

FLORIDA SEA GRANT

Profiling Milestones and Achievements From The Past Four Years Fulfilling Our Mission



Florida Sea Grant operates in a state with one of the nation’s longest coastlines. Nearly 80% of our 18.8 million residents live within 10 miles of that coast, 79% of the state’s economy is linked to the ocean and coasts, 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 include coral reefs, mangroves forests, seagrass beds, oyster reefs, and saltmarshes. People use the coastal zone for commercial and recreational fishing, diving, beach tourism, and aquaculture, as well as all of the activities 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 Cooperative Extension Service at the University of Florida (UF), one of the nation’s leading Land Grant universities. The program operates with a core budget of just over \$2 million, yet we leverage more than three dollars for every one dollar of core funds. Our 20 Extension Agents live and work in coastal communities and are co-employed by UF and their host counties. They have diverse expertise 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 NSF-style process, and we require that PIs work with end-users to ensure that research provides solutions to problems that are critically important, timely, and practical. In the last four years we funded 20 research projects at \$3,191,400, with that money going to seven Florida Universities. In addition, we funded 39 pilot projects in which PIs collected preliminary data to support larger proposals, address novel ideas, or conduct time-sensitive sampling. On the education side, Florida Sea Grant has a history of leading

the nation in Federal fellowships, with 15 Knauss and NOAA NMFS Fellows awarded just in the last four years. We have three privately-funded scholarship programs that supported an additional 14 students, and 97 students were supported as a mandatory component of our research grants.

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 Islands, ranging from research on viral disease in lobsters to improved management of artisanal fisheries on small island nations. Florida lies in two NOAA regions, and thus Florida Sea Grant is an active participant in the Gulf of Mexico and South Atlantic for the Governor’s Alliances, Coastal Ocean Observing Systems, NOAA Regional Teams, and Climate Outreach Communities of Practice. We lead the regional project in the South Atlantic and Caribbean dealing with lionfish, and a collaborative project on sustainable fisheries in the Gulf of Mexico.

This document highlights Florida Sea Grant’s major accomplishments and impacts between 2008 and 2011 in four focus areas: healthy oceans and coasts; safe and sustainable seafood; sustainable coastal communities; and hazard-resilient and climate-ready coasts. A majority of impacts reflect the results of programs that have occurred over a much longer time-frame, with our research, extension, and outreach investment coming to fruition in the last few years, and supporting our mission of fostering the sustainability of coastal resources and enhanced economic opportunities for the people of Florida.

HEALTHY OCEANS AND COASTS

Providing Science and Coordination for 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. Artificial reefs are created to achieve a wide range of goals—replacing damaged coral reefs, establishing breakwaters to protect shores, and even creating memorial sites for cremated human remains. Among the most popular objectives, however, are improving fishing opportunities and creating new scuba diving destinations. These uses boost Florida's multi-billion dollar tourism industry, especially in local coastal economies. Florida deploys about 70-100 public artificial reefs annually.

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, sponsoring research and educating leaders at both domestic and international venues. One manager for the state's artificial reef program refers to Florida Sea Grant as the 'glue' that binds the state's program together.

Sea Grant led a comprehensive economic impact assessment of artificial reefs in key counties of Southwest Florida, documenting the degree to which reef deployment programs benefit local economies and justify future public expenditures.

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. An additional 500 reef blocks have been deployed recently in a 100-square mile area off Taylor County, Fla., for conservation purposes. Some of these conservation reefs will soon be opened as fishing destinations.

Most coastal county-based extension faculty are involved with their local reef stakeholders in artificial reef activity – planning, siting, preparing permits, deploying reefs, or monitoring. Our faculty have presented at the 2009 international artificial reef conference in Curitiba, Brazil; the 2010 Florida statewide conference; the marine fisheries councils of the Gulf of Mexico and the South Atlantic; the marine fisheries commissions of the Gulf states; and several county commission meetings. Faculty have also authored chapters in scholarly books, and in 2011, the program published the state's *Guidelines and Management Practices for Artificial Reef Siting, Use, Construction, and Anchoring in Southeast Florida*. Though regional in name, the publication has become widely recognized as a practical manual for reef managers around the state.

In coordination with the state wildlife commission, Sea Grant is a co-organizer of the statewide Artificial Reef Summit, a conference held every four years that is based on the success of local reef workshops. Sea Grant organizes to bring together program coordinators, fishery managers, scientists and constituency groups.

RESULTS

A recent Southwest Florida economic impact study conclusively shows the importance of artificial reef programs, estimating that fishermen, divers, and other artificial reef users contribute \$253 million annually to the economy of the populous six-county region of Southwest Florida. Reefs support approximately 2,600 jobs and generate nearly \$17 million in business taxes. On a daily basis, an average of more than 5,600 persons, both residents and visitors, use artificial reefs. Visitors account for just under half of reef expenditures, bringing in nearly \$118 million of new money. This study was the first to provide clear insight into the role that the for-hire sector, including guide and charter operators, plays in the use of Florida's reefs. That sector generates more than a third of

overall expenditures. 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 fisheries-independent 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 local workshops, more than 400 individuals reported they were actively using the information presented in their reef programs.

HEALTHY OCEANS AND COASTS

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 for maintaining the economies and recreational resources of coastal communities. Among other benefits, healthy habitats support commercial fisheries and recreational fishing and diving, both for residents and millions of tourists. But coastal habitats face numerous threats ranging from litter and water pollution to storm damages, and these must be addressed in creative ways. A major contributor to habitat degradation is peoples’ lack of understanding about the effects of their own activities. Effective protection and restoration therefore demands the education and involvement of all stakeholders, including residents, visitors, business owners, and community leaders. With adequate information and tools, each group can alter its activities in ways that improve habitat, while protecting its own interests in the process.

FLORIDA SEA GRANT RESPONDS

Since its inception, one of our primary missions has been educating Floridians and visitors about protecting and restoring marine habitats. Extension agents use local knowledge and creativity to craft programs that meet specific community needs. One example is an ongoing, multi-regional effort to remove abandoned crab traps, which are boating hazards and also needlessly trap and kill fish. Extension agents leveraged their strong community ties and respect to forge a partnership between crab fishermen and the Florida Fish and Wildlife Conservation Commission—groups that historically have not worked together. This led to a cooperative effort to remove traps during the off-season. 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. Such programs tap a community’s volunteer labor force, but they also offer valuable opportunities to teach citizens about key issues.

