

Science Serving Florida's Coast

**Florida Sea Grant
College Program
Year 2003
Work Plan**

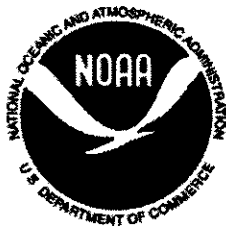
***A partnership program among the Florida Board of Education
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Florida's citizens, industries and governments

Technical Paper 127

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Year 2003 Work Plan Florida Sea Grant College Program April 2003

The Florida Sea Grant College Program is committed to enhancing the practical use and development of coastal and marine resources while at the same time creating a sustainable economy and environment. Florida Sea Grant's Strategic Plan for 2002-2005¹ defines the purpose of the program, highlights Florida's coastal wealth, and demonstrates the need for research and education. The plan also recognizes the three strategic areas of economic leadership, coastal ecosystem health and public safety, and education and human resources for Sea Grant investments and describes the programmatic framework for implementing the strategic plan.

The work plan for 2002 covered research, extension, communication and administrative goals and tasks scheduled to end in 2002 and beyond. The 2002 Florida Sea Grant annual progress report reported accomplishments and benefits against those tasks ending in 2002. This work plan for 2003 updates the 2002 work plan to include research, extension, communication and administrative tasks scheduled for completion during 2003 and beyond. The 2003 annual progress report, scheduled for May 2004, will cover accomplishments and benefits resulting from each of these tasks. Copies of the 2002-2005 Strategic Plan, previous Work Plans and annual progress reports can be obtained from the Florida Sea Grant College Program office.



¹ Florida Sea Grant College Program Strategic Plan 2002-2005. Florida Sea Grant College Program Technical Paper 108. Gainesville: University of Florida.

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Economic Leadership

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

- 1.1 This project provides leadership in a new direction to expand and enhance natural products research. It focuses the latest advances in biotechnology to identify and determine the mechanism of action of marine-derived compounds with pharmaceutical potential. It demonstrates the power of cross-species array technology for the development of unconventional model systems, such as marine invertebrates, to address questions in marine, cell and molecular biology. (2003). (Pomponi/Willoughby: R/LR-MB-19PD)
- 1.2 A number of natural compounds from marine sources are now being used as anti-inflammatory agents in medicines and other products. Elisabethadione is a biosynthetic intermediate that leads to natural agents. The goal of this project is to develop a biotechnical production method of elisabethadione, which in nature comes from the sea whip. (2004). (Kerr/Lopez: R/LR-MB-14)
- 1.3 R-PCR is a quantitative molecular methodology that offers higher throughput potential from current types of analysis, providing results within hours, not days. The goal of the project is to develop real-time PCR for rapid, quantitative, cost-effective technology for enumeration of *Vibrio* spp. pathogens in oyster. The methods will be developed for practical applications in shellfish monitoring and for evaluation of post-harvest treatments. (2004). (Wright/Rodrick/Schneider: R/LR-MB-15)
- 1.4 Protection of marine surfaces against fouling organisms is a big business, but a difficult process to make environmentally friendly. These natural products will be characterized and tested for barnacle larvae settling inhibition, lethality, and crustacean chemoreceptor activities. These anti-fouling compounds will be tested in both laboratory and field settings. (2004). (Kem/ Soti: R/LR-MB-16)
- 1.5 Cancer is the second leading cause of death in the United States. Lasonolides appear to have a novel, but undefined mode of action to kill tumor cells. This project will help define the utility of the compounds by identifying the primary protein target for the compounds. (2004). (Wright/Longley: R/LR-MB-17)
- 1.6 Conopeptides are powerful neuropharmacological agents that can be used for a wide variety of applications. More than 100,000 conopeptides exist; however, few have been sequenced to date. The goal is to obtain a novel set of conopeptides and evaluate their potential as a therapeutic agent. (2004). (Mari/Fields: R/LR-MB-18)
- 1.7 A statewide faculty coordinating committee organized by Florida Sea Grant to advance marine biotechnology will continue to operate. The goal is to partner with industry in a way that will yield both state and industry funds to support marine biotechnology research, education and economic growth in Florida. (Seaman/Cato)
- 1.8 Florida Sea Grant has one of the largest marine biotechnology research programs among all Sea Grant programs in the US. It is time to develop a complementary outreach program. This project will create a database for business and industry as a means of aiding science-based decisions concerning lines of research, policy and investment. Attributes to be summarized from the 24 FSG research projects to date include scholarly contributions, student training and actual or potential commercialization opportunities. (Seaman/Zimmerman/Kearl: PD-03-3)

- 1.9 There is a general lack of understanding of marine biotechnology by non-scientists. The goal of the project is to draw upon Sea Grant's vast national network of research, education and outreach resources to build an effective marine biotechnology website. It will be an effective tool for increasing awareness of this field among government officials, policymakers, students, educators, scientists, journalists, the general public, and industry professionals. (2005). (Masterson/Pomponi/Clark/Reed: E/T-11)
- 1.10 To promote industry awareness of Florida marine biotechnology opportunities and constraints, outreach will communicate a profile of existing commercial activities and interests in Florida via a publication, and also in a proposed session at a national biotechnology conference (in cooperation with the national theme team) and a proposed executive continuing education workshop. (Seaman)
- 1.11 To promote faculty cooperation and exchange to enhance research and training, a statewide marine biotechnology listserv will be continued, planning for the fourth statewide summit will commence, and the feasibility of an ad hoc faculty advisory panel will be determined. (Seaman)
- 1.12 To promote awareness and understanding of marine biotechnology by Extension faculty (for a topic for which no State Major Program [SMP] exists), an information packet of relevant materials and resources will be assembled and the possibility of establishing an SMP design team explored. (Seaman)

Cross-reference: See also items 2.5, 4.4, and 8.1.

