice in management decisions by helping the Council to recognize the importance of full scientific review of all analyses provided for management action. The SSC collectively affected king mackerel allocation decisions and confirmed that greater amberjack and gag grouper were over fished stocks. We also verified that the best source of recreational fishing data is the federal Marine Recreational Fisheries Statistics Survey that has frequently been criticized for its methodology—most recently by the National Research Council.
3. Invited participant of the South Atlantic Fishery Management Council's SSC that met twice during the year. The SSC recommended Atlantic king mackerel quotas, and snapper-grouper management conservation measures.
4. Invited participant in the joint fishery council Gag Grouper Stock Assessment Workshop as a part of the NOAA Fisheries Southeast Data and Assessment Report. The workshop concluded that gag grouper in both the Atlantic Ocean and Gulf of Mexico were in an over fished status.

Florida Keys National Marine Sanctuary:

1. Appointed to the Education seat, as an alternate, to the Florida Keys National Marine Sanctuary Advisory Council.
2. Organized and facilitated a panel discussion of fishermen for the Sanctuary Advisory Council to discuss the "Good Ole Days" as part of a larger workshop on historical trends in fish abundance.

2.32 Participate in a South Atlantic regional workshop on fisheries issues across South Atlantic states. (Holland)

P.I. withdrew from project. Project is being reprogrammed for 2006-07 time frame to carry out activities.

2.33 Hold a second workshop in South Florida to discuss recreational fisheries multicultural management issues, focusing on African American, Hispanic, and other minority recreational angler issues (Holland, Makopondo).

Meeting was held in Naples, coordinated by Collier County Sea Grant Agent.

- 2.34 Continue discussions and representation of the Florida for-hire sector as issues arise. Begin preparations toward writing proposal to conduct decadal study of Florida's charter and head boat sectors. This will be the 3rd decadal report of topic. (Holland)
- P.I. withdrew from project. Project is being reprogrammed for 2006-07 time frame to carry out activities.
- 2.35 Develop information data base at the Florida county level of many indicators of recreational fishery's magnitude and relative importance to each counties recreational infrastructure or importance as a recreational activity. (Holland)
- P.I. withdrew from project. Project is being reprogrammed for 2006-07 time frame to carry out activities.
- 2.36 Continue representing FSG on the Gulf of Mexico Recreational Fisheries Implementation Team and the Socioeconomic Panel of the Gulf of Mexico Fisheries Management Council. (Holland)
- P.I. withdrew from project. Project is being reprogrammed for 2006-07 time frame to carry out activities.
- 2.37 Hold a workshop in Northwest Florida (Pensacola) to explore waterfront access and other fisheries management issues impacting African American, Hispanic and other ethnic minority recreational anglers. (Holland, Makopondo)
- P.I. withdrew from project. Project is being reprogrammed for 2006-07 time frame to carry out activities.
- 2.38 Conduct an exploratory study on the impacts of hurricanes on small and medium-scale minority-based commercial and recreational fisheries ventures. (Makopondo)
- Faculty member is leaving university. Activity not conducted.
- 2.39 Participate in investigating issues and developing strategies to promote youth sport fishing competition and educational programs. (Makopondo)
- Faculty member is leaving university. Activity not conducted.
- 2.40 Focus major program activities on artificial reefs. (S.Jackson)
- 2.40.1 Renewal of Okaloosa Counties 3 Large Area Permit Sites which are economically vital to our nation's largest charter fleet (~100 vessels).
- Renewals should occur in 2007.
- 2.40.2 At least 1 Monitoring Project will be conducted through a local network of volunteers in cooperation with Okaloosa County Government. Projects will seek to study previously deployed reefs to provide information to local managers regarding future construction projects.
- Volunteer network still being mobilized for monitoring efforts and will continue in 2007.
- 2.40.3 Provide assistance for a minimum of three local governments to submit construction grants in order to build new artificial reefs utilizing funds from Florida Fish and Wildlife.

Provided assistance to local governments on construction grants. Efforts will continue in 2007.

- 2.40.4 Construct a permanent display to educate visitors about our local artificial reef program. At least 250 exhibit visitors will view the display during 2006.

Not completed, will continue effort to develop exhibit in 2006.

- 2.40.5 Work with other Sea Grant Agents and Specialists to create website detailing Florida's Artificial Reefs.

Website developed; and FSG faculty will continue to enhance in 2007.

- 2.41 Continue to provide scientific advice to the various fishery regulatory agencies. (Gregory)

Same as 2.31

- 2.42 Continue to support the Mote Marine Laboratory Volunteer Angler Tagging Program. (Gregory)

The agent's role in this project was primarily to provide public educational information about the project, including fish venting, volunteer angler tagging, and black grouper carcass collection. Flyers describing the program were produced and distributed at marinas and bait and tackle shops throughout the Keys. Numerous talk radio discussions were conducted. Three different newspaper articles were published in local papers throughout the year. Two PowerPoint presentations were published on the county cable TV channel. Ten days were expended visiting marina facilities to distribute information and discuss the program with interested persons. Five freezers are being maintained for collection of black grouper carcasses. The project ended in November, 2006. A final report will be forthcoming.

- 2.43 Conduct a major public event, The Florida Keys Seafood Festival in Key West, in conjunction with the Monroe County Commercial Fishermen industry association. (Gregory)

Monroe Sea Grant Extension co-sponsored the First Annual Florida Keys Seafood Festival in Key West with the Florida Keys Commercial Fishermen's Association (FKCFA). We provided most of the logistical support and they collected most of the money. The event was very popular and all the available seafood was sold out. An estimated 5000 people attended. The FKCFA subsequently made a \$1000 donation to the Extension Advisory Committee Account. The Event will be repeated on January 13, 2007 in Key West.

- 2.44 Progress extension efforts dealing with artificial reefs and their effects on fisheries. Participate in the environmental needs assessment being undertaken in Charlotte County. (Jacoby)

Progress on artificial reefs was delayed by departure of graduate student to veterinary school. Environmental needs assessment progressed to the point of discussing web-based access to environmental information.

- 2.45 Contribute to the enhancement of artificial reef science, technology and use in Florida. Lead program activities related to the Steinhatchee Fisheries Management Area and to the development of artificial reef BMPs, and to provide expertise to county and multi-county reef extension programs. My planned activities include: (Lindberg)

- 2.45.1 In partnership with FWC and local interests, (a) initiate funding requests for Phase II construction of the Steinhatchee Fisheries Management Area (SFMA) (~\$850,000), (b) continue to provide up-to-date SFMA information to the Taylor County Sea Grant Extension Agent for dissemination through the county program, and (c) design placement strategies for the Levy and Dixie County development of the SFMA area zoned for fishing reefs.

(a) A proposal for SFMA Phase II construction was prepared, submitted and approved for \$256,000 in Florida FY 2007-2008, with a commitment by FWC to partner directly with the University and FSGE in this development and to continue funding in subsequent years until the SFMA construction is completed.

(b) Communication of SFMA information and coordination of related extension programs occurred until the Taylor County SG Extension Agent position was vacated. The same or greater level of communication is anticipated when the position is filled.

(c) The placement strategy for SFMA fishing reefs has been developed and communicated to the Taylor County Extension Director, who is overseeing the construction contract from FWC for the first placements of fishing reefs.

- 2.45.2 In partnership with FWC, convene a working group of experts under the auspices of the State Artificial Reef Advisory Board for the purpose of drafting BMPs for particular applications of reef technology in resource management (e.g., estuarine nursery habitat).

In consultation partnership with staff of the FWC Artificial Reef Program, this working group has been deferred until fisheries management staff and artificial reef staff can be brought together for an understanding of the science, state of knowledge and uncertainties associated with integrating artificial reefs in fisheries management. Toward that end FWC is convening an internal science colloquium for its staff in July 2007, with Lindberg and other researchers invited to present and debate these issues. The result will be more knowledgeable staff focused on directing program investments to fill critical gaps and reduce uncertainties.

- 2.45.3 In cooperation with FSG Extension Agents from the Florida Panhandle and other researchers, outline, organize and deliver a workshop in the Panhandle addressing the science and management issues pertaining to Large-Area Artificial Reef Sites (LAARS), in conjunction with the first NW Florida Artificial Reef Coordinators' Meeting.

The first NW Florida Artificial Reef Coordinators Meeting was held August 1-2, 2006 in Pensacola, Florida with ~100 stakeholders attending; workshop evaluations were outstanding. Lindberg was the program Committee Chair, with Verlinde and Diller as workshop coordinators. The debating forum on science from this workshop gave rise to the request for an FWC colloquium noted in 2.45.2.

- 2.45.4 Author an extension publication tentatively entitled "Understanding the Attraction-Production Issue" targeted primarily for county artificial reef coordinators and industry sectors engaged in artificial reef development, to help foster more scientific approaches to reef development.

The first draft of the anticipated extension publication is now being written by a Master's student as a technical paper required for her non-thesis degree. This student desires a career related to the outreach and education mission of FSGE, and this collaboration on authorship will serve her professional development as well as advance the desired publication.

- 2.47 Continue work with Gary Graham (Commercial Fisheries Specialist – Texas Sea Grant) on shrimp industry related topics such as turtle excluder devices (TEDs) and electronic data logs (EDLs) to assist area shrimp fishermen in dealing with current economic and fishery management issues. (Mahan)

The Agent worked with Dr. Gray Graham (Texas Sea Grant) to help solve a problem that shrimpers were having with sharks attacking/tearing the cod-end of their shrimp trawls when the catch was being retrieved. This was reducing their shrimp catch and damaging/destroying the net. Several options were recommended to the fishermen and the least expensive worked (use red-colored chaffing-gear on the net) to greatly reduce the number of “attacks,” thereby increasing the shrimp catch and decreasing net damage.

The Agent continued to work with Dr. Graham on the ELB pilot-work, which is providing the fishermen and researchers with economic information. There are plans to expand this program in 2007.

- 2.48 Provide technical support to the newly formed Franklin County Seafood Taskforce on fisheries and Apalachicola Bay management issues. (Mahan)

The Agent worked closely with the members of the Seafood Industry Taskforce to address a number of Apalachicola bay management issues. These included: FL red tide; the impacts of coastal development on shellfish harvesting areas; storm-water run-off; dredging oysters; and the membership & by-laws for the organization.

As a result of this participation, the Agent is being asked to provide more research-based information and technical assistance to the seafood industry and elected officials.

- 2.49 Continue to provide technical information to the Franklin County Board of County Commissioners on area fisheries management issues and to be the Board’s liaison to DACS and other state agencies on Apalachicola Bay management issues. (Mahan)

The Agent presented 22 Extension Update Reports to the Board of County Commissioners, general public and reporters for the local mass media during their regularly scheduled meetings on the first & third Tuesday of each month.

As a result of these reports the Agent has had an increased number of requests from County officials to supply research-based information on a range of fisheries and environmental topics. In addition, City officials are now asking the Agent to attend their meetings to provide technical information to them on resource management issues.

- 2.50 Create a Taylor County Artificial Reef Dive Team, and work with private, state and University organizations to perform technical analysis and identification of candidate locations for artificial reef development, identify cost-effective strategies for the manufacturing of artificial reef materials, identify and pursue sustainable reef designs, and develop artificial reef systems that will have the greatest ecological and economic impact for the local community. (Sapp)

Faculty member resigned. Activity not conducted.

- 2.51 Following recommendations from SEACOOS year 4 workshops and white paper development for fisheries theme team, a test deployment will take place in May, 2006 on the West Florida Shelf to couple physical oceanographic data with fisheries data. Results will be used to determine how to broker partnerships in other areas of SEACOOS. Initial deployment is a partnership with

(academic) USF, College of Marine Science and state (FFWCC) program resulting from meetings held in 2005. (Simoniello)

Ocean data buoy was deployed the University of South Florida researchers. Efforts will be undertaken in 2007 to evaluate project.

- 2.52 Planning committee member and co-chair of two IOOS sessions/panel discussions at The Coastal Society's 20th International Conference. Applications of COOS for fisheries, NERR programs and ecosystem management will be the focus. (Simoniello)

Co-chaired two sessions-Integrating Coastal and Ocean Observations into Coastal Management Decisions, Part I and Part II. Co-moderator of the Panel Session, Track: Solutions for the Effective Integration of Science into Management (with Geno Olmi of the NOAA Coastal Services Center)

Oral Presentation: Geno Olmi, NOAA Coastal Services Center and Chris Simoniello, Florida Sea Grant Program "Integrating coastal and ocean observations into coastal management decisions: introduction and overview" (Abstract 75911).

Served as Chair of the Volunteer Committee, recruiting, and organizing the schedules and logistics of the 35 field trip leaders and session volunteers. St. Petersburg, FL, 2006

- 2.53 Enhance artificial reef habitat in Charlotte County. (Staugler)

2.53.1 Identify site for a new Charlotte County artificial reef.

2.53.2 Enhance existing reefs in need of materials as money allows.

2.53.3 Educate resource users of reef locations and proper etiquette for using reef resources through the Boating and Angling Guide to Charlotte Harbor, and through the development of a Charlotte County Artificial Reef brochure and local Sea Grant extension website.

Artificial reef brochure is in draft form and should be produced in 2007. A \$15,000 grant from Boating Improvement funds will be used for deployment of materials for artificial reefs in 2007. Received funds for socio-economic study on artificial reefs that will be conducted in 2007.

- 2.54 Participate in the planning and implementation of the Kids Cup Redfish Tournament. (Staugler)

120 youth participated in Kids Cup Redfish Tournament held in 2006.

- 2.55 Continue to work cooperatively with the FWC fisheries independent monitoring program with their monthly fisheries sampling and on the development of a Sea Grant initiated Coral Creek fisheries monitoring program. (Staugler)

Worked with FWC on project; and will continue in 2007.

- 2.56 Continue evaluation of sponge population recovery in Florida Keys following a widespread mortality. Project funded by Florida Fish and Wildlife Commission. (Stevely)

Field work successfully completed (June, 2006). Final report submitted to FWC (Oct., 2006). Information collected in 2005 and 2006 supported a recommendation by FWC to expand sponge grounds and change regulations to require cutting sponges. Final decision on new rule will come in 2007.

- 2.57 Present results of the Florida Keys sponge survey at 8<sup>th</sup> International Sponge Biology Conference (Buzios, Brazil, May 2006). (Stevely)
- Oral presentation at 8th International Sponge Biology Conference, May 9th, Buzios Brazil: “Long-Term Evaluation of Sponge Population Recovery Following a Catastrophic Mortality.” Poster Presentation: “Economic Evaluation of the Financial Feasibility of Small-Scale Sponge Farming in Micronesia.” Presented a video on sponge divers of Tarpon Springs Florida. Professional development activities have resulted in a proposed invited scientist at a New Zealand academic institution in 2008.
- 2.58 Optimize planning, construction and management to enhance fisheries production. (Stevely)
- 2.58.1 Assist in organization of the Florida West Coast Artificial Reef Program Coordinator’s Workshop.
- The Panhandle Artificial Reef Workshop was held August 1-2, 2006 in Pensacola, FL. Fifty-five participants from reef programs, fishery resource management agencies, scientists and artificial reef constituency groups attended this workshop. Evaluation of the program documented that participants increased their ability to properly manage artificial reef programs.
- 2.58.2 Work with the Manatee County Extension Advisory Committee and Manatee County government to develop two new artificial reefs.
- The Florida West Coast Artificial Reef Workshop held November 9, 2006 (Palmetto, FL.). Fifty participants from reef programs, fishery resource agencies, scientists and artificial reef constituency groups attended this workshop. Evaluation of the program documented that participants increased their ability to properly manage artificial reef programs.
- 2.59 Serve clients with educational programming (workshops, seminars, presentations and publications) relating to seafood safety, coastal zone management and sport fishing. Will continue restoration effort programming with sponge, scallop and oyster reefs. (Sweat)
- Served clients with educational workshops relating to seafood safety, smoking seafood, sport fishing and recreational scalloping.
- 2.60 Provide fish survival information and ethical angling information for recreational fisherman and youth. (Verlinde)
- Coordinated volunteers and provided ethical angling, coastal habitat, water quality and fish ID materials and activities for 300 Woodlawn Beach Middle School seventh grade PE students. Students indicated that this was best field trip ever and the event is being planned for 2007.
- Provided ethical angling and fishing tips to 113 4-H marine campers at Camp Timpooshee and 64 campers at the Santa Rosa / Bay county 4-H camps
- Provided fishing and ethical angling activities at the Seagrass Awareness Celebration and Coastal Encounters events.
- 2.61 Coordinate NW Florida Artificial Reef Conference, August 2006. (Verlinde)

Panhandle, a West Coast agent and Sea Grant Fisheries specialists coordinated, planned and hosted the first Florida Panhandle Artificial Reef Conference. Fifty-two participants from artificial reef programs throughout Florida, several from Alabama and one from California attended the workshop. Evaluations indicated 92% committed to using information learned at the conference and 100 % rated the conference as good or very good. (Verlinde, Diller, L.S. Jackson, Cameron, Stevely, and Lindberg)

- 2.62 Coordinate Santa Rosa County 2006 Artificial Reef deployment and FY 2006-2007 FWCC artificial reef proposal application. (Verlinde)

2 reef complexes of 15 coquina reef modules each were deployed in the FWC Escambia East Artificial Reef Site, Federal waters approximately 16 NM south of Pensacola Pass in June 2006.

Coordinated and contributed to the 2006 Santa Rosa County Artificial Reef Monitoring proposal to FWC for \$18,000. The proposal was not funded.

- 2.63 REDStart Fisheries Enhancement Program will be expanding to become a research facility for Florida Gulf Coast University, US Fish and Wildlife Service and Sanibel-Captiva Conservation Foundation. New research projects will be facilitated throughout the year. Projects that will be conducted include seagrass restoration work, oyster hatchery to supplement restored oyster reefs and mosquito fish (gambusia) to be used in US Fish and Wildlife Service Ding Darling Refuge to keep mosquito populations minimized. (Wasno)

Agent resigned. Project on hold until new agent is hired in 2007.

- 2.64 Continue to present circle hook technology, venting tools and proper fish handling techniques at fishing tournaments, boat shows and fishing clubs. (Wasno)

Agent resigned. Project on hold until new agent is hired in 2007.

- 2.65 5<sup>th</sup> Annual Boca Grande Pass Clean-Up will be conducted in March. 41 certified SCUBA divers will spend 2 days removing debris from the bottom. Over 34 governmental and civic associations have signed up. (Wasno)

The 5<sup>th</sup> Annual Boca Grande Pass Clean-Up was held on March 27-28, 2006. More than 115 participants, including divers, boat captains and deck hands worked together to pull up 3,377 pounds of trash from the pass' bottom, giving the program a five-year total of 25,692 pounds of debris. The volunteers retrieved 10 anchors, six fishing poles, piles of 80- and 100-pound-test. The Florida Sea Grant program, along with the Boca Grande Enhancement Fund, the South Florida Water Management District and Keep Lee County Beautiful, Inc. sponsored the event. In all, 30 government and civic organizations participated in the cleanup. Participants also included the Florida Fish and Wildlife Conservation Commission, Mote Marine Laboratory, the U.S. Coast Guard and the Charlotte Harbor National Estuary Program.