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, often through engaging hand-on activities. Such programs include “Propagules in Schools,” focused on planting mangroves, and “Grasses in Classes,” focused on marsh and dune plants. 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

More than 3,500 derelict crab traps have been removed, enhancing over 125,000 acres of waterways.

Beach cleanups, mangrove replanting, and oyster reef restoration programs have enhanced hundreds of acres of critical estuarine habitat.

New methods have been developed that the state is using to more effectively monitor the health of oyster reefs.

About ten thousand students have learned more about their local environment and how to protect it through classroom habitat programs and summer marine camps.

Florida bay scallop monitoring programs that partner volunteers with scientists have generated vital trending information for managing this fishery.

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 associated lagoon habitat critical for sportfish species and endangered Florida manatees.

HEALTHY OCEANS AND COASTS

Increasing the Effectiveness of Catch and Release Fishing



Saltwater fishing is one of Florida’s greatest assets, generating \$6 billion in economic impact and supporting tens of thousands of jobs. However, due to concerns about stock depletion, recreational fishermen face more stringent bag limits, size restrictions, and closed seasons. Because large numbers of fish must now be released, discard mortality has increased, diminishing the effectiveness of fisheries management.

FLORIDA SEA GRANT RESPONDS

Fishermen can improve the survival chances of released fish if they use fish-friendly tackle and know proper techniques. A principal focus of Florida Sea Grant’s fisheries research and extension has been to educate recreational anglers on the most effective handling and release techniques. One of our nationally recognized efforts over the last decade has been the refinement of “venting,” a procedure that discharges swim bladder gases from bloated snapper, grouper, and other deep-dwelling reef fish, allowing them to swim down to safe habitat depth. In 2008, federal and state rule changes required Gulf of Mexico fishermen to carry and use venting tools, as well as other kinds of tackle that increase the chances of released fish survival. This created an immediate need to educate over 3 million anglers in Florida and across the Gulf.

Florida Sea Grant, the only Sea Grant program in the Gulf to comprehensively address this issue, quickly partnered with the Florida Fish and Wildlife Conservation Commission and the National Marine Fisheries Service to mobilize a statewide catch-and-release outreach program. Strategies included:

- Creation of an eye-catching toolkit tackle box filled with examples of sustainable fishing gear our extension faculty used to stimulate interactions with audiences

- Train-the-trainer workshops for resource managers and outdoor journalists who could in turn provide training to others
- Delivery of workshops and presentations for fishing organizations and fishing expos
- Presentations at key professional venues, including Sea Grant extension meetings in the Gulf of Mexico and the American Fisheries Society annual meeting
- Launch of the catchandrelease.org website with instructional videos and downloadable teaching materials
- Organization of youth fishing clinics with the state wildlife commission and other partners to educate children and their parents about sustainable fishing practices

In addition to catch-and-release outreach, Sea Grant extension faculty routinely serve on scientific committees for the fishery management councils of the South Atlantic and Gulf of Mexico regions, helping address overfishing and marine resource management issues.

More recently, Sea Grant began evaluating the effectiveness of new fish descending gear in the Gulf of Mexico, and training a cadre of extension faculty in their use.

RESULTS

Thousands of recreational fishermen have now learned and are actively using practices to reduce discard mortality. Follow-up surveys after training indicate that thousands more are fishing in a more sustainable manner. Other Gulf region organizations as well as the national FishSmart initiative are now using Florida Sea Grant’s educational materials, significantly expanding regional impacts.

In addition, Sea Grant helped transfer the venting tool technology to the private sector. At least six small businesses in Florida are making tools based on the Sea Grant venting

tool design. These tools are now widely available through a number of tackle manufacturers and retailers and in use by commercial and recreational fishermen throughout the U.S.

Based on initial results from field trials to test fish descent gear, Florida Sea Grant has become a national leader in outreach and policy development for adoption of new release technologies. An advisory committee of the Gulf of Mexico Fishery Management Council has now recommended that fishermen have the option of using descent devices to minimize injury, and is partnering with Sea Grant to increase outreach efforts.

HEALTHY OCEANS AND COASTS

Keeping Marinas Clean



Millions of boaters navigate Florida’s waters each year, and the state’s multi-billion-dollar marina industry provides them with critical services including fuel docks, pump-out stations, and maintenance facilities. But the potential for pollution from marinas 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, and their relationships with state authorities were at times tense.

FLORIDA SEA GRANT RESPONDS

In the mid-1990s, the Florida Department of Environmental Protection developed the Clean Marina/Clean Boatyard Program 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. But encouraging marinas to cooperate with the agency proved daunting. Florida Sea Grant and its extension agents stepped in to help establish the trust needed to move the program forward. In 2000, the Clean Boating Partnership, a public/private initiative composed of DEP, marina and boatyard operators, marine industry representatives, Florida Sea Grant, the U.S. Coast Guard, and the Florida Fish and Wildlife Conservation Commission, was established to identify the key practices that would promote not only clean environments, but also profitable operations.

Once program guidelines were established, Florida Sea Grant began offering Clean Marina workshops to marina

owners and workers. During the workshops, participants learn about a step-by-step checklist for assessing whether a facility meets or exceeds government standards for pollution prevention, and that helps them identify areas for improvement. Inspection teams include Sea Grant agents and representatives from both DEP and industry. If marinas discover shortcomings, DEP gives them an 18-month grace period to make corrections, and withholds any fines during this time. Grants are made available through the Clean Marina Program and the federal Clean Vessel Act, which helps marinas construct and install sewage pump-out facilities. In addition, Florida Sea Grant extension agents regularly provide marina owners and operators with technical assistance in achieving 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

Florida was among the first states to establish a Clean Marina Program, and inspired other states and Sea Grant Programs around the country to launch similar efforts. The Clean Marina/Clean Boatyard Program was 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. Florida Sea Grant continues

to be a member of the Clean Boating Partnership and attends all Clean Boating Partnership meetings. Sea Grant agents also teach marinas about the program, and assist with workshops and the evaluation of new Clean Marina applicants.

