Florida Sea Grant Program Summary Report 2010-2013

Florida is a coastal state. Nearly 16 million residents live just a short drive from the coast and over 80 million tourists visit the coast each year. Eighty percent of the state's gross domestic product is in coastal and ocean sectors. This concentration of people, activities and economies along one of the longest coastlines in the U.S., creates challenges and opportunities for Florida Sea Grant in all of our focus areas.

We work closely with a wide range agencies, governments, NGOs and the private sector to identify key issues, and we tap into the expertise of over 800 coastal and ocean scientists at 18 major research universities to bring solutions that can be implemented directly through public-private partnerships or by our extension network of 20 agents and 8 specialists.

Priority issues, and strategies for addressing them are developed every four years in a face-to-face planning retreat of the parties mentioned above, and result in a strategic plan that serves as a road-map for our coordinated and pro-active research and extension programs. Florida Sea Grant also is nimble and able to respond effectively to unexpected crises, such as the BP Deepwater Horizon oil spill and the collapse of the state's major oyster fishery, both described in detail in this report.

In the four years of our last strategic plan, major challenges included (by focus area): ***healthy oceans and coasts*** – restoring and protecting critical habitat, developing new tools for fisheries management, and supporting effective decision making; ***sustainable communities*** – preserving water access, developing new policy tools to support sustainable development, and supporting safe use of coastal waterways; ***safe and sustainable seafood*** – enhancing the efficiency, cost-effectiveness, environmental benefits and sustainability of aquaculture, and developing and providing new approaches to the seafood industry for safe and effective handling of products; ***hazard-resilient coasts*** – providing communities with tools to increase their resilience to hazards; and helping coastal residents take actions prior to hazards that mitigate adverse impacts.

Our role in addressing issues varies depending on the subject. In some cases we play the lead role in providing the science and taking the results directly to end-users via our extension service. In other cases we partner with other organizations to support large scale regional activities. We have a history of leading new initiatives to address emerging issues both in the Gulf of Mexico and South Atlantic Regions.

Coastal communities in Florida, the southeastern US and the Caribbean region have benefitted from our efforts with public access to their waterfronts, safer waterways, safer building structures, increased sustainability of coastal fisheries, new aquaculture products, jobs and new small businesses and increased economic productivity. Agencies and NGOs have benefited from innovative new tools for resource management and habitat restoration.

Florida Sea Grant has become the 'go to' organization around the state for a wide range of issues that affect the resilience and economic prosperity of coastal communities and businesses and the quality of life and safety of coastal residents. This has occurred because of strong support from our host, the University of Florida, strong partnerships with coastal counties and state agencies, and a carefully planned team approach that brings together leading scientists with outreach and education professionals to bring practical solutions to priority issues affecting our coasts.

SAFE AND SUSTAINABLE SEAFOOD

Florida Sea Grant develops clam culture methods and technologies that enhance the viability of the state's seafood industry.

Throughout the 1990s, many of Florida's commercial fishing businesses were in decline. To create alternative employment opportunities, Florida Sea Grant collaborated with Harbor Branch Oceanographic institute and other entities to build a new hard clam aquaculture industry near Cedar Key. While hugely successful, the industry is based on a single species, which increases business risk.

Florida Sea Grant researchers have identified sunray venus clams as a potentially ideal aquaculture candidate in Florida, and are now exploring its potential through a variety of research efforts. Initial cultivation attempts began with established hard clam growing techniques. Researchers then moved on to identify gear and planting techniques that would optimize the species' growth, and they evaluated market potential. Sea Grant researchers and extension faculty together offer workshops and extensive materials that explain the best techniques for raising the clams.

The hard clam aquaculture industry has helped preserve a way of life in Cedar Key, where about 80 percent of Florida's clam farming occurs. Overall, the industry now has a statewide economic impact of over $50 million, supporting more than 550 jobs in Cedar Key alone. Work to date on the sunray venus clam has proven this species can be a successful component to the hard clam. Several growers are already raising the clams, and as available crops reach a critical mass, they will be able to begin

marketing this new product. In taste tests, numerous chefs and potential consumers have given the sunray's distinctly flavored meat encouragingly high marks.

But Florida Sea Grant is also working to increase the efficiency of harvesting the traditional hard clams by testing a type of mechanical harvesting device. Mechanical harvesters have been used in other areas of the United States and allow for bottom planting, which is thought to increase clam survivability during the warm summer months. However, the impacts from mechanical devices to sensitive bottom habitats could have negative impacts to the environment and first needed to be tested.

In partnership with the Cedar Key Aquaculture Association and the Florida Department of Agriculture and Consumer Services, Florida Sea Grant researchers tested a modified hydraulic rake system that delivers pressurized water through nozzles to dislodge clams from the bottom sediments. The unbound clams are then collected by hand, rake or basket attached to the mechanical device. The results indicated that compared to traditional harvest methods, mechanical harvesting had only minor, short-lived effects on water quality, turbidity and sediment disturbance. Based on these findings, a new bill seeking approval for the use of mechanical harvesting on shellfish aquaculture leases has been drafted by the Florida DACS as an amendment to the Florida Aquaculture Policy Act and is awaiting action by the Florida Legislature.

Leslie Sturmer, Florida Sea Grant's aquaculture specialist, was recently awarded for her work in the clam aquaculture industry. In 2015, she received the Distinguished Service Award by the U.S. chapter of the World Aquaculture Society for her" cutting- edge personal contributions to the U.S. aquaculture industry through her leadership in research, education, Extension and consultant work in aquaculture," the award plaque read. Sturmer's award is a reflection of the work Florida Sea Grant has done to preserve an important state industry through innovative research and extension.

Teach Aquaculture curriculum advances STEM literacy in failing schools and introduces students to career opportunities.

As aquaculture increases worldwide, what's also increasing is the need for science education programs at all levels about the aquaculture industry. Educators know that incorporating aquaculture science in STEM education can help students succeed in challenging subject areas, and obtain in-demand jobs in a high-tech industry.

Until recently, Florida schools wanting to teach aquaculture science to boost STEM grades did not have a comprehensive, formalized curriculum appropriate for the state's educational standards. In 2009, Florida Sea Grant researchers and aquaculture specialists with UF/IFAS Extension partnered with the Florida Department of Agriculture and Consumer Services, and the Harbor Branch Oceanographic Institute to develop curriculum that instructors in Florida could use to teach science, math, and vocational skills through hands-on experiences with an aquaculture facility in their school. "Teach Aquaculture" consists of eight learning modules with 24 activities appropriate for middle and high school teachers.

The "Teach Aquaculture" website, where the materials can be downloaded, has registered more than 800 users from 43 states and 5 foreign countries. The team has conducted in-service workshops for more than 90 middle and high school teachers. In addition, 25 teachers participated in a specially designed week-long training for novice aquaculture educators. According to a teacher survey conducted in 2012, 92% of the respondents believed that the systematic and structured content provided in the curriculum made it easier for them to understand and motivated them

to incorporate aquaculture issues, topics and activities into their lesson plans.

The principal at one middle school, says the curriculum helped turn around his school's reputation as an underachiever. The state letter grade of the school rose from a C to a B based on students improved scores in STEM testing. "That's the first time we've broken that barrier," Crystal Lake Middle School principal Chris Canning says. "We have an attractor now. It's an aquaculture facility where kids that normally wouldn't come near this place are involved in this school. Parents are involved in this school. This program has put our school on the map."

The curriculum is also the basis for Career Development challenge competitions at Florida Future Farmers of America annual events. Since 2009, participation has increased dramatically, to 45 high school and 24 middle school teams in 2014. Recently, the state FFA awarded Carlos Martinez, an IFAS aquaculture extension specialist and Florida Sea Grant affiliate, with the FFA Honorary State Degree, the highest honorary award it gives to recognize individuals who greatly contribute to the advancement of agricultural education and provide outstanding service to the FFA organizations.

HACCP training helps industry meet consumer expectations for safe choices, leads to national reduction in foodborne illness

Americans' love affair with seafood is growing. Today, we consume nearly 15 pounds each, or an aggregate of 4.6 billion pounds of fish and seafood products each year. In addition to a nutritious lifestyle, seafood fuels an industry that accounts for $140 billion in sales annually, and employs more than 1.2 million full-time and part-time fishermen, processors, packers, freight haulers, grocers, and restaurant staff, all of whom contribute to local, regional and global trade.

Keeping seafood selections safe, flavorful and abundant for consumers is a challenge for the industry. Unlike meats and poultry, seafood is highly perishable, and often prepared and served in ways that do not reliably kill pathogens. Moreover, illnesses linked to contaminated seafood can have high fatality rates in people with certain medical conditions.

In the mid-1990s, the seafood industry got out ahead of the sweeping Food Safety and Modernization Act by voluntarily adopting a safety protocol known as HACCP, the Hazard Analysis and Critical Control Point management system. U.S. processors and importers were now required to implement a seafood safety management program to ensure the marketing of safe seafood. That approach gave some direction, but what was required was education and research to provide the necessary understanding and implementation for change. Partnering with the Food and Drug Administration, NOAA Fisheries, and the Association of Food and Drug Officials, the national Sea Grant network responded by creating the National Seafood HACCP Alliance for Training and Education, a network of Sea Grant programs, processors, and government agencies that provides the HACCP training and technical assistance the seafood industry needed to comply with HACCP mandates.

Florida Sea Grant's seafood production and safety program has played a leadership role in Alliance programs from the beginning. The FSG seafood specialist has chaired the steering and editorial committees that exercise fiscal and educational responsibility for the Alliance. He convenes annual workgroups to update curricula and advance training capacity. Florida has also published the extensive library of HACCP training manuals for more than 15 years.

