

# Mississippi-Alabama Sea Grant Consortium

## Strategic Plan 2009-13



hazard resilience in coastal communities • healthy coastal ecosystems  
safe and sustainable seafood supply • sustainable coastal development

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## HISTORY

The National Sea Grant College Program engages citizens, scientists, organizations and governments to sustain and enhance the vitality, value and wise use of the nation's coastal resources. The Sea Grant program is national, regional and local in scope. Administered and supported by NOAA and implemented through leading universities in 32 coastal, Great Lakes and island states, Sea Grant provides unique access to research-based knowledge and expertise. Through its researchers, educators and outreach specialists, Sea Grant generates, translates and delivers cutting-edge unbiased information to help address the most complex coastal issues and the most promising coastal opportunities. The Mississippi-Alabama Sea Grant Consortium (MASGC) was created in 1972, and is one of 30 Sea Grant programs. It is comprised of nine member institutions.

## MISSION

MASGC enhances the value and sustainability of the nation's ocean and coastal resources through university-based research, education and outreach programs. **In other words: Science Serving Coastal Alabama and Mississippi.**

## VISION

MASGC will serve as one of the region's leading enterprises in addressing urgent and long-term needs in ocean and coastal resource management using ecosystem-based approaches through sound science, education and outreach excellence.

## VALUES

MASGC's values include using objective scientific discovery to improve coastal management policies and practices; sustainably developing small coastal communities; sustainably using the natural environment; serving residents and communities; collaborating with others to address coastal issues; and meeting marine educational needs for current and future generations.

## STRATEGIC PLANNING PROCESS

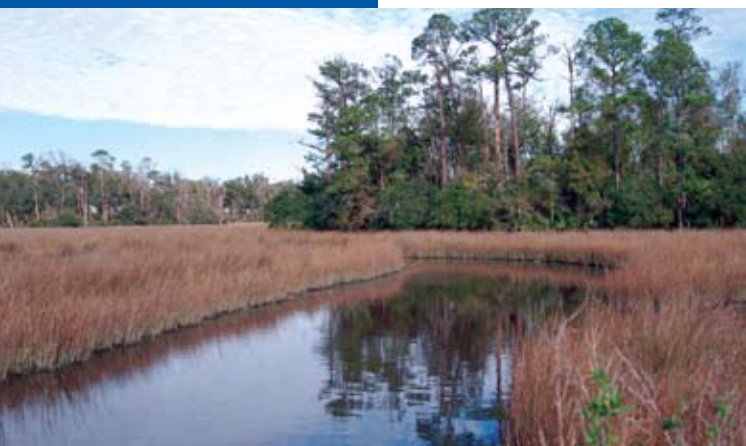
In 2008, the National Sea Grant Office requested that state Sea Grant programs align with the National Sea Grant 2010-2013 strategic plan. The National Sea Grant strategic plan was developed through a review of national priorities and based on input from state Sea Grant programs. The National Sea Grant plan contains four focus areas: Healthy Coastal Ecosystems, Sustainable Coastal Development, Safe and Sustainable Seafood Supply, and Hazard Resilience in Coastal Communities.

The priorities in the MASGC strategic plan are grounded in local stakeholder input and framed within the four National Sea Grant focus areas. The MASGC Advisory Council encouraged the MASGC to use existing plans and needs assessments as a basis for constituent input. This strategic plan is based on information gathered from numerous efforts by MASGC, Gulf of Mexico Research Plan, NOAA Gulf Coast Services Center, Gulf of Mexico Alliance, National Sea Grant Office, National Science and Technology Council Joint Subcommittee on Ocean Science and Technology and others. The priorities in this plan focus on serving Alabama and Mississippi needs but also align with the Gulf of Mexico Alliance priorities and other state, regional and national priorities.