Those in the industry speak highly of the program, which has significantly increased and improved communications between DEP and the industry, and in many cases shifted the relationship from adversarial to cooperative. The program has twice received the Gulf Guardian Award from the U.S. Environmental Protection Agency. Since the program’s inception, more than 75,000 gallons of oil and 25,000 pounds of material have been recycled, and 150 marinas have received fuel spill kits.

HEALTHY OCEANS AND COASTS

Supporting a Unique, Sustainable Sponge Fishery



For thousands of years, bath sponges have been harvested from the Mediterranean Sea, the main source for world markets. In Florida, the commercial harvest of bath sponges also has a long and colorful history dating back to the mid 1800s. Before World War II, the sponge fishery was the most economically important fishery in the state. But 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 exists. In the 1980s, demand for Florida bath sponges began rising once again, in part due to a major die-off in the Mediterranean, leading to new fears. Because sponges are important bio-filters and provide essential habitat for many marine organisms, resource managers and environmental groups became concerned that the surge in harvest could lead to over-exploitation. Some called for the closure of Florida’s fishery altogether.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant’s research and extension activities have addressed several key aspects of bath sponge biology and fishery management, underscoring that unique university expertise can lead to timely, cost-effective solutions for resource management issues. First, the benefits of changing harvest practices were documented and communicated to sponge fishers and fishery managers. 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 the traditional tearing. Second, contrary to public perception, Sea Grant research documented that commercial bath sponges make up only 1 to 2% of the total sponge community. Consequently, sustainable harvest of bath sponges could be expected to have minimal impact on sponges’ overall ecological function. Before this fieldwork was completed, a dramatic harmful algal bloom in the Florida Keys devastated sponge populations over approximately 1,000 square kilometers. This gave Florida Sea Grant researchers an unprecedented opportunity for long-term evaluation of the ability of sponges to recover following widespread mortality events.

RESULTS

Florida Sea Grant’s research showing the benefits of cutting vs. tearing sponges was so compelling that the sponge industry embraced the practice and supported a new rule by the Florida Fish and Wildlife Conservation Commission that sponge divers use this technique. Furthermore, the evidence that sustainable harvesting of sponges would have minimal impact on the ecological function of the sponge community led fishery managers to conclude 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. Finally, the long-term study of sponge recovery has provided a new picture of sponge population dynamics. It’s now known that sponge recovery following harmful algal blooms is at least a 10 to 15-year process. If it is determined that harmful algal blooms are caused by human impacts, reoccurrence of blooms on even a decadal time frame could cause a chronic reduction of sponge community biomass.

HEALTHY OCEANS AND COASTS

Using Genetics For Shark Fisheries Management, Conservation And Trade Monitoring



Sharks play a vital role in ocean ecosystems as a top predator, but are heavily fished throughout the world. One of the challenges in managing the U.S. shark fishery has been accurately determining how many are being caught, since the shark catches are often cleaned before reaching the dock, making species determinations difficult. Without species information, it's also difficult for law enforcement officers to prosecute individuals who poach sharks for the high price their fins command in foreign markets.

FLORIDA SEA GRANT RESPONDS

With funding from Florida Sea Grant, researchers at Nova Southeastern University's Guy Harvey Research Institute have developed a genetic fingerprinting technique that allows rapid and affordable determination of a shark species using just a small sliver of flesh or dried fin, or even the cartilage powder sometimes sold in pill form as a health supplement. The tests are based on work that identified DNA segments unique to dozens of specific shark species, including several listed as endangered, such as porbeagles, great whites, and hammerheads. These capabilities 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.

The team has also applied the expertise they developed to new areas. One project involves work to determine not only the species, but also the region where a shark was collected. This is critical, because in some cases fishing for a species from one threatened population—the northwest Atlantic for example—might be illegal, while targeting a healthier population in the Pacific might not. This ongoing work should eventually make it possible to discount false claims of illegal shark material having come from a legal fishery. The researchers are also working to develop tests for billfish and tuna to similarly aid research and law enforcement.

RESULTS

The success that NOAA Fisheries has had using this DNA fingerprinting to identify and prosecute illegal shark fin harvests has been widely publicized, and the research team continues to expand the benefits of this new capability. For instance, the great white shark is listed as a protected species by CITES, the Convention on International Trade in Endangered Species, and the ability of rapid and economical DNA testing to identify illegal great white shark meat on a global scale was a factor that enabled the species' move to the more protected vulnerable status on the CITES endangered species list. 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 develop lists of shark species whose fins are found in the Hong Kong market, the largest in the world for shark materials—information critical in identifying species most heavily targeted by fishermen. The researchers were able to 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.

SUSTAINABLE COASTAL DEVELOPMENT

Preserving Access to Florida's Waterways



Maintaining adequate marine resource access to support recreation, tourism, and commercial fishing is growing increasingly difficult. Even with economic declines, waterfront property in Florida is so valuable that it can be economically challenging to keep enough boat ramps open for residents and visitors. It's also difficult for critical businesses such as marinas to open or stay open on property more valuable if sold for development. These problems are exacerbated because many communities lack the resources to properly plan for maintaining water access in the midst of growth, or to apply for state and federal aid for such work.

FLORIDA SEA GRANT RESPONDS

For coastal communities, a healthy tourism economy depends on the ability to provide adequate infrastructure and public access to coasts and waterways. 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.

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. In addition to 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 \$10 million to the local economy. By clearly demonstrating a specific need as well as public support, the report also enabled Taylor County to successfully apply for \$700,000 in state and federal funding, which was used to expand a boat ramp facility near the Steinhatchee River and the Gulf of Mexico. Ramp use was monitored on 18 weekend days during peak use times, and averaged 65 boat trips per day. During these 18 days alone, boaters spent \$289,351, as estimated using tools developed through the study.

After the ramp opened, annual boat ramp permit decal sales doubled in comparison to the average of the three previous years, indicating a rapid behavior change in boaters launching from Taylor County. A new bait and tackle shop with boat rentals opened directly across the road from the boat ramp. A later analysis has shown that 90% of the ramp's users are visitors, and that one third are from out of state, verifying its value in supporting tourism. These results are also supporting new grant applications for funds to address other priorities identified in the access study. According to Jack Brown, the Taylor County administrator, the study was timely. "It supports our plans to expand our county's economic base," he said, "by developing the sectors that depend on outdoor recreation and tourism."