The Seafood HACCP Alliance has been one of Sea Grant's most successful extension efforts. Alliance certification courses annually train more

than 2000 individuals, and to date have graduated more than 35,000 participants from 28 nations. The training also supports the commercial viability of 5,400 seafood firms in the US and US territories. Official training curricula has been developed in English and Spanish; the materials have been translated into more than 10 other languages. Alliance training efforts have trained all FDA inspectors in the nation, most state-based inspectors and over 90 percent of the nationally based seafood processing firms. A cadre of 400 trainers is now available to continue training in every seafood-producing nation in the world.

According to recent data compiled by the Centers for Disease Control and Prevention, the outbreaks of foodborne illness from seafood consumption in the U.S. have declined significantly, from an average of 65 per year from 1998-2004, to 32 per year from 2005-2012. The trend appears to be for further decreases. The CDC specifically cited the efforts of the Seafood HACCP Alliance as one of the leading factors for the trend.

Shellfish industry training increases food safety while keeping Florida commercial fishermen on the water.

Reducing the incidence of foodborne disease is an ongoing concern for all food industries in the U.S. Recently, the Interstate Shellfish Sanitation Conference issued new national guidelines for shellfish harvesters and distributors in states where Vibrio illnesses are likely to occur. Vibrio bacteria live in warm, marine waters and can contaminate shellfish, which when eaten raw or undercooked can cause potentially life-threatening infections in people. Without technical and educational support to the industry, the phased-in rule changes could have thrown hundreds of fishermen out of a job in Franklin County, the focal point of harvesting grounds for Apalachicola Bay oysters, and in smaller locales around the state.

Florida Sea Grant has consistently been responding to the needs of the state's shellfish industry from catch to table with a multi-faceted training approach. For example, the new time/temperature rules made it nearly impossible for commercial fishermen to comply with more restrictive rules on fishing gear. Sea Grant staff explained the problem to state fish and wildlife officials, and as a result, the agency unanimously approved a change that enabled local fishermen to continue working during summertime months.

The oyster industry was forced to adopt new and expensive PHP, or post-harvest processing technologies to comply with the new rules. Sea Grant staff again helped coordinate a series of meetings between oyster processors and the local government, which then applied for grants totaling $800,000 from Congress to support the oyster industry's compliance with the new PHP protocols. Sea Grant also delivered a series of "oyster school" industry trainings in Apalachicola to instruct shellfish buyers and dealers on best management practices for marketing and regulatory updates on product safety.

Finally, all commercial harvesters and dealers in Florida are now required to complete an annual training course in shellfish sanitation, handling, and transportation practices before they can receive or renew their commercial fishing licenses. In 2013, the seafood safety specialist and a cohort of individuals recruited from the Apalachicola Bay Seafood Workers Association created a web-based training course that could be given online or in-person at select locations across the state. In the latest training period, 2,118 shellfish harvesters and dealers have watched the 20-minute training, and are now eligible to obtain the necessary licensing that allows them to keep making a living from the sea.

An app developed by Florida Sea Grant gives consumers access to information about the state's fresh and frozen seafood offerings.

Florida Sea Grant plays a key role advancing public understanding of safe, healthy choices in a changing world seafood market.

Seafood is a healthy food choice for people of all ages, but deciding whether to eat seafood can be confusing. There are conflicting messages in the press about high levels of mercury or the safety of imported product. Consumers unfamiliar with a given seafood species name are unlikely to try it. Cost can be an obstacle. A Florida Sea Grant survey shows that nearly half of Floridians eat more seafood than they did five to 10 years ago. In fact, on a per-capital basis, Floridians consume more seafood than the national average. However, 40 percent still do not eat the amount recommended by the USDA.

Knowing what types of seafood Florida has to offer, when it's available and where to look for it can help consumers make safe and nutritious choices. It also helps the Florida seafood industry maintain a viable market share and keep coastal communities vibrant. Through its linkages with other Sea Grant programs and UF/IFAS Extension, Florida Sea Grant is closing the knowledge gaps. In 2011, Florida joined with five other Sea Grant programs to create the Seafood Health Facts website, a comprehensive resource for healthcare providers and practitioners, and their patients on seafood nutrition and safety. The site is receiving an astonishing 545,399 annual page views, more than 45,000 page views monthly.

Florida Sea Grant extension faculty have been pursuing both online and train-the-trainer venues for educational outreach. Extension agents pioneered the use of "brown bag" webinar sessions to target professionals at partner agencies and NGOs on the safety and sustainability of Florida seafood. The 16 webinars produced were viewed by nearly 600 individuals. More than half of the viewers indicated their consumption of Florida seafood increased, and nearly all said they intend to share the information they learned during the webinar with others.

A team of extension agents also created the "Florida Seafood at Your Fingertips" program to provide science-based curriculum for extension agents and informal educators. The curriculum includes four PowerPoint modules, (1) Seasonality and Availability, (2) Purchasing and Handling Seafood, (3) Making Healthy Choices, and (4) Preparing Florida Seafood, with an outline of the objectives, notes to instructor, supporting materials, and evaluations for each module. An assortment of related branded materials was also created, including a mobile app for consumers to assist with purchasing and handling of seafood, and to promote seafood consumption. To date, more than 350 people have downloaded the app. Evaluations demonstrate knowledge gain, increase in confidence in purchasing and preparing seafood, and change in the amount of seafood consumed.

PIER PRP Program Focus Area Report

Florida Sea Grant

Safe and Sustainable Seafood Supply

Program Focus Area: SEAFOOD PRODUCTION AND SAFETY

Program Goals

1. Support enhanced seafood supply through sustainable fishing, aquaculture and habitat conservation.
2. Develop methods and processes that will enhance the viability and economy of the domestic seafood industry.
3. Develop procedures to ensure that seafood is safe and provide objective information to foster informed consumers.

JUMP TO REPORT SECTION

Full Text of Impacts
Program Performance Measures
Objectives

Impacts and Accomplishments toward Program Goals

1. **Program Goal: Support enhanced seafood supply through sustainable fishing, aquaculture and habitat conservation.**
   Impact(s)
   - 19602 - Florida Sea Grant partners with State agencies to restore critical oyster reef habitat.
   - 17331 - Developing stakeholder-driven processes that enhance the sustainability and economy of Gulf and Caribbean fisheries
   - 17316 - Best management practices strengthen the economic impact of Florida's Artificial Reef Program
   - 17314 - Florida Sea Grant mobilizes a rapid response to a commercial fishery collapse in Apalachicola Bay.
   - 15083 - Florida Sea Grant research informs decision to protect tiger and hammerhead sharks in Florida waters.
   - 14140 - Florida Sea Grant Extension provided a coordinated response to the Deepwater Horizon oil spill in 2010, addressing the multiple issues that affected the people, businesses, communities and environments along Florida's Gulf coast.
   - 14128 - Kid's Cup Redfish Tournament provides a hands-on experience that teaches sustainable fishing and acoustic tagging/monitoring methods to 56 youth and adult captains and contributes $58K to the local economy.
   - 14054 - Florida Sea Grant's statewide marine education and extension programs partner with state, local governments, and industry to implement hands-on learning experiences and ecosystem enhancement projects that harness the power of the scientific community, industry, citizen volunteers, and teachers and youth, who learn by doing, while also enhancing the environment.
   - 14020 - Florida Sea Grant researchers at Mote Marine Laboratory develop technology to use aquaculture effluent to grow marine plants, enhancing 310 acres of coastal habitat in Florida.

   Accomplishment(s)
   - 19576 - Florida Sea Grant extension agents train educators and law enforcement in methods to advance public compliance with fisheries regulations.

2. **Program Goal: Develop methods and processes that will enhance the viability and economy of the domestic seafood industry.**
   Impact(s)
   - 19627 - Florida Sea Grant supports the seafood and aquaculture based economy.
   - 19617 - Florida Sea Grant helps clam aquaculture industry become more resilient.
   - 17332 - Developing sustainable aquaculture technologies that support coastal habitat restoration efforts.
   - 15095 - Florida Sea Grant coordination of trade adjustment program sustains jobs and income for shrimp fishermen.
   - 14134 - Research and outreach conducted by Florida Sea Grant sustains 150 jobs and the economic viability of Florida's $3 Million commercial sponge fishery.
   - 14069 - Florida Sea Grant provided information needed by state regulators to eliminate a rule making it illegal to use oyster tongs prior to sunrise, which was severly impacting oyster harvesters.
   - 14067 - Florida Sea Grant helps to secure $800K to support oyster industry compliance with new Vibrio bacteria regulations, thereby helping to sustain 10 businesses and 300 jobs.

   Accomplishment(s)

- 15108 - Study shows impact that short-term leases and the trading of fishing quotas have on the Gulf of Mexico red snapper fishery
- 15101 - Florida Sea Grant helps clam growers obtain $54K in damage claims

3. **Program Goal: Develop procedures to ensure that seafood is safe and provide objective information to foster informed consumers.**
Impact(s)
   - 19620 - National seafood safety training coordinated by Florida Sea Grant credited as leading factor of foodborne illness reduction.
   - 17315 - Florida Sea Grant trains industry and agency professionals in safety protocols to ensure that seafood is safe for consumers.
   - 14081 - Thirty seafood whole sale operations, 40 seafood retail operations, and more than 200 regulatory agency inspectors received new HACCP certifications, thereby helping to sustain the seafood industry and the quality of seafood products.
   - 14079 - Third annual "Shellfish School" teaches BMP's for product safety and marketing to 20 shellfish buyers and 16 seafood businesses representatives. Participants estimated that they increased their business income by $10,000 due to the school.

Accomplishment(s)
   - 19609 - Timely response to new federal rules increases safety of oysters sold for raw consumption, reduces public health threat.
   - 15056 - New rapid test for the simultaneous detection of three primary Vibrio strains in oysters

Back to Top

Full Text of Impacts and Accomplishments

19627 - Florida Sea Grant supports the seafood and aquaculture based economy.
Relevance: The rising demand for seafood, high fishing pressure on certain local stocks, and issues such as product substitution are ongoing threats to Florida's seafood industry. Aquaculture may create new opportunities to meet rising demands for seafood; however a number of issues must first be addressed for this potential to be realized.