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

- 2.1 West Florida shelf-edge reefs are of major importance to reef fish fishery production in the Gulf of Mexico, yet little is known of the biological and geological characteristics of these reef systems. The commercial reef fish fishery of this region concentrates its effort on these shelf-ledge reefs. Virtually all of the important reef species are considered overfished; some are considered threatened. In 1999, the Gulf of Mexico Fishery Management Council set aside two 100 nautical-square-mile shelf-ledge areas for experimental purposes, providing opportunities to monitor fish demographics in protected areas. Monitoring of gag grouper (*Mycteroperca microlepis*) and scamp (*M. phenax*) spawning aggregations, movement patterns, and changes in year round distribution and abundance will provide comparison data for protected areas with unprotected areas of similar habitat. Benthic habitat characteristics and habitat changes will also be monitored at several scales in the study areas. (Koenig/Coleman/Levitan: R/LR-B-51)
- 2.2 Artificial reefs are a potentially powerful management tool that can be used to enhance fish production and divert deleterious impacts away from natural habitat. To date, their use is limited by some interests due to a scientific controversy over attraction-production. Solutions to this problem must quantify the negative effects of attracting fish away from natural reefs, the positive effects of providing new habitat, and the compensatory responses mediated by reducing density-dependence on natural reefs. Impact assessment, experimental design and a statistical framework will be developed for long-term studies of fish dynamics, using important ornamental reef fish species in the Florida Keys. These small reef fishes comprise an emerging fishery, and provide a tractable model system in which to explore the efficacy of artificial reefs. (Osenberg/St. Mary/Bolker: R/LR-B-52)
- 2.3 Diamondback terrapins range along the eastern and Gulf coasts of the US and prefer the same habitat as blue crabs. Large numbers of terrapins enter crab pots and drown as bycatch. Much of the mortality is avoidable with the use of bycatch reduction devices that limit the entrance size of trap funnels. This project is designed to test bycatch devices which can reduce turtle mortality. (Butler/Heinrich: R/LR-B-55PD)
- 2.4 Gag grouper is a highly prized fish in the Southeast United States. The fishing is under intense management, scrutiny and pressure. This project will link the importance of essential fish habitat to gag grouper population dynamics. This will allow management agencies to make science-based decisions related to essential fish habitat. (2004). (Lindberg/Mason/Murie: R/LR-B-53)
- 2.5 Declining shark populations worldwide have prompted concern about the sustainable health of the resource. Management on a species-specific basis is under consideration. This is currently not possible due to considerable difficulties in identifying shark carcasses and fins. The development of false identification methods is needed before valid data can be obtained and management measures developed. (2004). (Shivji: R/LR-B-54)
- 2.6 A number of research projects and programs have been completed on the spiny lobster fishery of south Florida over the last two decades. Most of the research results have been published in scientific journals or presented to management agencies. This workshop is designed to present the results to the commercial and recreational fishing industry and participants. The goal is to increase their knowledge about the fishery, exchange ideas, and promote collaboration between the fishermen and the scientific community. (Gregory: PD-03-4)

- 2.7 The goal of this project is to provide critical fish habitat information necessary for the conservation and management of a protected, large coastal species, the lemon shark (*Negaprion brevirostris*) and to provide baseline conditions for the planned Marine Protected Area that will protect the mangrove seagrass nursery at Bimini, Bahamas. (2005). (Gruber/Hoenig/Feldheim: R/C-E-47)
- 2.8 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, ball and hammerhead sharks. (2005). (Heithaus/Marshall/Carrier: R/MI-12)
- 2.9 Participate in the development of a Gulf-wide strategy of dealing with blue crab “ghost traps.” This effort will be lead by the Louisiana Sea Grant program, but Florida Sea Grant will assist in identifying the methods and justification for addressing this issue in the Gulf of Mexico region. (Adams)
- 2.10 Complete and submit the final report of the Blue Crab Facilitated Workshops to the Florida Fish and Wildlife Conservation Commission (FWC). The report will detail findings of the 17 workshops held in 2002. The findings will serve as a basis for public hearings to be held by the FWC for blue crab permit holders in an attempt to develop a draft management plan for blue crab in Florida. (Adams)
- 2.11 Serve on the Sheepshead Technical Task Force for the Gulf States Marine Fisheries Commission. The Task Force will develop a Fishery Profile and Draft Management Plan for the commercial and recreational harvest of sheepshead in the Gulf of Mexico region. (Adams)
- 2.12 Deliver a formal presentation addressing the current situation in the Gulf and South Atlantic shrimp industry at the UF-sponsored Trade Disputes Conference. The paper will be co-authored by Walter Kiethly and Sal Versaggi, and will be published in a book derived from the Conference proceedings. (Adams)
- 2.13 Complete an analysis of the fair market value of a vessel currently participating in the commercial shark fishery in the Gulf and North Atlantic region. This project will be funded by the Gulf and South Atlantic Fishery Foundation. The project will be a component of a larger study that will provide guidance for the development of a shark vessel buyout program for the region. (Adams)
- 2.14 Travel to Havana, Cuba and renew relationships with contacts at the Ministry of Fisheries. Present seminars addressing topics such as release mortality of reef fish, and sponge biomass assessment. (Adams)
- 2.15 Participate in the Second Biennial Meeting of the North American Association of Fisheries Economists, serving as a moderator for at least one technical paper session. Also, will serve on Nominating Committee that selects names for balloting to elect the first officers of the Association. (Adams)
- 2.16 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Regional Management Councils. Attend various meetings and provide economic input in the derivation and selection of management options. (Adams)
- 2.17 Develop workshops and individual outreach activities on proposed fishery management actions that can have a major impact on local marine resources or fishermen. (Gregory)

- 2.18 Continue to serve on the Scientific and Statistical Committees of the Gulf of Mexico and South Atlantic Fishery Management Councils. Membership will also continue on the Coastal Pelagics Stock Assessment Panel. (Gregory)
- 2.19 Develop two brochures that explain statewide and local bycatch allowances for lobster and stone crab trap fishermen. (Gregory)
- 2.20 Participate in Gulf of Mexico (GOM) Shrimp Summit that will address current economic, social and political problems affecting the GOM Shrimpers. (Adams, Gregory, Stevely, Sweat, Wasno, Spranger)
- 2.21 Continue to serve and execute duties as Executive Secretary of the Gulf and Caribbean Fisheries Institute. (Creswell)
- 2.22 Conduct fish survival workshops for recreational fishermen, charter boat operators and fishing tournament organizers that address such topics as fish venting, circle hooks, proper handling and release, and fishery management issues. (Combs, Crane, Creswell, Diller, S. Jackson, McGuire, Novak, Stevely, Sweat, Verlinde, Wasno)
- 2.23 Continue to conduct educational programs and provide materials and technical assistance for the maintenance and development of artificial reefs off Florida's coast. (S. Jackson, Novak, Stevely, Sweat, Wasno)
- 2.24 Continue to assist team of researchers from Stanford University, Duke University, Monterey Bay Aquarium and the National Marine Fisheries Service on a national blue fin tuna tagging program. (Novak)
- 2.25 Continue activities with REDstart, a redfish enhancement project at Tarpon Bay on Sanibel Island. (Novak, Stevely, Wasno)
- 2.26 Coordinate shrimp gear/TED workshops for local Shrimpers with Gary Graham, Texas Sea Grant, and Lindsey Parker, Georgia Sea Grant Fishing Gear Specialists to demonstrate new turtle excluder designs and discuss new regulatory requirements. (Gregory, Mahan)