### HEALTHY COASTAL ECOSYSTEMS

In Alabama and Mississippi, Perdido Bay, Mobile Bay and the Mississippi Sound are important estuaries representing a total surface area of 2,309 square miles. Mobile Bay and the Pascagoula River drainage basin in the Mississippi Sound are of special concern to MASGC. The 480-square-mile Mobile Bay estuary contains a documented 337 species of fish, more species per area than any other region of North America. Of the 74 major river estuaries in North America, the Pascagoula River is the only one in the United States that remains unaffected by channel fragmentation and flow regulation. As a result, the Pascagoula River is a vital center of biodiversity and essential fish habitats for numerous threatened and endangered species.



A bayou in Ocean Springs, Miss., protects coastlines, and provides essential habitat.

The anthropogenic impact on estuarine ecosystems has led to a decline in total acreage of habitat. Estuarine ecosystems, such as salt marshes and other wetlands, seagrass meadows, oyster reefs and tidal basins physically protect coastlines, provide essential habitat and filter nutrients and other pollutants that degrade water quality and adversely affect ecosystem health. Estuaries provide critical habitat for numerous species of commercially and recreationally important waterfowl, migratory birds, marine mammals and sea turtles. The decreased area and fragmentation have led to a decline in the essential ecological benefits provided by these habitats.

MASGC will use its research, extension and education capabilities to support improved restoration strategies, assist in restoring essential estuarine habitats, and deliver tools, data, and services in support of ecosystem based management.

**Goal:** Sound scientific information will support ecosystem-based approaches to managing the coastal environment.

#### **Outcome**

Coastal residents, resource managers, businesses and industries have the capability to predict the effects of human activities and environmental changes on coastal resources.

#### **Objectives**

1. By 2011, one integrated simulation model of SLAMM and ADCIRC in the Pascagoula River Basin to predict salt-marsh distribution and areal extent under accelerated sea-level rise will be used by two city governments and the Mississippi Department of Marine Resources for climate planning.
2. By 2011, one watershed-scale water-quality model to quantify the impact of land use/cover changes in Fish River, Alabama, will be used by the Alabama Department of Environmental Management to rapidly assess the River's Clean Water Act § 303d status.

#### **Strategies**

1. Conduct research on ecosystem processes, the relationships between coastal stressors (water quality degradation, contaminants, harmful algal blooms, invasive species and wetlands loss) and long-term human and ecosystem health and communicate this information to public and private planners, decision makers and managers.

2. Contribute to the development of baseline data, standards and indicators to support ecosystem-based approaches to land use, water, fisheries and other resource management, working with programs, such as NOAA's National Centers for Coastal Ocean Science, ocean observing programs and others.
3. Develop methodologies that can be used to evaluate ecosystem-based management approaches to assess their effectiveness and to guide future management efforts, working with the National Marine Fisheries Service and other federal, state and local partners.

**Goal:** Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.

### **Outcome**

Constituencies have access to data, models and training that support ecosystem-based planning and management approaches.

### **Objectives**

1. After participating in Legal Program Continuing Legal Education short courses on wetlands during 2010-2013, 15 of 60 attendees will apply their new knowledge of wetland ecosystems, the regulatory framework for those ecosystems and innovative policies to improve management decisions.
2. By 2013, representatives of local sewage utilities, agricultural extension service and managers from the city of Gulf Shores, Alabama will be able to identify the most probable sources of nutrients and fecal coliform bacteria in Little Lagoon in Baldwin County, Alabama.
3. By 2013, an integrated model of residence time and water quality in Little Lagoon will be used by representatives of Alabama Departments of Environmental Management and Conservation and Natural Resources to formulate management decisions.

### **Outcome**

People of all ages understand coastal and ocean environments and the need for stewardship of healthy ecosystems.

### **Objectives**

1. By 2013, 200 additional residents will achieve Mississippi Master Naturalist certification by the Mississippi State University Extension Service. The Master Naturalists will contribute 4,000 volunteer hours. They will promote environmental stewardship within their community through educational activities, projects, and demonstrations. A similar program will be initiated in Alabama.
2. By 2013, at least 10 nature tour operators will adopt sustainable viewing practices and promote stewardship of healthy ecosystems on the Alabama and Mississippi Gulf Coast.
3. Annually between years 2010-2013, at least 10,000 tourists to Alabama's Gulf coast will be educated by nature tour operators who participate in nature tourism workshops about the species and habitats of the Northern Gulf of Mexico and their role in providing clean air and water, safe food and storm resilience.