Response: Several Florida Sea Grant funded projects in 2013 helped close knowledge gaps for some of Florida's most lucrative aquaculture industries. Researchers at the University of Florida developed new tools for Vibrio detection in oysters. Research and extension faculty working with the clam industry helped eliminate barriers to commercial production of Sunray Venus Clams, and they identified optimal sediment characteristics for growing clams in the wild. Researchers at Mote Marine Laboratory developed a recirculating aquaculture system that links production of marine fish and plants, a dual output system that also reduces the amount of waste material.

Results: The Vibrio monitoring tool was accepted as an emerging method by the National Shellfish Sanitation Program. It reduces labor costs and assay time from 4-5 days to just 24 hours. There already is a $400,000 increase in income from sales of Sunray Venus Clam and 24 new industry jobs. The Mote recirculating aquaculture system produced over 180,000 wetland plants that were used for coastal habitat restoration around Florida by a private sector research partner.

RECAP: Florida Sea Grant supports the seafood and aquaculture industry with research and extension.

Back to Goals

19620 - National seafood safety training coordinated by Florida Sea Grant credited as leading factor of foodborne illness reduction.
Relevance: Seafood is a $65 billion industry in the U.S., and consumption is at an all-time high. Seafood sold in the U.S. is a healthy food choice for people of all ages and unlikely to cause illness; however, seafood is often prepared and served in ways that do not reliably kill pathogens. In addition, illnesses linked to contaminated seafood can have high fatality rates in people with certain medical conditions. Since the mid-1990s, all domestic seafood processors and importers have used the HACCP (Hazard Analysis and Critical Control Point) management system to meet federal food safety regulations. Foodborne illness remains a pressing public health concern and fish continues to be one of the most common foods implicated in outbreaks. (ongoing vigilance is necessary to reduce further risk.)

Response: Florida Sea Grant leads the National Seafood HACCP Alliance for Training and Education, a network of Sea Grant programs, processors, and government agencies that provides the HACCP training required to market fish and fishery products in the U.S. Alliance programs annually train more than 2000 individuals, and to date have graduated more than 35,000 participants from 28 nations. The training also supports the commercial viability of 5,400 seafood firms in the US and US territories. Official training curricula has been developed in English and Spanish; the materials have been translated into more than 10 other languages. Alliance training efforts have trained all FDA inspectors in the nation, most state-based inspectors and over 90 percent of the nationally based seafood processing firms. A cadre of 400 trainers is now available to continue training in every seafood-producing nation in the world.

Results: According to recent data compiled by the Centers for Disease Control and Prevention, the outbreaks of foodborne illness from seafood consumption in the U.S. have declined significantly, from an average of 65 per year from 1998-2004, to 32 per year from 2005-2012. The trend appears to be for further decreases. The CDC specifically cited the efforts of the Seafood HACCP Alliance as one of the leading factors for the trend.

RECAP: Seafood safety training led by Sea Grant's National Seafood HACCP Alliance is cited by federal authorities as a leading factor in the significant decline of fish-associated foodborne illness outbreaks over the last decade. Back to Goals

19617 - Florida Sea Grant helps clam aquaculture industry become more resilient.
Rationale: The clam aquaculture industry in Florida employs several hundred people and supports over 300 small businesses. Since its inception, that industry has depended on production of a single species, Mercenaria mercenaria. Aquaculture that depends on a single species is at risk of catastrophic failure. Should a disease affect the clams or water temperatures rise due to global warming, the industry could collapse. A diversified product line can help to increase resilience.

Response: Over the last 6 years, Florida Sea Grant has supported research and extension to bring a native clam species known as the 'sunray venus clam' (Macrocallista nimbosa) into production aquaculture. In the most recent work, investigators conducted a market analysis where the new species was provided to consumers at seafood and sushi restaurants in Cedar Key and Gainesville, and to chefs at the Boston Seafood Show. Participants were asked to rate the quality of the product and their willingness to buy it.

Results: At the restaurants, 239 consumers tried sunray venus clams and completed surveys. The overall assessment was extremely favorable, with 90% rating the clams as Excellent or Very Good. Restaurant chefs at the seafood show also were highly satisfied with sunray venus clams. It now is confirmed that there is a high demand for this product. We anticipate that production and sales will rise in upcoming years, resulting in increased revenue and more jobs.

RECAP: Florida Sea Grant diversifies the clam aquaculture industry. Back to Goals

19609 - Timely response to new federal rules increases safety of oysters sold for raw consumption, reduces public health threat.
Relevance: Finding ways to reduce illness from Vibrio vulnificus, a naturally occurring but potentially fatal organism found in oysters from the Gulf of Mexico, has been an ongoing effort between commercial fishermen and public health officials. Still, on average, since 2000, about 32 individuals a year in the United States have become ill from eating raw or undercooked oysters containing V. vulnificus, and about half have died. Recently, the U.S. Food and Drug Administration issued new requirements aimed at reducing V. vulnificus to non-detectable levels, jeopardizing the livelihoods of hundreds of Florida oystermen.

Response: Working with the FDA on an illness reduction strategy, the Interstate Shellfish Sanitation Conference, an organization of representatives from industry and government health officials, created new food safety training requirements for shellfish harvesters, farmers, and dealers. In Franklin County, Fla., the focal point of harvesting grounds for Apalachicola Bay oysters, Florida Sea Grant has created the interactive video training on processing, handling and transportation practices that Florida's agriculture department delivers to certify compliance with ISSC requirements.

Results: Since April 2014, nearly 1,000 Apalachicola Bay oyster harvesters and dealers have watched the 20-minute training, and are now eligible to obtain the necessary certification, recertification or licensing that will allow them to keep making a living from the sea. Officials estimate another 300 to 600 fishermen and dealers will complete the training before the June 30 deadline.

RECAP: As the shellfish industry and federal health authorities continue to work on illness reduction strategies, Florida Sea Grant creates timely industry training that helps decrease the number of seafood illnesses from a deadly shellfish bacteria, and keep more than 1500 Apalachicola Bay commercial fishermen and dealers in business. Back to Goals

19602 - Florida Sea Grant partners with State agencies to restore critical oyster reef habitat.
Relevance: A research program led by Florida Sea Grant and the University of Florida in late 2012 to early 2013 provided results that were used by the State of Florida to have a Fisheries Disaster declared by NOAA in response to the collapse of the oyster fishery in Apalachicola Bay. We documented that the collapse was caused by a prolonged drought, which led to low river inflows and high salinity in the bay that allowed predators to reach high densities and decimate oysters. We also learned that when normal river flows return, a lack of substrate could limit recovery.

Response: Florida Sea Grant has worked with the State of Florida and local communities to write grants and apply for federal assistance to support recovery efforts in the bay.

Results: We obtained a $4.7M grant from the National Fish and Wildlife Foundation to conduct experimental reef restoration, in order to obtain information to guide effective large-scale restoration in

the future. In response to a request from Florida, supported by our research report, Congress appropriated $6M to support restoration of oyster reefs, and another $5M has been obtained from BP settlement funds. This funding would not have occurred without the Florida Sea Grant-led research that identified the cause of oyster collapse and actions needed for recovery.

RECAP: Florida Sea Grant research supports over $15M of funding to restore oyster reefs.

Back to Goals

19576 - Florida Sea Grant extension agents train educators and law enforcement in methods to advance public compliance with fisheries regulations.

Relevance: Managing fisheries often has more to do with managing the people involved in fisheries than with managing the resource itself. In a state billed as the Fishing Capital of the World, communicating with recreational and commercial anglers about the importance of compliance with fisheries regulations is a paramount concern for state and federal officials.

Response: Extension agents with Florida Sea Grant have created a novel series of fisheries regulations workshops that focus on state and federal rule updates, sustainable fishing techniques, and tenets of fisheries stock assessments and management. Nearly 350 individuals employed as park rangers, law enforcement officers, tackle manufacturers, resource managers and informal educators have attended. Based on the success of the earliest workshops in southwest Florida, extension agents from the Panhandle area, the Florida Keys and the Atlantic coast have replicated the workshops for stakeholders in their area.

Results: In follow-up evaluations, there is near consensus by participants that the workshops have increased their ability to interact with and educate saltwater anglers about marine fisheries issues. The workshops have also increased the local network of agency staff capable of identifying and reporting marine fisheries violations. A spokesman with the Florida Fish and Wildlife Conservation Commission commented that Sea Grant provides the linkage between local communities, and state and federal agencies. He credits the workshops with improving inter-agency and intra-agency communication, and says they provide "an important person-to-person communications mechanism that will increase the level of compliance with fisheries regulations."

RECAP: Florida Sea Grant advances compliance with state and federal fisheries regulations by delivering innovative trainings on fisheries regulations to rangers, law enforcement personnel and educators.

Back to Goals

17332 - Developing sustainable aquaculture technologies that support coastal habitat restoration efforts.

Relevance: One of the challenges in producing aqua-cultured fish in land based systems is in dealing with the effluent, which typically rich in nitrogen, phosphorus and other elements. Typically, these are removed with man-made and biological treatment systems that are less than 100 percent effective. A result is a need for disposal for large amounts of waste material either on-site or in landfills.

Response: Florida Sea Grant funded the development of a coupled fish aquaculture / wetland plant production system. The researcher worked with a private company that specializes in wetland restoration in order to design and optimize the production of mangrove, cord grass, and rush plants.

Results: A total of 107K plants were produced by the system and used to restore six acres of coastal wetlands. In just the first year the system was also effective in producing more than 2,500 Florida Pompano, a recreationally important fish.

RECAP: New zero-emission technology increases the production, diversification, and sustainability of aqua-cultured products.

Back to Goals

17331 - Developing stakeholder-driven processes that enhance the sustainability and economy of Gulf and Caribbean fisheries

Relevance: The use of fish aggregation devices (FADs) is becoming more widespread in the Caribbean. So far, FAD development programs have focused their efforts on the deployment and the maintenance of the FAD infrastructure but comparatively little attention has been given to developing co-management strategies to normalize the use of FADs and sustain the pelagic fishery resources that are being targeted by these devices.

