

# where innovation **meets** **impact**



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## Where Innovation Meets Impact

Florida Sea Grant operates in a state with one of the nation's longest coastlines. Nearly 80 percent of our 20 million residents live within 10 miles of that coast, and from nearly every place in our state, a person can drive to the coast in less than 2 hours. Florida's natural resources are diverse, and people use the coastal zone for commercial and recreational fishing, diving, beach tourism, and aquaculture, as well as all of the uses and impacts associated with large populations and infrastructure immediately on the water's edge. Much of the coastal population lives just a few feet above sea level and already there are impacts to the built and natural environment from sea-level rise, altered rainfall and runoff patterns, and the large-scale changes in land use.

Florida Sea Grant provides solutions in this complex setting via a program that is highly collaborative with the private sector; with local, state, and federal agencies and governments; and with a variety of NGOs. We tap into the research expertise of over 800 coastal and ocean scientists at the state's 16 major universities and research laboratories, and we are an integral part of the Institute of Food and Agricultural Sciences Extension at the university of Florida, one of the nation's leading Land Grant universities. Our 20 Extension Agents live

and work in coastal communities and are co-employed by uF and their host counties. They have a breadth of experiences and tremendous trust from their local residents, businesses, and governments as honest brokers of science-based information. Our seven statewide Extension Specialists lead highly relevant programs including seafood safety, boating and waterway management, coastal conservation law, aquaculture, and fisheries management.

Florida Sea Grant awards research grants through a competitive process, and we require that principal investigators work with end-users to ensure that research provides solutions to problems that are critically important, timely, and practical. On the education side, Florida Sea Grant has a history of leading the nation in federal and privately funded fellowships.

Florida is the nation's only state with ecosystems in the subtropical biome and habitats and species common to the Caribbean. As such, we are actively involved in regional projects throughout the Caribbean. Florida also lies in two NOAA regions, and Florida Sea Grant is an active participant in the Gulf of Mexico and South Atlantic for the Governor's Alliances, NOAA regional teams, and Climate Outreach Communities of Practice.

*Karl Havers*



# Growing Florida's Clam Aquaculture 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. Developing another clam species for aquaculture could protect clam farmers, offer variety for consumers, and lead to increased sales.



## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant researchers have identified the native sunray venus clam as a potentially ideal aquaculture candidate in Florida, and are now exploring this 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.

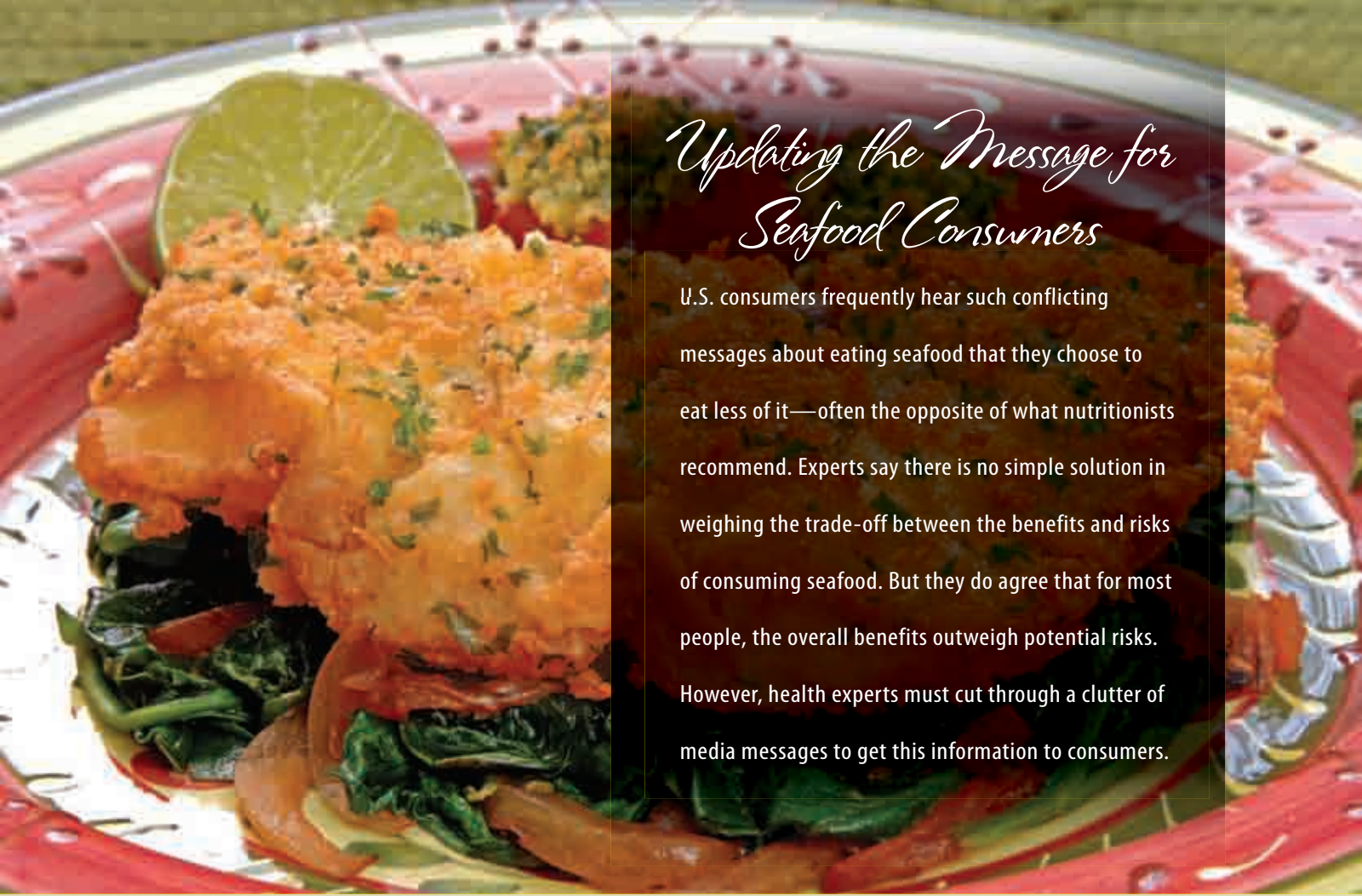
## RESULTS

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 complement 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.