SUSTAINABLE COASTAL DEVELOPMENT

Meeting the Challenges of Being America's Top Boating Destination



In less than 10 years, the number of registered boats in Florida jumped from 730,000 to over 1 million, with only a small decrease during the recession. This surge in boating popularity has intensified the need for more water access, improved boater safety, and better assessment and mitigation of environmental impacts. Florida's coastal communities are now facing unprecedented pressure to give boaters more freedom while conserving sensitive coastal habitats. These uses boost Florida's multi-billion-dollar tourism industry, especially in local coastal economies.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant is responding to this challenge with innovative programs to 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 have applied these to nine coastal counties. We also provide professional development opportunities created specifically to increase managers' abilities to resolve boating issues, including the recreational boating-focused From Stem to Stern conferences, regional boating management workshops, and training courses for using Geographical Information Systems.

Florida Sea Grant is building a working partnership among state agencies, inland navigation districts, federal entities,

and local governments to increase the effectiveness of boater management programs. The state Department of Environmental Protection has notably joined this effort. Sea Grant is also actively seeking novel ways to apply spatial data analyses that use science-based planning and practical policies to resolve congestion at boating hot spots, protect manatees and critical marine habitats, and efficiently site new boating facilities. Such efforts have included working with Brevard County on a GIS-based study to identify the best sites for much-needed managed mooring fields, and 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

Sea Grant boating survey techniques have gauged the economic impacts of artificial reefs in southwest Florida, and enabled development and implementation of a social marketing program to positively change behavior in boaters in the Indian River Lagoon. NOAA's Right Whale Recovery Program has begun working with Sea Grant 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. More broadly, recreational boater profiles have documented that the number one source of concern among boaters is a lack of courtesy shown by other boaters, which will help focus future outreach efforts.

More than 250 people have completed one of Florida Sea Grant's GIS workshops, including not just university

researchers but also employees from environmental consulting firms, public agencies, and timber management companies. Over 400 people have attended the Stem to Stern conferences and regional workshops, creating an important new network of resource professionals and elevating the profile of recreational boating and waterways management across the state.

Brevard County is now negotiating with local municipalities to develop a minimum of two new mooring fields, and Florida Sea Grant work in Palm Beach and Martin Counties supported state rule making that established new boating safety zones in the Intracoastal Waterway. The Florida Fish and Wildlife Conservation Commission is considering applying this approach to revise or establish speed zones in other waterways under its jurisdiction.

SUSTAINABLE COASTAL DEVELOPMENT

Providing Critical Tools for Waterway Management



Florida is the nation’s top destination for marine recreation. At nearly one million, the growing number of registered boats here surpasses any other state. The continuing growth in vessel registrations and associated recreational activity has been a boon to many coastal economies. But it has also brought challenges both in maintaining sufficiently navigable waterways, and in protecting sensitive marine habitats—the health of which is a key reason that boating is so popular. Dredging channels, while essential for boaters, has grown increasingly difficult, both for the high costs of planning and permitting, and the channel maintenance work itself. The planning and permitting phase is often half of a project’s total cost, so anything that streamlines the process means substantial savings to taxpayers. And better maintained waterways are safer and more usable, and can enhance protection of sensitive estuarine resources.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant’s Boating and Waterway Planning Program has a strong record of responding to the priority needs of Florida’s recreational boaters, natural resource managers, and policymakers. One of this program’s key activities is developing science-based planning tools that help communities more effectively manage their waters, save tax dollars, and reduce environmental impacts.

One tool is called the Regional Waterway Management System, which Florida Sea Grant developed for Southwest Florida in partnership with the West Coast Inland Navigation District and other agencies. Historically, dredging projects and assessments of boating impacts on marine habitats have proceeded mainly on a case-by-case basis. The Regional Waterway Management System instead allows local authorities to assess the needs of an entire region, allowing planning and permitting of multiple prioritized projects at the same time.

The process entails mapping precise depth data for major boat arteries as well as gathering detailed information about the number of boats in an area, and where their owners most often use them. This information is then combined with available data on the locations and extent of specific resources such as seagrass beds. Detailed environmental, vessel, and waterway bathymetry is then mapped and analyzed using a geographic information system, or GIS, putting the information in a form that planners can use to visualize it and identify where access or habitat problems may exist.

The system also provides information about areas where heavy boat traffic is adversely impacting natural resources. This might, for instance, lead to recognition that a particular channel should be shifted farther away from a seagrass bed. The overall goal is to achieve the best balance possible between maintaining waterway access and protecting vital habitat.

RESULTS

Using the Regional Waterway Management System (RWMS) planners and authorities in several Southwest Florida counties have been able to cut red tape in the permitting process for canal dredging enough to save taxpayers an estimated \$5 million since 2006. In Lee County, analyses are aiding work to establish non-combustion engine zones that will be set aside when dredging occurs, protecting as much as 1,200 acres of sensitive seagrass habitat. These steps help to

mitigate the effects of navigation channel improvements that might be conducted in environmentally sensitive areas such as aquatic preserves. Waterway information is so important to Florida coastal real estate that at least one county now includes the results of its RWMS assessments on its property appraiser’s website. Based on past successes, the Department of Environmental Protection is encouraging more widespread use of the system.

SUSTAINABLE COASTAL DEVELOPMENT

Supporting 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. This is especially true in Florida, where countless communities maintain at least some remnants of their waterfront heritage. But preserving working waterfronts—not only for posterity but because they remain vital economic supports for commercial fishing and tourism—has grown increasingly difficult. Development remains a major force on Florida’s coasts, and once scarce undeveloped land and critical waterfront businesses are lost, it’s very difficult to reclaim those areas for a community.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant extension faculty actively participate in many coastal communities’ efforts to develop their waterfront areas wisely and protect sensitive habitats. These efforts draw attention to the value of working waterfronts, and in some cases even help 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 heritage.

One long-running festival is in the town of Cortez, a small village south of Tampa founded by commercial fishermen from North Carolina in the 1880s. 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, an annual weekend event that raises funds to support commercial fishermen and to preserve the town’s waterfront. In Key West, at the request of a fishing industry hit hard by the hurricanes of 2004 and 2005, Sea Grant’s local extension agent organized the first Florida Keys Seafood Festival in 2006, which has also continued annually. The Fourth of July “Clamerica” and October Seafood Festival, both in Cedar Key, are similar events staged with Sea Grant extension support aimed at helping the shellfish aquaculture industry by promoting consumer confidence in, and demand for, shellfish products.