Response: Florida Sea Grant partnered with the Caribbean Regional Fisheries Mechanism, the Dominica Fisheries Division, and the St. Vincent Fisheries Division to develop and implement a strategy to monitor FAD use and catch effort to inform best management options to achieve optimal sustainable fishing success. The strategy involved both research and outreach components. A monitoring program was initiated at three landing sites to compare catch and fishing effort between FADs that were deployed privately with those that were established with the use of public funds. The monitoring results were subsequently shared with FAD fishers at three stakeholder meetings conducted at the landing sites being studied. The meetings were attended by more than 100 FAD fishers. Facilitated discussion identified (1) options to reduce the number of fishers competing for FAD fishery resources, (2) challenges to managing FAD fishing, and (3) the role of fishers, cooperatives, and the Fisheries Division in managing FAD fishing.

Results: The research and meeting results show that fishers who deploy private FADs enjoy a significantly higher profit margin than fishers who use public FADs. Reduced profitability among fishers who use the public FADs is due largely to greater numbers of fishers that must compete for and share the limited fishery resources that public FADs attract. In addition, fishers that use public FADs are less apt to let FADs 'rest' and typically take all fish caught (large and small) which diminishes the longer-term sustainability of the pelagic fishery. Project results were used to develop a Daily Activity Planner, which is now being used by fishers at two landing sites to help plan and manage their fishing activities.

RECAP: A stakeholder engagement program helps fishers to more sustainably manage the Gulf and Caribbean pelagic fishery. Back to Goals

17316 - Best management practices strengthen the economic impact of Florida's Artificial Reef Program

Relevance: Reefs provide critical habitat for Florida's multi-billion dollar recreational fishing and diving industry. Because of high fishing and diving intensity natural reef systems have been overexploited. Artificial reefs provide an opportunity to reduce pressure on natural systems by providing alternative habitats for fishermen and divers.

Response: Florida Sea Grant continues to play a leadership role in the state's artificial reef program, which it pioneered more than 30 years ago. We continue to organize, in partnership with the state's fish and wildlife commission, a statewide artificial reef summit. We also provide ongoing training and guidance to artificial reef coordinators in coastal counties, and we support research to test the efficacy of different configurations of reefs and different reef-building materials. A current project, led by a Florida Sea Grant extension specialist, involves the deployment and monitoring of 500 artificial reef blocks off of the Taylor County coast. At this time the project is for conservation purposes only, however some of these reefs will be opened for fishing in the future.

Results: A recent southwest Florida economic impact study estimates that fishermen, divers, and other artificial reef users contribute $253 million annually to the economy in just a six county region (we do not have data for the entire state). These reefs support approximately 2,600 jobs in southwest Florida.

RECAP: Florida Sea Grant plays a leadership role in providing science-based assistance for the deployment, monitoring and maintenance of Florida's system of artificial reefs. Back to Goals

17315 - Florida Sea Grant trains industry and agency professionals in safety protocols to ensure that seafood is safe for consumers.

Relevance: Keeping seafood fresh and safe for consumers is a challenging task for importers, wholesalers, restaurants, and retailers. Keeping up to date on the latest handling and processing techniques, relevant regulations and other information is essential for all segments of the industry. Federal guidelines require that all seafood processors in the US or foreign countries that export seafood to the US follow a strict set of safe handling techniques known as the Hazard Analysis and Critical Control Point protocol (HACCP). As a result, there is a great need for practical ongoing education opportunities.

Response: Florida Sea Grant plays a leadership role in providing training for industry and regulators alike in regard to issues that can affect the safety and quality of seafood. We hold annual seafood "schools" about shrimp, oysters, and other seafood products for professionals in the seafood industry - ranging from restaurant chefs to managers of seafood safety operations from large corporations such as Publix supermarket and Darden Seafood. This year Florida Sea Grant's seafood extension specialist led the process to develop a new addition of the HACCP training manual. The specialist also provided guidance to the People's Republic of China (PRC), a major source of seafood supplied to the US. As a result, the PRC has adopted the HACCP guidelines and is using a version of the HACCP manual that was translated into Chinese.

Results: In 2012, more than 500 shrimp and oyster processing firms adopted safe and effective methods for handling and processing seafood as a result of knowledge and skills acquired from shrimp and oyster schools. A total of 1,500 seafood processing operations maintained their federal certification to operate as a result of participating in HACCP Alliance training programs. An additional 3,000 people received new HACCP certifications in 2012. These activities sustained 5,000 jobs and 1,500 businesses. As a result of these programs seafood remains the safest source of animal protein product that is available to people in the US.

RECAP: Florida Sea Grant implements comprehensive training programs for industry and agency professionals to ensure that seafood is safe for consumers. Back to Goals

17314 - Florida Sea Grant mobilizes a rapid response to a commercial fishery collapse in Apalachicola Bay.

Relevance: Apalachicola is a heritage fishing community located in the Big Bend region of Florida. For decades, it has been the state's prime spot for production of oysters that are prized for their outstanding quality and taste. Today this unique oyster fishery may be on the verge of collapse for a variety of reasons, some due to nature and some man-made. During the last two years, a severe drought in Georgia, where much of the water in the Apalachicola River originates, has dramatically reduced freshwater inflows to Apalachicola Bay. Adding to this problem are withdrawals of water in the

river basin for human uses. Oystermen have pointed to declines in abundance of a wide range of aquatic animals in the bay, and they landings data document that their harvest has dramatically declined. This situation could reflect a variety of stressors, including increased predation as salinity in the bay has increased without the typical rate of freshwater inflow, perhaps nutrient limitation of the food web, and a high level of oyster harvesting. The rate of oyster fishing increased after the BP oil spill in 2010, when the state issued a large number of new harvesting permits, and allowed higher rates of harvest than traditionally occurred - the idea being to get oysters before oil might come into the bay. Despite a return to pre-spill regulations, harvesting rates remained high in 2011 and 2012, and evidence shows that there has been harvesting of sub-legal (less than 3 inch) sized oysters. In essence, the period from 2010 to 2012 may have been a 'perfect storm' for the oyster fishery in Apalachicola Bay - and - the storm may not be over, as drought is predicted to extend into 2013 in the river basin.

Response: The University of Florida and Florida Sea Grant responded to this situation in fall 2012, when UF's Senior Vice President Jack Payne formed the UF Oyster Recovery Team (Team), and asked Karl Havens, Director of Florida Sea Grant, to serve as Chair. Sea Grant created a diverse Team including about a dozen Florida researchers (UF, Florida State, Florida Gulf Coast University, Florida A&M University) with a broad range of experience and knowledge about oysters and coastal ecosystems in Florida, as well as staff from state regulatory agencies, and about twenty representatives from the oyster industry and other fishing-related businesses in Apalachicola. The Team was charged with identifying the cause of the oyster collapse and making suggestions as to how to make the industry more resilient. The Team met in Apalachicola for two public meetings in 2012, to gather broad input from constituents regarding their specific observations and concerns about the bay. Researchers also met with agency scientists on a number of occasions to obtain and jointly evaluate historical and contemporary data on oysters, water quality and other features of the bay. The focus of research has been on looking for signs of increased infection by oyster pathogens, signs of oil or dispersant from the BP oil spill, evidence of over-harvesting and harvesting of sub-legal oysters, and predation impacts on oysters and how it relates to salinity of water at different locations in the bay. To engage the oyster industry, instead of hiring technicians we trained and hired about 15 oystermen as field crew. The Team also worked with members of the industry and community to develop approaches for increased resiliency, including options for diversification of seafood products. While the research was underway, we also worked with the community to foster a greater sense of ownership of the Bay - helping oystermen and other community members form a citizen action group called SMARRT (Seafood Management Assistance Resource and Recovery Team) that aims to work with the state regulatory agencies to develop a process to ensure that the oyster industry has long-term sustainability. In 2012 we also implemented a program of community based social marketing in local high schools and wit
RECAP: Florida Sea Grant leads a team of university-based experts to determine the causes and solutions to a collapse in the Apalachicola Bay oyster fishery. Back to Goals

15108 - Study shows impact that short-term leases and the trading of fishing quotas have on the Gulf of Mexico red snapper fishery

The recent shift in fisheries management toward limited access privilege programs, such as "individual fishing quotas" (IFQ) is intended to increase the efficiency and profitability of the catch and to promote the long-term sustainability of the affected fishery. This program, which is quite controversial among commercial fishermen, is viewed by NOAA as a way to protect future harvests by not overharvesting in the current period. A potential problem is that IFQs are now being traded as a commodity by fishers who possess them to fishers who want to lease them. This situation can theoretically lead to the inefficient exploitation of the fishery resource, as may be the case of the Gulf of Mexico red snapper fishery. One reason for this is that fishers who own quotas do not face escalating lease costs. They can, therefore, fish with less efficient gear and still out-earn fishers that have to lease their quotas. It also may create a situation where fish stocks can suffer from short-term overexploitation by fishers wanting to maximize IFQ lease expenditures. As such, this project is evaluating the impact that short-term leases and the permanent trading of IFQs may have on the Gulf of Mexico red snapper fishery, which has implications for other similarly managed fisheries, including grouper and tilefish.
RECAP: This project evaluated the impact that short-term leases and the permanent trading of IFQs have on the Gulf of Mexico red snapper fishery, which has implications for other similarly managed fisheries, including grouper and tilefish. Back to Goals

15101 - Florida Sea Grant helps clam growers obtain $54K in damage claims

Operation and maintenance of a real-time web-based water quality monitoring system provided decision support for Florida's clam industry. During 2010, more than 50% of growers and 80% of seed suppliers accessed the system, which has helped growers obtain $54K in damage claims due to El Nino conditions.
RECAP: Operation and maintenance of a real-time web-based water quality monitoring system provides decision support for Florida's clam industry. Back to Goals

15095 - Florida Sea Grant coordination of trade adjustment program sustains jobs and income for shrimp fishermen.