## Updating the Message for Seafood Consumers

U.S. consumers frequently hear such conflicting messages about eating seafood that they choose to eat less of it—often the opposite of what nutritionists recommend. Experts say there is no simple solution in weighing the trade-off between the benefits and risks of consuming seafood. But they do agree that for most people, the overall benefits outweigh potential risks. However, health experts must cut through a clutter of media messages to get this information to consumers.

### FLORIDA SEA GRANT RESPONDS

To address the need for better seafood information, Florida Sea Grant extension faculty have joined with food technologists and seafood specialists from Sea Grant programs throughout the U.S. to provide objective, science-based information to help consumers sort through the benefit-risk dilemma. A survey the team conducted revealed that consumers trust health care providers more than any other source for their nutritional information, so the seafood safety team has focused subsequent outreach efforts on getting accurate information to this group. The work has included launching [seafoodhealthfacts.org](http://seafoodhealthfacts.org), which provides both consumers and healthcare providers with information tailored to their needs. A second key effort has been to design and organize a series of workshops in conjunction with the Florida Medical Association and state agencies. These focus on correcting misconceptions about topics such as the dangers posed by methylmercury in seafood. Recent research suggests this is often less of a threat than once feared, in part because farmed products—where mercury is not an issue—have become more common.

### RESULTS

The Association of Food and Drug Officials (AFDO), a 100+ year-old trade association, has passed a resolution calling on state agencies to update their seafood health messages based on the latest information. And, thanks in part to details provided by the Sea Grant-led seafood safety team, federal and state agencies are now considering altering the message about methylmercury in seafood.



# Providing a Safe Seafood Supply

Seafood is among the best choices for low-fat, high-quality protein, but it's also one of the most perishable food types. As such, federal guidelines now require that all seafood processors in the U.S., or foreign companies that export seafood to the U.S., follow the strict set of safe handling techniques known as the Hazard Analysis and Critical Control Point protocol, or HACCP. This management system prescribes key actions to prevent spoilage and food poisoning, but compliance requires technical training.

## FLORIDA SEA GRANT RESPONDS

In 1995, as it became clear that new federal seafood regulations would require HACCP compliance, Florida Sea Grant and other state Sea Grant programs formed an alliance with university researchers, federal agencies, state inspection services, and trade associations to develop a responsive training and technical assistance program. Since then, this National Seafood HACCP Alliance has organized countless HACCP training courses, and written the accompanying curriculum. The seafood HACCP network has grown to include programs in all seafood-producing states as well as countries around the world.



Florida Sea Grant continues to lead the Alliance steering committee and, among other related efforts, maintains a cadre of approved national and international HACCP trainers, and coordinates the publication and distribution of the HACCP training curriculum.

## RESULTS

Since the Seafood HACCP Alliance began it has trained almost 90 percent of the nation's seafood importers and processors in federally mandated compliance techniques. All told, over 30,000 people have completed courses. Florida Sea Grant's leadership of the Seafood HACCP Alliance has earned the Alliance broad appreciation as a



model nationally and internationally for food processing training. The program has now trained some 400 instructors that work around the country and the world using standardized training materials and protocols. The Seafood HACCP Alliance has become the national Sea Grant program's most successful extension program, playing a major role in enabling the nation's \$27 billion seafood industry to prosper.

# Making the Grade in Seafood School

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 critical information is essential for all segments of the industry. It is also a challenge, so there's a great need for ongoing practical education options.

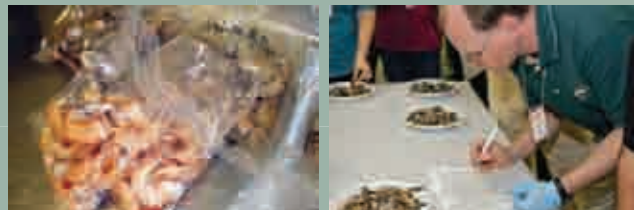


## FLORIDA SEA GRANT RESPONDS

In 1995, Florida Sea Grant established what came to be known simply as Shrimp School. The training teaches buyers, importers, and regulators everything from how to control bacterial growth to evaluation of products for proper taste, texture, and appearance. The need for this education has grown steadily stronger as shrimp has grown in popularity and as shrimp imports have increased.

Following this success, Florida Sea Grant began to pattern more seafood safety schools after Shrimp School but focused on other seafood products such as oysters and fish. Oyster School takes place in Apalachicola, the center of Florida's oyster industry, and has run annually since 2007. Fish School is offered on demand. In 2010, Florida Sea Grant further expanded its educational offerings to include a professional seafood sensory school. Sensory analysis in seafood science uses human senses such as touch, sight, smell, and taste to detect and judge the acceptance and shelf life of seafood products, but

in a controlled lab setting. These workshops are specifically designed for personnel from laboratories, both domestic and international, that provide seafood analysis services.



## RESULTS

Florida Sea Grant's various schools, offered in cooperation with state and federal agencies, have led to marked increases in the safety and quality of seafood sold in the state and around the country. With attendees from Australia, Mexico, Thailand, Venezuela, and other countries, there has also been a trend toward improved safety and quality of imported products.

# Shucking an Oyster Safety Issue

Eating raw oysters that contain bacteria found naturally in seawater, primarily *Vibrio vulnificus*, can cause life-threatening illness in people with existing immune deficiencies. The U.S. Food and Drug Administration recently implemented a policy requiring Gulf oyster processors to treat oysters during summer months, when the problem is worst, to eliminate contamination. To comply, the industry needed cost-effective options that would not adversely affect the prized taste of a raw oyster.