- 2.66 Assist in the development of a damage assessment and forecasting model for the commercial trap fisheries of Monroe County, Florida. The effort will be funded via NOAA, in conjunction with the FWC. Contributors to the effort include UF (FRED, Dept. of Geography), Florida Sea Grant, U Miami, Monroe County Commercial Fishermen's Association, and Monroe County. The project will develop a prototype model to assist the State of Florida in assessing damage to the commercial fishing industry due to a storm event, and provide the foundation for developing a damage forecasting model for the Keys region. (Adams)

Same as 2.16 above.

- 2.67 Teach at least one program on proper catch & release techniques for fish. (Mahan)

The Agent didn't conduct a formal program on catch & release techniques this year. However, several occasions arose when the Agent was able to educate some groups of anglers (fishermen on the beach & 4-H Camp) about the proper techniques of handling and releasing fish.

As a result, almost 100% of the fishermen reported that they had no idea about how stressing the fish using improper techniques can cause the fish to die after being released as a 'delayed mortality.'

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

New Florida Sea Grant Extension agent position was established in Collier County. This is a collaborative effort. Office space is being provided by the Rookery Bay National Estuarine Research Reserve, at their Education and Research complex in Naples. Collier County Board of Supervisors is also providing \$40,000 in support of the office operations.

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

- 3.1 The main objective is to develop innovative, reliable and environmentally sustainable hatchery technology for larval rearing and production of cobia fingerlings. This will be achieved by developing proactive health management methods aiming to reduce the input of microbes from major sources of contamination during the culture cycle (eggs/hatching/live food) and to increase survival and yield of fingerlings through the addition of probiotic bacteria to the larval culture tanks and to live feeds prior to feeding the larvae. A quantitative microbial management technology, using selected strains of probiotic bacteria will be adapted to cobia fingerling production. (2006) (Benetti/Orhun: R/LR-A-40)

The positive preliminary results of use of probiotics on the health of the cobia are very encouraging and show how probiotics may be used in a variety of ways to treat cobia larvae and fingerlings. The second advancement is the use of semi-continuous micro culture systems, to eliminate the batch culture steps of 2 L Fernbach and 16-20 L carboys which have been the industry standard over the last decade. Also importantly, three new graduate students were trained in hatchery technology of marine fish. It is interesting to note that some of our former graduate students who were funded by the Florida Sea Grant College Program are now running commercial hatcheries and developing the industry in the U.S. Finally, firm protocols were established for larval rearing of cobia, having obtained survival rates of 5-10% even under their worst case scenario - i.e., having dealt with hurricane Wilma, with outbreaks of both bacterial and parasitic diseases and while training new graduate students.

- 3.3 It is necessary to improve hatchery and offshore growout technology to expand marine fish aquaculture to the US. This project will perfect and transfer innovative, reliable and environmentally sustainable technologies and protocols for disease prophylaxis and management of cobia (*Rachycentron canadum*) eggs, larvae, post-flexion larvae, fingerlings, juveniles and adults. (Benetti/Orhun/Riley/Douillet: R/LR-A-42)

Results reported in performance measures section.

- 3.4 Biomarkers are biological changes that are observed in an animal following exposure to sublethal environmental or anthropogenic stressors. There are two approaches to biomarker work: traditional functional biomarkers that measure long-term responses and protein biomarkers that measure the molecular response to environmental stressors. In recent years, protein biomarkers have become increasingly powerful and popular tools in part because they test for evidence of stress at the level of organization primarily affected, the molecular level. However, few studies have attempted to validate the new molecular technology with the traditional functional techniques. That is the purpose of this fellowship. (Julian/Matos/Downs: E/INDST-4)

The use of 7 antibodies from EnVirtue Biotechnology were validated for application on *M. mercenaria*, and it was shown that most of these antibodies can be used on tissues from these commercially valuable clams for high-throughput stress protein biomarker assays. The previously recognized hypoxia tolerance of *M. mercenaria* is reflected in a relatively low change in stress protein expression and most functional biomarkers when the animals are exposed to mild or moderate hypoxia. The thermal tolerance of *M. mercenaria* is dependent upon season but is not reflected in significant changes in stress protein expression or glycogen content. When clams are exposed to the dual stressors of hyposalinity and high temperature, conditions typically found in their estuarine habitat, functional biomarkers such as survival and burial ability are strongly affected. Interestingly, the simple functional assay of burial ability was found to be surprisingly sensitive as a correlate of stress exposure, suggesting that this assay may be valuable for future laboratory and field studies of stress in *M. mercenaria*, and perhaps other bivalves. A strong seasonal effect was found in nearly all biomarker assays conducted, which suggests that future studies of stress physiology should be conducted in multiple seasons.

- 3.8 Continue to work with Mote Marine Lab on assessment of the financial characteristics of pompano hatchery and nursery production. Project is funded via the Aquaculture Research Council. (Adams)

Hatchery and nursery costs have been collected. However, project objectives have changed given uncertainty associated with the Mote technology. The objective is now to simply report research costs in an attempt to direct further analysis, rather than produce costs assessments for prospective growers. Information will assist Mote in pursuing more cost-effective culture techniques for pompano fingerling culture.

- 3.9 Continue to work on two Florida Sea Grant funded projects: (1) Triploid hard clam production and (2) sunray venus clam production. The economic characteristics of the hatchery, nursery, and grow-out stages will be the focus of the studies. (Adams)

See 3.5 above for (1). Nothing accomplished on economics objectives for (2).

- 3.10 Continue to work on the shellfish culture bio-fouling project, funded through the National Sea Grant Program Invasive Species Initiative. The project is in cooperation with the University of Connecticut. A grower survey will be conducted in early 2006, with an assessment of the economic costs and benefits associated with two fouling control methods to be completed by late 2006. (Adams)

Work continues on pace. Six separate surveys have now been initiated: NE region, North Carolina, South Carolina, Virginia, Florida, and NW region. Survey responses are still coming in. Preliminary information developed from the NE region survey was presented at the National Shellfisheries Assoc. Conference in Monterey, CA. Collecting primary cost information from a select group of NE region growers will begin in late Fall 2006.

- 3.11 Continue to serve as the Florida Sea Grant representative on the FDACS Aquaculture Interagency Coordinating Committee. Prepare a annual report for Florida Sea Grant-related activities for the AICC Annual Report. (Adams)
- 2005 report prepared and distributed to FDACS. The report for 2006 is due 1 Nov 06 and has been completed in sent to FDACS in anticipation of the annual AICC meeting to be held 13 November 06 in Tallahassee, FL.
- 3.12 Continue to serve as Committee Chair for FRED MS student Jennifer Clark. Ms. Clark's MS thesis will address the financial feasibility of utilizing penaeid shrimp culture as an alternative enterprise for south Florida citrus growers. The thesis will examine several production technologies. An assessment of the risks associated with shrimp culture and citrus production will be a key feature of the analysis. (Adams)
- Work is on-going. Graduation expected in Spring, 07.
- 3.13 Attend the Southeastern Regional Aquaculture Information Exchange Group (SERA IEG) meeting in Ruskin, FL. (Adams)
- Attended both the economics and marketing sessions. Due to the marketing working group session, participated with several others in preparation of a multi-year project proposal which focuses on developing an economic forecasting model for catfish and trout. My role is more advisory in nature, given that Florida does not have a large industry associated with either catfish or trout. The University of Arkansas Pine Bluff is taking the lead in this effort.
- 3.14 Conferences and Professional Presentations: (Adams)
- 3.14.1 Present Paper at the National Shellfisheries Conference in Monterey, CA
- Presented Paper at the National Shellfisheries Conference in Monterey, CA. Paper addressed the findings from on-going NSG-funded project with Univ. of Connecticut on biofouling. Presented the findings from a regional industry survey that focused on the financial burden biofouling places on molluscan shellfish culture operations. Approximately 50 people in attendance.
- 3.14.2 Paper to be presented (by co-author) at Aquaculture '06, Italy
- Paper was presented by co-author John Scarpa (HBOI). Paper was entitled "Production and evaluation of triploid hard clams for Florida aquaculture".
- 3.14.3 Present Paper at the 7th International Sponge Conference in Buzios, Brazil
- Presented poster concerning sponge culture work done some years ago in Micronesia with Marine Agents Stevely and Sweat.
- 3.15 At least 100 students will learn more about aquaculture through classroom and distant learning programs. (Creswell)
- Classroom and distant learning programs for aquaculture was not completed in 2006 (see 3.16).
- 3.16 Submit proposal to FDACS for state-wide teacher in-service training in the field of aquacultural science (Creswell, Ohs, Martinez, Chapman)

Creswell, as co-principal investigator with Dr. Ohs and Chapman (UF Dept of Fisheries) and Carlos Martinez (UF Ruskin Aquaculture) were awarded a grant from Florida Department of Agriculture and Consumer Services (\$313,000) for state-wide teacher in-service training in the field of aquaculture science. The program is scheduled for implementation in 2007.

- 3.17 Develop a series of two-page fact sheets on potential aquaculture species in Florida. (Creswell, Ohs)

Creswell, in collaboration with Dr. C. Ohs (UF/IRREC) and C. Miller (Dade County Extension) submitted three EDIS publications on potential species for aquaculture in Florida. One was a general introduction to aquaculture methods, one on spiny lobster culture, and one on the culture of croaker as a baitfish species.

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

Six half hour radio broadcasts conducted on WPSL – Port St. Lucie, Florida were presented on various topics related to aquaculture including: clam farming in Florida, spiny lobster aquaculture, potential for baitfish culture in Florida, oyster culture for ecosystem restoration, aquaculture in Florida (general), and the life history and culture of the queen conch.

- 3.19 Present at least one ½ day workshop on the potential for baitfish/shrimp aquaculture in Florida. (Creswell/Ohs)

Due to facility construction in Dr. Oh's department, the seminar for the potential/shrimp aquaculture in Florida was not scheduled. This will be included in the 2007 Plan of Work.

- 3.20 Promulgate a manual for the aquaculture of ponderous arks and blood arks from hatchery through harvest. (Creswell, Sturmer, Nunez, Baker)

The manual for the aquaculture of ponderous arks and blood arks (with Sturmer, Nunez, and Baker of UF Fisheries Department) is in preparation for publication in 2007.

- 3.21 Conduct collection and shipping trials of sunray venus clams. Initiate spawning trials for sunray venus clams in collaboration with Harbor Branch Oceanographic Institution, Inc. (Creswell, Sturmer, Stevely, Sweat)

In collaboration with UF aquaculture specialist L. Sturmer and Dr. J. Scarpa of Harbor Branch Oceanographic Institution, received funding from Florida Sea Grant to develop and demonstrate the aquaculture potential of the sunray venus clam, *Macrocollista minbosa*, as a alternative species for Florida's hard clam industry. The team successfully collected broodstock clams, cultured the larvae at HBOI's shellfish hatchery, and are currently distributed seed clams for growout trilas to Florida clam growers. The results of this work will be presented at the World Aquaculture Society annual staff meeting and through professional and trade publications in 2007. (Creswell)

Assisted in field collections of sunray clam broodstock in northern gulf. Conducted exploratory searches in Sarasota Bay area, found broodstock and shipped to Harbor Branch Oceanographic Institute. (Stevely)

Assisted Agents Sturmer and Creswell and HBOI Sea Grant sun ray venus clam project by making field collections. 50 *Macrocollista nimbosa* collected and forwarded to lab for potential spawning. (Sweat)

- 3.22 “Project Red-start” – continue to provide technical assistance and training to project staff. (Creswell)

Due to disease problems and changes in Lee County Sea Grant staffing, “Project RedStart” was discontinued.

- 3.23 Write invited chapter entitled, “Best Management Practices for Shellfish Aquaculture”, for the book “Best Management Practices for Aquaculture Industry.” (Creswell)

In collaboration with Dr. A. McNevin of the World Wildlife Fund, an invited chapter entitled “Best Management Practices for Bivalve Mollusc Aquaculture” was completed and submitted to the editors of the book “Best Management Practices for the Aquaculture Industry”. The book is in press with Blackwell Scientific Publishing Co., Oxford, U.K.

- 3.24 Provide support and assistance to aqua-farmers and pond owners utilizing best management practices for managing these aquatic resources and associated businesses. (S.Jackson)

- 3.24.1 Through the education programs and with the assistance of the Sea Grant Agent area farmers (5) will gain knowledge and fish culture skills necessary to explore potential aquaculture crops appropriate for the give local resources and marketing conditions.

Conducted three site visits to individual forms, two telephone conversations and two consultations via email, 32 clientele visited pond management website.

- 3.24.2 Fish pond owners (20) will gain knowledge in pond management through the Extension education programs and individual site visits conducted by the Agent.

There were 39 contacts via personal visits, telephone calls and emails during 2006.

- 3.25 Provide one-on-one consultations to individuals interested in learning more about aquaculture issues. (Mahan)

The Agent provided one-on-one consultations to 35 people on a variety of fresh and saltwater aquaculture questions.

As a result of the consultations, 30 of the individuals decided that aquaculture was not a business in which they wanted to be involved. The remaining five requested additional information.

- 3.26 Continue work with Franklin County clam farmers to address local issues. (Mahan)

The Agent worked with Leslie Sturmer to teach a Clam Aquaculture Workshop for Franklin County clam farmers. In addition, the Agent worked with the farmers on marketing their clams.

As a result of the workshop the 12 farmers attending learned about disaster relief assistance that they were eligible for, research on developing approved anti-fouling coatings that can be used on the grow-out bags, and the Franklin County Seafood Industry Taskforce. The Alligator Harbor clam was one of the main dishes sampled by the participants of the Southern Foodways Alliance and received national press coverage.

- 3.27 Continue to work with Lee County government with the creation of a clam nursery to improve farmer’s profit margin and industry foundation by providing consistent product for market. (Wasno)

Agent on leave the latter part of 2006, and then resigned. Work not completed.

- 3.28 Working with Florida Division of Aquaculture facilitate the construction of an educational kiosk at a local boat ramp on Pine Island. The kiosk will feature many aspects of the clam farming industry. (Wasno)
- Agent on leave the latter part of 2006, and then resigned. Work not completed.
- 3.29 Serve clients with aquacultural information with consultations, publications and site visits. (Sweat)
- Provided one-on-one consultations to individuals interested in learning more about aquaculture issues.
- 3.30 Establish, coordinate and provide training for Lee County clam farmers. (Wasno/Sturmer)
- Worked with 2 industry representatives in Lee and Charlotte Counties to set up a program to provide direct assistance to clam growers using state funds for industry-driven hurricane recovery projects. As a result, 44 growers in these 2 counties were scheduled to receive about 30,000 seed each in the spring (2007), allowing them to begin to rebuild their businesses. In addition, educational signs were reprinted with this funding which will be posted at lease areas to inform the public about clam farming activities.
- 3.31 Increase the scientific, industry and agency knowledge about Florida clam aquaculture through participation at regional and national conference. (Sturmer)
- Hosted and taught in a Shellfish Commodity Session held in conjunction with the Florida Aquaculture Association's annual conference held in Tampa during which 4 speakers reported to 45 industry members on 10 research and extension projects.
- Was an invited speaker at the 2006 BioFlorida Conference held in Gainesville and provided 74 attendees with information about applied research strategies for the Florida hard clam aquaculture industry.
- Was an invited speaker at the Marine Aquaculture Task Force Scoping Meeting which has held in Tampa, and informed 35 participants from national institutions and federal agencies about the economic and environmental importance of small-scale clam farms in Florida.
- With Adams, provided an overview of clam farming in Florida and research and extension commitments at the annual meeting of the Marketing, Trade and Management of Fisheries and Aquaculture Resources Project, which was held in Cedar Key.
- Provided a poster presentation at the National Shellfisheries Association's Annual Conference held in Monterey, CA, providing information to over 300 attendees on clam genetic issues and ongoing applied research projects to address these issues.
- 3.32 Establish, coordinate and provide training and technical assistance in counties where clam farming is ongoing. Counties involved include Levy, Dixie, Charlotte, Lee, Brevard, St. Lucie, Indian River and Franklin. (Sturmer)
- Organized and hosted listening sessions in 4 counties (Indian River, Brevard, Dixie, and Levy) for growers to provide comments to Research Triangle Institute consultants on the effectiveness of the pilot crop insurance program, and to make recommendations for the future of this program.

Organized and conducted a Clam Informational Fair during which clam growers from Levy and Dixie Counties interacted with representatives from state and federal agencies to gain current information about their programs.

Conducted a workshop in Franklin County to keep the 35 new growers in that area informed of industry initiatives and programs to assist them in their businesses.

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

Completed field trials to compare the production performance of multiple Florida strains of hard clams under aquaculture conditions. Assisted UF researchers in compiling field data to correlate this performance with genetic diversity and began writing the final report for this USDA-funded project.

Through a grant obtained from USDA Rural Development, assisted a local growers association in purchasing 2 lots in Cedar Key, allowing for parking of trucks and boat trailers adjacent to a boat ramp and securing clam growers' access to their offshore leases. Presentations to the city government resulted in a special use permit to conduct these activities in a residential area and approval of the site plan.

Initiated a partnership agreement with USDA and FL Department of Agriculture and Consumer Services to continue operating 7 "real time" monitoring stations at lease areas in 5 coastal counties so that clam farmers may be able to make informed management decisions based on water quality parameters.

With funding through a USDA special research grant, put together a team of researchers and submitted a proposal to evaluate the use of stock hybridization for improving clam production and to assess the soil characteristics of lease areas. This applied research project will begin in 2007.

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

With Creswell and a Harbor Branch Oceanographic Institution researcher, initiated a FL Sea Grant-funded project to investigate the culture and market potential of the sunray venus clam to assist the hard clam aquaculture industry diversify from a single product line. With 2 industry project partners, collected over 270 broodstock on 7 collection trips from 3 west coast sites for spawning trials, and conducted shipping trials with these adult clams.

Completed monitoring production performance of the blood ark and ponderous ark in the growout phase. Initiated compiling results with the project team for a manual on the hatchery, nursery, and growout production requirements for these two marine bivalves. The culture and market potential of these two molluscan shellfish species was evaluated during 2002-5 in a USDA-funded project. Results from spawning, nursery and growout trails were provided to industry members at a state conference and in a newsletter article.