Relevance: Commercial shrimpers and fishermen whose commodities have been certified as being adversely affected by import competition are now eligible for business training and trade adjustment compensation through the U.S. Department of Agriculture's Trade Adjustment Assistance for Farmers (TAAF) program. The intent of the TAAF program is to provide training to farmers and commercial fishermen and then encourage them to apply the new skills and benefits received to improve the

productivity and profitability of their businesses.

Response: This project has supported efforts at Florida Sea Grant being conducted under a cooperative agreement with the U.S. Department of Agriculture - Farm Service Agency, and the University of Minnesota Cooperative Extension Program, to implement the TAAF initiative. The Florida program conducted 20 workshops throughout the state providing approximately 300 commercial fishermen with training on (1) the current status of the domestic shrimp market, (2) innovative marketing methods, (3) techniques for making their vessels more fuel efficient, and (4) effective business planning.

Results: Approximately 150 commercial fishermen have been trained and have received either the complete or initial TAA benefits payments. It is estimated that this project has helped to sustain 500 jobs and increased the income of fishermen who participated in the program by a total of $1.5M. This amount will be potentially doubled when the program is completed in 2013.
RECAP: Approximately 150 commercial fishermen have been trained and have received either the complete or initial TAA benefits payments. Back to Goals

15083 - Florida Sea Grant research informs decision to protect tiger and hammerhead sharks in Florida waters.
Relevance: Sharks are highly threatened worldwide due to overfishing, a trend that is largely driven to fuel the shark fin trade as well as from accidental bycatch from commercial fishing operations. Populations of hammerhead sharks in the northwest Atlantic have declined more than 80 percent over the last two decades. DNA analysis of great hammerhead fins sold in the Asian shark fin market has shown that a large majority of the sharks came from Atlantic waters. The great hammerhead shark is listed as endangered in the northwest Atlantic and Gulf of Mexico by the International Union for Conservation of Nature (ICUN).

Response: The research team used satellite tags to track large and environmentally threatened sharks in Florida and the Bahamas, including great hammerhead, bull and tiger sharks. The research focused on identifying hotspots (areas that are important for feeding, mating, and pupping), and it documented their largely unknown migration routes. The research indicated that Florida waters are important pupping and feeding grounds for sharks, providing them with the critical habitat required for these slow-to-mature ocean animals to survive.

Results: The results of this research provided evidence that was used by the Florida Fish and Wildlife Conservation Commission (FWC) to ban fishing of tiger sharks and three species of hammerheads in state waters.
RECAP: Florida Sea Grant researchers demonstrate the importance of protecting tiger and hammerhead shark populations in Florida waters, which provide critical habitat that supports juvenile populations. The research informed a decision by the Florida Fish and Wildlife Conservation Commission to ban fishing for these shark species in Florida waters. Back to Goals

15056 - New rapid test for the simultaneous detection of three primary Vibrio strains in oysters
Gulf of Mexico oysters are prized for their outstanding texture and taste, and the oyster fishery is an economic engine of certain Florida coastal communities. Florida Sea Grant has a long history of working with the oyster industry to ensure that in addition to high quality the product is safe for consumers. This ongoing research project, conducted by scientists at the University of Florida, is making advances towards the development of a more rapid and lower cost test than currently is available for detecting Vibrio, the bacterial pathogen that is of greatest concern from a public health standpoint for consumption of raw oysters. This project has developed a new rapid test (real-time polymerase chain reaction - PCR - protocol) for the simultaneous detection of three primary Vibrio strains in oysters. The new protocol is now under review by the National Shellfish Sanitation Program.
RECAP: The new test is anticipated to help sustain the year-round harvest of oysters and 75,000 businesses engaged in oyster processing and sales. Back to Goals

14140 - Florida Sea Grant Extension provided a coordinated response to the Deepwater Horizon oil spill in 2010, addressing the multiple issues that affected the people, businesses, communities and environments along Florida's Gulf coast.
Relevance: The explosion of the Deepwater Horizon oil platform and subsequent massive leak of oil into the waters of the Gulf had devastating impacts on the Gulf ecosystem and its coastal communities. In Florida, environmental impacts were constrained to the extreme western region of the state's 'panhandle' yet of all the Gulf states, Florida experienced the greatest economic impacts, as tourists cancelled vacations to our beaches and people had concerns about eating Gulf seafood.

Response: Florida Sea Grant developed a decision support framework to help affected businesses and residents determine how to file claims for lost revenue and income. Our Extension Agents helped small businesses apply for economic relief from BP, and helped train boat owners who were able to participate in the BP vessels of opportunity program to deploy booms to collect oil. This provided them with steady income when they were put out of the fishing business by the oil spill. Another 1,000 residents received training to be BP 'Qualified Community Responders' to deal with issues such as tar ball clean-up on area beaches. Sea Grant Extension Agents also provided training for volunteers to care for marine mammals, and this activity was featured on CNN's 'Building up America' television show. Florida Sea Grant also worked with Franklin County to develop an oil spill contingency plan, which was

approved by Unified Command, and a seafood sensory program called Harvest Open Waters (HOW) that trained regulatory agency staff and industry representatives to detect oil contamination in seafood. This program was implemented for the entire affected area of the Gulf of Mexico. Sea Grant Extension Agents also led 'listening sessions' in the panhandle region, where residents voiced their concerns and needs in public forums. All of this work was coordinated with the other Gulf of Mexico Sea Grant Programs, with our respective state emergency management agencies, and with NOAA.

Results: As a result of these efforts, 14 small businesses obtained economic relief from BP, and 1,350 boat owners were able to participate in the vessels of opportunity program, earning an estimated $2.03 million dollars and helping to deploy booms to protect beaches and sensitive oyster habitat. In addition 129 volunteers were trained to care for oil-impacted marine animals and over 50 regulatory agency staff and industry representatives received training that they used to screen seafood for oil contamination.

RECAP: Oil spill response and recovery actions help to sustain coastal economies and environments.

Back to Goals

14134 - Research and outreach conducted by Florida Sea Grant sustains 150 jobs and the economic viability of Florida's $3 Million commercial sponge fishery.
Relevance: Florida's $3 Million commercial sponge fishery employed traditional harvesting practices that impaired the ability of sponges to regrow, making the industry unsustainable.

Response: Florida Sea Grant agent, John Stevely, an internationally recognized sponge expert, developed a new harvesting protocol (one that harvests sponges by cutting rather than hooking) that allows the sponges to regenerate. This method is now used by the industry to harvest sponges sustainably.

Results: Areas that had been traditionally closed to sponge harvesting have been reopened following Florida Sea Grant research that showed current harvesting methods are sustainable. It is estimated that Florida Sea Grant's recommended approach to sponge harvesting has resulted in the retention of 150 jobs and $3 million in annual earnings to the Florida commercial sponge industry. Jim Cantonis, President of ACME Sponge and Chamnios, Tarpon Springs, FL, commented that "If it was not for Florida Sea Grant, there would be no commercial sponge industry in Florida."

RECAP: Jobs/Created Sustained

Back to Goals

14128 - Kid's Cup Redfish Tournament provides a hands-on experience that teaches sustainable fishing and acoustic tagging/monitoring methods to 56 youth and adult captains and contributes $58K to the local economy.
Relevance: Fishing is the number one water-based activity in Florida. Red drum are a popular fish species that is suffering from over-exploitation. There is a need to preserve Florida's red drum fishery and manage catch and release tournaments, through a coordinated outreach program that targets anglers of all ages.

Response: Florida Sea Grant agent, Betty Staugler, partnered with Mote Marine Laboratory and Progress Energy to develop a Kid's Cup Redfish Tournament, that works though volunteers to teach sustainable angling practices to kids. A series of hands-on activities that include acoustic tagging, monitoring, and catch and release techniques, demonstrate fisheries science and management skills.

Results: "The 56 youth who participated in the 2010 Kids Cup tournament learned about fisheries science, acoustic tagging and proper catch and release techniques to support efforts to determine post release mortality and dispersal patterns. Volunteers donated time estimated to be worth $7K to the activity which generated $38K in direct impact and an additional $20K in value-added impact to the local economy.
RECAP: Marine Literacy Enhanced

Back to Goals

14081 - Thirty seafood whole sale operations, 40 seafood retail operations, and more than 200 regulatory agency inspectors received new HACCP certifications, thereby helping to sustain the seafood industry and the quality of seafood products.
Relevance: Seafood, including shellfish, is among the most perishable of foods. That is due to the kind of enzymes and bacteria found on fish and the effects of oxygen, which can cause the "fishy smell' that is one sign of spoilage. HACCP, or the Hazard Analysis Critical Control Point System, is a process control system that identifies where hazards might occur in the food production process and puts into place stringent actions to prevent contamination and resulting food poisoning. This is particularly important for seafood which, unlike beef and poultry, typically arrives at the processing plant dead - sometimes dead for days.

Response: The Florida Sea Grant affiliated seafood safety specialist, Dr. Steve Otwell, developed a new HACCP curriculum and trained almost 300 individuals from seafood processing, retail operations, and government agencies on new seafood safety regulations.

Results: It is estimated that new HACCP certifications obtained by participating seafood processing and retailer firms has sustained an estimated 70 businesses and 5,000 jobs in the industry.

RECAP: Jobs Created/Sustained Back to Goals

14079 - Third annual "Shellfish School" teaches BMP's for product safety and marketing to 20 shellfish buyers and 16 seafood businesses representatives. Participants estimated that they increased their business income by $10,000 due to the school.
Relevance: It is critical that workers handling seafood at all stages from catch to the restaurant table follow appropriate methods to ensure product safety and quality.

Response: Florida Sea Grant operates schools for seafood professionals where they learn these important skills. Many large public corporations require that their seafood staff attend this training program.