## FLORIDA SEA GRANT RESPONDS

Most post-harvest treatments that kill *Vibrio* also kill the live oyster, changing the taste and texture consumers demand in a fresh product. Sea Grant researchers, however, have successfully developed a process for irradiating oysters that keeps oysters alive while reducing *Vibrio* counts to non-detectable levels. The technique relies on irradiation, which is used in other food industry sectors and kills germs by passing low doses of gamma rays through products. Oysters survive for about a week after irradiation, which satisfies consumers that crave a live product involving the full shucking experience. Irradiated oysters can also be sold as in-shell oysters to prolong commercial shelf life up to 14 days. Consumer taste tests revealed no detectable change in raw oyster flavor after irradiation.



## RESULTS

Based largely on Sea Grant results, both federal and state authorities in Florida have accepted irradiation as a valid post-harvest process. Two of the state's largest oyster processors are now involved in small-scale testing. Buyers are also expressing great interest in the irradiated product. Though the FDA was moving toward complete closure of the summer oyster harvest, the success of Sea Grant post-harvest processing research, which also included evaluating other techniques, was a key factor in so far averting that decision.





# Securing Aid for the Shrimp Trawling Industry

The u.S. domestic shrimp industry has struggled to adjust over the past decade to cheaper imports entering the market. One source of industry aid was the 2009 federal economic stimulus package's reauthorization of the Trade Adjustment Assistance for Farmers program. This initiative provided both financial help and business training for agricultural producers and commercial fishermen who could prove that an influx of foreign products was significantly reducing prices for their catches.

## FLORIDA SEA GRANT RESPONDS

To participate in the Trade Adjustment Assistance (TAA) program, the shrimp trawling industry had to collectively show eligibility before individual shrimpers could apply for the benefits that many desperately needed, not only due to the economic crisis, but later because of industry effects from the deepwater Horizon oil spill in the Gulf.

Once the TAA reauthorization was announced, Florida Sea Grant began working with industry partners and other Sea Grant programs to complete a regional petition for inclusion of the shrimp trawling industry. The Southern Shrimp Association successfully filed that petition in 2010, making shrimpers eligible for up to \$12,000 in support.

Florida Sea Grant's marine economics extension specialist worked with industry to develop training topics and materials specific to shrimpers, to complement general business education units available through the TAA. And Florida Sea Grant continues to work closely with shrimpers to help them navigate the program and maximize their chances of receiving available aid.

## RESULTS

Over 2,000 commercial shrimp trawling business owners in the southeast u.S. have completed the shrimp training unit, which includes 240 commercial fishermen in Florida. When the program concludes in 2013, Florida Sea Grant's efforts will have helped shrimp trawlers secure as much as \$3 million in aid, helping sustain an estimated 500 jobs.



# Strengthening Florida's Artificial Reef Program

Florida is responding to fisheries depletion and habitat degradation with one of the nation's most progressive artificial reef programs, deploying up to 100 public artificial reefs each year. Among the most popular objectives for artificial reefs are improving fishing opportunities and creating new scuba diving destinations, both of which boost Florida's multi-billion dollar tourism industry.



## FLORIDA SEA GRANT RESPONDS

For more than three decades, Florida Sea Grant has played a leadership role in the evolution of the state's artificial reef program. This includes co-organizing, in coordination with the state wildlife commission, the statewide Artificial Reef Summit, a conference held every four years to bring together program coordinators, fishery managers, scientists and constituency groups.



Florida Sea Grant's long-term research, funded by state and federal partners, continues on a vast network of one-ton concrete reef blocks deployed in the northeast Gulf of Mexico. The research is testing how reefs can enhance habitat for gag grouper and other targeted fish species. The project recently expanded with deployment of 500 reef blocks off Taylor County

for conservation purposes. Some of these reefs will soon be opened as fishing destinations.

## RESULTS

A recent Southwest Florida economic impact study estimates that fishermen, divers, and other artificial reef users contribute \$253 million annually to the economy of this populous six-county region. Reefs support approximately 2,600 jobs and generate nearly \$17 million in business taxes. The study also found strong support for using public funds on reef deployment and maintenance.

Scientific results to date from the long-term reef networks project have greatly increased our knowledge of grouper ecology, and are improving the data available to NOAA Fisheries for fine-tuning the reliability of reef fish stock assessments.

The 2010 statewide summit attracted a capacity crowd of more than 200. Based on evaluations of attendees from this event and attendees from local workshops, more than 400 individuals reported they were actively using the information presented in their reef programs.

# Restoring Vital Coastal Habitats

Healthy coastal habitats provide essential nursery grounds for fish, and homes for manatees, wading birds, and other wildlife. As such, they are critical in supporting commercial fisheries and recreational fishing and diving. But coastal habitats face numerous threats ranging from litter and water pollution to storm damages.

## FLORIDA SEA GRANT RESPONDS

Since its inception, one of our primary missions has been educating Floridians and visitors about protecting and restoring marine habitats. One example is an ongoing, multi-regional effort to remove abandoned crab traps, which are boating hazards and also needlessly trap and kill fish. Another widespread success has been the deployment of monofilament fishing line recycling receptacles at popular fishing areas around the state to prevent the line from clogging reefs and entangling wildlife. Extension agents also sponsor artificial reef and beach cleanup days, and they lead workshops to teach coastal residents about how to dim nighttime lighting that disorients sea turtle hatchlings. Other programs have focused on removal of invasive coastal plant species, building new oyster habitat, and sea oat planting to reduce erosion of coastal dunes. To complement these more informal community efforts, Florida Sea Grant has developed formal classroom curricula that educate students about habitat issues. Finally, Florida Sea Grant supports various research and monitoring efforts that identify areas of concern and devise innovative ways to restore and monitor coastal habitat.



## RESULTS

Crab trap removals, beach cleanups, mangrove replanting, and oyster reef restoration programs have improved or restored thousands of acres of critical estuarine habitat. Tens of thousands of students have learned more about their local environment and how to protect it. Florida bay scallop monitoring programs have generated vital trending information for managing this fishery.