- 3.35 Provided statewide service to clam grower associations and state agencies. (Sturmer/Adams)

Assisted the Cedar Key Oystermen's Association in implementing a project funded through hurricane disaster relief funds, which allows for clam shells to be recovered from participating wholesalers and stored at a county site until used in shell plantings to enhance the oyster fishery.

Provided administrative and technical assistance to the Cedar Key Aquaculture Association, a 100-member clam growers association. With the association conducted the following: 1) a workshop for county and state representatives to address agriculture assessments and valuation issues as they pertain to upland clam support facilities; 2) a food festival, CLAMERICA Celebration, held on the 4th of July to provide local awareness and promotion of the clam farming industry; 3) educational displays on clam farming at the Cedar Key Seafood Festival; and, 4) development of the partnerships and framework to initiate a program in which “derelict” clam bags can be recovered from leases and used as structural components for shoreline stabilization and oyster restoration efforts.

Assisted in the development of a statewide clam industry taskforce that allows industry representatives to meet with state representatives and others to proactively address challenges and issues affecting the industry. Participated as an ex-officio member and the agenda has allowed for reporting and input of extension activities. At their first meeting, conducted a planning exercise in which research and extension needs for identified and prioritized.

Served on the Florida Aquaculture Association’s education committee and organized a shellfish session at their annual conference in which over 100 attendees were provided with current information on research and extension projects.

Served as the Florida representative for the East Coast Growers Association and presented industry updates via their newsletter and website.

- 3.36 Provide easy access to up-to-date information on shellfish aquaculture in Florida through website, quarterly newsletter and fact sheets. (Sturmer)

Maintained a website, <http://shellfish.ifas.ufl.edu>, in which pertinent publications, research and extension projects updates, and other industry information can be accessed electronically.

Produced 4 issues of a newsletter, The Bivalve Bulletin, which provided updates on national, state, and local issues pertaining to the shellfish industry and distributed to over 700 individuals, including industry members, state agency representatives, faculty, elected officials, and others.

With UF faculty, produced two EDIS fact sheets: 1) Introduction to Infectious Diseases in Hard Clams, and 2) The Role of Salinity in Hard Clam Aquaculture. In addition, compiled fact sheets, listing current sources of seed, equipment suppliers, and wholesalers.

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

A new pump station and water supply system for the Shellfish Research and Extension Facility was installed with county support. The facility provided support to 2 ongoing FL Sea Grant-funded projects.

- 3.38 Provide aquaculture consultations and shrimp pond assistance. (Sweat)

Provided one-on-one aquaculture consultations with clients interested specifically in farming marine shrimp species. No on-site pond assistance was requested.

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

- 4.1 *Vibrio vulnificus* remains the leading cause of seafood-associated deaths. Current detection assays are consuming (2-7 days), labor intensive, expensive and not always reliable. FDA has increasingly turned to molecular detection, but problems have been reported with available assays. The objective of this project is to evaluate and improve molecular detection and typing methods for *V. vulnificus* in order to standardize evaluation of oyster and seawater samples. (Wright/Heil/Harwood: R/LR-Q-26)

Results reported in performance measures section.

- 4.8 Continue to work with Steve Otwell (FSG Seafood Specialist) on USDA CREES Grant to develop and certify post-harvest processing techniques to reduce that number of *Vibrio vulnificus* bacteria to non-detectable levels in Post-Harvest-Processed oysters. (Mahan)

The Agent continued to work with Steve Otwell, Victor Garrido and Charlene Burke on the PHP of oysters.

As a result of the work, three different oyster PHP methods, used by three different companies were US Food & Drug Administration validated for use in Florida.

- 4.9 Continue membership and Interstate Shellfish Sanitation Conference committee work on assigned topics. Committee assignments include; *Vibrio vulnificus* Education Subcommittee, Education Committee, Post-Harvest Processing Committee, and Biotoxin Committee. (Mahan)

The Agent was reappointed by the Chairman of the Executive Board to the *Vibrio vulnificus* Education Subcommittee and the Education & Biotoxin Committees for 2005 – 2006. The Education and Biotoxin Committees had no issues to address this past year. However, the *Vv* Education Committee was active and worked on several projects as well as monitored the *Vv* illnesses associated with the consumption of raw oysters harvested of Gulf of Mexico. As of December 31, 2006 it appears that FL, LA, & TX attained the 60% reduction in *Vv* illness rate as required by the Interstate Shellfish Sanitation Conference and the US Food & Drug Administration.

- 4.10 Continue work on the FL Department of Ag and Consumer Service's *Vibrio vulnificus* Illness Reduction Workgroup. (Mahan)

The DACS *Vv* Illness Reduction Workgroup didn't meet formally this year however, we did communicate via phone and emails about *Vv* illnesses in the state and the progress in meeting the Interstate Shellfish Sanitation Conference's/US Food & Drug Administration's raw oyster consumption caused *Vv* illness rate reduction goal of 60% for FL and the other Gulf of Mexico states by December 31, 2006.

As of mid-January 2007 it appears that the Workgroup's education strategy has worked and FL and the other Gulf states have had a 70+% illness reduction rate of *Vv* illnesses due to the consumption of raw oysters. Thus, the state's oyster industry will not have to face any new federally mandated regulations to reach the illness reduction goal of 60% over the past five-years.

- 4.11 Distribute the recently published book entitled "Use of carbon monoxide and other modified atmospheric conditions in seafood processing." The use of carbon monoxide is currently under regulatory scrutiny and this book will make the latest scientific information available to everyone. (Editor-Otwell: PD-04-07)

The book, "Modified Atmospheric Processing and Packaging of Fish, edited by W. Steven Otwell (University of Florida, Aquatic Food Products Program), Murat O. Balaban (University of Florida, Aquatic Food Products Program) and Hordur G. Kristinsson (University of Florida, Aquatic Food Products Program) was published in July 2006 by Blackwell, Press, and publicized throughout seafood industry.

4.12 Conduct annual Seafood Training schools. (Otwell)

4.12.1 International Shrimp School for industry and agencies in May 2006 for suppliers and buyers about the USA and world.

The 11th annual "UF Shrimp School" was held May 2-4 and attended by seafood suppliers and buyers from the USA and other countries.

First Annual 'Certification School' for Cooked Shrimp Processors was completed Feb. 22-24, 2006 in conjunction with the Laitram Equipment Corp in New Orleans for domestic and other processing operation about the world cooking both warm and cold water species. Attendance included 25 participants across 12 nations. The school involved expertise from the University of Florida, FDA and a selection of technical experts.

As a consequence of the success from the schools, a new commercial advisory team has initiated a third shrimp school to address "Shrimp Product Development." This school will be organized and conducted in cooperation with the FSG Seafood Specialist to begin April 2007 in conjunction with the National Shrimp Processors Association in Orlando, Florida.

4.13 Direct and maintain the National Seafood HACCP Alliance for Seafood Safety and Education. Anticipate revising the Alliance training protocol to accommodate the growing international interests and needs, plus revising all training materials to be consistent with new edition of FDA's Fishery Product Control Guide anticipated by December 2006. (Otwell)

4.13.1 Continue role as National Coordinator role for the Seafood HACCP Alliance that provides seafood safety training for all federal FDA seafood inspectors in the nation, most state based inspectors and over 90% of all nationally based seafood processing firms, plus over 10,000 international participants from 30 nations. The training now includes the traditional 3-day HACCP courses and 1.5 day sanitation courses taught biannually in Florida, plus a special one-day support course taught for individuals that complete an established Internet course developed by the Seafood HACCP Alliance based at Cornell.

See 4.16.1 below

4.13.2 Maintain the inventory for all seafood HACCP education materials in support of Alliance training programs about the nation and world as certified and recorded in company with the national Association of Food and Drug Officials (AFDO).

Continue to maintain inventory of seafood HACCP materials.

4.13.3 Specifically assist in preparation of revisions of the new FDA Fishery Products and Controls Guide due for release in late 2006.

Nothing to report.

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

Nothing to report.

- 4.13.5 Plan and conduct a series of Seafood HACCP Update sessions about the nation to orient trainers and users per new regulatory mandates and changes in HACCP requirements.

Nothing to report.

- 4.13.6 Plan and conduct another Alliance HACCP ‘Train-the-Trainers’ program to provide more qualified trainers for seafood safety with particular efforts to prepare bilingual trainers in company with AFDO regions.

See 4.16.1 below.

- 4.13.7 Revise the Alliance ‘Compendium of Methods’ as a technical resource for test methods and procedures in support of HACCP implementation in processing and regulatory inspections.

See 4.16.1 below.

- 4.14 FAO/ OIE /World Health Organization (WHO) Committee member assigned to address Antibiotic Use in Aquaculture and Antibiotic Resistance. Report anticipated in 2006. (Otwell)

Nothing to report.

- 4.15 Committee Member for the National Academy of Sciences report on Nutrient Relationships in Seafood: Selections to Balance Benefits and Risks due for completion December 2005. (Otwell)

Report was completed. The National Academies Press published “Seafood Choices: Balancing Benefits and Risks” and disseminated throughout United States. Committee members of the National Academy of Sciences’ report were invited to participate in a statewide in-service training and workshop in March 2007 entitled “Seafood Risk-Benefits. A number of extension faculty and members of the seafood industry attended, receiving latest research information on the benefits and risks of seafood consumption.

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

- 4.16.1 National Seafood HACCP Alliance, National Coordinator.

The FL Sea Grant Seafood Specialists maintained his role as the National Coordinator for the Seafood HACCP Alliance that has provides seafood safety training for all federal FDA seafood inspectors in the nation, most state based inspectors and over 90% of all nationally based seafood processing firms, plus over 10,000 international participants from 30 nations. The total graduates of the training since 1995 exceeds 25,000. 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. This program remains the benchmark training program by which all other training is assessed per seafood commercial about and into the USA. It remains the required course for most state and all FDA inspectors.

The Seafood HACCP Alliance training format and certain materials have been adopted with Alliance approval for use in structuring similar HACCP courses for medical supplies and pharmaceuticals.

- 4.16.2 Seafood Science and Technology Society (SST) of the America's, Executive Director. Conference scheduled for Nov 2006 in San Antonio, TX.

Maintained website for the Seafood Science Technology Society of the Americas (SST) and co-organized annual convention that was held November 2006 in San Antonio, Texas.

- 4.16.3 U.S. Representative on the Board of Directors for the International Association of Fish Inspectors (IAFI) – convene in Beijing, China 2006 and Ireland in 2007.

Continued to serve as U.S. Representative for IAFI.

- 4.16.4 U.S. Advisory Representative to the European 'Seafood Plus' organization involving every EU nation collaborating in various aspects of seafood safety and quality research – convene in Tromso, Norway May 2006.

Continue to serve as U.S. Advisory Representative to European "Seafood Plus" organization involved in seafood safety and quality research.

- 4.17 Determine ways to advance the use of post-harvest treatments (PHT) for production of safer Florida oysters for raw consumption. Coordinator for current USDA Special Research Projects extending into 2009. Current work includes assessing use of special freezing techniques and development of a industry based lab for analytical certification for product safety based in Apalachicola, Florida to assist commercial adaptation. (Otwell)

Work continues in PHT for production of safer Florida oysters at shellfish lab in Apalachicola.

- 4.18 Participate in the development of a "Mark of Quality" program for the U.S. domestic shrimp industry. Coordinating WASI Certifier Training School to begin at UF/IFAS in September 2006. Work in collaboration with Sea Grant staff at TXAM, LSU, MSU, UGA, Clemson and NCSU. (Otwell)

Continue to participate in the development of the "Mark of Quality" program for the U.S. domestic shrimp industry.

- 4.19 Assist FDA in continuing international study to determine proper handling methods to control and prevent development of histamine in for large tuna. Work locations for actual harvest include Grenada and Hawaii. Final report due in Fall 2006. (Otwell)

Continue to participate with seafood researchers to determine proper handling methods to control and prevent development of histamine in large tuna.

- 4.20 Conduct seafood workshops and seminars at local seafood festivals and boat shows. (Sweat)

Seafood seminars were conducted and publications distributed at Cortez, John's Pass and Homosassa seafood festivals and at the St. Petersburg Boat Show. Several hundred persons received seafood information at these presentations.

4.21 Continue recreational scallop restoration program. (Sweat)

The scallop restoration project was terminated due to lack of funding. A workshop on recreational scalloping was presented to local clientele in Citrus County. This clientele enjoyed a good recreational scallop season.

4.22 Hold 18<sup>th</sup> Annual Kid's Fishing Tournament. (Sweat)

Served as tournament director for the St. Petersburg Pier Aquarium 18th Annual Kid's Fishing Tournament. Over 500 children 12 years of age and younger enjoyed a morning of pier fishing. Educational emphasis was on conservation and ethics of marine fishing. 60 volunteers and \$9000 in donated food, drink, supplies, prizes and trophies made the event a complete success.

4.23 Hold recreational fishing workshops. (Sweat)

A recreational fishing workshop relating to fish handling, circle hooks and venting was held.

4.24 Conduct annual commercial sponge survey in Florida Bay. (Sweat)

With Agent Stevely, conducted an annual commercial sponge survey in Florida Bay. Data from the survey was then analyzed and report prepared which was provided to management agencies (FWC, Fla. Keys National Marine Sanctuary), Fla. Sea Grant and interested university researchers.

4.25 Assist Agent Wasno with Project RedStart and resuscitation workshops. (Sweat)

Assisted Agent Wasno with Project RedStart resuscitation workshops.

4.26 Provide one-on-one consultations to seafood dealers and harvesters on seafood related topics. (Mahan)

The Agent provided 97 one-on-one and small group consultations this year on a range of issues. For example: sharks tearing-up shrimp trawls; HACCP guidelines; post-harvest processing of oysters, water testing, etc.

As a result, seafood dealers were kept up-to-date on the PHP work being done at the lab and about changing regulations. In addition the shark problem was greatly reduced by making a minor gear change, resulting in increase catches and less gear damage.

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

- 5.1 Local waterfront governments often lack the time, funds or expertise to pursue waterfront policy innovation and secure this within their comprehensive planning structure. This will benefit from a comprehensive legal analysis of coastal policymaking authority, especially in the confusing near shore jurisdictional environment, and from a systematic assessment of the planning tools at their disposal that are packaged in a useable format. This project will provide this assessment and incorporate non-regulatory alternatives such as tax and other land use incentives. (Ankersen/Hamann: R/C-P-27CC)

The ability for researchers to gain access to boat trailer registration was gained. A research report “Anchoring Away: Government Regulation and Rights to Navigation in Florida” was updated. A publication, “There’s a Beach in My Backyard” was completed. Legislation to require sellers of real property to notify subsequent purchasers that the property is subject to coastal erosion and environmental constraints was requested and passed by the 2006 Florida legislature. Extension activities have been conducted with Florida’s Waterfront and Waterways Program. A tool kit was developed for Florida local governments to use in adopting the program. Statewide conferences on waterfronts and waterways were held in 2004 and 2006.

- 5.3 Controversy currently exists between users of waterways and proponents that wish to protect manatee habitat. Manatee idle speed zones greatly impact coastline property values, constrain the construction of docks and boat ramps, and affect the total economic output of the Florida marine industry (\$14.1 billion dollars/180,000 related jobs). This research has the potential to significantly reduce the economic impact that round-the-clock idle speed zones have on boating associated businesses and recreational boating activities in Florida’s waterways, while maintaining the integrity of the manatee habitat. (Niezrecki/Beusse: R/MI-13-PD)

This work contributes to the scientific knowledge of manatees and manatee avoidance technology by providing information that is essential in estimating the distance at which a manatee vocalization can be detected in various background noises. This work also compares several shallow water acoustic spreading models with data collected from the waterways where manatees frequent. The research also provides a survey of the noise levels that are found in these waterways, which are attributed to boat noise as well as background noise. This research represents the first effort to extend the range of manatee detection by using advanced adaptive filters in order to extract manatee vocalizations (or other bio-acoustic signals) that are buried in background noise. Lastly, these noise reduction techniques are applicable to other marine mammals such as whales or dolphins. Successful completion of the research has the potential to significantly reduce the economic impact that round-the-clock idle speed zones have on boating associated businesses and recreational boating activities in some of Florida’s most heavily used waterways. The research may ultimately help to sustain economic viability and foster development in Florida’s coastal communities while maintaining the integrity of the manatee habitat. If successful, this technology can be deployed in lieu of round-the-clock idle speed zones in selected areas with high boat traffic. Boaters would only be required to reduce speed when manatees are actually detected within the area. Not only would this technology protect manatees from boat strikes, it also would likely improve compliance with speed restrictions when manatees are present and sharply reduce the economic impact that round-the-clock idle speed zones have on boating associated businesses and recreational boating activities in some of Florida’s most heavily used waterways. The work is being continued and a U.S. Patent “Manatee Avoidance System,” has been applied for.

- 5.8 Florida Sea Grant Extension will work with the research and education community to develop the Gulf of Mexico Coastal Ocean Observing System (GCOOS), providing technical assistance in development of the GCOOS memorandum of agreement, business plan, and creation of an Education and Outreach Council. (Spranger)

GCOOS Board of Directors (BOD) has been established, with approved memorandum of agreement and business plan. Mike Spranger elected to the BOD and GCOOS Executive Board. He also coordinated first meeting of the GCOOS Education and Outreach Council (EOC). At this meeting, he was elected their chair for 2006-07. At this meeting, the EOC developed their organizational structure, work plan, and provided recommendations to the GCOOS Board of Directors. During 2006, presentations on GCOOS were made to Florida organizations that included the Clean Boating Partnership, Florida Marine Science Educator Association, Extension Professional Association of Florida, and the Florida Caucus on Ocean Observing Systems. In early 2007, GCOOS hired its first EOC coordinator; this position was patterned after the SEACOOS Education Coordinator who is employed by FSG Extension.

- 5.9 Work with the UF Law School on the coastal water access issue (via the Fisheries Extension Enhancement Committee). Assist the UF Law School with a survey to determine how water dependent business owners will avail themselves to recent changes in statutes that address water dependent uses, taxation, etc. (Adams)

Assisted Tom Ankersen in a brief survey of waterfront property owners' opinions regarding recently enacted property tax deferral program.

- 5.10 Work with the UF Law School and the community of Cedar Key in assessing the potential economic benefit of allowing shore side hard clam nursery operators to claim agricultural tax exemptions for their hard clam nursery facilities. (Adams)

Was not involved due to scheduling conflicts with workshops held in Cedar Key.