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

- 3.1 Certain marine algal species make up an important part of the natural diet of Atlantic surgeonfish, which have economic importance in Florida, and are traded globally for the aquarium trade. An experimental diet that approximates the natural diet of these fish will be developed and tested. The goal is to develop diets that can be used to improve the health and management of Atlantic surgeonfish and to enhance efforts for captive propagation. (Francis-Floyd/ Phlips/ Berzins/ Cardeilhac: R/LR-A-30)
- 3.2 Depletion of bay scallops in the Eastern Gulf of Mexico is largely due to loss of seagrasses that form an essential habitat. Seagrasses are recovering, but bay scallop spawning stocks are at an all-time low abundance in Tampa Bay. The goal is to significantly advance developing hatchery-release technology to replenish bay scallop populations on the Florida West Coast and to test the relative efficiency of cage versus free-planting cultured scallops in the field. (Leber/Halstead/Arnold/Blake: R/LR-A-34 [TAQ-99-104])
- 3.3 Clam aquaculture is currently focused on a single species. Diversification is needed to allow the industry to grow. This project will help determine the production feasibility of two marine bivalve species. Limited stocks of these species have prevented the development of major fisheries, but aquaculture could provide a source of seed for both species. This project will focus on spawning and larval rearing technologies. (Baldwin: R/LR-A-37-PD)
- 3.4 This study utilizes a novel approach to understanding key factors about a major problem in aquaculture. High mortality rates occur during the first-feeding stage of hatchery-reared marine fish larvae. Development of techniques that will increase the survival rate is critical. (Turingan/Coleman/Creswell: R/LR-A-38PD)
- 3.5 Suitable food for early life stages of cultured fish is a bottleneck for raising them for the ornamental fish hobby-based market. The goal of this project is to scale-up production of capepod species as food for rearing tropical ornamentals. (2004). (Marcus: R/LR-A-36).
- 3.6 The 30th Joint Meeting of the U.S.- Japan Natural Resources (UJNR) Aquaculture Panel was held in Fall 2001 in Florida. The proceedings of the symposium on stock enhancement and marine fish aquaculture will be published. (Leber: PD-01-3)
- 3.7 The objective of the 14th International Scallop (Pectinid) Biology and Aquaculture Workshop is to provide unique opportunities for researchers and managers to exchange new information. About 125 people from 25 countries are expected to attend the Conference to be held in Florida. University of South Florida researchers and Florida Sea Grant Extension faculty are organizing the conference. (Blake/Sweat: PD-01-08)
- 3.8 Many marine ornamental species are collected from coral reef areas. Aquaculture is recognized as one solution to minimize the wild collection, while sustaining the aquarium industry and creating new commercial opportunities. This Sea Grant Industrial Fellow will continue former Sea Grant research to develop protocols to cultivate high value and popular marine ornamental shrimp. (2004). (Lin/Rhyne/Calman: E/INDST-2)
- 3.9 The aquaculture of marine ornamental fish is one way to reduce the collection of the fish from coral reef areas. A major problem is diseases contracted by the fish in culture situation or while on display in aquariums. Longer-lived fish mean fewer must be collected or cultured. This Sea

Grant Industrial Fellow will examine the causes of head and lateral line erosion syndrome of the popular surgeonfish and attempt to find the solution to the problem. (2004) (Francis-Floyd/Tilghman/Stamper: E/INDST-3)

- 3.11 A series of workshops will be held to demonstrate record keeping principles and practices to clam growers in Florida. (Sturmer/Adams) Conduct a nation-wide survey of agricultural and aquacultural organizations and associations, targeting the association's directors. The survey will assist the Florida hard clam growers as they intend to start their own association. (Adams, Sturmer)
- 3.12 Complete the USDA-funded study that is developing a low cost investment strategy for inland shrimp culture in Florida. The study will provide an assessment of the investment and operating costs of a one-acre, dug-pond system. The final report will provide investors with a strategy for trying shrimp culture with a low-cost method. (Adams, Sweat)
- 3.13 Participate in the Aquaculture America 2003 meetings in Louisville, KY. Present a paper on the economic impact of commercial hard clam culture in Florida. The paper will be included in a special edition of the Journal of Applied Aquaculture. (Adams)
- 3.14 Participate in the World Aquaculture Association 2003 meetings in Salvador, Brazil, and co-present a paper that describes the Florida Sea Grant-funded study that assessed the market potential for culture sturgeon products. (Adams)
- 3.15 Develop educational program, technical assistance and materials and provide educational support to local agents on sustainable hard clam aquaculture production throughout the state. (Sturmer)
- 3.16 Continue to establish an extension network in counties where clam farming is ongoing, or projected. Counties involved will include Levy, Dixie, Charlotte, Lee, Brevard, St. Lucie, Indian River and Apalachicola. (Sturmer, Novak, Wasno, Combs, Creswell, Mahan)
- 3.17 Continue to provide technical assistance to the 4-year Clam Lease Assessment, Management, and Modeling using Remote Sensing (CLAMMRS) project. This USDA-funded project allows for adoption of remote sensing technology for the clam aquaculture industry. (Sturmer)
- 3.18 Provide technical assistance on the Expert Assistance and Distance Identification Network (EADIN), a USDA-funded project that establishes protocol and implementation procedures for the rapid distance identification of biological samples, specially focused on phytoplankton. (Sturmer)
- 3.19 Establish a health monitoring program that will provide baseline information on important shellfish pathogens. (Sturmer)
- 3.20 Develop and coordinate at least four water quality monitoring workshops for the clam farming industry. (Sturmer)
- 3.21 Conduct six crop record keeping workshops for clam farmers. (Adams, Sturmer)
- 3.22 Provide technical assistance to the UF Whitney Lab to establish an experimental shellfish laboratory and initiate investigations of alternative molluscan species for possible aquaculture production. (Sturmer, Creswell)
- 3.23 Continue development of workshops and materials to shellfish growers who are participating in the USDA pilot crop insurance program. (Sturmer, Adams)