RESULTS

While the first Cortez Commercial Fishing Festival in 1981 was a one-day event that drew roughly 500 people, it has grown into a 2-day affair with about 25,000 attendees. Revenues have also grown; in 2010 alone, the festival raised \$85,000. 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. F.I.S.H. has used the money raised since to expand and restore this preserve, and to purchase additional cultural resources in Cortez. These activities have been critical in preserving Cortez’s waterfront heritage.

The Florida Keys Seafood Festival has become the main fundraiser for the Florida Keys Commercial Fishermen’s Association, which advocates for working waterfront

preservation and protection of fishing stocks. Over the years, Florida Sea Grant has been able to transition most of the duties for organizing the festival to the organization, though still providing support. The festival now brings in tens of thousands of dollars to support the association’s efforts, and is also a significant draw for tourists. In Cedar Key, Clamerica has drawn up to 10,000 attendees, and the October Seafood Festival is now in its 42nd year. Both these events provide Sea Grant extension with special educational venues to reach Florida residents and visitors with information about the availability of locally produced shellfish, and the environmental and economic importance of clam aquaculture to coastal communities.

SUSTAINABLE COASTAL DEVELOPMENT

Finding Solutions To Advance The Viability And Sustainability Of Coastal Communities



Florida's shifting economy and its coastal hazards create major hurdles for communities interested in protecting the viability of their waterfront heritage. Some businesses deteriorate while others are converted to uses no longer waterfront-focused. Ongoing development threatens protective beach dune systems and estuaries. Other challenges include adapting for future changes as expansive coastal development collides with the prospect of hurricanes, sea-level rise, and other looming hazards. Adequately addressing these challenges requires legal and policy resources that local governments often lack.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant has a long history of supporting waterfront communities by providing legal research and extension to state and local policy professionals. Many key recent efforts have involved a productive collaboration with the Conservation Clinic at the University of Florida's Levin College of Law. With Sea Grant support this team of law faculty and students is providing coastal communities with the latest legal and policy information that 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, the epicenter of the state's clam aquaculture industry, they advised the property appraiser on a policy framework that allowed clam farmers to receive a major new aquaculture tax benefit. The team worked with the city of Punta Gorda to develop their plan for addressing potential sea-level rise threats as described elsewhere in this report.

Other efforts have included rewriting the land development code for the town of Marineland, based on principles of coastal sustainability. More recently, the group completed a survey of coastal property purchasers to determine whether they received adequate notice of erosion issues and other information required by a 2006 law. Based on the results, the group has drafted proposed revisions to the law to better accomplish its intended purposes.

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. Dubbed the Blackwater to Bluewater Initiative, the project targets areas whose watersheds have major impacts on important estuaries that are situated near traditional waterfront communities. One success under the program was a study of the St. Mary's River, which is legally challenging to manage because it runs through both Georgia and Florida. This work revealed a number of issues and associated solutions for better and more coordinated water quality monitoring.

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 planning strategies that addresses legal and policy issues relevant to waterway and waterfront protection efforts.

Portions of the Conservation Clinic's model comprehensive plan for working waterfronts have been adopted by communities throughout the state.

Thanks to the work on the St. Mary's, there is now enhanced coordination of water-quality monitoring between Georgia

and Florida, and the group's broader work with watersheds contributed to the EPA recognizing the University of Florida as a Center for Excellence in Watershed Management.

The taxation project in Cedar Key ultimately led to the local government deeming clam farmers eligible for \$16,000 in property tax reductions.

The innovative code developed for the Town of Marineland won an award from the Florida Chapter of the American Planning Association.

SAFE AND SUSTAINABLE SEAFOOD

Helping Secure Aid for the Shrimp Trawling Industry



U.S. domestic shrimp landings have been declining considerably over the past decade due to rising fuel prices, hurricane damage, and cheaper imports flooding the market. One source of industry aid has been the 2009 federal economic stimulus package's reauthorization of the Trade Adjustment Assistance for Farmers Program. Created in 2002, this program provided help for agricultural producers and commercial fishermen who could prove that an influx of products from foreign countries was significantly reducing the prices they could command for their products. Though the program involves cash assistance, the overall goal is to help participants adjust to a changing economic environment by improving the productivity and profitability of their businesses. Successful applicants commit to extensive training and development of new business plans.

To participate in the 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.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant has a history of working with commercial fishermen seeking relief through the TAA program. Once the reauthorization was announced, Sea Grant began working with industry partners and Sea Grant programs in the southeast U.S. to complete a regional petition for inclusion of the shrimp trawling industry. This entailed compiling data about both regional shrimp landings, and shrimp import trends from foreign competitors in Asia and Central America. The Southern Shrimp Association successfully filed the petition in 2010. As a result, applicants could then qualify as part of an initial group selected in 2010 who would be eligible for up to \$12,000 in support, or a 2011 group eligible for \$4,000.

While the TAA has established training options for participants that cover budgeting, business planning, and other

universally important topics, Florida Sea Grant recognized the need for more industry-specific options in order to maximize the program's value. Our marine economics extension specialist worked with industry to identify appropriate topics, including alternative shrimp marketing methods, ensuring the quality of shrimp on boats during operations, making vessels more fuel efficient, job opportunities outside of shrimping, and reducing operational costs by increasing efficiencies. Sea Grant then created the materials needed for a unit covering these topics and organized and offered the necessary training events. We also pushed successfully for online courses to make it easier for shrimpers to participate. Florida Sea Grant continues to work closely with shrimpers to help them navigate the TAA program and maximize their chances of receiving available aid.

RESULTS

Over 2,000 commercial shrimp trawling business owners in the southeast U.S. completed the shrimp training unit. In Florida, 240 commercial fishermen received training either online or at one of 48 workshops Florida Sea Grant organized. As of April 2012, Florida Sea Grant's efforts had helped

hundreds of Florida shrimp trawlers receive nearly \$1.5 million in aid. The financial support process, which continues through 2013, could potentially double that amount when the TAA program ends. Estimates suggest the overall program has helped to sustain 500 jobs.