- 5.11 Continue working with the Clean Boating Partnership and DEP staff to designate new Clean Marinas and Boatyards and assist recovery of marinas damaged by hurricanes in 2004 and 2005. Present Clean Boater education materials to boaters at the Pensacola Boat Show and other environmental events. (All agents)

Conducted two clean marina workshops and enrolled three marinas into the Clean Marina Program in Broward County. Distributed clean Marina/Boatyard Program and Clean Boater education materials at the annual Fort Lauderdale Boat Show, Yamaha Miami Billfish Tournament and National Clean Marina Celebration. Approximately 2,000 visitors received information and 400 of them signed Clean Boater pledge cards. (Behringer)

Escambia agent represented Florida Sea Grant as the Clean Boating Partnership conducted the walk-through certification of Palm Harbor Marina to be recognized as a Clean Marina. The designation of Palm Harbor was the first new Clean Marina in Escambia County since Hurricane Ivan in 2004. (Diller)

Two hundred and ninety-two people took the "Clean Boating Pledge" at the Pensacola Boat Show promising to protect local waterways while boating. Agents distributed 96 children's personal flotation devices (PFD), 168 seat cushion PFDs, and 100 bilge socks. The bilge socks will prevent approximately 150 quarts of oil/petroleum products from impacting local waterways. (Diller & Verlinde)

There was no activity in this area in Franklin County during 2006. However, I have been told that the City of Carrabelle is building a City Marina in 2007 and that they want to be a Clean Marina. (Mahan)

Agent worked with NE District DEP Clean Marina coordinator to review and recommend two marinas for designation as both Clean Marinas and Clean Boatyards. Agent contributed articles on monofilament recycling and Pacific barnacles to Clean Marina newsletter in 2006. (McGuire)

- 5.12 Provide leadership and assist in development of lake management plans for all 15 coastal dune lakes in Walton County, through facilitation community discussion and educational programs. (S.Jackson)

Hosted 11 coastal dune lakes neighborhood meetings to develop individual lake management plans. Developed coastal dune lake website (<http://duneslake.org>) to facilitate discussions.

- 5.13 Assist 4-H teen council project that will install at least five additional fishing line recycling bins in Okaloosa and Walton Counties; and collect and recycle at least 100 lbs. of fishing line during 2006. (S.Jackson)

New recycling bins installed and more than 100lb of fishing line collected in 2006.

- 5.14 Continue to work with local government on waterfront access issues. (Gregory)

The Monroe County Sea Grant Marine Extension Agent presented overview of requests to the County for working waterfront properties to the Florida Keys Commercial Fishermen's Association Board of Directors and encouraged them to communicate their needs to local politicians. I subsequently arranged meeting with a county commissioner and staff with the Marine Resources Department which resulted in a strategy to present industry needs to the Monroe County Marine and Port Advisory Committee (MPAC). At the MPAC meeting the industry presented a case for the purchase of Gulf Seafood on Stock Island as a public access commercial fishing waterfront. The MPAC passed a motion requesting the Monroe County BOCC consider Gulf Seafood for the purpose of preserving commercial fishing in the lower Keys and to conduct an economic feasibility study, recognizing a sense of urgency due to a pending contract on the property." Later the Monroe County Sea Grant Marine Extension Agent presented the site plan and MPAC motion to FKNMS Sanctuary Advisory Council who subsequently passed a motion to support the MPAC recommendation to the Monroe County BOCC. At the last minute of the December, 2006 Monroe County BOCC meeting the County Administrator pulled the item from the agenda due to confusion over the asking price of the property.

- 5.15 Provide technical information to the consultants of Lampl/Herbert as they conduct a feasibility study on constructing a Seafood Industrial Park in Franklin County. (Mahan)

Reported in 5.16.

- 5.16 Provide technical information to the consultants of Ross International as they conduct a feasibility study/redevelopment plan for the City of Apalachicola's historic waterfront and Scipio Creek boat basin. (Mahan)

The Agent met with Larry Sabiston once and communicated with him several times via the phone to discuss a wide range of Apalachicola and Franklin County topics as they relate to seafood processing and the survival of the industry.

As a result of my input and that of other individuals the feasibility study/redevelopment plan was completed and presented to the Mayor and City Commissioners of Apalachicola. City officials are now working to implement the plan.

- 5.17 Collaborate with the Chamber of Commerce and local seafood producers and dealers to prepare for and host the Southern Foodways Alliance's, Center for the Study of Southern Culture at the University of Mississippi visit to Franklin County to sample and promote the area's seafood and culture. (Mahan)

The Agent worked with the Chamber, seafood processors, dealers & harvesters to plan, prepare for, host and teach the 120 Southern Foodways Alliance members about the area's seafood industry and culture.

As a result of the Alliance's visit, several dealers made contacts to expand their markets and the area received a lot of very positive press about the area's seafood industry, its people and culture.

- 5.18 Continue work to identify areas in Franklin County that are appropriate for the construction of boat ramps to provide increased public boat access in the county. (Mahan)

The Agent identified several areas in the County where the state permitting agencies would "rubber stamp" their approval for the construction of a boat ramp.

As a result the County has secured the funds to begin building boat ramps in two of these areas which will provide greater water access to resident and visiting boaters.

- 5.19 Work with Bob Swett to develop a boating guide for Flagler County. (McGuire)

Flagler County boating guide was put on hold pending procurement of funding.

- 5.20 Publications, technical assistance and special extension programming activities will be created to inform and educate the local citizenry of viable alternatives for productive careers in areas of aquaculture and nature-based tourism. These efforts seek to boost local economies while contributing towards a broad-based coastal conservation ethic and sustainable coastal development. (Sapp)

Agent resigned. Work not completed.

- 5.21 Support Hurricane Preparedness efforts of other Sea Grant agents by providing literature, explanations of technology used to measure topics of relevance-e.g. storm surge models, water level data; also provide maps of COOS asset locations so boaters can customize local forecasts and make more informed decisions. Provide PowerPoint presentations and other information to facilitate work of other agents. Engage legislators/decision makers from waterfront communities to participate in FL COOS Caucus meetings. (Simoniello)

Co-host of the Hurricane Preparedness & Evacuation Brown Bag with the NWS and EOC Coordinators, May 12, 2006, St. Petersburg, FL

Created COOS flyers and signage for model buoy displayed at The Capitol, Tallahassee, FL for Florida Oceans Day, 2006 and 2007. Working with Jyotika Virmani, the FL COOS Caucus Coordinator participated in Marine Quest-a public outreach marine awareness day in St. Petersburg, FL that attracts thousands of citizens, legislators and decision makers. The SECOORA Asset Inventory poster was displayed and several hundred brochures were distributed to boaters and recreational water users. SEACOOS Hurricane Educators Workshop, Miami, FL, July, 2006; Contributed to article: "Hurricane Season is Here" published in The Georgia Science Teacher, Fall, 2006. Served on the Marine Advisory Panel for the joint FL Division of Emergency Management, SG, and FEMA DVD "Boater Preparedness" being created by

Envisioneering, Inc. Assumed Co-Chair role of the Technical Advisory Team with Bryan Fluech when Marella Crane left FSG.

5.22 Assist with water dependent enhancement activities in Charlotte County. (Staugler)

5.22.3 Develop an Abandoned Vessel program for Charlotte County by organizing and chairing a committee towards this end.

5.22.4 Work with Team Punta Gorda to develop a managed mooring field.

5.22.5 Work with Bob Swett to develop a Cruising Guide to Charlotte Harbor.

Coordinated and facilitated county staff and county/state law enforcement to review state statutes. Worked with County Assistant Attorney to create new county abandoned vessel ordinance facilitated meeting with state specialists, Swett and Ankersen to have county explore creation of managed mooring field.

5.23 Complete the Boating and Angling Guide to Pensacola Bay, Summer, 2006. (Verlinde)

The Boating and Angler Guide was deferred until 2007.

5.24 The State of Florida, with the guidance of Florida Sea Grant (FSG), will develop a new administrative rule for dredging public waterways in Lee County under the authorization of a general permit. The rule will apply to traffic sheds with high priority maintenance dredging needs as identified by applications of the FSG Regional Waterway Management System. (2006-2007) (Swett/Fann/Sidman)

Lee County, the West Coast Inland Navigation District, the Florida Department of Environmental Protection, the Florida Fish and Wildlife Conservation Commission, and Florida Sea Grant have determined how to implement non-combustion-engine zones (NCEZ) to mitigate maintenance dredging activities in aquatic preserves. Lee County expects to implement public meetings in January to present the NCEZ/NGP package, with the expectation that the County will implement a resolution of support that will be referenced in the state rulemaking process.

5.25 A boating and anchoring guide will be produced for Jupiter Inlet, with funding from the Jupiter Inlet District, to (1) enhance the experiences of local and transient boaters, (2) promote safe navigation and responsible boating and anchoring behaviors, and (3) provide boaters with information on area resources and amenities. (Fann/Swett/Sidman)

5,000 copies of a boating and anchoring guide for Jupiter Inlet District were printed and distributed. A companion Web site was developed and is available at:  
<http://www.jupiterinletdistrict.org/BoatersGuide/index.html>.

5.26 Local municipal regulations that govern boating activities on local waterways will be identified, documented, and incorporated into a statewide GIS database for use with the Florida Fish and Wildlife Conservation Commission's Coastal Resource Information System. The purpose is to assist the FWC and partners in implementation of more effect waterway management. The project will span multiple years, this year being the first. (2006-2007) (Swett/Ruppert/Ankersen/Fann/Purdy/Sidman/Sargent-FWC)

Florida Sea Grant and the University of Florida Levin College of Law initiated a multi-year project to catalog and incorporate into a GIS database local municipal regulations that govern boating activities on Florida's coastal waterways. The project will be completed in June 2007.

- 5.27 A seasonal characterization of recreational boating in Brevard County will be initiated to characterize the preferences, activities, and use-patterns of area boater populations. The information will be used for resource management and planning applications by Brevard County and the Florida Fish and Wildlife Conservation Commission. (2007). (Sidman/Swett/Fann/Sargent)

The project is scheduled to be completed by September 2007.

- 5.28 Advancing Waterway Access in Florida: Legal and Policy Tools to Implement the 2005 Working Waterfronts Legislation (HB 955/SB1316). The Conservation Clinic at the University of Florida School of Law and Florida Sea Grant will analyze the legal and policy context for regulatory incentives and criteria and identify implementation strategies to satisfy the requirements of the 2005 working waterfronts legislation. For selected strategies, models for adaptation and use by local governments will be provided. (Ankersen/Ruppert/Swett/Sidman)

Extensive analysis was completed. Information on preserving access, character and water quality can be found at: <http://www.aw.ufl.edu/conservation/waterways/waterfronts>

- 5.29 The spatial patterns of recreational boaters who use Greater Charlotte Harbor will be analyzed according to trip origin type (marina wet-slip, dry-storage facility, ramp, private dock), using reported data from mail surveys conducted during the spring, winter, and fall seasons (2005-2006). This project will analyze test methods of obtaining spatial and descriptive data about recreational boating on Florida waterways. (Sidman/Swett/Fann/Sargent)

A spatial analysis mapped and evaluated boating patterns for the boating seasons captured by three waves of mail surveys. A raster (e.g., grid or cell-based) was used to determine the relative proportions and distribution of destinations, routes, and activities over the seasons. Grid cell weighting accounted for seasonal differences between sample sizes and an analysis of proportions was implemented to compare relative use intensities. Those cells with statistically similar weighted use proportions were considered to have similar seasonal profiles and those with statistically different weighted use proportions will be considered to have different seasonal profiles. In addition, the timing, frequency, and duration, of trips, and types of activities were statistically evaluated by season. The results were documented in a report entitled "Greater Charlotte Harbor: A Comparison of Boating Patterns by Season" to the FWC Fish and Wildlife Research Institute and to Lee County.

- 5.30 The Florida Coastal Training Program (CTP) provides coastal decision-makers with the best available science based information, tools, and techniques required to make responsible decisions about land use in Florida and the resulting effects on coastal resources. The Florida Conflict Resolution Consortium, the Center for Economic Forecasting and Analysis at Florida State University, and the Florida Sea Grant Program at the University of Florida will assist in this mission. Their objectives will include an assessment of the training and information needs of elected and appointed government officials and land use planners, a pilot project based on the results of the assessment, and an outreach plan to continue positive, long-term relationships with the target audience. (Taylor/Harrington/Swett/Sidman)

This project is scheduled for completion in spring of 2007.

- 5.31 Alachua County's system of freshwater springs, lakes, and rivers represents a unique resource in the regional recreational geography, serving as destinations for various recreational pursuits. The University of Florida Department of Tourism, Recreation and Sport Management and the Florida Sea Grant Boating and Waterway Management Program will assist the County in the development of a countywide waterways master plan for achieving sustainable water-based

recreation through community visioning, education, and waterway planning and management. (Confer/Delaney/Swett/Sidman/Schnell/Ankersen/Holland/Fann)

This project is scheduled for completion in June 2007.

- 5.32 Waterfront communities and coastal counties are increasingly aware of the need to develop long-term plans for their public waterways and, in particular, to provide adequate public access to their coastal resources. Planning workshops will be conducted in Manatee and Santa Rosa Counties to assist local officials and management staff prepare waterway and public access plans. (Verlinde/Sevelly/Swett/Sidman/Ankersen)

Planning workshops and presentations on comprehensive boating and waterway management were given in Bay, Brevard, Collier, Manatee, and Santa Rosa counties. Work on developing comprehensive boating and waterways management plans is ongoing with Bay, Brevard, and Santa Rosa counties. (Swett)

Work with the Bagdad Waterfronts Partnership Natural Resources Committee to provide public access, site restoration, invasive species control and development of the historic Bagdad Mill Site Community Park.

- 5.33 Florida Sea Grant and the Florida Fish and Wildlife Conservation Commission's Boating and Waterways Section will organize the first biennial conference of boating and waterway management in Florida, to be held from November 1 to 3, 2006 in Cocoa Beach. (Swett/Sidman/Spranger/Ankersen/Sargent/Ouellette/Alford)

There were 177 attendees at the statewide conference, 62 percent of whom represented the target audience: local and state government. Evaluations were returned by 156 participants and their responses indicate that 62% of the attendees obtained a "significant amount" of new information. The conference steering committee will meet in January 2007 to plan for future events and, based on the results of facilitated planning session held at the conference, coordinate and develop strategies, timelines, funding, and regional alliances to address boating and waterways management issues in Florida.

- 5.34 Florida Sea Grant and the Department of Fisheries and Aquatic Sciences will conduct a 3 hour in-service training session to introduce UF/IFAS extension faculty to Geographic Information Systems (ArcGIS 9.1). The primary objective of the training is to provide faculty with an introduction to GIS. (Swett/Lindberg/Fann)

There were 24 attendees at the workshop. They rated the workshop design and logistics, learning environment, instruction, and materials provided as good to very good. As a result of the training, a 2.5 day GIS training is scheduled for February 2007.

- 5.35 An important component of the mission of the University of Florida and National Sea Grant is to (1) facilitate understanding of, and solutions to, global human and natural resource issues; (2) disseminate knowledge and expertise on the U.S. extension model, its role, constraints and opportunities; and (3) develop opportunities for greater international participation in extension. The Conservation Clinic at the University of Florida School of Law and Florida Sea Grant will seek to collaborate with the University of Costa Rica to implement a marine and extension program in Costa Rica. (Ankersen/Spranger/Swett)

Personnel from the Conservation Clinic, Florida Sea Grant, and the Department of Fisheries and Aquatic Sciences traveled to Costa Rica in May 2006 and met with personnel from the University of Costa Rica (UCR). UF and UCR personnel developed a proposal to (1) establish a long-term

partnership between UF and UCR and (2) institutionalize marine and coastal extension within UCR. The proposal was submitted to the National Marine Sanctuaries Foundation, but was not funded. Searches for other potential funding sources are ongoing.

- 5.36 Continue producing information, brochures and other products to help Sea Grant agents in FL, GA, SC and NC educate the public about COOS. Lead effort for third poster in SEACOOS/COSEE series (Ocean Circulation). Oversee redesign of extension and education portion of [www.seacoos.org](http://www.seacoos.org) website, including layout and content. Participation (lecture, lead field trips, provide exhibits) for a variety of educational forums: SEPORT workshops, COSEE Teacher Workshops, Marine Quest, Oceans Day at the Capitol, GK-12 Oceans program, Oceanography Camp for Girls, etc. Partner with Charlie Barans (SC DNR) on Design a Fish interactive kiosk at SC Aquarium. (Simoniello)

Third poster was completed and distributed throughout SE USA. Redeveloping SEACOOS Education and Outreach website was updated. Provided presentation and educational materials at a number of forms and conferences: COSEE, Marine Quest, Oceans Day, and Oceanography camp for girls, the Coastal Society, the American Meteorological Society, NOAA Ocean Exploration Workshop, FLCOOS Caucus, and GCOOS Board of Directors.

- 5.37 Serve as Florida Sea Grant liaison as voting member of the State of Florida Clean Boating Partnership that implements the Clean Marina and Clean Boatyard programs. Efforts will continue to expand these programs in the state, with county agents assisting in the development and designation of clean marinas and boatyards in their area. (Spranger)

Mike Spranger continued to serve on the State Clean Boating Partnership (CBP), attending their quarterly meetings. CBP is comprised of representatives from the marine industries, Florida Department of Environmental Protection, U.S. Coast Guard, and Florida Sea Grant. They provide guidance and oversight to the clean marina and clean boatyard program. In 2007, they also created a new program, the “clean retailer” designation for businesses that provide products and services to the boating community.

- 5.38 Participate in state, regional, national and international activities that are associated with coastal ocean observing systems, providing “best management practices” and “lessons learned” through publications and presentations at workshops. (Spranger, Simoniello)

Either participated directly or provided literature/ presentation material for state, regional, national and international COOS workshops, conferences and publications including: The Coastal Society’s 20th Biennial Conference, St. Petersburg, FL, NOAA Climate Office for International COOS Workshop with the Sea Grant Partnership Program, Bali, Indonesia, 2006, FL COOS Caucus meetings, GCOOS Board of Directors Meeting, St. Petersburg, FL, 2006, American Meteorological Society Chapter Meeting, Ruskin, FL, 2006, Sierra Club Red Tide Forum, St. Petersburg, FL, July, 2006, Mote Marine Laboratory/USF Forum on new Coastal Ocean Observing Technologies, Sarasota, FL, August, 2006, American Meteorological Society International Meeting, Using Ocean Observing System Data to Promote Ocean Literacy in the SE US, Atlanta, GA, 2006, Invited to edit the MTS Journal Special Edition, Ocean Education, Dec. 2005/Jan 2006 (Simoniello)

Continued to play a leadership role in regional OOS efforts. Continued as a member of the Southeast Atlantic Coastal Ocean Observing System (SEACOOS) Extension and Education Work Group that coordinates outreach activities. Provided oversight to SEACOOS regional extension coordinator who is based at the University of South Florida. Elected member of GCOOS Board of Directors and Executive Committee, as well as Chair of their Education and Outreach Council. Involved with new the Florida Coastal Ocean Observing System (FL COOS) Caucus, formed in

- the fall of 2005 through convening efforts of the Deans of the University of Miami's Rosenstiel School of Marine & Atmospheric Science; Nova Southeastern University's Oceanographic Center; and University of South Florida's College of Marine Science. FL COOS Caucus meetings provide a mechanism to bring together Florida's scientific, management, regulatory and private sector provider and user groups interested in ocean observing systems. (Spranger)
- 5.39 Continue to serve on the Public Education and Image Committee of the Marine Industries Association of South Florida Marine Master Plan Steering Committee. (Behringer)
- Developed and distributed 1000 "Welcome Bags" for boat captains containing information on local events, entertainment, marine facilities, Clean Marina Program and marine and coastal resources. (Behringer)
- 5.40 Assist Sea Grant waterway management program in providing technical assistance in managing anchorages and boat ramps. (Stevely)
- Assisted in organizing Sunshine Skyway Boat Ramp Feasibility Workshop. Florida Sea Grant specialists (Swett, Sidman) presented information on boating use patterns in the region. Manatee is continuing to develop justification on plans for a regional boat ramp facility at the Sunshine Skyway (Manatee Co.).