- 3.24 Develop a shellfish aquaculture research and demonstration center in Cedar Key. This will be the first salt-water running laboratory on Florida's Gulf of Mexico that will allow UF faculty to address the research needs of the clam farmers. (Sturmer)
- 3.25 Conduct workshops and tours on the fundamentals of shrimp farming and specific technical and economic criteria established from data collected at the Ft. Pierce shrimp demonstration farm. Also present and publish results from demonstration project at professional association conference and publication. (Creswell)
- 3.26 Provide technical assistance that includes startup considerations to new and existing aquaculturalists in Florida and South Alabama. (S. Jackson)
- 3.27 Conduct annual Oyster Industry Workshop for oyster dealers, providing them with latest technology, products and regulations. (Otwell, Mahan).
- 3.28 Conduct workshops for new clam farmers who are developing their farms on new clam lease sites in the Apalachicola Bay. (Mahan, Sturmer)
- 3.29 Continue to provide local workshops and technical for potential and existing clam farmers. (Sturmer, Mahan, Novak, Combs)
- 3.30 Continue to participate in regional and national Interstate Shellfish Sanitation Conference committee meetings to provide technical support to the industry. (Mahan)
- 3.31 Provide educational programs on aquaculture to local k-12 teachers. (Creswell, Mahan, Stevely, Sturmer)

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

- 4.1 The use of reduced-oxygen packaging continues to expand for seafood despite warnings of potential food toxicity problems. This project will develop “smart-labels” for time-temperature integration and packaging film permeability. Unbiased, scientifically based controls can then avert regulatory interaction or product safety issues. (2004). (Balaban/Otwell/Welt/Kristinsson: R/LR-Q-22)
- 4.2 Millions of U.S. consumers eat oysters. However, for a small segment of the population, eating raw or undercooked oysters can cause serious illness or death from *Vibrio vulnificus*. The goal of this project is to educate consumers, conduct new oyster product research and processing technologies and education medical groups so that human safety risks can be minimized or eliminated while maintaining an industry. (2004). (Jamison/Jamir: R/LR-Q-23 [FL-G01-5])
- 4.3 Bacteriophage have been proven to be effective in the prevention and treatment of diseases in humans and animals. Previous Sea Grant research has shown that phage specific for *V. vulnificus* can prevent lethal disease in mice caused by this organism. This project extends that work to test scale-up systems for phage treatment to eliminate *V. vulnificus* from the system. (2004). (Duckworth/Gulig/Rodrick/Wright: R/LR-Q-24 [G01P-03])
- 4.4 *Vibrio vulnificus* remains the leading cause of seafood-associated deaths. Current detection assays are consuming (2-7 days), labor intensive, expensive and not always reliable. FDA has increasingly turned to molecular detection, but problems have been reported with available assays. The objective of this project is to evaluate and improve molecular detection and typing methods for *V. vulnificus* in order to standardize evaluation of oyster and seawater samples. (2005). (Wright/Heil/Harwood: R/LR-Q-26)
- 4.5 One of the primary strategies to reduce the number of illnesses in the high risk population for *Vibrio vulnificus* is to educate and inform the medical community. The result will be that appropriate information will be transmitted directly to the high-risk patient at the time of treatment and/or counseling for the high-risk condition. This project will conduct 30 regional workshops at local chapters of the Florida Dietitians Association and Florida Nurses Association to provide educational materials developed by trained health educators. (2005). (Heil: E/TP-3)
- 4.6 Convened an industry Steering Committee to develop handbooks on HACCP and “variances” for retail processing of foods. Participants include representatives from most major retail supermarket chains (Krogers, HEB, Wal-Mart, Publix, Winn Dixie), various national trade associations (Food Marketing Inst., National Restaurant Assoc., Assoc. Food & Drug Official, Conf. Food Protection, and National Food Processors Assoc.), and individual expertise from selected state agencies and academic programs (over 12 universities involved). Six Retail Advisories (Sushi, Smoked Seafood, Reduce Oxygen Packaging, Fresh Juices, Fresh Cut Produce and Specialty Meats) are currently in development through assigned Subcommittees. The anticipated products will be made available in text and on the AFDO website for use by all segments of the nation's retail industry that are processing foods in retail settings, plus for guidance of regulatory programs in every state. (Otwell)
- 4.7 Trials continue with post harvest treatment (PHT) methods in actual commercial settings in Apalachicola, FL to determine potential utility in Florida. A survey of the entire Florida oyster processing industry has been completed to assess commercial capacity to adopt mandated PHT's. Methods under investigation include freezing, high pressure, cool pasteurization and irradiation. (Otwell)

- 4.8 Conduct annual international Shrimp School for industry and agencies. (Otwell)
- 4.9 Conduct annual hard Clam School for industry and agencies. (Otwell)
- 4.10 Conduct annual Oyster School for industry and agencies. (Otwell)
- 4.11 Continue role as National Coordinator role for the Seafood HACCP Alliance that has provided seafood safety training for all federal FDA seafood inspectors in the nation, most state based inspectors and over 90% of all nationally based seafood processing firms, plus over 5,000 international participants from 30 nations. The training now includes the traditional 3-day HACCP courses and 1.5 day sanitation courses taught biannually in Florida, plus a special one-day support course taught for individuals that complete an established Internet course developed by the Seafood HACCP Alliance based at Cornell. (Otwell)
- 4.12 Continue to serve on a technical committee developing an innovative, interactive Internet system recently titled, "Fish Port" (based on main frame – ECOPORT). This technology support system is being developed in collaboration with FAO/World Health Organization. The next meeting and developments occur in Iceland in June 2003. (Otwell)
- 4.13 Continue to explore development of an annual Lobster School for industry and agencies, similar to the successful Shrimp School. Expectation is that the lobster school will be held in Fall 2004. (Otwell)
- 4.14 Continue to explore development of an annual Smoked Fish School for industry and agencies, similar to the successful Shrimp School. Expectation is that the school will be offered in 2005. (Otwell)
- 4.15 Continue in leadership positions with number of seafood technology organizations. (Otwell)
 - 4.15.1 National Seafood HACCP Alliance, 2001-2003, National Coordinator
 - 4.15.2 Seafood Sciences & Technology Society of the America's, Executive Director
 - 4.15.3 U.S. Representative to International Assn. of Fish Inspectors
 - 4.15.4 National Academy of Science's Committee on the "Use of Scientific Criteria and Performance Standards for Safe Food."
- 4.16 Coordinate workshops and seminars at local festivals that provide home seafood consumers with seafood safety information. (Sweat)