SAFE AND SUSTAINABLE SEAFOOD

Keeping Seafood Safe



Seafood is among the healthiest 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 or importers intending to sell seafood in the U.S. follow the strict set of handling techniques known as the Hazard Analysis and Critical Control Points, or HACCP, management system. HACCP identifies where hazards might occur in the food processing chain, then prescribes key actions to prevent spoilage and food poisoning. This system sets the world standard for food safety, but the industry needs assistance and technical training to comply.

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, the National Seafood HACCP Alliance (SHA) 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. The FDA recognizes the program developed and delivered, in part by Florida Sea Grant's seafood specialist, as the foundation training program for seafood commerce in the U.S.

Florida Sea Grant leads the Alliance steering committee. This entails managing the acquisition of operational grant funds; convening quarterly meetings of the editorial committee and an annual meeting for the full steering committee membership; organizing Alliance activities when food processing standards are updated; maintaining a cadre of

approved national and international trainers; and coordinating the publication and distribution of the HACCP training curriculum. When the FDA issued comprehensive revisions to seafood safety regulations in 2011, Florida Sea Grant directed the organization of a new round of national trainings to update the industry, training materials, and curriculum. Under the editorial guidance of Florida Sea Grant, the Alliance also published new editions of the FDA's *Guidance for Industry: Fish and Fishery Products Hazards and Controls Guidance*, as well as English and Spanish-language editions of the *HACCP Training Curriculum*. The books are the recognized curriculum for the requirements outlined in the FDA's seafood HACCP regulations, and have been translated in five languages.

Historically, the HACCP program has received funding through Sea Grant as well as the U.S. Department of Agriculture, and the FDA. However, the program is now self-sustained through training registration fees and training manual sales. Florida Sea Grant continues to work with the Seafood HACCP Alliance and regulators to update processing safety standards for the seafood industry.

RESULTS

The Seafood HACCP Alliance has become Sea Grant's most successful extension program, playing a major role in the ability of the nation's \$27 billion seafood industry to prosper.

The Seafood HACCP Alliance has trained almost 90% of the nation's seafood importers and processors in federally mandated compliance techniques. All told, over 30,000 people have completed courses.

More than 330 individuals from the nation's top importers, distributors, processors, and restaurants attended the HACCP update training sessions in 2011. Participants included

70 seafood importers and distributors, and more than 200 regulatory agency inspectors. The new HACCP certifications obtained by participants have sustained an estimated 5,000 jobs in the industry.

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 now has trained some 400 instructors that work around the country and world using standardized training materials and protocols.

SAFE AND SUSTAINABLE SEAFOOD

Seafood Schools Improve Quality And Safety For Consumers And Industry



Keeping seafood fresh and safe for consumers is a challenging task for importers, wholesalers, restaurants and retailers. The situation has grown more complicated, given that more than 85% of seafood consumed in the U.S. is now imported. 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, highlighting a need for ongoing practical education options.

FLORIDA SEA GRANT RESPONDS

In 1995, recognizing the difficulties that shrimp handlers from importers to restaurants face in training workers to properly handle seafood, Florida Sea Grant established what came to be known simply as Shrimp School. The plan was to offer comprehensive, practical training to buyers, importers, and regulators in everything from controlling bacterial growth to evaluating product taste, texture, and appearance. Extension faculty thought they would make it a one-time or occasional event, but the course became so popular that Sea Grant began offering the course annually, and eventually multiple times each year.

Shrimp School has even been taken on the road, and has been offered in other countries such as Nicaragua and Ecuador. The need for education has grown steadily stronger as shrimp has grown in popularity and as shrimp imports have increased. Attendees now come to Shrimp School, hosted on the University of Florida campus, not just from around the state but from coastal communities around the country and from shrimp exporters around the world. The course features lectures on current topics, but emphasizes hands-on training for participants.

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 is designed to help retailers buy and market raw oysters from the Gulf of Mexico, and thus includes training on advancements made in post-harvest processes that eliminate pathogens, chiefly *Vibrio vulnificus*. Oyster School takes place in Apalachicola, the center of Florida's oyster industry, and has run annually since 2007.

Fish School, offered on demand, gives similar opportunities for handlers to learn the best ways to avoid deterioration and keep their products safe, fresh, and tasty. 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 quality 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. Sensory School includes one full week of lectures and hands-on product training by FSG seafood safety specialists and leading sensory experts from the U.S. Food and Drug Administration.

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 China, India, Thailand, Australia, Mexico, Belize, Nicaragua, Honduras, Venezuela, Brazil and other countries, there has also been a trend toward improved safety and quality of imported products. The Shrimp

School has become the leading academically based domestic and international training program for shrimp processors and regulators worldwide, with about 50 attendees each year. Approximately two dozen individuals attend Oyster School annually; some 25 companies sending multiple representatives have attended Fish Schools. Approximately 25 people have completed sensory training.

SAFE AND SUSTAINABLE SEAFOOD

Improving the Safety of the Fresh Oyster Supply and the Sustainability of Florida's Oyster Fishery



Eating raw oysters that contain bacteria found naturally in seawater, primarily *Vibrio vulnificus*, can cause life-threatening illness in people with existing immune deficiencies. In oysters harvested from the Gulf of Mexico, the level of *Vibrio* greatly increases during warm weather months, posing a significant public health risk. When the U.S. Food and Drug Administration recently implemented a policy requiring Gulf oyster processors to use post-harvest treatments during summer months to eliminate *Vibrio* contamination, the industry sought treatment options that would be cost effective while not adversely affecting the prized taste of a raw oyster.

FLORIDA SEA GRANT RESPONDS

In 2004, Florida Sea Grant, in cooperation with the University of Florida, the U.S. Department of Agriculture, and the Apalachicola Bay Oyster Dealers Association, opened a first-of-its-kind oyster industry lab in Apalachicola, the area that produces 90% of Florida's oysters. The lab gives commercial producers quick access to routine verification protocols that certify their oysters are free of *Vibrio* before entering the marketplace.

The lab has also given Sea Grant researchers access to oyster producers and sophisticated analytical testing capabilities to develop alternative post-harvest treatments. Most of these treatments 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 preserves a live product while reducing *Vibrio* counts to non-detectable levels. Irradiation is a processing

technique used in other sectors of the food industry, and kills germs by passing low doses of gamma rays through products. Oysters survive for about a week after irradiation, or they can be sold as in-shell oysters to prolong commercial shelf life up to 14 days. This key difference matters to many consumers that crave a live product involving the full experience of shucking. Moreover, consumer taste tests revealed no detectable change in raw oyster flavor after irradiation. Working with industry partners, Florida Sea Grant researchers went on to develop the full technical standards that processors would need to begin full-scale use of irradiation.