## **Coastal Stewardship and Public Safety**

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

- 6.1 Identification of point-source and non-point sources of freshwater to coastal estuaries is essential in understanding the water quality of these areas. Planned future changes in freshwater deliveries to Biscayne Bay from point-source discharges via canals to non-point source discharge from wetlands and groundwater flow requires a monitoring method that effectively detects these changes, i.e., one that can detect changes in canal discharge versus groundwater seepage. The results of this project will provide a scientific-based tool for assessing the results of the freshwater redistribution plan. (Price/Swart: R/C-E-51)
- Reported in performance measures section.
- 6.2 The Florida Keys coral reef ecosystem, comprised of a network of interconnected inshore coastal bays, barrier islands, and offshore coral reef environments, supports highly productive and diverse fish and invertebrate communities and a multibillion dollar fishing and tourism industry. The goal is to develop robust methods for identification and quantification of reef fish habitat use that improves the statistical precision of ecosystem-wide fishery-independent reef fish visual census sampling surveys; enhances stock assessment capabilities; and, provides a framework for evaluation of marine reserves. (Ault/Smith/Bohnsack/Rubec/Miller: R/C-E-50)
- Reported in performance measures section.
- 6.3 Develop educational programs that maintain and increase the quality of Florida's estuaries and ecosystems through the North Florida NEMO (Nonpoint Education for Municipal Officials) Program with regards to water quality and critical fish habitat. (Cameron)
- Developed educational programs through PowerPoint presentations and displays to maintain and increase the quality of Florida's estuaries and ecosystems through the North Florida NEMO

(Nonpoint Education for Municipal Officials) Program with regards to water quality and critical fish habitat. Educated over 50 citizens on rain gardens and storm water pollution.

- 6.4 In collaboration with St. Lucie County Artificial Reef Coordinator establish an oyster restoration program for the Indian River Lagoon; secure necessary permits for deploying spat collectors and oyster cultch; establish a youth education and volunteer program for distribution and monitoring of “artificial oyster reefs”. (Creswell)

Project was established and will continue planned activities in 2007.

- 6.5 Continue to promote utilization of monofilament recycling through newspaper articles and radio programming. (Creswell)

The St. Lucie Monofilament Recycling Program continued through 2006 with four new recycling collection center deployed, one newspaper article, and two radio broadcasts devoted to the subject. During 2006 approximately 300 miles of monofilament line was collected and submitted for recycling.

- 6.6 Distribute invasive species information to retail pet outlets throughout St. Lucie County. (Creswell)

No distribution of materials in 2006.

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

Task force was disbanded in 2006.

- 6.8 Partner with the Florida Yards and Neighborhood agent, natural resource agents, Florida Lakewatch, and other organizations to reduce stormwater runoff, provide watershed education, and develop water quality monitoring programs. (Diller)

The St. Lucie Monofilament Recycling Program continued through 2006 with four new recycling collection center deployed, one newspaper article, and two radio broadcasts devoted to the subject. During 2006 approximately 300 miles of monofilament line was collected and submitted for recycling.

- 6.9 Conduct local workshops for K-12 teachers and interest citizens on marine invasives. (Diller)

Several teacher workshops held in 2006. (See 6.28)

- 6.10 Develop and assist with coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems as they recover from Hurricane Ivan. (Diller)

Assisted County with coastal restoration projects such as project GreenShores (see 6.11). 4,600 youth and family members are involved through the Resource Rangers Program. This program won Coastal Living Magazine’s Coastal Living Award for Education in 2006.

- 6.11 Continue to work with the Project Greenshores team to develop site two of this coastal ecosystem restoration project in Pensacola Bay that includes oyster reefs, seagrass beds, and salt marsh habitats. Also develop other ecosystem restoration projects. (Diller)

Agent continued to serve on the Project GreenShores Steering Committee. The project experienced delays in 2006 waiting for permit and replacing the Florida DEP coordinator. Construction efforts should resume in 2007. Over 90 youth participated in planting additional marsh grasses at the original site organized by the Environmental Education Coordination Team.

- 6.12 Coordinate the Turtle Friendly Beach program for sea turtle awareness and protection. Conduct sea turtle lighting workshops and provide sand fencing information during the recovery from hurricanes in 2004 and 2005. Provide educational assistance and Sea Grant Extension representation to various sea turtle working groups. (Diller)

Agent represented Florida Sea Grant and its clientele at the stakeholder's meeting on revision of the Kemp's ridley sea turtle recovery plan in Houston, Texas. Assisted recruiting volunteers for a research project to determine the historic nesting numbers of ridley turtles.

Turtle Friendly Beach Program was adopted by St. Lucie County. Agent assisted St. Lucie County natural resources staff with adaptation of program to fit their needs. Escambia and Santa Rosa County activities delayed due to hurricane recovery. Program will resume full activity in 2007.

- 6.13 Continue support and development of educational programs for teachers, boaters and interested citizens on marine debris, coastal clean-ups, and monofilament line recycling. (Diller)

Agent assisted with advertising and coordination for the annual Coastal Cleanup. Agent presented marine debris programming to school groups and the Pensacola Power Squadron.

- 6.14 Work with agents in the Panhandle to adjust and implement projects related to stormwater using the materials from the national program, Non-point education for municipal officials (NEMO), as a base. (Jacoby)

Work with agents in the Panhandle to adjust and implement projects related to storm water using the materials from the national program, Non-point education for municipal officials (NEMO), as a base. Presentation on concerns with NEMO made. Discussion proceeding.

- 6.15 Assist Florida Sea Grant Agent, Brian Cameron, in coordinating the NEMO pilot program in Franklin County. (Mahan)

The Agent worked with Brian Cameron and other members of the NEMO team to determine the best strategy to educate local elected officials about implementing NEMO principles.

As a result of some of these efforts, the City of Carrabelle has added some NEMO's principles into their Comprehensive Development Plan and they hope to add more landscaping and land management - best management plans in the future.

- 6.16 Assist the staff of the Apalachicola National Estuarine Research Reserve in planning, coordinating and conducting a derelict crab trap clean-up in Apalachicola Bay. (Mahan)

There was no derelict crab trap clean-up in 2006. There is one scheduled for early 2007.

- 6.17 Work with faculty at UNF to study distribution of Asian green mussels and advise the public and local decision makers about the results of this research. (McGuire)

Agent worked with faculty at UNF to write and submit two grant proposals to study Asian green mussels in NE Florida. One grant was submitted to Disney Wildlife Conservation Fund, one to the National Sea Grant ANS grant program. Neither grant was selected for funding in 2006.

- 6.18 Continue work identifying and organizing teams to build pilot projects that use COOS information to improve fisheries/ecosystem health monitoring. Joint efforts with USF CMS, UM, AOML, FLKNMS, FWRI, FMRI, USGS and NOAA Fisheries will be expanded. Course of action will depend on success of test deployment coupling physical and biological parameters off Passa-Grille Beach. Goal of pilot projects is to include biological parameters in main research plan rather than as afterthought post-data acquisition. This also includes timely release/awareness of availability/capabilities of new technologies as they come on line (e.g. WERA data off South Florida in 2005-2006; HF Radar test bed off South Atlantic Bight in 2006-2007) (Simoniello)

The White Papers generated during our 2005 meetings were successful and the partners involved are pursuing federal grant money to conduct the research (in 2006). FSG involvement at this point is not required (but communication lines remain open to broker future collaborations).

The Passa-Grille site is experiencing technical problems/lack of ship time to service equipment, so this course of action has been delayed. Existing (limited) funds are being diverted to maintain existing data streams and support staff. However, a partnership with a private company called SonTek/YSI Instruments is being pursued to get instruments into classrooms (FL, CA and Korea) with the goal of creating a pilot project that teaches students how to use the instruments to monitor ecosystem health. The National SG Office will be a partner to facilitate international exchange of information if grant money is secured.

- 6.19 Continue work with Braxton Davis, USC Baruch Institute assessing needs of coastal managers through Coastal States Organization (initial surveys have been complete; Fall 2006 plan is to summarize survey results, provide priorities to SECOORA Board of Directors). (Simoniello)

The Coastal States Organization survey of COOS-related needs of coastal managers is complete and the full report available. (Meeting the Needs of Southeastern Coastal Resource Managers through Coastal Ocean Observing Systems, available at

<http://www.scdhec.net/environment/ocrm/science/docs/CSO-SECOORA.pdf>

Results were presented at The Coastal Society's 20th International Meeting in St. Petersburg, FL, May, 2006 and at the SECOORA Annual Meeting, Jacksonville, FL, 2006

- 6.20 Provide general educational training and assistance to improve coastal ecosystem health. (Staugler)

- 6.20.1 Work with the Charlotte Harbor NEP to produce a seagrass video/DVD that will be used to educate SW Florida boaters through public broadcast and government television, educational programs and events.

Worked with CHNEP and WCGU (public television) to develop one two-minute video on "Sea Grasses: Good Boater Practices". Video was shown 88 times on WCGU in 2007. A seven minute video on "Sea Grass & Boaters" was developed and show at all US Power Squadron and US Coast Guard Auxiliary Safe boaters classes in Charlotte County.

- 6.20.2 Continue to chair the Charlotte Harbor NEP Hydrologic Alterations Subcommittee. Participate as a member of the Water Quality Quantifiable Objectives Sub-committee, and Habitat Conservation Sub-committee of the Charlotte Harbor National Estuary Program.

Continued serving on committees in 2006.

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

Continued work with Clean Marina Program. 10,000 Charlotte Harbor Boating and Angling Guides were distributed. Working with U.S. Power Squadron. They now incorporate “clean boating habits” materials into all their boating safety inspection programs.

- 6.20.4 Provide educational programs to boating and fishing groups, master gardeners, civic groups and citizens on coastal habitats and invasive species.

Continue to provide technical support for “Keep Charlotte Beautiful.” Organized first ever derelict crab trap cleanup in 2006, improving navigation and boating safety. 162 traps were removed. Spoke to number of community groups. Wrote monthly column in local boating and fishing magazine that reaches 30,000.

- 6.21 Develop an Estuary/Marine needs assessment for the waters of Charlotte County – a database/GIS project to identify research, monitoring & educational efforts. (Staugler)

A committee was established which met four times during 2006. A template for the development of a modified Water Atlas has been prepared. At this time funding has not been identified.

- 6.22 Assist with local mangrove transect monitoring effort to document recovery of mangroves post hurricane post hurricane Charley and changes to shoreline. Incorporate information into education and outreach efforts. (Staugler)

Mangrove transects were established and monitored during 2006. Results documented an 80% loss to the fringing red mangroves. As a result of this study a community based mangrove restoration proposal was prepared and submitted to Fish America Foundation with the support of eleven agencies and community organizations.

- 6.23 Work with NRLI fellows from FWC Division of Law Enforcement and UF Wildlife Ecology Program to put together a local stakeholder meeting and panel as part of a statewide seagrass management initiative and NRLI practicum. (Staugler)

A stakeholder facilitated meeting was held in Tallahassee in August 2006. As a result of the meeting, the stakeholders were able to come to consensus on seagrass protection measures. The committee and FWC are moving forward with the recommendations from its meeting.

- 6.24 Work to enhance water quality around Pensacola Bay. (Verlinde)

Created awareness of water quality in Pensacola Bay through such programs as the Resource Rangers, Clean Boating Partnership, and Pensacola Waterway Tours (see 6.26).

- 6.25 Coordinated materials, equipment and sample drop-offs for the Lakewatch program in Santa Rosa County. (Verlinde)

Coordinate materials, equipment and sample drop-offs for the Lakewatch program in Santa Rosa County. Sampling equipment and materials have been provided for 3 sampling sites included in the Florida Lakewatch Program. Samples and equipment are picked up by the Santa Rosa Sea Grant Agent.

- 6.26 Coordinate and lead the 2<sup>nd</sup> Pensacola Watershed Tour. This will be a tour of the watershed from SW Alabama to the coastal area of Florida for community leaders from both states. The goal is to educate participants on watershed impacts and successes involving water quality issues and continue

collaborative efforts of watershed management for officials in both states of the watershed.  
(Verlinde/Diller)

Assisted with the coordination and program for the 2nd annual Pensacola Bay Watershed Tour, provided materials and bus ride video on the Gulf of Mexico Alliance. 50 participants enjoyed the urban watershed field trip that featured stops in Escambia and Santa Rosa Counties.

- 6.27 Provide general educational training and assistance to improve coastal habitats throughout the Pensacola Bay Watershed. (Verlinde)

See 9.46 and 9.47

- 6.28 Provide aquatic nuisance species information to 4-H leaders, teachers, and the public at various talks and programs. (Verlinde/Diller)

Coordinated, planned and taught an invasive species workshop for 37 teachers, 4-H leaders and informal educators. Aquatic invasive species and upland invasive species information was provided as well as hands-on activities from the Florida Sea Grant/Tampa Aquarium Invasive species curriculum. Evaluations showed a forty percent increase in knowledge of invasive species. In addition, two teachers were interested in service learning projects concerning invasive species.

Working with the Bagdad Waterfronts Partnership, invasive species were identified at the historical Bagdad Mill Site. The eradication of Cogongrass is being undertaken by members of the partnership.

- 6.29 Coordinate an oyster reef restoration project in East Bay. Use oyster reef importance/ecology curriculum developed in support of this project. Provide updates on restoration and field activities to restoration sites for community leaders and students. (Verlinde)

Oyster shells were deployed as part of the Offer Your Shell to Enhance Restoration (O.Y.S.T.E.R.) program with FDEP. Shells are collected from area restaurants and placed in local waterways to enhance estuarine habitats. Oyster curriculum has been utilized by 2 teachers who attended previous workshops.

Fossilized oyster shell was deployed by the Florida Department of Agriculture and Consumer Services/Division of Aquaculture/Shellfish at 4 locations in Santa Rosa County. Updates on progress were provided to the SRC MAC and repeated attempts to get community leaders and the media have been unsuccessful due to weather conditions and short notice.

- 6.30 Work with UF/IFAS West Florida Research and Education Center researchers on dune restoration research projects. Coordinate volunteers for planting. Provide educational materials on restoration sites and to various organizations. (Verlinde)

Volunteers from the Navarre High School 4-H marine biology club were recruited for one UF research dune planting on Okaloosa Island.

Beach renourishment was completed by Santa Rosa County at Navarre Beach. Six miles of beach was renourished with state and county funds. This project was contacted out and no room for research was included in the project.

- 6.31 Continue to support Project Greenshores, a FDEP habitat restoration initiative. (Verlinde/Diller)
- The agent continued to serve on the Project Greenshores steering committee. Development of Site 2 of the project has been delayed due to permits and staffing. The Environmental Education Coordination Team organized 90 youth in planting marsh plants at site 1.
- 6.32 Coordinate Coastal Clean-Up and Monofilament Madness events with local elementary school students. Additional goal is to increase school participation. (Wasno)
- Agent resigned. Activities not undertaken.
- 6.33 Efforts related to the Florida COOS Caucus will help shape Florida's role in the R-COOS (regional COOS which is not necessarily SEACOOS). Finding ways to incorporate BIOSENSE effort into SEACOOS thematic areas (Fisheries/Ecosystems) will help transition SEACOOS into SECOORA by addressing IOOS societal goals related to ecosystem management and public health. (Simoniello)
- Active participant in FLCOOS Caucus in 2006, assisting in meeting logistics and program development.
- 6.34 As part of a four state effort in the Gulf of Mexico region, conduct and sponsor several training programs for extension faculty and formal educators that provide latest science on issue of aquatic and marine invasive species. (Spranger: ET-13)
- Coordinated activities and provided funding support for county extension faculty to provide several training programs on issue of aquatic and marine invasive species in the Florida Panhandle, North Florida, and Southeast Florida. Funding was also provided to assist in the development of a CD "Intruders in Paradise: Invasive Species in Florida" that was distributed to teachers and those that attended the various workshops held in the state.
- 6.35 Work with partners throughout Florida and beyond to develop and improve volunteer water quality monitoring programs. (Jacoby)
- Little progress made due to lack of funding.
- 6.36 Work with partners to develop and implement training and curricula dealing with a watershed approach to water quality. (Jacoby)
- In-service training held and another planned.
- 6.37 Research cruise/dive support in August, 2006 to deploy/test fluorometers/sensors to be used in monitoring HABs, chlorophyll a and turbidity. Test platforms to determine if sensors are meeting IOOS operational requirements. (Simoniello)
- Participated in deployment of fluorometers and sensors. Analysis will continue in 2007 to see if they meet IOOS requirements.
- 6.38 Continue to conduct applied research on the economic consequences of red tide events on businesses and communities of SW Florida. Project is funded via U.S. EPA. The project will address the impacts on local businesses of red tide events in the Collier County to Pinellas County region. (Adams)

Project work is on-going. An additional grant was received for the EPA contract. Work is looking at changes in daily sales data for four restaurants in the Amelia Island/Longboat Key region. In addition, beach attendance data is being examined for changes due to red tide events. Work is supporting the PhD research of FRED student Kim Morgan. Preliminary findings of this work were presented at the 12<sup>th</sup> International HAB Conference in Copenhagen, Denmark in September, 2006.

- 6.39 Present a paper at the International HAB Conference, Copenhagen, Denmark. (Adams)

See above

- 6.40 Conduct educational programs on sea grass beds and salt marshes in St. Andrew Bay and how they are an important part of the ecosystem for various fish species and water quality. (Cameron)

Conducted educational programs on sea grass beds and salt marshes in St. Andrew Bay and how they are an important part of the ecosystem for various fish species and water quality through a partnership with the NOAA Fisheries lab in Panama City. Through beach field trips and classroom enrichment involving hands on touch tank events, over 500 youth learned about sea grass beds and biodiversity in St. Andrew Bay and could identify at least 5 fish found in the bay.