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

- 5.1 Intensive boating by over one million boaters in Florida waterways plays tremendous environmental pressure on the waterways. This project will use technical and science-based education methods to educate Florida boaters. The goal is to have boaters become self-regulatory in order to maintain boating as an economically valuable enterprise while at the same time eliminate boating-related environmental damage. (2004). (Spranger/Swett: R/C-P-24)
- 5.2 The rapid increase in the number of boats in Florida has created environmental issues at the same time. Boats create huge economic impacts for the state. Currently, expensive on-the-water surveys are needed to compile data sufficient for boat traffic management use. This project will determine the feasibility of modifying the Florida vessel registration system to make it more usable for research purposes. (Swett/Sidman: R/C-P-25PD)
- 5.3 There is a need among state and local decision makers to achieve effective sustainable development solutions that resolve conflicts between boating and the environment of Florida's urban bays and waterways. This project will develop Geographic Information Systems (GIS) technology to educate decision makers, planners, and the boating industry. (Spranger/Swett: PD-01-4)
- 5.4 Initiate a 17-month collaborative effort with local, regional, and State entities, including the Fish and Wildlife Conservation Commission, Florida Marine Research Institute (FMRI); the Florida Marine Patrol; and the Marine Trade Association of Florida, to enhance the content of and linkage between existing databases, such as the Florida Vessel Title Registration System, for use in inventory, management, and planning tools. The techniques to be developed have the potential to replace or augment existing field survey methods used for the Regional Waterway Management System. (Swett, Sidman: R/C-P-25)
- 5.5. The NOAA Coastal Services Center (CSC) has approved full funding for a new project, "A Coastal Data Information Server System for the Gulf Intracoastal Waterway and Adjoining Bay Waters of Southwest Florida." The scope includes collating bathymetric and land use/land cover data generated in prior FSG projects, as well as scanning and georeferencing imagery and maps collected over years (e.g., 600+ Historic aerial photographs, hydrographic and topographic maps, etc.). The data and metadata will be provided to UF's Florida Geographic Data Library (FGDL), which will soon become a Federal Geographic Data Committee (FGDC) node, so that it can be made available on the World Wide Web. (Fann: CDI-Fann)
- 5.6 A historical digital data library will be developed to serve a broad community of users, such as the general public, resource managers, policy makers, and scientists. The digital data library will rescue information sources from archives and publish it to a wide variety of users via the internet. Rescued information will include: (1) 673 Aerial Photographs; (2) 10 USC&GS Descriptive Reports; (3) US Army Corps of Engineers Survey Reports--35 reports, 20 maps; (4) 98 Hydrographic Maps; and (5) 55 Topographic Maps. (Fann, Antonini)
- 5.7 A sample survey of recreational boats in prominent Manatee County marinas and waterways will be completed to (1) determine rates of change in the location and types of recreational vessels and (2) categorize the transient boater population. (Swett, Sidman)
- 5.8 Cooperative work with the Florida Marine Research Institute will be completed by conducting a boating characterization study for Tampa and Sarasota Bays. The study will include a survey of

8000 recreational boaters to estimate boat traffic potential for Tampa and Sarasota Bays as a function of trip origins, destinations, and travel routes. (Sidman, Swett)

- 5.9 A workshop will be held in support of a National Sea Grant initiative to develop a national strategy on dredging shallow draft harbors and waterways. Workshop objectives are to (1) build a constituency and gather information about the dredging needs for shallow draft navigation projects, (2) add information to state-of-the knowledge reports, (3) and gather ideas and input to a proposed national dredging strategy. (Swett)
- 5.10 Technical and scientific support will be provided to local, regional and state governments, in implementing regional waterway management efforts. Thirty community leaders will be educated through three workshops, one extension bulletin, five meetings with state and local governments, and 15 individual consultations and meetings. (Swett, Antonini)
- 5.11 The Florida Sea Grant model for waterway management and state policy modifications will be presented at a special National Sea Grant session of the Coastal Zone 2003 conference titled Dredging for Recreational Ports and Harbors: Changing the Policy Paradigm. (Swett)
- 5.12 Presentations on boating related coastal waterway management will be made at the Biennial Coastal GeoTools '03 Conference in Charleston, South Carolina. (Swett, Sidman)
- 5.13 A Notice General Permit will be developed for Lee County based on the Regional Waterway Management baseline studies and GIS applications completed by Florida Sea Grant for the county (TD-3, TD-4, and TD-5). (Antonini, Swett)
- 5.14 A Florida Sea Grant extension bulletin will be developed to show the benefits of undertaking waterway improvements statewide using Notice General Permit and regional waterway management approach. (Swett)
- 5.15 A conference sponsored by Florida Sea Grant, the Southwest Florida Marine Industries Association, and the West Coast Inland Navigation District will examine the problems and issues in providing water access and maintaining water dependent uses in Florida's coastal areas. (Spranger)
- 5.16 Continue working with Clean Boating Partnership that will establish 100 clean marina designations and 25 clean boatyard designations in 2003. (Combs, Crane, Creswell, Diller, S. Jackson, McGuire, Novak, Stevely, Sweat, Verlinde, Wasno Spranger, Jackson).
- 5.17 Develop and distribute a manual for boaters that will provide information on how to prepare their boat for severe storms or hurricanes. (Crane)
- 5.18 Continue developing educational programs and materials on impacts of feeding large fish to pelicans at marine-related facilities. (Crane)
- 5.19 Develop a recreational guide that will educate boaters about local waterway issues, such as manatee zones, shorebird nesting areas, right whales, and exotic species, while also providing them with a navigational aid for boating. (McGuire, Novak)
- 5.20 Design a boater component to the Florida Yards and Neighborhoods Program. (Stevely, Antonini)