Results: During 2010, 36 participants learned safe methods of handling seafood and it is estimated that their total business income was increased by $360,000 as a result of attending this school. This increase in revenue reflects cost savings from reduced product spoilage and new revenues from products that are more attractive to consumers.

RECAP: Income Increased Back to Goals

14069 - Florida Sea Grant provided information needed by state regulators to eliminate a rule making it illegal to use oyster tongs prior to sunrise, which was severly impacting oyster harvesters.
Relevance: In order to comply with new Federal & State summer-time/temperature harvesting regulations, harvesters would have to launch their boats and travel to the oyster bars well before sunrise in order to have enough time to harvest oysters and land them at a certified dealer within the new restive time/temperature timeline.

Response: Florida Sea Grant organized three meetings with Florida Fish and Wildlife Conservation Commission staff to explain the new Federal and State harvesting time/temperature regulations and the problem the FWC caused by not allowing the fishermen enough time to launch their boats, travel to the oyster bar, harvest oysters, and land them at a certified shellfish dealer within the new restrictive time frame.

Results: The FWC commissioners unanimously approved a change to remove the restriction on having oyster tongs onboard a vessel on state waters prior to sunrise. As a result, 300 oystermen are now able to continue to work during the summer harvest season.

RECAP: Jobs Created/Sustained Back to Goals

14067 - Florida Sea Grant helps to secure $800K to support oyster industry compliance with new Vibrio bacteria regulations, thereby helping to sustain 10 businesses and 300 jobs.
Relevance: The Florida oyster industry is now required to adopt new and expensive Post Harvest Processing technologies to comply with new regulations to address Vibrio bacteria concerns.

Response: The Florida Sea Grant agent for Franklin County, home to Florida's largest oyster processing industry, helped to coordinate a series of meetings about the impacts that the new and pending U.S. Food and Drug Administration (FDA) regulations were having on Florida's oyster industry. Oyster processors, harvesters, the Executive Director of the Seafood Task Force and the Chairman of the Franklin County Commission listened to perspectives on Vibrio bacteria regulation issues.

Result: As a result of the meetings, Franklin County obtained $800,000 (over 3-years) from Congress to support the oyster industry's compliance with the new Federal Vibrio time/temperature requirements. This is in addition to funds received directly through U.S.D.A. for continued Vibrio research related to Post Harvest Processing methodologies in support of FL's oyster industry. It is estimated that this new funding has helped to sustain 10 businesses and 300 jobs in rural Franklin County.

RECAP: Jobs Created/Sustained Back to Goals

14054 - Florida Sea Grant's statewide marine education and extension programs partner with state, local governments, and industry to implement hands-on learning experiences and ecosystem enhancement projects that harness the power of the scientific community, industry, citizen volunteers, and teachers and youth, who learn by doing, while also enhancing the environment.
Relevance: Florida Sea Grant's marine education programs complement the public school system's science curriculum, which in many communities lacks a comprehensive coastal and marine ecology component. In addition, Florida Sea Grant responds to the need expressed by local cooperative extension programs for more informal learning experiences through a blending of education and extension that targets not only youth, but also adults who want to learn more about coastal and marine systems through immersion programs, which offer hands-on educational experiences.

Response: To meet a growing demand for hands-on formal and informal marine science learning experiences, Florida Sea Grant's network of 20 outreach specialists develop their respective marine

education and extension programs with input from local advisory committees. These programs are further coordinated through a Florida Sea Grant supported Work Action Group, and through an annual Florida Sea Grant extension meeting that identifies areas of common interest, such as habitat enhancement, responsible angling, monofilament recycling, and Coastal Master Naturalist Certification programs, which become integrated into annual work plans. The success of Florida Sea Grant's marine education program is due to adherence to four overarching principles: First, educational activities are conducted through partnerships with state agencies, the Cooperative Extension Service, the school system, local citizen groups, and/or industry. Second, activities harness and benefit from local volunteer involvement. Third, activities must impart knowledge of coastal and marine systems by providing interactive learning experiences. And last, activities where possible are organized in a way that support local small-scale coastal dependent businesses, such as commercial fishing enterprises.

Results: In 2010, Florida Sea Grant agents coordinated learning programs that involved sustainable angling and habitat enhancement, seamlessly blending environmental education with volunteer-based community service. Some of the activities, such as the new Kid's Let's Go Fishing Program and a Statewide Crab Trap Removal Program (which enhanced 125,000 acres of near-shore coastal environments), were planned to involve and supplement the income of commercial fishing captains during the off-season. Florida Sea Grant also continued its partnership with the State in implementing a monofilament line recycling program. The program showed a 60% increase in the amount of line collected from 2008-2010, enhancing an estimated 3,000 acres of coastal habitat. In one area alone, 500 lbs of cast nets were removed from popular artificial reefs (Naples, Collier County). Florida Sea Grant also organized habitat enhancement projects to help coastal communities restore degraded coastal dune, mangrove, marsh, and oyster habitats. For example, in 2010, ten acres of critical oyster habitat in the Indian River Lagoon (Brevard County) and in Choctawatchee Bay (Wakulla County) were restored. These efforts complemented shoreline enhancement projects that restored sand dunes at Shell Point Beach in Wakulla County and 0.25 acres of marsh habitat along East Bay in Santa Rosa County. The innovative Florida Sea Grant Propagules in Schools Program restored five acres of mangrove habitat valued at $75K in Miami-Dade County. These restoration activities were complemented by a new kayak-based ecological immersion program which taught field sampling techniques and ocean literacy to 1,500 kids in Santa Rosa County.
Agents also helped to organize large annual festivals aimed at boosting the incomes of commercial fishermen and sustaining small water-dependent communities. Examples include the Cortez Fishing Festival, which in 2010 raised $85K, helping to preserve 95 acres of environmentally sensitive waterfront land and waterfront access for the local commercial fishing Fleet, and the Florida Keys Seafood Festival, organized in part by the Monroe County Fl
RECAP: During 2010, Florida Sea Grants marine education and outreach program provided learning experiences for 700 teachers, 10,000 youth, and 6,000 citizens, supported water-dependent businesses and communities and was responsible for enhancing more than 128,000 acres of critical coastal habitats in communities throughout the State. Back to Goals

14020 - Florida Sea Grant researchers at Mote Marine Laboratory develop technology to use aquaculture effluent to grow marine plants, enhancing 310 acres of coastal habitat in Florida.
Relevance: Inland marine aquaculture facilities can be environmentally friendly and economically feasible if they have innovative approaches to use wastewater with zero-discharge recirculating systems. This project is developing "smart design" technologies in the form of sustainable recirculation waste systems to allow for the simultaneous commercial production or stock enhancement of marine fish and plants.

Response: Florida Sea Grant researchers from Mote Marine Laboratory are partnering with the aquaculture industry to develop an innovative recirculating system that can accommodate both fish and land-based production of native saltwater plants and macroalgae associated with sustainable aquaculture farming to restore coastal and marine habitats and to provide an additional income stream to Florida's aquaculture enterprises.

Results: This project is successfully developing a new brackish water collection system to expand an existing fish aquaculture facility, Aqua Green, to also produce marine plants, including red mangroves, smooth cord grass, rush, and saltwort. The new system captures and uses fish waste product as fertilizer. To date, 107,614 plants have been grown and transplants used to enhance more than 300 coastal acres around Florida. According to Gil Sharell, Jr, Vice President of Aquatic Plants of Florida, Inc. Thus far, plant growth performance using the new wastewater systems has been a raging success and cost savings has been dramatically improved compared to off-site horticulture operations."
RECAP: Florida Sea Grant researchers at Mote Marine Laboratory develop technology to use aquaculture effluent to grow marine plants, enhancing 310 acres of coastal habitat in Florida.
Back to Goals

Back to Top

Program Performance Measures (2010 - 2013)

Program Performance	Program Plan Target	Reported	Program Comments

Measure	(2010-2013)		
Businesses created from the discovery or application of fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery	5	19	2010 - New small businesses formed to produce dehooking devices and venting tools developed in FSG research projects and now required by State law to be carried onboard by fishing vessels. 2011 - In addition to the five businesses manufacturing dehooking devices, five new small businesses producing aquaculture products and one eco-tourism business were created. 2012 - Introduction to Aquaculture workshop teaches prospective businesses how to be competitive in Florida's $250M aquaculture industry. Five individuals have used the trainings to move forward with establishing baitfish and aquaculture businesses. 2013 - Three new producers have initiated culture of marine baitfish in Florida and one new hatchery started production in 2013 for pinfish and is currently hatching, culturing, and marketing pinfish to marine baitfish retailers.
Economic (market and non-market) benefits ($) derived from the discovery or application of fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery (income)	100,000,000	848,990,000	2010 - This number is based on a 2007 economic analysis of the Cedar Key aquaculture industry and a 2010 economic analysis of the benefits of the Florida artificial reef network. The economic and business activities associated with the use of artificial reefs in SW Florida were estimated through a formal survey and analysis process. Surveys were sent to private boaters, for-hire vessel operators and others. These surveys collected information such as how many boating trips were made to artificial reefs, the expenditures associated with those reef trips, in what counties those expenditures were made, where the users of artificial reefs come from, and other related information. That information was then analyzed by a complex computer model that determines the total expenditures spent on artificial reef trips, how many "new" dollars were brought in by tourists who use those reefs ... and how those dollars are "multiplied" within the local economies ... creating incomes, jobs, and taxes. The economic impact of the reefs is provided by these estimates. 2011 - The reported actual value is the two year total. This value assumes similar economic benefits accruing in the 2010 and 2011 period. 2012 - These economic benefits are related to FSG extension efforts to improve the quality and dependability of the clam aquaculture industry centered in the community of Cedar Key. The number also reflects FSG activities that directly supported the sustainability of the Apalachicola oyster industry (e.g., shelling and relaying efforts). 2013 - These economic benefits are derived from FSG extension efforts to improve the quality and dependability of the clam aquaculture industry centered in the community of Cedar Key. The number also reflects FSG activities that directly supported the State's artificial reef program and the sustainability of the Apalachicola oyster industry (e.g., shelling and relaying efforts).
Jobs created from the discovery or application of fishery production and management models or techniques that	500	3,670	2010 - Created or sustained as per FSG strategic plan 2011 - Estimate is derived from participation in HACCP trainings and shellfish and shrimp schools. 2012 - This estimate reflects the number of industry and management personnel who participated in mandatory HACCP trainings, which are geared towards creating and sustaining industry jobs. Approximately 10 percent of the 3,000 people who