- 6.41 Coordinate 2006 South Florida Extension Natural Resource Summit. The objective is to increase effectiveness and coordination of natural resource extension programming in south Florida. (Stevely)

Organized (chair of organizing committee) the 2006 South Florida Extension Natural Resources Summit March 9, Immokalee, FL. There were 42 participants representing all facets of natural resource extension programming. Program evaluation documented that the information presented would be used in extension natural resource programming.

- 6.42 Train 40 Extension Master Gardeners in Manatee and Sarasota County in coastal plant ecology and identification. (Stevely)

A total of 25 Master Gardeners received training in coastal plant ecology and identification. Program evaluation documented a significant increase in knowledge.

- 6.43 Conduct mangrove management program for property managers and landscape maintenance professionals in Manatee and Sarasota County. (Stevely)

Held Mangrove Shoreline Management Workshop with extension horticulture programs in Manatee and Sarasota counties (February 9th, Sarasota, FL). A total of 90 participants reported the information presented would allow them to more effectively manage mangrove shorelines.

- 6.44 Provide training session on relationship between nutrient loads and red tides for extension horticulture faculty. (Stevely)

Completed Manatee Co. Fact Sheet and newsletter article: "Does Coastal Pollution Cause Red Tides." Assisted in planning red tide informational presentations for Extension Horticulture Agents in South Central Extension District.

- 6.45 Maintain functional Sarasota Bay Estuary Program Technical Advisory Committee. (Stevely)

A functional Sarasota Bay Estuary Program Technical Advisory Committee was maintained (chaired 5 meetings).

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

6.46.1 Continue to serve as the Local Navigator for the Appreciation and Awareness Focus Team of the Southeast Florida Coral Reef Initiative (SEFCRI).

Continue to partner with Florida Department of Environmental Protection's Coral Reef Conservation Program to coordinate and implement the SEFCRI Awareness and Appreciation Local Action Strategy projects. (Behringer)

Selected to participate in the Project WET Coral Reef Education Project. Developed coral reef curriculum that will be field tested and finalized in 2007 and distributed nationally through Project WET workshops. (Behringer)

6.46.2 Develop a marketing identity for the Southeast Florida Coral Reef Initiative.

Agent resigned, activity not completed.

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

Agent resigned, activity not completed.

6.46.4 Educate the general public, resource user groups, educators and youth about the coral reefs, impacts to them and how to conserve them through workshops, festivals and other educational programs.

Presented a talk on local coral reef ecology and the SEFCRI to 56 members of the Wynmoor Nature Club. Pre and post test results indicate a 51% knowledge gain.

Presented a talk on local coral reef ecology and the SEFCRI to 30 members of the N Club (boating club).

Presented a talk on local coral reef ecology and the SEFCRI to 45 Broward County Public School marine magnet students. Pre and post test results indicate a 37% knowledge gain.

Presented a talk on local coral reef ecology and the SEFCRI to 90 high school students at the American Heritage Environmental Awareness Day. Pre and post test results indicate a 54% knowledge gain.

Presented a talk on local coral reefs and SEFCRI to 50 student participants in Youth Leadership Broward, sponsored by the Leadership Broward Foundation and Broward County School Board to educate students about community issues. Pre and post tests results indicate a 31% knowledge gain.

Staffed a Florida Sea Grant Extension booth at the Broward County Water Matters Day and distributed SEFCRI coral reef educational material to approximately 2,800 students.

Served as a marine resources panel representative for the Leadership Fort Lauderdale program sponsored by the Greater Fort Lauderdale Chamber of Commerce. Presented a talk on the SEFCRI and local coral reef management and conservation issues to 25 class participants.

Presented a talk on local coral reef ecology and the SEFCRI to 30 teachers at a coastal resources teacher workshop. Pre and post test results indicate at 48% knowledge gain.

Educated 46 elementary students on coral reefs, threats to them and what they can do to help.

Staff a SEFCRI booth at the annual Ocean Fest in Ft. Lauderdale. Distributed coral reef educational material to approximately 1,250 scuba divers, fishers and boaters.

Staffed a SEFCRI booth at the annual World's Ocean Day event and distributed coral reef educational material to approximately 500 visitors.

Interviewed by CNN Comcast Newsmakers Headline News regarding local coral reef issues and the SEFCRI. This segment reached 600,000 viewers in south Florida.

6.46.5 Serve as the Outreach Committee Co-Chair for the 11<sup>th</sup> International Coral Reef Symposium.

Participated in planning meetings for the 2008 International Coral Reef Symposium and initiated set up of a local coral reef photography exhibit at a Fort Lauderdale art gallery to occur during the 2008 symposium.

6.47 Continue to work with the Apalachicola River Basin Invasives Workgroup to establish partnerships and educate elected officials and the general public on environmental problems associated with invasive species. (Mahan)

The Agent worked with the Apalachicola River Basin Invasives Workgroup to educate Apalachicola City Commissioners and property owners about invasive exotic plants and their potential impacts on coastal & river environments.

As a result, the Commissioners agreed to work with group to seek funding to control invasive exotic plants growing in the watershed on City property.

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

7.1 Vulnerability of human settlements to damage from natural disasters is a significant constraint to local and global sustainability. Local growth management strategies have been advocated as a principal strategy for reducing such vulnerability, but empirical analysis of direct measures of the effectiveness of such strategies is very limited. Principal beneficiaries will include the Florida Department of Community Affairs, local governments of coastal jurisdictions in Florida, and state and local governments in other coastal areas of the United States. (Deyle/Chapin/Baker: R/C-P-26)

Preliminary results indicate that Florida's planning mandate, viewed by most planners as the most prescriptive in the United States, may have been only modestly effective in minimizing the exposure of people and property to hurricane flooding. The quasi-experimental research design for assessing the apparent impacts of comprehensive plan adoption is the first to be employed on a large data set. Causal analysis of the influence of plan quality on land use outcomes will be the first to test the effects of changes in plan policies over time based on archival analysis of plan contents. A method has been developed for retrospectively documenting changes in land use based on property appraise data that will be of great value to a wide range of plan and policy implementation and effectiveness analysis questions. Presentations made describing the methods and preliminary

findings have generated keen interest from planning scholars and planning professionals, including project co-sponsors at the Florida Department of Community Affairs.

- 7.2 The implementation of affordable solutions to mitigate damage from hurricane winds can only follow from a quantification of the wind forces causing this destruction, models that relate wind forces to the capacity of man-made structures to resist them, and engineering-based evaluations of the cost effectiveness of various mitigation techniques. There is a strong need for a public risk model that will allow for a scientific and accurate evaluation of the cost effectiveness of mitigation measures on the scale of city, county, or state. (Gurley/Pinelli/Subramanian: R/C-S-45)

Reported in performance measures section.

- 7.3 The fundamental motivation for this project is that rip currents have resulted in significant numbers of deaths both in the State of Florida and the Nation. A predictive rip current index can be employed to reduce the number of rip current related rescues and deaths by more accurately identifying the conditions under which the strongest and most dangerous rip currents will occur and hence providing real-time information with which to assist lifeguards with staffing decisions and to alert the public to the hazard. The goal of this project is to develop the index. (Thieke/Kennedy/Hanes: R/C-S-44)

Reported in performance measures section.

- 7.4 Assist Sea Grant faculty with the development of the Specialized Marine Action Response Team (SMART) for response to disasters occurring in marine and coastal habitats. (Cameron)

Assisted Sea Grant faculty with the development of the Specialized Marine Action Response Team (SMART) for response to disasters occurring in marine and coastal habitats. Assisted with workshop development and needs assessment for disaster response in coastal areas.

- 7.5 Continue to provide educational programs/displays for beach safety and hurricane preparedness focusing on rip currents, shark awareness, sun safety, and boat preparation for hurricanes. (Cameron)

Continued to provide educational programs/displays for beach safety and hurricane preparedness focusing on rip currents, shark awareness, sun safety, and boat preparation for hurricanes. Educated over 200 youth about shark awareness so they could provide 10 ways to reduce the risk of being attacked by a shark. Distributed 30 rip current signs to local condos and resorts along Panama City Beach to increase awareness of rip currents how to escape them. Educated over 50 boat owners on how to prepare their boat for hurricanes.

- 7.8 Continue assisting Escambia County Marine Resource Division, and other groups to respond to storms, develop Specialized Marine Action Response Teams (SMART), and produce and distribute educational information. (Diller/Jackson/Verlinde)

Hosted the Florida Sea Grant hurricane Specialized Marine Assessment and Response Team (SMART) training at the Escambia County Windstorm Mitigation Building. Twenty six Sea Grant faculty from six states participated in the training which discussed what these response teams could provide communities before and after hurricanes. The group also toured the Escambia County Emergency Operations Center.

- 7.9 Continue to provide general and boating specific hurricane preparedness information to the general public via the local mass media outlets. (Gregory)

Provided information during 2006 hurricane season.

- 7.10 Provide one-on-one consultations to people on red tide and other coastal hazards. (Mahan)

- 7.11 Working with regional Florida Fish and Wildlife Conservation Commission, a public awareness campaign will be created to increase awareness of the direct economic and recreational value of marine fish species, the indirect economic value of sea grass beds, and the economic and ecological impacts of illicit harvest activities. Efforts may be initiated to increase funding and/or support for regulatory agencies and to increase awareness of such activities among regional organizations with regulatory power. (Sapp)

Agent resigned. Work not completed.

- 7.12 Expanding the Carolina's Coast project-a partnership between ocean observing system programs in the southeast and the Wilmington, NC Weather Forecast Office- into Florida. Extension efforts include facilitating meetings between the National Weather Service, SEACOOS data management folks and private stakeholder groups; forming a marine advisory group to provide feedback/test products developed through the Tampa WFO/SEACOOS project. Regional extension efforts to promote the Carolina's Coast project will commence when the NWS officially launches the website (expected Fall, 2007). Expanding the project to the Miami-Dade County. Promotional products for the Carolina's Coast project will be developed in conjunction with Jen Dorton, CORMP outreach coordinator and Payne Seal and Braxton Davis of USC Baruch Institute. (Simoniello)

The prototype Carolinas Coast Marine Weather Portal, developed by forecasters, web designers, data managers, and outreach personnel working with Caro-COOPS, CORMP, COMPS and NWS WFOs in Wilmington, NC and Charleston, SC was successfully launched and is currently being used to disseminate consolidated marine information for North Carolina, South Carolina and northern Georgia: [www.weather.gov/carolinascoast](http://www.weather.gov/carolinascoast). Work with the Southern Region Headquarters and WFOs to expand the Carolinas Coast marine portal into Florida, creating a standardized Southeastern Marine Weather Portal that covers the entire Southeast Coastal Ocean Observing Regional Association (SECOORA) domain, has begun. FSG is providing support for two contractors (Charlton Purvis and Vembu Subramanian) to develop the marine portal for the Tampa WFO. Three meetings with NWS-WFO personnel, SEACOOS data management folks, private sector stakeholder groups (WeatherFlow Inc.), and O&E folks have been held in Ruskin (2) and St. Petersburg (1), FL. A marine advisory group for the Tampa Bay area is 75% complete-but not fully engaged until there is a prototype product ready for evaluation locally. An LOI submitted to the NOAA CSC was approved and a full proposal in support of the expansion is pending approval. Expansion into Miami-Dade County is contingent on approval of funds.

- 7.13 Provide hurricane preparedness and water safety information at various events and programs. (Verlinde)

Santa Rosa County Emergency Management participated in the Seagrass Awareness Celebration and Coastal Encounters events. Florida Sea Grant provided water safety information at these events.

Water safety presentations were presented at Milton and Gulf Breeze public libraries to 50 youth.

Contributed to coordination of Florida Sea Grant Hurricane Specialized Marine Assessment and Response Team (SMART) training. 26 Sea Grant Faculty from 6 states participated in the training

and discussed what response teams could provide communities before and after hurricanes. (D. Jackson, Diller & Verlinde)

- 7.14 The Miami-Dade County Agent will provide hurricane preparedness information to area bait shops, marinas, and boating supply stores as they prepare for hurricane season. (Crane)

Information provided during 2006 hurricane season.

- 7.15 The Miami-Dade County Agent will continue to secure funding in effort to produce a comprehensive digital video guide on hurricane preparedness for marinas and boat owners. She will continue to work with a multi-disciplinary statewide Technical Advisory Committee to determine planning needs and assessments. (Crane)

Funding secured. Agent resigned. Work to be completed in 2007 by other Sea Grant agents.

- 7.16 Develop a regional training program on hurricane preparedness for marine agents, and establish a “specialized marine action and assessment response teams” (SMART) for response to coastal disasters in marine and coastal habitats. (D.Jackson, M. Spranger)

We coordinated a hurricane action and assessment response in-service training at the Escambia County Extension Hurricane House in Pensacola on 23-25 January 2006. Participants included 28 extension faculty from the states of Texas, Louisiana, Mississippi, Alabama, Florida and Georgia. Funding was provided through a FEMA Grant. Discussion centered around pre-hurricane event, response, recovery and rebuilding strategies and exploration of regional cooperative, mutual aid efforts in preparation for the 2006 hurricane season. The following objectives of the training were met: 1) Participants identified “lessons learned” from the previous two years of hurricanes and what roles Sea Grant extension agents could play in addressing marine and coastal clientele in both pre and post hurricane, 2) Participants received an understanding of the formal incident command system (ICS) that is put into place following a natural disaster and identify what “essential service functions” Sea Grant Extension agents might play in the EMS on a county level, 3) Participants identified educational needs and gaps that could be addressed prior to the 2006 hurricane season, 4) Participants were provided an understanding and new skills in becoming a self-contained team that would work in post-hurricane response, assessment and recovery efforts.

## Scientific Literacy

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

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

- 8.1.1 A minimum of two qualified applicants will be submitted annually to the Sea Grant John A. Knauss Marine Policy Fellowship national competition. Over each five-year period, an average of one Knauss Fellow per year will be from Florida.

For the 2006 Class of Fellows, five applicants were submitted. Two were selected, but one withdrew prior to placement:

- Christian Barrientos (UF)
- Chanda Littles (UF) (withdrew)

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

No competition was held in 2006.

- 8.1.3 At least 30 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students.

For 2006, 30% of all research funds supported graduate students.

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

A total of six students were awarded Aylesworth (5) and Old Salt (1) scholarships during 2006.

- 8.1.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship.

One high school senior, Nicole Bell, Central High School, received a one-year scholarship and enrolled at Pasco Hernando Community College during 2006.

- 8.1.6 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held.

No students expressed an interest in submitting proposals although the competition was advertised widely.

- 8.2 A minimum of \$600,000 per year in non-national Sea Grant CORE program funding will be received from extramural funding sources to support Sea Grant programs. (Cato)

A total of \$629K in non-Sea Grant core funds were received in 2006 and administratively handled by Florida Sea Grant.

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

See Section 10.0 (Self Evaluation) for this analysis.

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

For the 2006-08 (2006-07 was first year) Florida Sea Grant two-year program, six of the sixteen participating institutions were successful in competing for research funds. Two other institutions also are participating.

Florida Atlantic University  
 Florida Institute of Technology  
 Nova Southeastern University  
 University of Georgia

University of Florida  
 University of south Florida  
 University of West Florida  
 Smithsonian Marine Station

A total of fifteen different academic departments (disciplines) are participating in 2006-07.

Aquaculture (HBOI)	Law (UF)
Biological Sciences (FIT)	Marine Science (USF)
Biology (UWF)	Medicinal Chemistry (UF)
Biomedical Marine Research (HBOI)	Oceanography (NSU)
Chemistry and Biochemistry (FAU)	Pharmaceutical & biomedical Sciences (UG)
Civil and Coastal Engineering (UF)	Smithsonian Marine Station (Fort Pierce)
Fisheries and Aquatic Sciences (UF)	Whitney Laboratory for Marine Bioscience (UF)
Food Science & Human Nutrition (UF)	

Six Faculty Progress Reports were distributed.

Campuses visited were: University of Miami, University of South Florida, University of West Florida, Florida A&M University, University of North Florida, Florida Institute of Technology, Harbor Branch Oceanographic Institution, Florida Gulf Coast University, Jacksonville University.

- 8.5 An average of four Florida Sea Grant supported seminars will be funded annually as a way to increase the skills of faculty and students in ocean and coastal related academic disciplines. (Seaman/Cato: PD-06-1)

Six seminars were sponsored during 2006. They were as follows:

<u>Speaker</u>	<u>Title</u>	<u>University</u>
David Wethey	Ecological Forecasting in the Coastal Zone: Climate and Biogeography	UCF
Kam-biu-Liu	Paleotempestology of the U.S. Gulf and Atlantic Coasts	FIT
Adeel A. Butt	Application of Nanotechnology in Physiology and Disease Studies to Evaluate Environmental Stress	UNF
R. Grant Gilmore, Jr.	Discontinuous Utilization of Critical Estuarine Habitat: Hot Spots and Their Importance to Fishery Management	FGCU
Sandra Shumway	Bivalve Molluscs as Potential Vectors for Transport and Ecological Impacts of Harmful Algal Blooms	FGCU
James E. Wilen	Economic Impacts of Marine Reserves: The Importance of Spatial Behavior	UF

- 8.6 Conferences, workshops and travel to conferences and workshops will be supported for Florida Sea Grant researchers and potential researchers and Florida Sea Grant Extension and Communications faculty. The activity will be supported when consistent with priorities in the Florida Sea Grant Strategic Plan: 2002-2005. (Cato/Seaman: PD-06-2)

Support was provided for Extension Faculty to attend the annual Sea Grant Extension meeting and for research faculty and students to attend Marine Biotechnology Summit V.

- 8.7 Sea Grant Extension faculty will improve their content and process skills by attending a minimum of 8 days of in-service training workshops or conferences that support their individual educational programs (all agents).
- Faculty participated in a three day Extension Symposium, Marco Island and two day Florida Sea Grant planning meeting.
  - West coast agents and specialists attended three day Sea Grant regional training, brought agents/specialists together from North Carolina, South Carolina, Georgia and Florida.
  - Agents attended a variety of programs and workshops that enhanced their professional development. These included following topics:
    - Fisheries management
    - Water quality sampling and monitoring
    - Hurricane preparedness
    - Marine Ecology judging
    - Artificial reef
    - Ocean observing systems
    - Social Marketing
    - Promotion and tenure
    - Environmental Science Communication
    - Natural Resources Planning
    - AAVS SCUBA Re-Certification
    - Estuarine Restoration

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

Coordinated annual Florida Sea Grant Extension (FSGE) In-service Training and Program Planning Workshop. This meeting was held in September, 2006 in conjunction with the annual Extension Professional Association of Florida. At this meeting, FSGE faculty reviewed past activities of the work action groups in such areas as fisheries, aquaculture, waterway management, coastal hazards, and marine education. They used this meeting to prepare their annual plans of work for 2007.