Coastal Ecosystem Health and Public Safety

Goal 6: Protect and Enhance Coastal Water Quality and Safety

- 6.1 The potential for nitrogen and other inputs reaching coastal water via groundwater contaminated with sewage discharge is high. State of the art techniques will be used to assess the potential for sewage contamination of an urban bay (Sarasota) and a less populated bay (Apalachicola). The results will be useful to help manage the use of septic tanks in Florida's coastal zone. (2004). Chanton/Burnett: R/C-E-44)
- 6.2 Current on-site sample collection and laboratory-based analysis is costly and time consuming in regards to approving coastal waters for shellfish growing for human consumption. Red tide is often a problem which requires constant sampling. This project will test the accuracy and effectiveness of satisfying red tide monitoring methods using remote sensing equipment rather than labor-intensive on-site sampling. (2005). (Wilhelm/Kirkpatrick: R/LR-Q-25)
- 6.3 Pursue resources to support an in-service training program for extension agents on specific aspects of how activities in watersheds affect water quality (Jacoby)
- 6.4 Explore partnerships with education and outreach personnel from the Water Management Districts, National Estuary Programs and National Estuarine Research Reserves. (Jacoby)
- 6.5 Develop an interdisciplinary workshop for extension agents that focus on the rural/urban issues. (Jacoby)
- 6.6 Host a tri-state watershed inservice training for teachers and extension faculty from states of Florida, Alabama, and Georgia. (S. Jackson)
- 6.7 Work with volunteers and local community leaders to develop water quality monitoring programs. (Diller, S. Jackson, Verlinde)
- 6.8 Continue regional fish extension activities that focus on topics of derelict fishing traps, mercury in fish, shrimp management, marine protected areas, essential fish habitat and fish management. (Adams, Creswell, Diller, Gregory, S. Jackson, Mahan, McGuire, Novak, Spranger, Stevely, Sturmer, Sweat, Verlinde, Wasno)
- 6.9 Obtain funding from Florida Fish and Wildlife Conservation Commission's Marine Research Institute to continue longitudinal survey on sponges in the Florida Bay, and provide workshops and presentations at several professional organizations. (Stevely, Sweat)

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

- 7.1 Large populations along Florida's coast have created conflicts between human uses of the waterways and natural resources such as oysters. This project will determine the impact of boat wakes on intertidal oyster reefs and will provide coastal managers with data on which science-based management decisions can be based. (2004). (Walters/Coen/Grizzle: R/C-E-45)
- 7.2 Over the last several years swamp eels have been discovered in aquatic habitats in Georgia and Florida. These are large ambitious predators capable of dispersal over land with the potential to disrupt ecosystems. The goal of this project is to discover how eels are introduced, how this can be prevented, describe their ecology and life history, and support methods to control them. (2004). (Collins/Trexler/Nico/Loftus: R/C-E-46 [ANS-20])
- 7.3 A critical and emerging need for ocean sciences education is to determine and catalog the types and impacts of aquatic nuisance species in the Gulf of Mexico region. Leaders will learn and develop materials for K-12 classroom use. This is a joint project with Mississippi/Alabama Sea Grant and includes holding elementary, middle school and high school teacher workshops. (2004). (Spranger: E/NS – 2)
- 7.4 Invasive species represent a serious challenge, with tradeoffs related to accidental and purposeful introductions. Preliminary estimates indicate that problem species cause annual losses of \$179M in sales and expenditures of over \$90M on management. This workshop will summarize all work on invasive species, determine needed public services to deal with them, prioritize approaches to provide the service and develop an overall management strategy. (Jacoby: PD-02-07)
- 7.5 Restoration and long-term sustained water quality of the South Florida Ecosystem is a priority among federal, state and local agencies, with billions of dollars being expended on a variety of projects over the next 25 years. The ultimate success of these projects will depend on the awareness, knowledge and decisions of citizens, business owners, and community leaders that are based on sound science. This project will serve as the educational link between science-based information developed by NOAA agencies and Sea Grant supported research and the citizens of South Florida. (Spranger/Score: E/T-9)
- 7.6 Since 1984, aquarium releases of *Caulerpa taxifolia* - Mediterranean strain have led to this “killer algae” becoming established in coastal waters in Europe, California and Australia. In all cases, the ecological and economic costs have been substantial. The goal of this project is to significantly reduce the likelihood that *Caulerpa taxifolia* will become established in Central Florida. (2005). (Walters/Olsen: R/C-E-49)
- 7.7 Many reef fishes are thought to make diel, seasonal, or ontogenetic migrations among multi-habitats. But most evidence of such movements is indirectly inferred from density and size-structure differences among the habitats. This project will provide quantitative results (time and spatial range) which will have direct utility for resource managers charged with designing and implementing management plans for tropical and subtropical coastal habitats and fisheries. (2005). (Luo/Su/Serafy/Lorenz: R/C-E-48)
- 7.8 Florida coastal counties have proceeded mostly independently of one another to build artificial reefs that in aggregate represent about one-half of the national total. The practices of counties for monitoring reef performance and reporting data, including by means of Geographic Information System (GIS) practices will be characterized as the first step in developing procedures to coordinate regional comparison and application of reef evaluation data. (2003). (Seaman)