Sea Grant researchers have also validated a number of other post-harvest techniques developed elsewhere, such as flash freezing and cold pasteurization. They are also innovating with Apalachicola processors to develop novel value-added oyster products.

RESULTS

The opening of the oyster lab has increased the safety and efficiency of post-harvest oyster processing in Florida, and reduced the lag time in post-harvest certification, helping industry lower operational costs and limit inventory loss.

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 post-harvest processing research was a key factor in so far averting that decision.

Sea Grant researchers have also helped one processor develop and patent the "Frosted Oyster," individually quick frozen through an approved post-harvest process. The Frosted Oyster is growing in popularity throughout the restaurant industry.

SAFE AND SUSTAINABLE SEAFOOD

Growing Florida's Clam Industry



Throughout the 1990s, due to closures of oyster harvesting areas and a 1994 state constitutional amendment limiting fishing nets, 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 in building a new hard clam aquaculture industry in the Gulf of Mexico waters near Cedar Key. While hugely successful, the clam industry is based entirely on a single species, which increases business risk. Developing another clam species for aquaculture could protect the industry, 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 developing its cultivation by providing essential science, technology transfer, and outreach to support market acceptance. Specific efforts have focused on improving farming practices, enhancing brood stock performance, and protecting the environment.

Initial cultivation attempts have used established hard clam growing techniques as a starting point. Researchers then moved on to identify gear and planting techniques to optimize the species' growth. They have also worked with Florida Sea Grant's seafood technology faculty to evaluate

sensory characteristics and shelf-life parameters. Sea Grant extension has conducted surveys with wholesale dealers, chefs, and other potential buyers to determine the likelihood of wide market acceptance. They arranged to feature the clam in the Florida pavilion at the international Boston Seafood Show, introducing this new product to 18,000 attendees and 918 worldwide suppliers. They are working with a large seafood distributor to develop product standards for growing, handling, harvesting, and processing the clams, measures that will later need to be adopted by growers and wholesalers. 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. What was once a finfish industry in decline is now a thriving aquaculture industry that produces more than 185 million clams per year, with over 80% of this production coming from the Cedar Key area. This translates into a statewide economic impact of \$53 million and 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. The species can be raised using similar culture methods, and the project continues to actively involve growers in the development of genetically diverse stocks and identification of optimal lease sites. 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 with chefs and potential consumers, the sunray's distinctly flavored meat has been extremely well received. More than 250 international visitors and buyers sampled the clams at the Boston Seafood Show and gave their flavor high marks, agreeing with prior consumer acceptance studies. At least 50 seafood companies expressed interest in purchasing the product when it becomes commercially available. The surveys of wholesale dealers demonstrated strong market acceptance for sunrays, and yielded key information that will help the industry better understand its market development potential.

SAFE AND SUSTAINABLE SEAFOOD

The Benefits Outweigh the Risks: Reaching Seafood Consumers to Update the Message



In today’s media-saturated environment, U.S. consumers frequently hear so many conflicting messages about eating seafood that they actually choose to eat less of it—the opposite of what nutritionists recommend. Although increasing seafood consumption will improve health and save lives, apprehension persists. 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. Now, health experts face the daunting task of cutting through the clutter to reach diverse audiences with their updated message.

FLORIDA SEA GRANT RESPONDS

The Florida Sea Grant seafood specialist served on the National Institutes of Medicine committee that co-authored the 2007 report, *Seafood Choices: Balancing Benefits and Risks*, which identified consumers’ “seafood dilemma” as a primary obstacle to improved public health. The report recommended a U.S. national seafood assessment program to provide better and timelier information to consumers and regulators.

To address the needs 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. An initial survey the team conducted uncovered that consumers trust health care providers more than any other source for their nutritional information, so the team has focused subsequent outreach efforts on getting accurate information to healthcare providers.

After two years of analyzing and synthesizing content, the team has launched seafoodhealthfacts.org, which provides both consumers and healthcare providers with information tailored to their needs. One feature is an easy-to-follow decision tree that provides customized consumption advice based on the amount and type of seafood you eat.

In Florida, where residents consume twice the national average of seafood, the need for updated information is especially great. The Sea Grant extension specialist organized in-service training for statewide faculty on this topic, so they could return to their communities and share the information. Some have met with dieticians’ groups in their area; others are working with local seafood distributors to host seafood education classes and webinars for the general public.

A second key effort has been to design and organize a series of workshops in conjunction with the Florida Medical Association and state agencies to correct misconceptions about topics such as the dangers posed by methyl mercury in seafood. Though this issue has received wide attention, most of the information is outdated. For instance, many of the initial calculations about mercury ingestion were performed at a time when almost all the seafood products consumed were wild caught. But aquaculture products now make up a substantial chunk of the market, and with these, mercury is not a concern. Other misconceptions include a lack of understanding about the substantial health benefits of consuming seafood that, though repeatedly confirmed by health professionals, have been lost in the noise of misinformation.

RESULTS

Federal and state agencies are now considering altering the message about methyl mercury in seafood. After a number of informal conversations, the cohort of Sea Grant extension faculty and food technologists has prepared a letter to the secretary of Health and Human Services and the FDA commissioner requesting that they release additional information to support the need to change the message.

The Association of Food and Drug Officials (AFDO), a 100+ year-old trade association of every regulatory agency in the nation dealing with seafood safety, has passed a resolution calling on state agencies to consider new information on seafood benefits and update their health messages.