And a Florida Sea Grant-assisted project led to the successful opening of the Blind Pass Inlet in Lee County, Florida, which has increased the flushing of hundreds of acres of lagoon habitat critical for sportfish species and endangered Florida manatees.

# Conserving Sharks By Decoding Genetics

Historically, one of the challenges in managing the u.S. shark fishery has been accurately determining how many of a given species were being caught and when illegal species were being poached, since the shark catches were often cleaned before reaching the dock.

## FLORIDA SEA GRANT RESPONDS

With funding from Florida Sea Grant, researchers at Nova Southeastern university's Guy Harvey r esearch Institute developed a genetic fingerprinting technique that allows rapid and affordable identification of endangered and other shark species based on a small sliver of shark material. This opened the possibility of not only testing confiscated shark parts to catch criminal activity, but also of gathering previously unavailable data about which species are most commonly sold in Asian markets where shark parts, particularly fins used to make a traditional soup, command high prices. The researchers are also working to develop tests for billfish and tuna to similarly aid research and law enforcement.

## RESULTS

The shark DNA work has led to numerous successes. For instance, availability of dNA identification capabilities was a critical factor in the Convention on International Trade in Endangered Species, or CITES, deciding to list the great white shark as a protected species.

The team continues to work directly with the NOAA Office for Law Enforcement, but instances where the agency has come to Nova to run tests have grown rare. This is likely due, at least in part, to the testing capability convincing would-be illegal traders to turn away



from what was once an easy crime to hide. Working with the uK's Imperial College, the team was also able to analyze shark parts in the Hong Kong market, the largest in the world for shark materials, and ultimately make the first quantitative estimate of the number of sharks killed each year to supply the international fin market. This estimate, about 38 million, is now widely used to make the case for shark conservation.

# Sustaining Florida's Unique Sponge Fishery

Florida's commercial bath sponge harvest has a long and colorful history dating back to the mid 1800s. After World War II, a combination of disease, harmful algal blooms, overfishing, and the introduction of synthetic sponges, reduced the fishery to a fraction of its former importance. Still, a significant world trade for natural marine sponges remains, and in the 1980s, demand for Florida sponges grew. This created concerns that sponge harvests might cause ecological problems. Some people even called for the sponge fishery's closure.



## FLORIDA SEA GRANT RESPONDS

Traditionally, divers harvested sponges by hooking and tearing them free from the bottom. However, sponges, which are essentially a colony of single-celled organisms, have remarkable regenerative ability. Florida Sea Grant research showed that cutting sponges from the bottom and leaving a small amount of sponge tissue behind doubles the number of sponges that regrow, relative to tearing.



Sea Grant research also documented that, contrary to public perception, commercial bath sponges make up only 1 to 2% of the total sponge community. This showed that bath sponge harvest should have minimal impact on sponges' ecological functions including filtering water and providing habitat.

## RESULTS

Based on Florida Sea Grant's research, the sponge industry embraced the practice of cutting vs. tearing and supported a new rule by the Florida Fish and Wildlife Conservation Commission requiring that sponge divers use this technique. And the evidence that sustainable harvesting of sponges would have minimal impact on the ecological function of the sponge community convinced fishery managers that no new restrictions beyond those already in place for sponge harvesting were necessary. Without this supportive science, it is likely that this traditional fishery, long a part of Florida's history, would have been unnecessarily eliminated.



# Improving Catch-and-Release Practices

Saltwater fishing in Florida generates \$6 billion in economic impact and supports tens of thousands of jobs. However, because of stock depletions, recreational fishermen have faced increasingly stringent fishing regulations and must release large numbers of fish. Discard mortality is a major issue, diminishing the effectiveness of protective measures. Many problems tied to fish releases can be avoided using special tackle and techniques, but fishermen have to know how and when to use them.

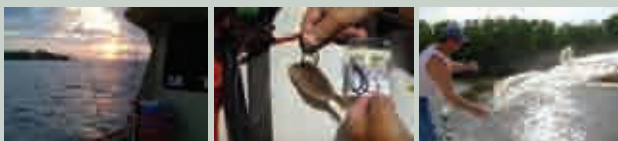


## FLORIDA SEA GRANT RESPONDS

A principal focus of Florida Sea Grant's fisheries research and extension has been to reduce discard mortality by educating the recreational fishing community on effective handling and release techniques. One of our nationally recognized efforts over the last decade has been the refinement of "venting," which involves using a hand-held tool to puncture the body cavity of bloated reef fish. This deflates swim bladders, allowing the fish to swim back to safety. In 2008, new federal and state regulations required fishermen targeting reef species in the Gulf of Mexico to carry and use venting tools, as well as circle hooks and dehooking tools, all of which increase the chances of released fish survival. This created an immediate need to educate over 3 million anglers in Florida and across the Gulf on proper handling and release techniques.



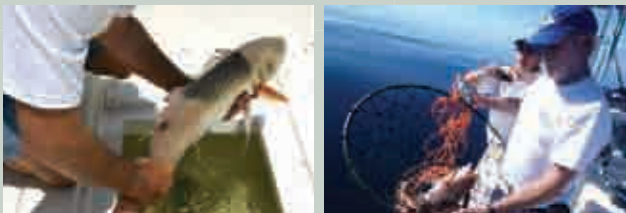
Florida Sea Grant partnered with the Florida Fish and Wildlife Conservation Commission and the NOAA Fisheries to mobilize a statewide catch-and-release outreach program. Strategies included developing training aids; offering workshops to a variety of audiences, including resource managers and outdoor journalists who could in turn provide training to others; and additional educational outreach such as the launch of [catchandrelease.org](http://catchandrelease.org), which offers instructional videos and teaching materials.





Florida Sea Grant researchers have also gone on to study the use of fish descending devices, which allow release at depth. This work has shown that survival of reef fish can be further improved. Sea Grant is evaluating the effectiveness of these new devices in the Gulf of Mexico, and training a cadre of extension faculty in their use.