- 7.9 An invited scientific session on improvement of marine habitat for fisheries and conservation be organized for the World Fisheries Congress. (2004). (Seaman)
- 7.10 Produce a report from the invasive species workshop held in November 2002. (Jacoby)
- 7.11 Form a working group that deals with invasive species in Florida's saltwater systems. (Jacoby)
- 7.12 Develop a one-day in-service training workshop on marine invasives for Extension agents. (Jacoby, Spranger)
- 7.13 Conduct local workshops for K-12 teachers and interested citizens on marine invasives. (Combs, Crane, Creswell, Diller, S. Jackson, Mahan, McGuire, Novak, Stevely, Sweat, Verlinde, Wasno)
- 7.14 Work with Dr. Kevin Johnson, Florida Institute of Technology on studies of marine plankton in the Indian River Lagoon (IRL) that may help in early identification of invasive species that could pose a threat to the IRL ecosystem. (Combs)
- 7.15 Develop coastal restoration programs such as sea grass planting, dune restoration and beach renourishment that will improve coastal ecosystems. (Crane, Creswell, Diller, S. Jackson, McGuire, Verlinde)
- 7.16 Provide technical assistance to National Estuary Programs and local governments in the implementation of Comprehensive Conservation and management Plans. (Stevely)
- 7.17 Continue working with the Florida Institute for Saltwater Heritage (FISH), a Cortez community-based organization to purchase and preserve 95 acres of environmentally sensitive lands, as well as continue to assist in coordination of the 2003 Cortez Commercial Fishing Festival. (Stevely)

Goal 8: Prepare and Respond to Coastal Storms

- 8.1 Commercial sea oats micropropagation for dune restoration is limited by absence of a protocol for efficient production of multiple genotypes. Removing this limitation is critical for this technology to be used for commercial application of the technology for dune stabilization and restoration. The goal for this project is to develop an efficient protocol. (2004). (Kane/Wilson: R/C-S-41)
- 8.2 About 36,000 beachgoers are rescued from rip currents annually. About 30 rip current related deaths were reported in Florida in a recent year. The goal of this project is to develop rip current threshold criteria for rip current channels, identify conditions under which significant rip channels develop, and determine ways the beachgoing public can be warned of danger. It is a continuation of project R/C-S-40. (2004). (Thieke/Hanes/Dean: R/C-S-42)
- 8.3 Florida coasts are impacted by hurricane winds which create structural damage and public hazards. Affordable solutions to mitigate damage can only follow from an accurate quantification of the wind forces causing the destruction. This project will develop new instrumentation for ground-level wind fields, create tools to analyze the data and develop models to predict the effect of winds over a building. (2004). (Gurley/Pinelli/Subramanian: R/C-S-43)
- 8.4 Florida has been a leader in beach management. This book will build on decades of Sea Grant projects and other agency research, authorized by one of the world's foremost coastal engineers. It will provide a "Legacy of Florida's Beaches." (Dean: PD-01-10)
- 8.5 Forty-six percent of all hurricanes or tropical storms that pass over Florida will touch the St. Johns River watershed. A new offshore sentinel buoy near Jacksonville is providing weather and ocean conditions in real time. This NOAA coastal storms initiative will allow emergency managers to make better predictions on which areas to evacuate and determine the best evacuation routes among other uses. Florida Sea Grant is providing the education/outreach component of the project. (Jackson: E-T-10)
- 8.6 Assistance will be provided Sea Grant Extension programs in Washington and Oregon in planning outreach efforts for the Pacific Northwest NOAA Coastal Storms Initiative.
- 8.7 Florida Sea Grant Extension will continue its second year outreach activity as a component of the Southeast Atlantic Coastal Ocean Observing System (SEA-COOS). The four Sea Grant programs (North Carolina to Georgia) are cooperating in this regional project. The goal is to establish a dialog with non-scientific users, identify their information needs and the preferred formats and moods of information delivery. Florida will train its extension faculty, focus on regional groups (e.g., ports, hazards) and local sectors (e.g., fishers and emerging response offices), host sector workshops and convene three instate meetings with user groups. (On-going). (Spranger/Jackson/various county faculty)

Education and Human Resources

Goal 9: Produce a Highly Trained Workforce

- 9.1 A minimum of two qualified applicants will be submitted annually to the Sea Grant John A. Knauss Marine Policy Fellowship national competition. Over each five-year period, an average of one Knauss Fellow per year (of 30 nationally) will be from Florida. (Cato: E/ST-26; E/ST-27; E/ST-28)
- 9.2 At least one national Sea Grant Industrial Fellow candidate (of 2-4 per year nationally) will be successful every three years. (Cato)
- 9.3 At least 25 percent of the annual Florida Sea Grant federal core program research budget will be used to support graduate students. (Cato)
- 9.4 A minimum of five graduate students will receive scholarship funding through private funds in cooperation with the Aylesworth Foundation for the Advancement of Marine Science and the Old Salt Fishing Club. (Cato)
- 9.5 One high school student will receive a college scholarship through the Chuck Skoch Florida Sea Grant Scholarship. (Cato)
- 9.6 A minimum of \$400,000 per year in non-national Sea Grant CORE program funding will be received from extramural funding sources to support Sea Grant programs. (Cato)
- 9.7 Florida Sea Grant will participate in National Strategic Investment, National Outreach and National NOAA/Sea Grant proposal competitions when available. Funding data will be analyzed to measure the success rate of Florida Sea Grant against the other Sea Grant programs. (Cato)
- 9.8 At least 15 different academic disciplines and six different Florida universities and research laboratories will receive Florida Sea Grant funding in each proposal cycle. This can only be achieved through the encouragement of competitive proposals from many participants because peer review determines actual funding. At least six institutions participating in Florida Sea Grant will be visited each year to meet faculty and students to keep a high level of participation in Florida Sea Grant. Six faculty progress reports will be distributed annually to 800 faculty statewide to inform them of Sea Grant activities and opportunities. (Cato/Seaman)
- 9.9 An average of four Florida Sea Grant supported seminars will be funded annually as a way to increase the skills of faculty and students in ocean and coastal related academic disciplines. (Seaman/Cato: PD-03-1)
- 9.10 A minimum of two qualified applicants will be submitted to the NOAA Coastal Services Center Competition each time it is held. (Cato)
- 9.11 Conferences, workshops and travel to conferences and workshops will be supported for Florida Sea Grant researchers and potential researchers and Florida Sea Grant Extension and Communications faculty. The activity will be supported when consistent with priorities in the Florida Sea Grant Strategic Plan: 2002-2005. (Cato/Seaman: PD-03-2)
- 9.12 There is a need for qualified, affordable help to assist in providing environmental education programs at parks, beaches and elsewhere in Florida. The Florida Master Naturalist Program

(FMNP) training develops knowledge, critical training and interpretive teaching skills to assist in environmental education statewide. This project will assist in developing the coastal module of FMNP. A minimum of eight instructors and 120 coastal naturalists will be trained. (Main: PD-02-5)