HAZARD-RESILIENT AND CLIMATE-READY COASTS

Responding To The Deepwater Horizon Spill



The massive 2010 Deepwater Horizon oil spill in the Gulf began just 150 miles from Florida shores and ultimately damaged sensitive coastal environments as well as regional economies. In Florida the only direct oil impacts were in the Panhandle region, but there were major indirect effects throughout the state. Tourists began avoiding even clean Gulf beaches, both out of fear of where the oil could spread, and misperceptions about where it was already found. Consumers around the country were shunning Gulf seafood even from regions far removed from the spill. Many of Florida's Gulf residents, still struggling from the effects of recession, had well-founded fears about their livelihoods and their homes. There was confusion to the point of chaos in many coastal communities, creating a great need for accessible, understandable information.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant quickly determined that it could provide 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 cleaning oil-impacted habitats and wildlife. Just over a week into the spill, Gulf Sea Grant offices collaborated to post a regional oil web portal, gulfseagrant.org, which featured comprehensive content on all aspects of the spill. Within a month, the South Atlantic Sea Grant programs had launched a second site, southatlanticseagrant.org, which presented scientifically sound information about the likelihood of oil movement from the Gulf to the Atlantic. Safety experts also posted other information frequently, including media advisories about seafood and oil contamination.

In conjunction with these efforts, Florida Sea Grant launched a major campaign that included numerous television news interviews to inform consumers about the processes in place to ensure that any Gulf seafood sold was safe. Sea Grant agents and specialists were also instrumental in establishing the

protocols for the sensory “sniffer” analysts to screen seafood samples, and in training federal agency staff and industry representatives in these techniques.

Our economics and legal team exhaustively investigated the BP claims process, and developed a widely distributed advisory with step-by-step instructions for filing claims. The team also issued an advisory about making legal decisions related to spill damages to help businesses and individuals understand all their legal options.

Other key activities included: posting information about how to get shore-based cleanup jobs and how to take part in the Vessels of Opportunity program, which allowed local commercial and recreational boat owners to join the spill response on the water; organizing a major public forum in Pensacola, “The Science of the Spill;” and supporting three 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, 1,350 boat owners and displaced fishermen were able to participate 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.

Overall, the Gulf event showcased Florida Sea Grant's ability to quickly respond to an emergency event in an effective and organized manner while collaborating with various state and federal agencies, and with other Sea Grant programs.

HAZARD-RESILIENT AND CLIMATE-READY COASTS

Addressing Threats From Future Sea-Level Rise



In the U.S., Florida has been identified as one of the most at-risk locations for impacts of sea-level rise, due to its low topography, and the concentration of more than 80% of its population and over 75% of its economic revenues in the coastal zone. While planning has occurred in some major cities, most coastal locations are ill-prepared for sea-level rise. 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 Restoration 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, and the array of solutions under various sea-level rise scenarios.

Florida Sea Grant worked closely with the City of Punta Gorda after it was severely damaged in 2004 by Hurricane Charlie, leaving residents anxious to address future risks. Based in part on information from Sea Grant, along with

substantial public participation, the city developed language that creates a legal obligation that future city planning consider the risks and hazards associated with sea-level rise. At the same time, the city was working with the Charlotte Harbor National Estuary Program to join the Environmental Protection Agency's Climate-Ready Estuaries program. To aid this effort, in 2010 Florida Sea Grant and the University of Florida College of Law produced the report, *Sea-level rise Ready: Model Comprehensive Plan Goals, Objectives and Policies to Address Sea-Level Rise Impacts in Florida*.

Florida Sea Grant is a founding member of the Gulf of Mexico Climate Community of Practice, which brings together local officials and extension professionals from throughout the five-state region so coastal communities can be better informed about effective approaches to sea-level rise adaptation. 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.

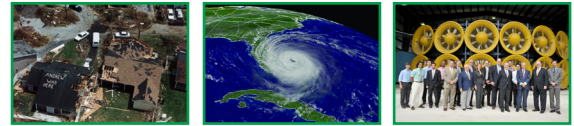
RESULTS

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. The city's inclusion of sea-level rise in its comprehensive plan was a deciding factor in Punta Gorda's successful application for a Climate-Ready Estuaries grant from the federal government. This effort has been highlighted nationally as an example of progressive sea-level rise planning. 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. The South Florida Water Management District and its federal partner, the Army Corps of Engineers, are incorporating sea-level rise into conceptual ecosystem models that drive the adaptive planning of the Comprehensive Everglades Restoration Program. Several coastal communities are using sea-level rise models and storm-surge models developed by Sea Grant-funded researchers in future planning scenarios.

HAZARD-RESILIENT AND CLIMATE-READY COASTS

Preventing Hurricane Damages



Catastrophic hurricane losses are the largest and most pervasive risk facing Florida’s coastal communities, and that risk has only grown as people, buildings, and support infrastructure have become increasingly concentrated along the coast. In 2004 and 2005, eight hurricanes slammed the state, leading to 2.9 million insurance claims and \$31.3 billion in insured losses. Much of this damage occurred because of roofs performing poorly during severe wind and rain. With the incidence of extreme weather expected to increase, the already substantial need for improved safety and resilience for businesses and homes will grow, as will the need for better understanding of how the most serious damages to structures occur.

FLORIDA SEA GRANT RESPONDS

Florida Sea Grant is funding research designed to develop technologies and policies that reduce hurricane damages. This work is 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 inflicting category five hurricane-strength wind, rain, and flying debris on full-sized, single-story buildings.

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 allows identification of the most troubling components and development of new mitigation products and improved construction techniques. As importantly, the results

will make the first comprehensive test-based correlation between exterior and interior damages. That correlation is a key factor in determining insurance claim payouts, as well as in developing the models insurance companies use to model likely hurricane damages. To date such risk assessments have been made without a sound scientific basis.

A second project focuses on a potential direct solution to prevent storm damages. The FIU team has developed polymer strips with epoxy adhesive to strengthen connections between roof trusses and walls. Typically this is accomplished by adding metal straps using nails and screws, which weakens wood and opens paths for water damage. The polymer strips are intended to be a cost-effective retrofit to strengthen older houses or used in new construction. The FIU team also tested a new product developed by a commercial partner that is designed to be attached to roof edges to make them less susceptible to wind damage.

RESULTS

The FIU team has successfully completed the first phases of work to quantify the process of water intrusion using the smaller scale wind fans and mockups of sections of a house. They are now working to confirm these small-scale estimates with the full-size Wall of Wind and a one-third-scale model of a complete house.

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. Wide use could eventually eliminate approximately \$20 million in annual Florida damage claims and support about 10 businesses and 100 jobs. The team showed that the roof edging product reduces roof suction by as much as 70%. As this product moves toward wider use, it could support 15 businesses and 150 new jobs.