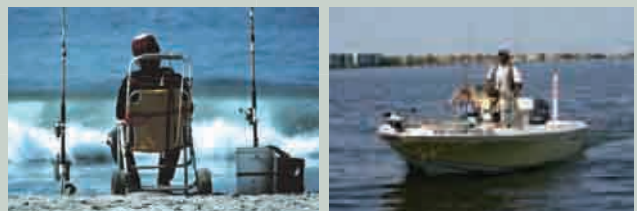
the venting tool technology to the private sector, where at least six small businesses in Florida are now making tools widely available based on a Sea Grant venting tool design.



Based on results from 2011 field trials to test fish descending gear, Florida Sea Grant is poised as a national leader in outreach and policy development for adoption of new release technologies. The science advisory committee of the Gulf of Mexico Fishery Management Council has now recommended that fishermen be given the option of venting or using descending devices to minimize fish injury, and is partnering with Sea Grant to increase outreach efforts for reducing release mortality.

## RESULTS

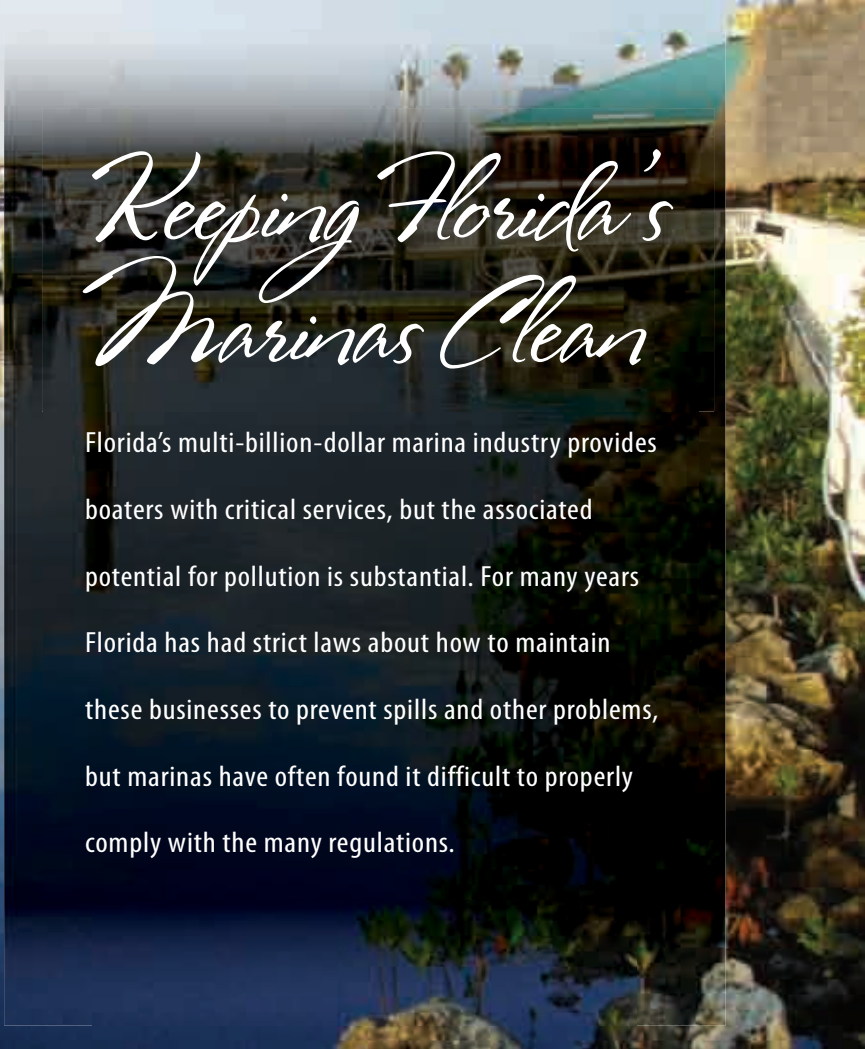
Through outreach by Florida Sea Grant and its partners, thousands of recreational fishermen have learned and are actively using practices to reduce discard mortality in catch-and-release fishing. Follow-up surveys indicate that thousands more are fishing in a more sustainable manner. In addition, Sea Grant helped transfer





# Keeping Florida's Marinas Clean

Florida's multi-billion-dollar marina industry provides boaters with critical services, but the associated potential for pollution is substantial. For many years Florida has had strict laws about how to maintain these businesses to prevent spills and other problems, but marinas have often found it difficult to properly comply with the many regulations.



## FLORIDA SEA GRANT RESPONDS

In the mid-1990s, the Florida department of Environmental Protection developed the Clean Marina and Clean Boatyard Programs to motivate the state's thousands of coastal marinas to voluntarily follow practices that would prevent water pollution and bring them in compliance with state laws. Encouraging marinas to cooperate with the agency proved daunting, so Florida Sea Grant and its extension agents stepped in to help establish the trust needed to move the program forward.

In 2000, through the public/private Clean Boating Partnership, Sea Grant worked with state agencies and industry to identify the key practices that would promote not only clean environments, but also profitable operations. Florida Sea Grant then began offering Clean Marina workshops to marina owners and workers to help them comply. Florida Sea Grant extension agents are also part of the program's inspection teams and regularly provide marina owners and operators with technical assistance in achieving program compliance. Marinas that meet the standards become eligible to fly the Clean

Marina flag, which boaters now widely recognize as a sign of a well-managed and environmentally-responsible facility.

## RESULTS

The Clean Marina/Clean Boatyard Program has been so successful that Florida Sea Grant, dEP, and other members of the Clean Boating Partnership worked together to establish a Clean Boater Program in 2001 and Clean Marine retailer Program in 2005. As of August 2012, 264 Florida marinas are now successful members of the Clean Marina Program, vastly improving the health of waters around the state. In addition, 39 facilities are participating in the Clean Boatyard Program, and 17 in the Clean Marine retailer Program.