lead to increased sustainability and productivity from the fishery			participated in the HACCP trainings were new employees. 2013 - This estimate reflects the number of industry and management personnel who participated in mandatory HACCP trainings, which are geared towards creating and sustaining industry jobs. Approximately 10 percent of the 1,759 people who participated in the HACCP trainings were new employees
Number of aquaculture-related businesses sustained as a result of Sea Grant funded research and extension	200	1,785	2011 - Number is based upon estimates of businesses associated with clam and oyster aquaculture in Cedar Key and Apalichacola - two localities where FSG has had a long-standing working relationship with the industry. 2012 - Number is based upon estimates of businesses associated with clam and oyster aquaculture in Cedar Key and Apalichacola - two localities where FSG has had a long-standing working relationship with the industry. 2013 - Number is based upon estimates of businesses associated with clam and oyster aquaculture in Cedar Key and Apalichacola - two localities where FSG has had a long-standing working relationship with the industry.
Number of nation-wide regulatory inspectors that participate in the new editions of the University of Florida and Florida Sea Grant Seafood HACCP Alliance training programs	400	800	2011 - Estimate is derived from participation in HACCP trainings. 2012 - This estimate is derived from participation at HACCP Alliance trainings. 2013 - This estimate is derived from participation at HACCP Alliance trainings.
Number of nation-wide seafood processing operations that participate in the new editions of the University of Florida and Florida Sea Grant Seafood HACCP Alliance training programs	4,000	7,205	2011 - Estimate is derived from participation in HACCP trainings. 2012 - This number reflects the seafood processing operations that maintained their federal certification to operate as a result of participating in HACCP Alliance training programs. 2013 - This number is conservative and reflects seafood processing operations that participated in HACCP trainings and used the training manual from Florida Sea Grant during 2013. According to the Association of Food and Drug Officials, During 2013, 1,233 HACCP training certifications were issued to industry representatives and 2,019 HACCP manuals were purchased through FSG.
Number of new native Florida aquaculture products commercially produced as a result of Florida Sea Grant funded research and extension	2	6	2011 - FSG researchers are implementing culture and grow-out trials of Pinfish and Pigfish as new baitfish species. In addition, the FSG marine ornamental specialist is developing procedures to grow Anglefish for the aquaraium industry. 2012 - A new zero discharge recirculating aquaculture system was used to simultaneously culture pompano and three varieties of saltwater plants. For example, 107,000 saltwater plants (rush, red mangrove, and cordgrass) were used to enhance 6 acres of coastal shoreline in Florida. 2013 - Three new producers have initiated culture of marine baitfish in Florida and one new hatchery started production in 2013 for pinfish and is currently hatching, culturing, and marketing pinfish to marine baitfish retailers.

Number of seafood retail operations adopting information from seafood safety educational materials developed by Florida Sea Grant	200	12,350	2011 - This number is estimated from attendance at HACCP, shellfish, and shrimp school trainings. 2012 - This number reflects the more than 1500 seafood processing firms that adopted safe and effective methods for handling and processing seafood as a result of knowledge and skills acquired from HACCP Alliance trainings. Following HACCP guidelines is a requirement of law and is monitored by state and federal regulatory agencies. 2013 - In 2013, 162 official seafood HACCP courses were approved and conducted that issued over 1,233 certificates per persons participating from over 850 companies across the USA, including 15 major retail chain operations with 100's of stores that handle domestic and imported products. Trainings involved firms operating in every sate in the nation and all USA territories, and over 12 nations exporting to the USA.
Number of shrimp and oyster processing firms adopting safe and effective methods for handling and processing seafood as a result of knowledge and skills acquired at Florida Sea Grant shrimp and oyster schools	20	940	2011 - Estimate is derived from participation in shellfish and shrimp schools. 2012 - This number reflects the more than 500 shrimp and oyster processing firms that adopted safe and effective methods for handling and processing seafood as a result of knowledge and skills acquired from shrimp and oyster schools. 2013 - There were no shrimp or oyster schools offered by the Florida Sea Grant seafood safety specialist during 2013.

Back to Top

Program Objectives (2010 - 2013)

Program Objective	Achieved (yes/no)	Program Comments
Clam, oyster and other aquaculture producers, and state agencies involved with the regulation and support of the aquaculture industry will continue to receive technical assistance, training and support from Florida Sea Grant, and consumers will be provided with educational information regarding healthy sustainable seafood choices.	Yes	2010 - Florida Sea Grant's seafood safety specialist continues to provide support to the industry and regulatory agencies in the form of oyster and shrimp schools and a HACCP certification program. In 2010, 40 shrimp and oyster processing forms adopted safe and effective methods for handling and processing seafood as the result of knowledge gained from the oyster and shrimp schools alone. 2011 - FSG's seafood safety specialist continues to provide support to the industry and regulatory agencies in the form of oyster and shrimp schools and a HACCP certification program. In 2011, 5,000 clam, shrimp and oyster processing firms and affiiates adopted safe and effective methods for handling and processing seafood as the result of knowledge gained from the oyster and shrimp schools. The number rose dramatically from 2010 because FSG released the new edition of the HACCP seafood safety training manual. 2012 - During 2012, FSG's seafood safety specialist provided support to the industry and regulatory agencies in the form of oyster and shrimp schools and a HACCP certification program. In 2012, an estimated 500 shrimp and oyster processing firms adopted safe and effective methods for handling and processing seafood as a result of knowledge and skills acquired from shrimp and oyster schools. An estimated 1,500 seafood processing

		operations maintained their federal certification to operate as a result of participating in HACCP Alliance training programs and an estimated 3,000 people received new HACCP certifications in 2012. These activities sustained an estimated 5,000 jobs and 1,500 businesses. 2013 - 2013: During 2013, FSG's seafood safety specialist provided support to the industry and regulatory agencies in the form of a HACCP certification program. In 2013, 1,233 industry workers received certificates for safe and effective methods for handling and processing seafood. An estimated 850 seafood processing operations nationwide maintained their federal certification to operate as a result of participating in HACCP Alliance training programs and an estimated 3,000 people received new HACCP certifications in 2012. These activities sustained an estimated 5,000 jobs and 1,500 businesses. FSG's aquaculture specialist also worked closely with clam farmers to evaluate the effectiveness of mechanical harvesting technologies to increase the productivity of the industry. These actions helped to sustain 350 small clam farming businesses that employ about 650 people.
Commercial, regulatory and institutional seafood interests will develop increased international collaboration facilitated by Florida Sea Grant, to better share the responsibility for seafood safety and sustainability.	Yes	2010 - The Florida Sea Grant seafood safety specialist is fostering international collaboration among seafood processors, retailers, and agencies through participation in the HACCP training curriculum. The seafood safety specialist interfaces with local, state, national, and international stakeholders to facilitate collaboration among the various industry and government interests. Recently a HACCP training manual was developed in Chinese and will be required for use by seafood handlers in the P.R. China. 2011 - The FSG seafood safety specialist is fostering international collaboration among seafood processors, retailers, and agencies through participation in the HACCP training curriculum. The seafood safety specialist interfaces with local, state, national, and international stakeholders to facilitate collaboration among the various industry and government interests. In 2011 the specialist worked with seafood industries in China and the Chinese government now is planning to require that all seafood processors in that nation receive the Sea Grant HACCP training program. 2012 - In 2012, the FSG seafood safety specialist is fostering international collaboration among seafood processors, retailers, and agencies through participation in the HACCP training curriculum. The seafood safety specialist interfaces with local, state, national, and international stakeholders to facilitate collaboration among the various industry and government interests. In 2012 the specialist continued to work with seafood industries in China and the Chinese government now is requiring that all seafood processors in that nation receive Sea Grant HACCP training. 2013 - 2013: In 2013, the FSG seafood safety specialist continued an international collaboration among seafood processors, retailers, and agencies through participation in the HACCP training curriculum. The seafood safety specialist interfaces with local, state, national, and international stakeholders to facilitate collaboration among the various industry and government interests.
Florida Sea Grantâ€™s research and extension will provide information that helps to sustain at least 200 aquaculture related businesses.	Yes	2010 - Aquaculture extension and research represent core Florida Sea Grant capacities for more than three decades. During this time, Florida Sea Grant has helped to develop a robust statewide aquaculture support program that involves researchers at the Harbor Branch Oceanographic Institute who are developing methods to increase the production and harvest of clams and