- 9.13 Extension faculty will attend at least 4 days of inservice training workshops or conferences that will support their educational programs. (All Agents)
- 9.14 Coordinate annual inservice meeting for Extension faculty that provides status of on-going research and extension activities, and organizes program planning efforts. (Spranger)
- 9.15 Serve as member of National Extension Tourism Program Planning Committee to coordinate annual conference that will be held in September 2004 in Orlando. (Spranger)
- 9.16 Serve as Extension Administrative Liaison in planning activities for annual Florida Association of Extension Professionals conference. (Spranger)
- 9.17 Continue coursework toward Master's Degree in Environmental Studies at University of West Florida. (Verlinde)
- 9.18 Continue coursework toward Master's Degree in Environmental Studies at Florida Gulf Coast University. (Wasno)

Goal 10: Create a Scientifically and Environmentally Informed Citizenry

- 10.1 A number of educational activities are implemented under the previous goals. The following ones cross many goals and are implemented in general.
 - 10.1.1 Produce high quality publications and productions that effectively communicate results of Florida Sea Grant activities to both general and specialized audiences. Productions include Sea Grant Reports, Sea Grant Extension Fact Sheets and brochures, Sea Grant Technical Papers, books, book chapters, staff papers, conference proceedings, newsletters, posters signage and electronic formats including CD-Roms and videos. (Kearl/Zimmerman)
 - 10.1.2 At least ten print or broadcast news releases will be produced. (Kearl/Zimmerman)
 - 10.1.3 The Florida Sea Grant Internet home page and website will be upgraded and maintained. (Zimmerman/Whitehouse/Damron/Wagner)
- 10.2 Complete a primer on invasive species for k-12 teachers (Jacoby)
- 10.3 Complete a publication on marine protected areas in collaboration with other Sea Grant programs in the South Atlantic Region. (Gregory, Jacoby)
- 10.4 Complete a publication on the effects of activities in watersheds on coastal fisheries in collaboration with other Sea Grant programs in the South Atlantic region. (Jacoby)
- 10.5 Contribute to formulating and implementing a work plan for the South Florida Ecosystem Project. (Jacoby)
- 10.6 Develop educational programs for teachers, boaters and interested citizens on marine debris and monofilament line recycling. (Combs, Crane, Creswell, Diller, Gregory, S. Jackson, McGuire, Sturmer, Verlinde, Wasno)
- 10.7 Work with volunteers in annual fall coastal clean-up campaigns. (Combs, Crane, Creswell, Diller, S. Jackson, Mahan, McGuire, Novak, Verlinde, Wasno)
- 10.8 Work with Extension 4H agents in the development of marine environmental programs for local clubs. (Combs, Crane, Creswell, Diller, Gregory, S. Jackson, Mahan, McGuire, Novak, Stevely, Sturmer, Sweat, Verlinde, Wasno)
- 10.9 Provide technical assistance and support for annual statewide 4H Marine Ecology Contest. (Combs, McGuire)
- 10.10 Develop marine environmental programs for local K-12 teachers. (Combs, Crane, Creswell, Diller, S. Jackson, Mahan, McGuire, Novak, Stevely, Sturmer, Sweat, Verlinde, Wasno)
- 10.11 Coordinate statewide 4H poster contest celebrating Oceans Day at the State Capitol. (Combs, Crane, McGuire, Spranger)
- 10.12 Develop online or hard-copy newsletter or newspaper articles on local marine/coastal topics that is distributed to interested citizens. (Combs, Crane, Creswell, Diller, Gregory, S. Jackson, Mahan, McGuire, Novak, Stevely, Sturmer, Sweat, Verlinde, Wasno)

- 10.13 Provide Master Naturalist Programs featuring wetlands and coastal systems to interested citizens and establish a volunteer coastal program for marine extension. (Crane, Diller, S. Jackson, Verlinde)
- 10.14 Assist local agencies in development of sea turtle awareness programs. (Combs, Diller, S. Jackson, Verlinde)
- 10.15 Conduct Central Gulf of Mexico – Center for Ocean Science Education Excellence summer teacher training institute that will involve middle school teachers and scientists in field-based and online training. (Spranger)
- 10.16 Conduct Central Gulf of Mexico – Center for Ocean Science Education Excellence fall conference that will involve informal educators, agency representatives, and scientists in discussions on ocean science education in the State of Florida. (Spranger)
- 10.17 Continue to provide technical assistance to the Florida Marine Mammal stranding Network and Florida Feasibility Study. (Wasno)

Key to Individual Responsibilities

Adams	4, 5, 7, 13
Antonini	11, 12
Arnold	6
Balaban	9
Baldwin	6
Berzins	6
Blake	6
Bolker	3
Butler	3
Calman	6
Cardeilhac	6
Carrier	4
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Clark	2
Coen	14
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Fann	11
Feldheim	4
Fields	1
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Gregory	3, 4, 5, 13, 19
Grizzle	14
Gruber	4
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Halstead	6
Hanes	16
Harwood	9
Heil	9
Heinrich	3

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Kerr	1
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Kristinsson.....	9
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Lin.....	6
Lindberg.....	3
Loftus.....	14
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Lorenz.....	14
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Marcus	6
Mari.....	1
Marshall.....	4
Mason	3
Masterson.....	2
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Olsen	14
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Otwell	8, 9, 10
Phlips	6
Pinelli.....	16
Pomponi.....	1
Pomponi/.....	2

Reed	2
Rhyne	6
Rodrick	1, 9
S. Jackson	5, 8, 12, 13, 15, 19, 20
Schneider	1
Score	14
Seaman	1, 2, 14, 15, 17
Serafy	14
Shivji	3
Sidman	11, 12
Soti	1
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Stamper	7
Stevely	5, 8, 12, 13, 15, 19
Sturmer	7, 8, 13, 19
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Swett	11, 12
Thieke	16
Tilghman	7
Trexler	14
Turingan	6
Verlinde	5, 12, 13, 15, 18, 19, 20
Wagner	19
Walters	14
Wasno	5, 7, 12, 13, 15, 18, 19, 20
Welt	9
Whitehouse	19
Wilhelm	13
Willoughby	1
Wilson	16
Wright	1, 9
Zimmerman	1, 19