# Cultivating Coastal Heritage

Historically, working waterfronts, including the marinas, seafood wholesalers, and other establishments that bring them to life, have been the economic drivers for many coastal communities. But preserving working waterfronts—not only for posterity but because they remain vital economic supports for commercial fishing and tourism—has grown increasingly difficult.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant extension faculty actively participate in many coastal communities' efforts to develop and preserve their waterfront areas. Such work draws attention to the value of working waterfronts, and in some cases even helps reclaim or replace critical waterfront property needed to maintain essential businesses such as marinas.



One of our more visible efforts has been establishing and growing festivals that create awareness of these communities' commercial fishing heritages. The longest running festival is in Cortez, a small village south of Tampa. There, Florida Sea Grant's marine agent worked with volunteers from F.I.S.H., the Florida Institute for Saltwater Heritage, to launch the Cortez Commercial Fishing Festival. Other

events Florida Sea Grant supports include the Florida Keys Seafood Festival, which began in Key West in 2006 at the request of a fishing industry hit hard by hurricanes.

## RESULTS

The first Cortez Commercial Fishing Festival in 1981 drew roughly 500 people, but has grown into a 2-day affair with about 25,000 attendees. Funds raised to date have enabled F.I.S.H. to acquire and pay off 95 acres of sensitive mangrove wetlands immediately east of the village, to expand and restore this preserve, and to purchase additional cultural resources in Cortez. The Florida Keys Seafood Festival brings in tens of thousands of dollars each year and has become the main fundraiser for the Florida Keys Commercial Fishermen's Association, which advocates for working waterfront preservation and protection of fishing stocks.



# Advancing Coastal Communities' Sustainability

Florida's shifting economy creates major hurdles for communities interested in protecting the viability of their waterfront heritage. Some businesses deteriorate while others are converted to uses no longer water-focused, and ongoing development threatens various resources.

Adequately addressing these challenges requires legal and policy resources that local governments often lack.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant collaborates with the Conservation Clinic at the university of Florida Levin College of Law to provide coastal communities with policy resources they need to balance the use and protection of their coastlines and working waterfronts.

Besides producing written materials to aid state and local policymakers through the state's Waterfronts Florida Partnership Program, the group works directly with coastal communities to help them address specific issues. For instance, the team advised the unincorporated community of Millville on non-regulatory techniques to remedy waterfront blight using tax incentives. In Cedar Key, they advised the property appraiser on a policy framework that allowed clam farmers to receive a major new aquaculture tax benefit. Florida Sea Grant has also funded the uF legal team's work, in collaboration with the university's Water Institute, to address some of the unique challenges various regions face in properly managing their watersheds through a program called the Blackwater to Bluewater Initiative.

## RESULTS

One of the legal group's key accomplishments has been developing and distributing *Waterways and Waterfronts Community Guide and Policy Tools*, a collection of information that addresses legal and policy issues relevant to waterway and waterfront protection efforts.

The taxation project in Cedar Key ultimately led to the local government deeming clam farmers eligible for \$16,000 in property tax reductions. Work through the Blackwater to Bluewater Initiative contributed to the EPA recognizing the university of Florida as a Center for Excellence in Watershed Management.





# Preserving Access to Florida's Waterways

Maintaining adequate marine resource access to support recreation, tourism, and commercial fishing is growing increasingly difficult. Florida waterfront property remains so valuable that it can be economically challenging to keep enough boat ramps open. It's also difficult for critical businesses such as marinas to open or stay open on property more valuable if sold for development. Adding to these problems, many communities lack the resources to properly plan for maintaining water access, or to apply for needed aid.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant has developed programs that communities can use to aid them in planning wise waterfront development, and has been directly involved in helping communities put them to use. For example, in Taylor County, which includes the popular boating destinations of Steinhatchee and Keaton Beach, a Florida Sea Grant study provided a comprehensive assessment of existing boat ramp and dock capacity, coupled with a survey of residents and visitors that gauged public support for ramp improvements. Besides determining what and where improvements should be made, the survey quantified the economic benefits to Taylor County from existing facilities.

## RESULTS

The Taylor County study revealed that waterway access facilities are essential to sustaining some 158 jobs, and contribute about \$10 million to the local economy. The report also enabled Taylor County to successfully apply for \$700,000 in state and federal funding to expand a boat ramp facility that is now a key economic driver for



the area. The ramp's positive impacts, established through surveys and other analyses, are also supporting new grant applications for funds to address other priorities identified in the access study. Overall, says Jack Brown, the Taylor County administrator, the study was timely. "It supports our plans to expand our county's economic base by developing the sectors that depend on outdoor recreation and tourism."

# Creating Critical Tools for Waterway Management

Florida is the nation's top destination for marine recreation.

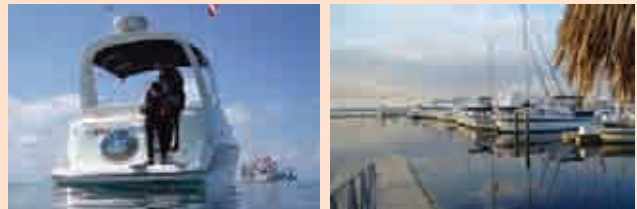
This popularity is an economic boon. But it also creates challenges in maintaining navigable waterways, and in protecting sensitive marine habitats—the health of which is a key reason for boating's popularity. Anything that streamlines channel dredging means substantial savings to taxpayers. And better-maintained waterways are safer, more usable, and enhance protection of sensitive resources.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant's Boating and Waterway Planning Program is developing science-based tools that help communities more effectively manage their waters, save tax dollars, and reduce environmental impacts. One such tool is called the regional Waterway Management System. This helps local authorities to assess the needs of an entire region, allowing planning and permitting of multiple prioritized projects at the same time. In contrast, past dredging projects and assessments of boating impacts on marine habitats typically proceeded on a case-by-case basis, which was more expensive and time consuming.

Regional waterway assessments involve gathering precise depth data for major boat arteries, detailed information about the number of boats in an area and where owners most often use boats, and the locations of specific resources such as seagrass beds. The information is then mapped in a way that enables planners to visualize access and habitat problems. The overall goal is to

plan dredging and habitat protection projects that achieve the best balance possible between maintaining waterway access and protecting vital resources.