- 8.9 As part of a four state effort in the Gulf of Mexico, sponsor and conduct summer teacher Center for Ocean Science Education Excellence (COSEE) institute. Work with co-P.I.s in other states to coordinate activities, develop governance structure, develop online teacher training, and evaluate project activities (Spranger: COSEE-GOM)

An intense one-week, field-based education institute for eleven teachers and seven scientists was held in the summer of 2006. The field-based course focused on the broad areas of coastal habitats, coastal processes and marine technologies, and how they relate to federal and state curricula standards. FSG Extension faculty provided presentations at the institute. The field-based institute was complemented with a six-week internet-based distance learning program that focused on topics related to hurricanes. More than 50 educators from the region participated in the online program. Evaluations indicate that all participants increased their knowledge and are utilizing this new knowledge and skills in their respective classrooms. GOM-COSEE and FSG also were sponsors of the Florida Marine Science Educator Association Conference, held in Crystal River, Florida, and the 2006 State 4-H Youth Marine Ecology Contest that was held at the 4-H Youth Camp in Sebring, Florida.

- 8.10 Conduct evaluation of National Sea Grant Training Academy; by surveying attendees one year after the program has been completed to measure impacts and benefits. In 2005, 28 Sea Grant faculty from 20 states participated in this inaugural event. Results of the survey will be distributed to the National Sea Grant network, and data results will be used to solicit funds for continuation of the activity by the Sea Grant Assembly. (Spranger)

Conducted a survey of participants of the 2005 National Extension Training Academy. All participants have indicated that they are using the information in their extension activities. An internal network among participants has developed allowing the opportunity for more regional program activities. The graduates are beginning to leverage resources and grants among themselves to create new, synergistic programs that benefit marine and coastal resources users. Although there was verbal support for conducting additional national trainings from the Sea Grant network, lack of funding in 2006 prevented another Academy to be held. Future Academy trainings will be dependent on available federal funding in the future.

A spin-off of this training is that interest in this academy concept is that here is interest in many counties' developing a marine and coastal extension program modeled after the SGE model in the United States. Along with this interest in developing these programs, there is interest and need in training and capacity building of administrators and staff in these programs. The U.S. National Sea Grant Extension Academy is being looked at as a model for training and capacity building. In July 2006 Mike Spranger and Don Jackson were invited to provide an "extension training academy" to the Sea Partnership Program (SPP) in Indonesia. SPP is a newly formed marine extension program patterned after the United States Sea Grant Extension Model. More than 40 individuals from 25 provinces and universities attended this two-day capacity-building workshop. Feedback from the participants was that this was an excellent training as they further developed their SPP network. Funds for travel support for this training came from the Indonesia Government and NOAA's Office of International Affairs.

- 8.11 Participate as a Fellow in the Natural Resources Leadership Institute (NRLI) to develop skills necessary for effective natural resource leadership, communications, and conflict resolution. Over the course, seven 3-day seminars and activity sessions will be attended, and a course practicum completed. (Staugler)

Participated in NRLI. Practicum focused on impact of growth on seagrass beds.

- 8.12 Continue coursework toward a Masters Degree in Environmental Studies. (Staugler/Wasno/Verlinde)

Completed 12 hours of Masters Degree course work.

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

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

- 9.1.1 Produce high quality publications and productions that effectively communicate results of Florida Sea Grant activities to both general and specialized audiences. Productions include Sea Grant Reports, Sea Grant Extension Fact Sheets and brochures, Sea Grant Technical Papers, books, book chapters, staff papers, conference proceedings, newsletters, posters signage and electronic formats including CD-ROMs and videos. (Kearl/Zimmerman)

- 9.1.2 At least ten print or broadcast news releases will be produced. (Kearl/Zimmerman)
- 9.1.3 The Florida Sea Grant Internet home page and website will be upgraded and maintained. (Zimmerman/Whitehouse/Damron/Wagner)

See Section 10.0, Publications, and Section 9, Outreach Activities; Displays and Web-based Technologies/

- 9.2 Continue to conduct marine educational programs on monofilament recycling, marine debris, and marine/natural resources for local K-12 teachers in Bay County. (Cameron)

Continued to educate youth about monofilament recycling, marine debris, and marine/natural resources for local K-12 youth in Bay County. Educated 400 youth about monofilament and marine debris and how it affects the marine ecosystems and the animals that live in it.

- 9.3 Work with 4-H Extension agents in the development of marine environmental programs for local clubs and assist with county and marine 4-H camps. (Cameron)

Worked with 4-H Extension agents in the development of marine environmental programs for local clubs and assist with county and marine 4-H camps. Educated over 100 youth on hydrothermal vents and how photosynthesis is not used at the bottom of the ocean. As well as taught 40 youth about whales and dolphins found in the Gulf of Mexico.

- 9.4 Conduct public education program in Dade County. (Crane)

- 9.4.1 Volunteers who will participate in beach clean up activities will remove marine debris from the shoreline and will learn the impacts of litter to the shoreline.

Coordinated the Florida Coastal Cleanup for Bear Cut in Key Biscayne. 70 volunteers removed 200 pounds of debris filling 130 trash bags. Volunteers categorized the items collected in a report to be used by the Ocean Conservancy. 37 volunteers responded to a survey, with 28 said they gained knowledge on the impacts of litter to the shoreline.

- 9.4.2. Conduct presentations and workshops on marine environmental and ocean system topics for informal and formal educators/teachers.

Agent conducted 2 presentations and hosted 6 workshops on marine environmental and ocean system topics reaching 255 teachers/educators. As a result, 17,607 students will be taught this information in the classroom. Pre and post test indicated the following gain in knowledge:

Invasive Species Teacher Workshop: 29.5% gain in knowledge (12 attended)  
 Master Naturalist Class: 11% gain in knowledge (11 attended)  
 SEACOOS Hurricane Workshop: 38% gain in knowledge (41 attended)  
 Coral Reef Teacher Workshop: 40% gain in knowledge (82 attended)

- 9.4.3 Continue to manage and work with volunteers to construct and install outdoor fishing line recycling bins and continue to educate citizens on the impacts of discarded fishing line to the marine environment.

Collaborated with Citizens For a Better South Florida to teach 15 boy scouts how to construct and install 9 fishing line recycling bins for 2 local parks (Legion Park and Tropical Park). Volunteers were taught about the impacts of discarded line to the

environment. 15 volunteers donated 93 hours of community service by installing bins and educating anglers about the recycling program.

- 9.4.4 Conduct classroom presentations and field studies to teach youth (K-12 grade) the basic concepts of the coastal and marine ecosystems.

1,470 youth were educated about marine animals and their environment through classroom presentations for career days, outdoor field studies, or hands on demonstrations at community events. 100% of the participants indicated an increase in knowledge of the marine environment.

- 9.4.5 Assist in conducting a workshop for landscape architects on mangrove maintenance in south Florida.

Hosted a seminar and presented a talk on mangrove biology to 34 people who attended the Mangrove Maintenance Short Course Seminar, as part of the Miami-Dade County Extension Mangrove workshop. Pre-post tests indicated an 18% gain in knowledge.

- 9.4.6 Online or hard-copy newsletter will be developed on local marine/coastal topics that are distributed to interested citizens. Bi-monthly "At the Waters Edge" will be distributed to 200 people.

Agent authored and edited 6 bi-monthly "At the Waters Edge" newsletter and distributed it in print and electronic format to 200 people.

- 9.4.7 Continue to maintain and update the Miami-Dade County Sea Grant website with current information of marine/coastal topics.

Agent continues to update and maintain the Miami-Dade County Sea Grant Website. A new design layout was initiated this year for the Miami Sea Grant website.

- 9.4.8 Assist county staff in developing a youth fishing program to promote ethical angling practices.

Hosted a youth sport fishing clinic at Black Point Marina. Sponsors included the Miami Billfish Tournament and the Captain Bob Lewis Fishing Foundation. 22 youth learned important ethical angling skills of knot tying, casting, catch and release, and environmental education. Youth expressed interested to join a youth sport fishing club in Miami. Family fishing days and evening programs are planned for 2007.

- 9.4.9 Work with Extension 4-H staff and club leaders in developing marine environmental program for local clubs.

Instructed 20 4-H kids on how to dissect a dogfish. Kids learned the anatomy and biology of sharks in addition to dissection procedures.

Coordinated with local 4-H staff field activities to study marine plants. In addition, organized a trip to Bill Baggs State Park to identify plants to help prepare for the state marine ecology judging event.

Taught 26 foster kids from His House about marine life and its value to the oceans with the local 4-H Club.

Completed a 4-H Marine Science Curriculum Guide for elementary level focusing on math and reading state standards.

9.4.10 Work with county Extension staff in developing educational fair exhibits for the annual Miami-Dade County Fair.

Assisted Extension Agents in the design and construction of our Cooperative Extension Exhibit for the Miami-Dade County Fair.

9.5 Three hundred fourth grade students will become more knowledgeable about the marine environment by attending the “Ecosystem Explorer” program at the St. Lucie County Marine Center. (Creswell)

180 – 4th grade students from St. Lucie County public schools successfully measured water quality parameters in the Indian River Lagoon during the “Ecosystem Explorers” field program at the St. Lucie County Marine Center.

9.6 Two hundred seventh grade students will become more knowledgeable about the marine environment by attending the “Ecosystem Explorer” program at the St. Lucie County Marine Center in conjunction with classroom instruction at their schools. (Creswell)

120 – 7<sup>th</sup> grade students from St. Lucie County public schools successfully compared quadrat and transect sampling techniques on a virtual coral reef community display through the “Ecosystem Explorers” field program at the St. Lucie County Marine Center.

9.7 Three hundred fifth grade students attending middle and high schools in the St. Lucie County School District will improve their knowledge of marine science through the “Motion in the Ocean” program, a hands-on instructional which focuses on the relationship between anatomical form, function and adaptation to the environment. (Creswell)

750 – 5<sup>th</sup> grade students from St. Lucie County public schools successfully completed the “Motion in the Ocean” anatomical/adaptation classroom demonstration. Each student identified taxonomic groups of marine organisms based on their morphology and mode of locomotion.

9.8 Two hundred 4-H, Indian River “Lagoon Days”, and other summer camp students will increase their knowledge of the Indian River Lagoon through field activities, such as beach seining, benthic sampling, canoeing, and observation. (Creswell)

625 – 5<sup>th</sup> grade students from Indian River county public schools increased their knowledge of the Indian River Lagoon during a day long field activities. The agent instructed students in proper canoeing techniques and boater safety. Each student was required to demonstrate the techniques through in-water demonstrations.

9.9 Two hundred students attending middle and high schools in the St. Lucie County School District will improve their knowledge of marine invasive species in Florida and methods to decrease introductions of non-native marine species. (Creswell)

124 – 11<sup>th</sup> and 12<sup>th</sup> grade students from St. Lucie county public schools improved their knowledge of marine invasive species in Florida during classroom seminars. Each student successfully defined the attributes of an “invasive species” and correctly named at least one marine invasive species established in Florida.

9.10 Continue bi-weekly radio broadcast “At Home in St. Lucie” (1/2 hour program) discussing topics related to the impacts of coastal development and man’s activities on the marine environment. (Creswell)

19 – ½ hour radio broadcasts conducted on WPSL – Port St. Lucie, Florida were presented on various topics related to the marine environment, clean boating habits, hurricane preparedness for boaters, ecosystem restoration, aquaculture, and the St. Lucie County Monofilament Recycling Program.

- 9.11 Conduct at least two workshops dedicated to public education of marine invasive species. (Creswell)

47 – adults from Brevard County increased their knowledge of marine invasive species through a series of public lectures on that topic sponsored by the Marine Resources Council of Brevard County, FL.

- 9.12 Maintain and update the Escambia County Marine Extension website with local marine resource information, sea turtle education, and educational events. (Diller)

Escambia County Marine Extension web site updated with information on the USS Oriskany artificial reef, local sea turtle nesting, and upcoming educational events. Over 500 people visited the site for information in 2006.

- 9.13 Work with Extension 4-H specialists and agents in the development of marine environmental programs for youth. Assist with development and activities at state marine and county 4-H camps. (Diller)

Assisted with the organization, instruction, and staffing of the State 4-H Marine Camp at Camp Timpooshee in Niceville. The week-long camp had over 110 youth in attendance who participated in activities including fishing, kayaking, snorkeling, and learned about fish identification, deep sea life, and other marine/coastal issues. (Verlinde, Diller, Cameron, Jackson)

Assisted four youth from Escambia County receive scholarships from the West Florida Regional Planning Council, the State 4-H Office, and the Escambia County EFNEP program to attend the 2006 State 4-H Marine Camp.

Attended two-day meeting in Gainesville to serve on the State 4-H marine education work action group. Group is tasked with updating state 4-H marine curriculum and will begin with beach ecology materials. (McGuire, Verlinde, Diller)

- 9.15 Develop marine environmental programs for K-12 teachers and youth. Continue writing Resource Rangers video series and developing associated educational programming. (Diller)

Escambia and Santa Rosa County agents co-organized “Bay Day 2006” as members of the Environmental Education Coordination Team (EECT). Approximately 1100 sixth grade students in Escambia County attended this two-day environmental festival in downtown Pensacola. More than 25 exhibitors provided demonstrations and hands-on activities in environmental sciences. Exhibitors included Gulf Power, The Zoo, Florida Department of Environmental Protection, Escambia County, City of Pensacola, Northwest Florida Wildlife Sanctuary, University of West Florida, and UF-IFAS Extension. (Diller & Verlinde)

Escambia agent served as chairman of the Environmental Education Coordination Team (EECT). The EECT’s Resource Rangers educational program taught over 4600 youth during classroom visits and field trips during 2006. Locations utilized included Gulf Islands National Seashore, Blackwater State Park, Big Lagoon State Park, and Shoreline Park of Gulf Breeze. Topics included salt marshes, forestry, water quality, storm water, beach ecology, and sea grasses. (Diller & Verlinde)

Escambia and Santa Rosa County agents assisted with writing and production of Resource Rangers television/video episodes on air quality, the rural-urban interface, and urban forestry. To date, nine episodes have been completed in the award winning series. The episode entitled "Sharing Our Space" was recognized with a University of Florida IFAS Gold Image award in 2006. (Diller & Verlinde)

The Escambia agent partnered with the Florida Yards and Neighborhood Agent to host a Project WET workshop for local teachers. A dozen teachers attended the one-day workshop and received curriculum and training in water and aquatic resources.

Escambia agent presented programs on fish, sea grasses, shorebirds, sea turtles, hurricanes, marine debris, watersheds, and dune/beach ecology to youth in 4-H home school groups, Baptist Hospital Lakeview Center summer camp, Scenic Heights Elementary School, Pine Meadow Elementary School, West Florida High School, and Gulf Islands National Seashore.

- 9.16 Develop and assist production of website, newsletter, or newspaper articles on local marine/coastal topics that are distributed to interest citizens. (Diller)

Escambia agent updated Escambia County Marine Extension website with articles on topics of interest. Also presented marine and coastal resource programs at the Garden Club Center in Pensacola and Pensacola Power Squadron meetings where the information provided was included in local newsletters.

- 9.17 Provide Master Naturalist Program training to interested citizens and continue to develop volunteer program for local Sea Grant extension programs. (Diller)

Master Naturalist Program training not held in 2006 due to recovery from Hurricane Dennis in 2005. Resumption of program scheduled for early in 2007.

- 9.18 The Okaloosa/Walton County agent will provide support to teachers conducting classroom enrichment projects such as NaGisa at Niceville and South Walton High Schools. Additionally, a supporting team role will be taken for COSEE and 4-H Camping Projects. Frontline planning and teaching roles will be taken for projects such as State Marine Camp, Local School programs such as Dunes in Schools, Florida Master Naturalist, Cooperative Teacher Education programs with Dauphin Island Sea Lab, and Sea Turtle Education programs. (S.Jackson)

- 9.19 Work with 4-H, Florida's National Estuary Programs and National Estuarine Research Reserves, and other partners to implement a program dealing with estuaries. (Jacoby)

In-service training on science communication held. Initial Marine Education Work Action Group attended. Discussions proceeding.

- 9.20 Teach 4-H and other youth programs (including summer camps) relating to marine issues/topics. (McGuire)

9.20.1 Teach workshops for 4-H marine ecology judging event.

Two 4-H home school clubs in the agent's area, one in Duval and one in St Johns County, trained for the 2006 marine ecology judging event. Agent attended two club meetings, conducted three workshops and a mock competition to help youth prepare for the competition. Nine youth from Duval and five from St Johns competed. The junior

team from St Johns county had first, second and third place individual high scores (and won first place team).

- 9.20.2 Conduct teacher workshops on invasive species, working with deaf clients, field studies, including presentations at NMEA, FMSEA conferences.

Agent taught two teacher workshops on invasives in St Johns County. Fifteen teachers from St Johns and Duval Counties attended one workshop; 8 teachers from Florida School for the Deaf and Blind attended the second. Agent taught invasives programs at FMSEA and FAST conferences; a total of 37 teachers attended these programs. Agent presented a poster presentation on conducting programs with deaf clients and gave a presentation on “Conducting Field Studies on a Shoestring Budget” at the 2006 NMEA conference.

- 9.20.3 Coordinate and teach Kids’ Day activities for First Coast Birding & Nature Festival (2 days). Serve on planning committee for First Coast Birding & Nature Festival.

Agent helped plan Kids’ Day activities for the First Coast Birding and Nature Festival. Agent arranged for youth from 4 elementary schools in St Johns County to attend the event; youth rotated between 8 environmental education booths where they participated in hands-on activities. Agent provided one booth’s activity on one day and two booths on the second day.

- 9.20.4 Continue to write the quarterly newsletter “aqua-notes”.

Agent wrote and published 4 issues of “aqua-notes” which is distributed to over 600 clients by mail and over 250 clients by e-mail. Topics covered in 2006 included invasive barnacles, hurricane preparedness for boat owners, measurement of fish and shorebird nesting.

- 9.20.5 Continue to write monthly articles for the Flagler News Tribune.

Agent wrote monthly articles for the Flagler News-Tribune (distribution 5500). Topics included fish release mortality, stingrays, marine debris, sea turtles and aquatic invasives. Average article length was 700 words.

- 9.20.6 Judge at local, regional and state science fairs. Select Skoch Scholarship recipient at state science fair.

Agent judged science fair projects at state, two regional and three school science fairs in 2006. Agent also selected Skoch scholarship winner at Florida state science fair. Agent was asked to teach a workshop for middle school teachers in St Johns County on scientific method and experimental design; 14 teachers attended this workshop in August, 2006. Agent gave 4 classroom presentations to high school students on scientific method and experimental design.