		oysters, University-based seafood specialists and scientists who are working with the industry to implement post harvesting and rapid vibrio detection technologies to make oysters safer for consumers, and aquaculture extension professionals who interface with researchers and work directly with local oyster and clam farmers and processors to apply new technologies and information that have sustained and expanded the industry. In 2010, Florida Sea Grant's aquaculture program has helped to sustain more than 405 aquaculture businesses, many of which are small and family owned. 2011 - Aquaculture extension and research represent core Florida Sea Grant capacities for more than three decades. During this time, Florida Sea Grant has helped to develop a robust statewide aquaculture support program that involves researchers at the Harbor Branch Oceanographic Institute who are developing methods to increase the production and harvest of clams and oysters, University-based seafood specialists and scientists who are working with the industry to implement post harvesting and rapid vibrio detection technologies to make oysters safer for consumers, and aquaculture extension professionals who interface with researchers and work directly with local oyster and clam farmers and processors to apply new technologies and information that have sustained and expanded the industry. In 2011, Florida Sea Grant's aquaculture program helped to sustain 395 aquaculture businesses, many of which are small and family owned. 2012 - Aquaculture extension and research represent core Florida Sea Grant capacities for more than three decades. During this time, Florida Sea Grant has helped to develop a robust statewide aquaculture support program that involves researchers at the Harbor Branch Oceanographic Institute who are developing methods to increase the production and harvest of clams and oysters, University-based seafood specialists and scientists who are working with the industry to implement post harvesting and rapid vibrio detection technologies to make oysters safer for consumers, and aquaculture extension professionals who interface with researchers and work directly with local oyster and clam farmers and processors to apply oyster relaying and new technologies and information that have sustained the industry. In 2012, Florida Sea Grant's aquaculture program helped to sustain an estimated 395 clam aquaculture businesses, and 600 clam and 375 oyster harvesting jobs. 2013 - 2013: Aquaculture extension and research represent core Florida Sea Grant capacities for more than three decades. During this time, Florida Sea Grant has helped to develop a robust statewide aquaculture support program that involves researchers at the Harbor Branch Oceanographic Institute who are developing methods to increase the production and harvest of clams and oysters, University-based seafood specialists and scientists who are working with the industry to implement rapid vibrio detection technologies to make oysters safer for consumers, and aquaculture extension professionals who interface with researchers and work directly with local oyster and clam farmers and processors to apply oyster relaying and new mechanical harvesting technologies that have sustained the industry. In 2013, Florida Sea Grant's aquaculture program helped to sustain an estimated 395 clam aquaculture businesses, and 600 clam and 375 oyster harvesting jobs.
Florida Sea Grant's research	Yes	2012 - In 2012, FSG's clam aquaculture extension

and extension will provide information that helps to sustain at least 200 aquacuture related businesses		program focused on enhancing the productivity of the clam industry, which is centered in the town of Cedar Key. Programming evaluated the substrate of lease sites, and monitored the water temperature and quality to determine the potential of commercially growing sunray venus clams. This and other activities directly benefitted clam farmers and helped to sustain an estimated 600 jobs and 395 businesses associated with the clam industry. 2013 - This objective is redundant. Please see comments pertaining to the above objective.
Seafood professionals from across the nation will participate in the University of Florida / Florida Sea Grant Seafood HACCP Alliance for Education and Training which provides educational support for every seafood processing and importing entity in the nation. This program will be significantly updated and revised in 2009 to anticipate new mandates for the next decade of seafood commerce in both domestic and international settings.	Yes	2010 - Florida Sea Grant's seafood safety specialist oversees an internationally renowned Seafood Safety and Technology Program. In 2010, the seafood Safety and Technology Program's HACCP Alliance for Education and Training curriculum is estimated to have reached 2,792 seafood professionals throughout the nation. Approximately 400 individuals from the seafood industry and from regulatory agencies received formal HACCP certifications during 2010. Approximately 80 seafood processing and retail operations adopted new information and practices due to HACCP trainings. 2011 - FSG's seafood safety specialist oversees an internationally renowned Seafood Safety and Technology Program. In 2011, the seafood Safety and Technology Program's HACCP Alliance for Education and Training curriculum is estimated to have reached 5,400 seafood professionals throughout the nation. Approximately 1,700 individuals from the seafood industry and from regulatory agencies received formal HACCP certifications during 2011. Approximately 5,400 seafood processing and retail operations adopted new information and practices due to shrimp and oyster and HACCP trainings. 2012 - In 2012, FSG's seafood safety specialist provided support to the industry and regulatory agencies in the form of a HACCP certification program. An estimated 1,500 seafood processing operations maintained their federal certification to operate as a result of participating in HACCP Alliance training programs and an estimated 3,000 people received new HACCP certifications in 2012. These activities sustained an estimated 5,000 jobs and 1,500 businesses. 2013 - 2013: In 2013, FSG's seafood safety specialist provided support to the industry and regulatory agencies in the form of a HACCP certification program. An estimated 850 seafood processing operations maintained their federal certification to operate as a result of participating in HACCP Alliance training programs and according to the Association of Food and Drug Officials, 1,233 people received new HACCP certifications in 2012.
The aquaculture industry will produce and sell new products developed as a result of research and extension supported by Florida Sea Grant addressing larval development, grow-out, quality control and product economics and marketing strategies.	Yes	2010 - Florida Sea Grant has supported a long-term research and extension program aimed at diversifying risk to Florida's hard clam aquaculture industry, which is based on a single species. To this end, Florida Sea Grant has funded recent research that has evaluated the potential of triploidy to produce a clam that can thrive in Florida's warming waters. Another project that shows great promise is the culture and production of a new native species, the Sunray Venus clam, which is now being locally grown and selectively marketed due to a coordinated Florida Sea Grant supported research and extension effort. 2011 - FSG has supported a long-term research and extension program aimed at diversifying risk to Florida's hard clam aquaculture industry, which is based on a single species. To this end, Florida Sea Grant is funding the third in a series of research projects to develop the protocols for growing and marketing a native species, the sunray venus clam. In 2011, several restaurants

		participated in test marketing to determine consumer demand for the product, both cooked and as a sushi menu item. One grower is producing and selling the product. Additional clam farmers are expected to cultivate the native clam during 2012-2013. 2012 - During 2012, Florida Sea Grant researchers developed a new zero discharge recirculating aquaculture system that is now being used to simultaneously culture pompano and three varieties of saltwater plants. For example, 107,000 saltwater plants (rush, red mangrove, and cordgrass) were used to enhance 6 acres of coastal shoreline in Florida. In addition, FSG is supporting research that is determining feeding and grow-out parameters for commercial production of several species of popular baitfish (pinfish and pigfish). 2013 - 2013: During 2013, FSG supported research that is determined optimal feeding and grow-out parameters for commercial production of several species of popular baitfish (pinfish and pigfish).
The seafood industry will be provided with new information from integrated research and extension/outreach that addresses emerging concerns for the limitations in traditional wild resources and responsible introduction, use and understanding of alternative selections from aquaculture and importation.	Yes	2010 - Florida Sea Grant's seafood safety specialist is actively working with industry partners to diversify the selection and gain consumer confidence and acceptance of alternative seafood choices. If these choices are commercially viable and desired by consumers, then can reduce pressure on wild populations that are being overexploited. 2011 - During 2011 FSG's seafood safety specialist worked with industry partners to diversify the selection and gain consumer confidence of the safety and health benefits of eating seafood products. The seafood safety specialist organized a work action group to coordinate activities with Florida Sea Grant marine agents. This resulted in several Extension projects that evaluated consumer preferences and concerns related to Gulf seafood in the aftermath of the DWH oil spill, and working with the American Medical Association to develop consumer guidelines that are consistent with recent research showing the low-level of risk associated with the presence of methylmercury in seafood. 2012 - FSG has supported a long-term research and extension program aimed at diversifying risk to Florida's hard clam aquaculture industry, which is based on a single species. To this end, Florida Sea Grant is funding the third in a series of research projects to develop the protocols for growing and marketing a native species, the sunray venus clam. One grower is now producing and selling the product. Additional clam farmers are expected to cultivate the native clam during 2013. In addition, FSG researchers were issued a US patent for a new hand-held device called a QuadPyre that quickly determines the authenticity of 17 species of grouper to reduce consumer fraud and confirm the authenticity of wild caught seafood products. Also in 2012, the FSG seafood safety specialist introduced of an innovative "Domestic Seafood Heritage Program' based on voluntary industry participation to nominate and recognize domestic seafood operations that have maintained historical commitments to sustainability. 2013 - 2013: During 2013, FSG developed new interactive "Seafood at your Fingertips" and "Seafood Brown Bag" programs that informed more than 500 people about healthy and sustainable local seafood choices.
The seafood industry will implement new production and processing methods to reduce and eliminate potential pathogens in raw molluscan shellfish that can	Yes	2010 - Since its inception, Florida Sea Grant has supported research and extension to ensure the economic viability of seafood processors, particularly those involved in the shellfish industry. To this end, Florida Sea Grant is currently funding research projects that are developing new methods to evaluate consumer

be applied across all processing operations associated with warm coastal waters as a result of Florida Sea Grant research and extension.		preferences, perceived risk, and willingness to pay for shellfish that have been treated by post harvest processing methods. Florida Sea Grant is also supporting research to develop new technologies for rapidly detecting vibrio in shellfish. 2011 - Since its inception, FSG has supported research and extension to ensure the economic viability of seafood processors, particularly those involved in the shellfish industry. During 2011FSG funded outreach initiatives to increase the business capacity of clam farmers and assist the oyster industry in adjusting to new regulations for harvesting and processing. FSG is also supporting research to develop new methods to evaluate consumer preferences, perceived risk, and willingness to pay for shellfish that have been treated by post harvest processing methods, and to develop new technologies for rapidly detecting vibrio in shellfish. 2012 - Since its inception, FSG has supported research and extension to ensure the economic viability of seafood processors, particularly those involved in the shellfish industry. During 2012 FSG funded outreach initiatives to increase the business capacity of clam farmers and assist the oyster industry in adjusting to new regulations for harvesting and processing. FSG is also supporting research to develop new technologies for rapidly detecting vibrio in shellfish. For example, a new protocol for rapidly detecting vibrio was just accepting as an emerging method, and is pending final approval by the National Shellfish Sanitation Program. 2013 - 2013: Since its inception, FSG has supported research and extension to ensure the economic viability of seafood processors, particularly those involved in the shellfish industry. During 2013 FSG funded outreach initiatives to increase the profitability of clam farmers through adoption of new mechanical harvesting technologies and assisted the oyster industry in adjusting to new HACCP regulations. FSG is also supporting research to develop new technologies for rapidly detecting vibrio in shellfish. For example, a new protocol for rapidly detecting vibrio was just accepted as an emerging method, and is pending final approval by the National Shellfish Sanitation Program.