## RESULTS

Using the regional Waterway Management System has allowed various county planners and authorities to cut red tape in the permitting process for canal dredging enough to save taxpayers millions of dollars, and allowed planning for the protection of well over 1,000 acres of sensitive seagrass habitat. Based on such successes, Florida's department of Environmental Protection is encouraging more widespread use of the system.

# Overcoming Challenges as America's Top Boating Destination

In less than 10 years, the number of boats registered in Florida jumped from 730,000 to over 1 million, with only a small decrease during the recession. This surge in popularity has intensified the need for more water access, improved boater safety, and better assessment and mitigation of boating's environmental impacts.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant is helping coastal communities with the challenges of increasing boating popularity through innovative programs that help state agencies and local governments understand and manage their recreational boating needs. We have developed new survey methods and statistical analyses that better describe the concentrations of boaters and their boat use habits, and we provide professional development opportunities created specifically to increase managers' abilities to resolve boating issues.

Florida Sea Grant is also building a working partnership among state agencies, inland navigation districts, federal entities, and local governments to increase the effectiveness of boater management programs. And, we work with individual communities to address specific needs. This has included projects such as working with Palm Beach and Martin Counties to design a uniform, defensible system that takes the guesswork out of deciding where controversial slow-speed zones are most essential.

## RESULTS

Among other successful boating management and survey projects, Florida Sea Grant is working with NOAA's Right Whale Recovery Program to map recreational boating traffic patterns in northeast Florida to identify problem areas and to design outreach efforts to reduce boat strikes on these endangered whales. Florida Sea Grant work in Palm Beach and Martin Counties supported state rule making that established new boating safety zones in the Intracoastal Waterway. Based on success there, the Florida Fish and Wildlife Conservation Commission is considering applying this approach to revise or establish speed zones in other waterways under its jurisdiction.



# Confronting Threats from Future Sea-Level Rise

Florida is one of the most at-risk locations in the u.s. for sea-level rise impacts, due to its low topography, and the concentration of more than 80 percent of its population in the coastal zone. While some major cities have begun planning for sea-level rise, most coastal locations are ill prepared for it. Nonetheless, many are already experiencing negative impacts, both in the built and natural environments.



## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant responded to this emerging threat by creating a climate change focus area in 2009, and hiring two full-time climate change coordinators. One works on the built environment and one on natural ecosystems. We also formed a work action group of extension professionals to tackle this issue on a statewide basis. Florida Sea Grant has provided science-based information to support planning for sea-level rise for local communities, for the Comprehensive Everglades r estoration Program (working in partnership with the u.s. Geological Survey and the Army Corps of Engineers), and for state resource management agencies. We have informed members of the u.s. Congress, the Florida governor, the state legislature, and multi-county commissions about the known, probable, and possible impacts, as well as the array of solutions under various sea-level rise scenarios.

Other Florida Sea Grant activities have included working with the City of Punta Gorda after it was severely damaged in 2004 by Hurricane Charlie, to develop language that creates a legal obligation that future city planning consider the risks and hazards associated with sea-level rise. Florida Sea Grant has also funded research to develop state-of-the-art models that

integrate storm surge and sea-level rise for use in coastal community emergency planning and long-term comprehensive planning.

## RESULTS

The City of Punta Gorda has approved a sea-level rise adaptation plan, joining several other Florida coastal communities as a successful example for local governments considering the issue. Florida Sea Grant continues to offer workshops at the state and regional level on sea-level rise issues, and several other communities are moving toward their own adaptation plans.



# Preventing Hurricane Damages

Catastrophic hurricane losses are the largest and most pervasive risk facing Florida's coastal communities. In 2004 and 2005, eight hurricanes slammed the state, inflicting \$31.3 billion in insured losses. Much of this damage occurred because of roofs performing poorly during severe wind and rain.

## FLORIDA SEA GRANT RESPONDS

Florida Sea Grant is funding development of technologies and policies that reduce hurricane damages, creating new options for innovative and low-cost retrofits, better building codes, and more realistic models for insurance companies to value properties and assess risk. Sea Grant supports an industry-research partnership at Florida International university that has constructed an impressive "Wall of Wind" research facility capable of creating hurricane-like conditions in a controlled setting.

To date, Florida Sea Grant has supported three key projects at the facility. One is an ongoing study of how wind-related damages to the outside of a house or other structure create paths for water intrusion to the interior. Better understanding this process should allow improved construction techniques as well as more realistic risk assessments by the insurance industry.

In a second project, the Flu team has developed polymer strips with epoxy adhesive to strengthen connections between roof trusses and

walls, as a cost-effective retrofit, and in new construction. The strips offer major advantages over conventional techniques with metal straps, whose attachment can weaken structures. The Flu team also tested a new product, developed by a commercial partner, that attaches to roof edges to make them less susceptible to wind damage.

## RESULTS

The Flu team has successfully quantified the process of water intrusion using mockups of sections of a house and is moving on to a larger-scale trial. Wall of Wind test results have shown that the low-cost polymer strip truss-to-wall connectors perform as well or better than traditional techniques. The group has applied for a patent and is seeking a commercial partner for marketing. They also showed that the roof-edging product, which is on a path to wide availability, dramatically reduces damaging roof suction.





# Responding to the Deepwater Horizon Disaster

Though Florida's only direct impacts from the massive 2010 deepwater Horizon oil spill were in the Panhandle region, there were major indirect effects throughout the state as tourism and seafood purchases declined even in regions far removed from the oil. Many of Florida's Gulf residents had well-founded fears about their livelihoods and their homes. There was confusion to the point of chaos in coastal communities, creating a great need for accessible, understandable information.

## FLORIDA SEA GRANT RESPONDS

during the crisis, Florida Sea Grant, in cooperation with other Sea Grant offices, provided critical information in three areas: the safety of Gulf seafood, the claims process for lost income and revenue, and opportunities for paid and volunteer positions related to spill response. This included establishing the informational websites [gulfseagrants.org](http://gulfseagrants.org), and [southatlanticseagrants.org](http://southatlanticseagrants.org).