- 9.20.7 Continue to represent FSG on US Fish and Wildlife Service’s Manatee entanglement and manatee education working groups.

Agent continues to represent Florida Sea Grant on two US Fish & Wildlife Service manatee working groups—one on education and one on entanglement.

- 9.20.8 Continue to coordinate monofilament recycling program in NE Florida.
- Agent continues to coordinate monofilament recycling program in NE Florida; installed two new recycling bins in 2006.
- 9.20.9 Teach field trip programs for Coastal Master Naturalist classes.
- Agent led three field trips for coastal master naturalist classes in NE Florida.
- 9.21 Working primarily with key faculty in the University of Florida Department of Fisheries and Aquatic Science, a public awareness and education campaign will be continued to gain broad public support for a new project aimed at enhancing essential fish habitat off the coast of Taylor and Dixie Counties. Increased awareness of the Steinhatchee Fisheries Management Area project will be achieved through public presentations, comprehensive web-based publications, and through various regional print publications. (Sapp)
- While earning Taylor County a record amount of grant funds from the FWC Artificial Reef Program, a community support campaign was initiated and over 1,500 personal signatures were attained that expressed specific support for both the artificial reef program and for the Steinhatchee Fisheries Management Area, a large-scale conservation/fisheries enhancement project. Additionally, published articles (distribution: 65,000) served to stimulate support and active involvement in reef projects. Furthermore, web publications explaining the science and rationale of the conservation projects were accessed thousands of times a month.
- 9.22 Plan, market and produce a regional fishing tournament titled, "4-H Nature Coast Classic." This event will feature specific adult and youth education programs focusing on responsible angling and fisheries enhancement and conservation that are consistent with Florida Sea Grant. It will also feature a commercial expo that will draw many of the top boat, tackle, and marine-related equipment manufacturers in the State. Grant funding will be pursued to support the marketing of this event. (Sapp)
- Sponsorship sought and preliminary planning performed, but no tournament.
- 9.23 Continue to update and improve the development of the highly successful Taylor County Extension Service Web site, while directly referencing Florida Sea Grant and Florida Sea Grant programs in all Taylor County Marine program areas. Through direct marketing, effective design principles, and consistent "cross-promotional" efforts (direct reference in various outreach campaigns, web site traffic will increase by 150-200% during the second year (after increasing by over 1,500 % in the first year). (Sapp)
- Utilization of the Web site increased to 175% of the 2005 end-of-year amount through effective marketing, updated information and additional features.
- 9.24 Initiate a broad community education program that seeks to increase knowledge and awareness of Florida Sea Grant programs including aquaculture, fisheries, coastal habitats, boating and waterways, water quality, and coastal storms. Program areas will be tailored to issues and concerns that are relevant to Taylor County and the "Nature Coast." Consistent with regional demographic indicators, education will focus on the principles of empowerment and ownership. (Sapp)
- General increase in awareness through local government and citizen action groups achieved.
- 9.25 Conduct public education programs in Charlotte County. (Staugler)

- 9.25.1 Develop and maintain a Charlotte County Marine Extension website with local marine resource information.
- Website developed.
- 9.25.2 Research and write at least 12 columns for the WaterLIFE Magazine on marine-related topics, monthly distribution of 30,000.
- Monthly news columns written.
- 9.25.3 Write marine-related column for quarterly Extension Newsletter.
- Quarterly column written.
- 9.25.4 Participate in the planning and aquatics testing section of the Envirothon competition for high school students in SW Florida.
- Worked with Charlotte County FFA instructor to bring first Charlotte County team to SW Envirothon event since 2003 (before the hurricanes). The Gulf Coast Regional Waterways competed in state contest and finished 1<sup>st</sup> place in Aquatic Section and placed 2<sup>nd</sup> overall.
- 9.25.5 Work with CCA, & U.S. Coast Guard Auxiliary, and 4-H Marine Ecology Club to assemble, install and maintain monofilament recycling bins at marinas, ramps and fishing piers within the County.
- 32 recycling bins and signs are now located at 26 locations in the county.
- 9.25.6 Help coordinate Coastal Cleanup and derelict crab trap clean up events.
- 9.25.7 Provide coastal information and activities at various marine-related events.
- Continued to be speaker and provide education materials at US Power Squadron, Coast Guard Auxiliary, Fishing Clubs, Garden Clubs and teacher training workshops.
- 9.25.8 Provide marine-related speaker programs to at least six community organizations.
- Continued to be speaker and provide education materials at US Power Squadron, Coast Guard Auxiliary, Fishing Clubs, Garden Clubs and teacher training workshops.
- 9.25.9 Work with Wasno to organize the Boca Grande Pass cleanup event.
- Participated in the 5<sup>th</sup> Annual Boca Grande Pass Cleanup held in March, 2006. (see 2.65)
- 9.25.10 Distribute 40,000 Boating and Angling Guides.
- Distributed 10,000 guides in 2006.
- 9.26 Enhance the sustainability of the commercial fishing heritage of Cortez. (Stevely)
- 9.26.1 Organize 25<sup>th</sup> Annual Cortez Commercial Fishing Festival. This festival reaches 15,000 citizens with information on environmental issues. The festival generates the revenue (approximately \$60,000/year) to purchase 95 acres of environmentally sensitive land.

The 2006 Cortez Commercial Fishing Festival was held (February 18, 19, Cortez, FL.). A total of \$65,000 was generated for purchase of environmentally sensitive land.

- 9.26.2 Assist the Florida Institute for Saltwater Heritage (FISH) in conducting educational programming to support acquisition and management of the FISH Preserve, development of the Florida West Coast Maritime Museum at Cortez, and restoration of the 1912 Cortez School House.

Participated in six Florida Institute for Saltwater Heritage (FISH) board meetings. Progress continues to be made in development of the Florida Maritime Museum in Cortez.

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

See below

- 9.28 Provide coastal information articles to various media outlets. (Verlinde)

Contributed to the 4-H newsletter, the Bay Area Resource Council Newsletter, news articles concerning boating, water safety and upcoming coastal events, press releases and announcements for workshops, Seagrass Awareness and Coastal Encounters. (Verlinde)

Utilize a number of e-mail lists for announcements to teachers, 4-H leaders, scout leaders, Environmental Education Coordination Team, Florida Master Naturalists, Bay Area Resource Council members and the National Sea Grant Educators Network. (Verlinde)

- 9.29 Continue to support, coordinate and develop curriculum and videos for the Resource Ranger Program, and environmental education program for 4-H and students. The program includes curriculum, videos, day camps and field trips about coastal issues. (Verlinde)

Participated in script writing for stream restoration, urban forestry and sharing our space videos. 9 Resource Ranger videos have been completed to date. 2006 awards included an IFAS image award and Coastal Living Magazine Youth Environmental Education Award. (Verlinde & Diller)

Contributed to the coordination and presented the water safety jeopardy activity at the Environmental Education Coordination Teams' "Bay Day" 1111 sixth grade students attended this event. Essays from the event were provided by some teachers, one included a description of the water safety jeopardy activity "My favorite station at Bay Day was definitely the Jeopardy table. You could choose between "Beach Safety, Boating Safety, Water Safety, or Potpourri". Each one has choices between \$100 through \$400 dollars. They have questions about different color flags in the water and lifeguards. If you got any amount of money you can keep it or give it back. The money is light green and it says "Save our Bays" in the middle. You didn't get very much, but it was still fun, and my favorite. I wish that we could have played longer, but that was my favorite station at Bay Day!"

Resource Ranger hands-on field trips were provided for more than 1500 youth at various locations in the Pensacola Bay Area, such as Project Greenshores, Blackwater State Park, Shoreline Park, Naval Live Oaks, Big Lagoon State Recreation Area, Blackwater Fish Hatchery and Navarre Nature Walk Park. (Verlinde & Diller)

- 9.30 Coordinate the 6<sup>th</sup> annual Seagrass Awareness Celebration and 3<sup>rd</sup> annual Coastal Encounters event. (Verlinde)

More than 600 local residents and visitors attended these 2 events. Activities included: kayaking, fishing tips and ethical angling, Eat a Seagrass Bed, Know your limit fishing game, a marine themed Easter egg hunt, arts and crafts, touch tanks and fish ID, natural resource displays and information from SRC Emergency Management, FWC, US Fish and Wildlife Service, the Florida Keys Marine Sanctuary, National Park Service, Navarre HS 4-H marine club, Santa Rosa 4-H and Hagatha Slithers.

- 9.31 Teach Florida Master Naturalist Program wetlands and coastal modules. (Verlinde)

The agent presented coastal bird presentations for the Walton county FMN coastal module.

Many sites in Escambia and Santa Rosa Counties are still in recovery from hurricanes in 2004-2005, no local program was held.

- 9.32 Coordinate 21<sup>st</sup> annual NW Florida Rivers Clean-up and International Coastal Clean-up. (Verlinde)

Coordinated planning and more than 300 volunteers who participated in the 21st annual Northwest Florida Rivers Clean-up, more than 25 pickup trucks of debris was removed from area rivers and creeks. The Rivers Clean-up committee of the Santa Rosa Clean Community System purchased 5 Leave no Trace banners for area canoe venders as a show of appreciation for continued support of this program.

More than 150 volunteers participated in the annual Coastal Clean-up at Navarre Beach coordinated by the Santa Rosa Clean Community System.

- 9.33 Develop educational programs for 4-H, teachers, boaters and interested citizens on marine debris, safe boating and monofilament recycling. (Verlinde)

Marine Debris, safe boating and monofilament recycling displays were displayed at the Seagrass Awareness Celebration, Coastal Encounters, PJC Forestry Conclave, Blackwater Heritage Trail Earth Day Celebration, 4-H Week Expo and at various hand-on field trips for youth.

- 9.34 Work with extension 4-H agents in the development of coastal programs and activities for local clubs. (Verlinde)

See 9.39 and 9.46.

- 9.35 Provide coastal information and hands-on activities at various environmental events. (Verlinde)

See 9.30

Provided the “build a seagrass model” activity and materials to the Environmental Education Coordination Team for the Pensacola Earth Day Event, more than 1500 people attended this event with 200 seagrass beds built by participants. (Verlinde)

Provided Florida Sea Grant materials and display for the Pensacola Junior Colleges’ Forestry Conclave. More than 200 people attended this event.

- 9.36 Provide Santa Rosa County community leaders with coastal information. Support the SRC Board of County Commissioners Marine Advisory Committee. Work with Florida Sea Grant Waterfront group to develop a long range waterway management plan for Santa Rosa County. (Verlinde)
- See 5.32
- 9.37 Provide “Sea Turtle Friendly Beaches” program to beach residents. (Diller/Verlinde)
- Escambia and Santa Rosa County activities delayed due to hurricane recovery. Program will resume full activity in 2007.
- 9.38 Provide coastal issue talks to various community organizations. (Verlinde)
- The agent presented coastal restoration and estuarine ecology presentations at the Garden Gate Nursery in Gulf Breeze for 55 participants at 2 workshops.
- The agent presented a coastal habitats hands-on field trip for 8 Okaloosa College Adult Environmental Education students.
- 9.39 Support 4-H marine and county camps. Provide 4-H leaders and teachers with coastal information and opportunities. (Verlinde)
- The agent provided fishing and snorkeling field trips for the Santa Rosa / Bay county 4-H camps. 64 participants.
- The agent participated in coordination and program planning and provided materials and activities for the state 4-H marine camp. 113 participants.
- Provided a 4-H marine activity display at the 4-H week expo at the Santa Rosa County Auditorium. 50 participants
- Lead a field trip for junior 4-H marine club to the Grand Bay NERR in MS and the Weeks Bay NERR in AL. to prepare for the 4-H marine ecology event.
- Provide various materials and activities for 4-H beach ecology field trips.
- Participate in the development of the Beach Buddy Cloverbud curriculum with the 4-H marine education team work action group.
- 9.40 Publications to be completed in 2006: Hazardous Marine Creatures, Fish Resuscitation Tank System, Exotic Fishes and Invertebrates of Southwest Florida. (Wasno)
- Agent resigned. Work not completed.
- 9.41 Envirothon Academic Challenge – Plan is to increase school participation and have one school place in top 3 at state competition. (Wasno)
- Agent resigned. Work not completed.
- 9.42 Conduct “Fishing for Success” presentations at Lee County Library System. This is a series of four presentations for different skill levels. In addition to fishing skills, invasive species, outdoor safety, circle hooks, venting tools and fish identification is covered. (Wasno)

Agent resigned. Work not completed.

- 9.43 Fishermen's Educational Display covering 18 different topics of concern will be displayed at local fishing tournaments, boat shows and environmental events. This display will be used throughout southwest Florida by all Marine Agents. (Wasno)

Agent resigned. Work not completed.

- 9.44 Research and write at least 40 newspaper columns on a variety of environmental issues and topics. (Mahan)

The Agent had forty-three newspaper columns published this year in the Apalachicola & Carrabelle Times newspapers covering a variety of local to international environmental topics.

As a result of the columns there was a significant increase in the number of calls to the offer from homeowners asking for the most environmentally-friendly way of solving their problem.

- 9.45 Continue to work with the Apalachicola River Basin Invasives Workgroup to establish partnerships and educate elected officials and the general public on environmental problems associated with invasive species. (Mahan)

The Agent worked with the Apalachicola River Basin Invasives Workgroup to educate Apalachicola City Commissioners and property owners about invasive exotic plants and their potential impacts on coastal & river environments.

As a result, the Commissioners agreed to work with group to seek funding to control invasive exotic plants growing in the watershed on City property.

- 9.46 Provide teacher workshops for the marine collectors permit, Florida's Black Bear, Project Learning Tree. (Verlinde)

Coordinated and presented a Florida Black Bear Workshop, Project Learning Tree, Aquatic Species Collectors Permit workshop, Invasive Species workshop, and 2 Project WET workshops that reached 155 teachers, 4-H leaders, Americorps volunteers and informal educators.

- 9.47 Provide levels one and two stream restoration workshops for agency, industry and private consultants. (Verlinde)

32 agency and private consultants attended the level one workshop and 26 agency and private consultants attended the level two workshop. These workshops offer information on stream geomorphology, natural design channelization, vegetation recommendations and hands-on stream evaluation techniques. Surveys have shown that methods presented have been used by participants of the workshops in Florida and Alabama.

- 9.48 Provide presentations on Florida Sea Grant, extension activities and success stories to clientele and stakeholder groups across the state and region, upon request. Continue to develop linkages collaborative efforts and programs with state, national and international audiences. (Spranger)

Provided presentations about Florida Sea Grant to a variety of groups in 2006. In the state of Florida this included graduate classes at the University of Florida and the Florida Agricultural and Mechanical University, the COSEE Summer Teacher Institute, the State 4H Marine Ecology Contest, the Florida Marine Science Educators Association and the Florida Clean Boating Partnership. Regionally this included the U.S. Global Coastal Ocean Observing Advisory Council

Planning Meeting, the Southeast U.S. Aquaculture Consortium Workshop, the Biennial Gulf of Mexico Sea Grant Extension Workshop, and the Southeast Atlantic Regional Sea Grant Extension Workshop. Internationally, at the invitation of NOAA's Office of Climate Change, Mike Spranger was invited to present a paper on developing extension education programs on ocean observing systems at a joint US-Indonesia capacity-building workshop. He also presented a planning framework that the parties utilized in developing their future programs. He returned a second time to Indonesia at invitation of NOAA's Office of International Programs and provided a training workshop on "fundamentals of Sea Grant Extension" to their newly formed Sea Partner Program.

9.49 Conduct a general marine education program for youth and adults to increase community awareness and protection of coastal and marine environmental resources in Broward County. (Behringer)

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

Coordinated the current events section of the Broward County Envirothon. 60 students participated in the event.

Developed a fact sheet on WavE Radar (WERA), a shore based oceanographic high-frequency radar that measures ocean surface movement targeting boaters and fishers. (Behringer and Bradway)

Presented a talk on Sea Grant and manatees to 85 students at North Side Elementary Career Day. Pre and post test results indicate a 74% knowledge gain.

Presented a talk on mangrove ecology to approximately 50 landscape architects, as part of the Miami-Dade County Extension Mangrove workshop.

62 youth were educated about marine animals and their environment through a hands-on touch tank, as part of an Ocean Week celebration. 100% of the participants indicated an increase in knowledge about the marine environment.

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

Coordinated 98 volunteers to pick up approximately 500 pounds of trash from the North Fork of the New River during the annual Marine Industries Association of South Florida Waterway Cleanup. 60 youth participants were educated about marine debris impacts and 97% state they gained knowledge about marine debris. Received funding to sponsor a lunch for youth volunteers.

Coordinated 34 dive volunteers to remove marine debris from coral reefs during the annual Reef Sweep. Divers removed 114lbs of monofilament fishing line and other debris.

Coordinated 51 volunteers to remove 450lbs of trash and marine debris from 2 miles of coastline during the annual Coastal Cleanup. 80% of volunteers state that they gained knowledge about marine debris and its impacts on marine resources and 50% state they saw less debris at the site than last year.

9.49.3 Develop a manatee educator tool box and coordinate the Manatee Awareness and boater safety art contest for Broward County schools and 4-H clubs.

Coordinated the Manatee Awareness and Boating Safety art contest in Broward County for K-12 students and 4H youth. 46 entries were received.

Continue to update the Manatee Educator Toolbox to provide teachers with educational materials such as lesson plans, activities, posters, videos, photographs relate to manatees. Sections on manatee research and local news articles will be included.

9.49.4 Increase manatee awareness and boater safety through educational programs.

Updated the Broward County manatee website to include current information and local photographs of manatees.

Developed a flyer to educate residents and visitors about manatees in local waterways and engage them in monitoring by contacting Broward County with specific manatee location information.

Partnered with Broward County Environment Protection Department to conduct monthly aerial surveys to monitor manatee populations. Data is used for the Manatee Protection Plan.

Presented manatee education program to 23 youth at the Broward County “Bring Your Kids to Work Day.” Pre and post test results indicate a 60% knowledge gain.

Presented a manatee education program to 55 youth at two summer camps. Pre and post tests indicate a 39% knowledge gain.

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

Continue to submit articles to the Southeast Florida Coral Reef Initiative electronic newsletter. This newsletter provides update on SEFCRI projects, upcoming events and coral reefs in the news to approximately 450 recipients.

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

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

Judged 72 projects in the Environmental Science category of the Broward County Public Schools Science Fair.

9.50 Research and write at least 40 newspaper columns on a variety of environmental issues and topics. (Mahan)

Wrote 43 newspaper articles in Apalachicola and Carrabelle Times under “The World Around You” banner.

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