Florida Sea Grant also launched a major media campaign, participating in numerous television news interviews to inform consumers about the processes in place to ensure that any Gulf seafood sold was safe, and we led the effort to establish oil-screening protocols for seafood samples.

Other activities included an exhaustive study by Florida Sea Grant's economics and legal team of the BP claims process, which produced a widely distributed advisory on filing claims; organizing a public forum in Pensacola, "The Science of the Spill," and supporting spill-related research projects that examined oil's effects on marine life and habitats.

## RESULTS

Florida Sea Grant extension faculty presented sound seafood and other information to an estimated 400,000 people, in person and through the media. As a direct result of information we provided to the public, 1,350 boat owners and displaced fishermen found



work participating in the BP Vessels of Opportunity program, and over 1,000 residents received training to become BP Qualified Community responders paid to clean beaches and provide other services. Nearly 130 volunteers found the information they needed to get training to care for oiled marine mammals.





# Investing in the Next Generation of Resource Professionals

Managing Florida's ocean and coastal resources for economic growth and sustainability grows more complex each day.

To secure the future of Florida's economy and a healthy coastal environment, it is critical that the state develop a highly educated and trained workforce.

Florida Sea Grant responds to this challenge by supporting graduate student assistantships and other direct student involvement in research activities. Today's students can one day embrace new ideas and design the creative management concepts that ensure Florida's ability to compete in a global economy. Instead of "teaching" or "graduating" students in the tradition of an academic department, we support graduate education research projects and scholarship programs. Funding for these initiatives comes from both public and private sources.

Through Aylesworth scholarships, we have awarded nearly \$500,000 to 92 students in 14 Florida universities over the past 26 years. Applicants can pursue any academic discipline having direct application in marine science. The scholarship is a joint effort of the Aylesworth Foundation for the Advancement of Marine Science, the Southeastern Fisheries Association, and Florida Sea Grant.

Since its establishment in 2010, the Guy Harvey Scholarship has provided \$44,000 to 10 students from six Florida universities. The

award recognizes full-time undergraduate or graduate students at Florida universities who are conducting research related to large pelagic marine fish. This scholarship is a joint effort of the Guy Harvey Ocean Foundation and Florida Sea Grant.

Florida Sea Grant has placed 46 applicants from Florida universities in the Knauss Fellowship program, which is in its 33rd year. The program provides graduate students pursuing careers in ocean and coastal resource policy with a one-year paid fellowship in Washington, D.C., working in the legislative or executive branch of the federal government.

## RESULTS

Florida Sea Grant's graduate student programs support between 30 and 40 students every year and have produced substantial results. Numerous past Florida Sea Grant scholarship and fellowship awardees are now working at universities, state and federal agencies, high schools, businesses, and non-profit organizations. Many are national and international leaders in their areas of expertise.

# Developing Regional Resource Management Capacity

Gulf of Mexico and Caribbean nations share valuable marine fisheries stocks. Professional development to improve management of those fisheries, particularly among island nations, has long been identified as a critical need. Although member nations are eager to promote greater collaboration, synergy, and the sharing of knowledge in the region, they often lack networks and opportunities to achieve these goals.

Florida Sea Grant is building a professional exchange program implemented through our association with Florida's premier academic institutions and international partnerships. The Sustainable Gulf of Mexico and Caribbean Fisheries Initiative offers opportunities for both Florida and Caribbean-based fisheries professionals to spend time in international settings and learn more about promoting practices that encourage sustainable and safe fishing and seafood processing.

In 2011, we began a cooperative effort with the Caribbean Regional Fisheries Mechanism, the principal institution governing fishery resources in the Caribbean. This agreement grew out of an exchange with a senior fisheries officer from dominica, who is now collaborating with Sea Grant on research to evaluate the impacts of fish aggregation devices on pelagic fishery resources and the communities that depend on them.

Another outcome of the initiative is an exchange program supported by the Gulf and Caribbean Fisheries Institute and the

Billfish Foundation. The program is currently soliciting applications for study at the university of Florida in fisheries management and extension, stock assessment, data analysis, and geographic information systems.

In 2012, Florida Sea Grant expanded the cooperative program to include the Japanese government's International Cooperation Agency. Two Caribbean fisheries managers have attended an intensive seafood safety training program conducted in cooperation with the National Seafood HACCP Alliance in Miami. These managers learned skills they are now passing on to help develop more effective seafood handling and processing plants that will increase the quality of Caribbean seafood products and expand available markets.





## LOOKING AHEAD

In the upcoming years, Florida Sea Grant will continue to provide the research, education, and outreach needed to conserve our coastal resources and enhance economic opportunities for the people of Florida. We will continue to embrace a grassroots approach where constituents from coastal Florida, including people, businesses, and communities, identify the most pressing issues, and we work in partnership with university of Florida / IFAS Extension, other Florida universities, and state and federal agencies to efficiently and effectively provide solutions.

At the same time, we will remain flexible enough in our planning to provide needed responses in times of crisis, as we did during the 2010 Gulf oil spill and as we are doing in 2012 in response to the collapse of the oyster fishery in Apalachicola Bay.

Looking forward, we will continue to support our traditional areas of strength, including healthy ecosystems, sustainable and safe seafood, and sustainable and hazard-resilient communities. And we will examine opportunities to contribute in emerging areas including alternative energy, eco-tourism and ocean governance.

Over-arching goals will continue to be: providing sound scientific information; helping to inform the public about the value and vulnerability of coastal resources; supporting the development of a highly competent workforce; and supporting decision-making that involves the full range of coastal interests and helps build consensus on complex issues such as coastal land use, energy development, public access, and climate change.

The issues are daunting in breadth and complexity, yet we will address them enthusiastically to help sustain Florida's coastal resources and economies for future generations.

Science Serving Florida's Coast

[flseagrant.org](http://flseagrant.org)