4. By 2010, links between sewage treatment plants and fisheries and human health will be used by the Alabama Department of Public Health as one criterion for opening of oyster reefs in south Mobile Bay, Alabama.
5. By 2011, spawning habitat for spotted seatrout in two Mississippi estuaries will be identified, characterized and uniquely managed by Mississippi Department of Marine Resources.
6. By 2012, management of coastal sharks by Mississippi Department of Marine Resources, Alabama Department of Marine Resources Division and the National Marine Fisheries Service will incorporate food availability in abundance and distribution estimates.
7. By 2012, the National Marine Fisheries Service and Alabama Marine Resources Division will implement management changes based on an improved understanding of the interactions between gray triggerfish and red snapper.
8. By 2010, a coastal fisheries population dynamics model will be used annually by the Alabama Marine Resources Division, Mississippi Department of Marine Resources and the Mobile Bay National Estuary Program to predict sustainability of commercially and recreationally important species.

### **Strategies**

1. Provide life-long learning programs for people of all ages that enhance understanding of coastal and ocean environments and promote stewardship of healthy ecosystems.
2. Work with NOAA and other partners to develop data, models, and training activities that support ecosystem-based planning and management approaches and share them with a wide variety of constituencies.

**Goal:** Restored function and productivity of degraded ecosystems.

### **Outcome**

Coastal residents, resource managers, businesses and industries have access to new approaches and technologies developed to improve the effectiveness of restoration of coastal ecosystems.

### **Objectives**

1. By 2013, the Mississippi Coastal Restoration and Habitat Committee will enhance coastal restoration efforts through the sharing of knowledge regarding suitable project locations and alternative restoration techniques. Twenty-five acres of priority habitats will be restored.
2. By 2013, over 10,000 linear feet of shoreline on public and private land in Mississippi and Alabama will be protected using alternative erosion control strategies.
3. By 2013, 20,000 linear feet of stream banks on degraded waterways in Mississippi and Alabama will be restored to increase storm buffering capacity and ecosystem services. Stream restoration training will be given to 20 county planners and 50 natural resources managers.



4. By 2013, ten homeowners will utilize living shoreline techniques to control erosion on their property, protecting a total of 30 acres of shoreline.
5. By 2012, 2 acres of submerged aquatic vegetation will be restored in Bayou Cumbest, Mississippi, using seed broadcast and seedling transplant methods.
6. By 2012, the number of oyster gardeners in Alabama will increase from 30 to 45 and annual production will be 10,000 oysters.
7. By 2013, at least 70 property owners participating in water quality programming will adopt at least one new best management practice in order to conserve water and protect water quality as determined by three month follow-up surveys.
8. By 2012, two natural resource managers will incorporate prescribed burning of salt marshes into their management plan based on MASGC-supported research.
9. By 2013, one new building project in Mississippi or Alabama will incorporate constructed marshes into their landscape design to serve as a natural filter of nitrogen contained in storm water.
10. By 2013, Mississippi Department of Marine Resources, the Nature Conservancy, and additional three fisheries/resource management/scientist groups will use the SAV Habitat Suitability Index model as one of their restoration and conservation planning tools.



Scientists study fire's effect on marsh grasses at Grand Bay National Estuarine Research Reserve.

### Strategies

1. Provide technical support for citizens and businesses that need help with specific mitigation/restoration problems, giving them access to the latest information and techniques.
2. Support research to improve the effectiveness of ecosystem restoration and identify promising new restoration approaches and technologies.
3. Invest in the development and dissemination of new information, policies, technologies and methods to address water quality degradation, prevent the introduction and spread of aquatic non-native species and minimize the negative impacts of these on coastal and ocean food webs.

### Performance Measures

1. Number of stakeholders who use ecosystem-based approaches in the management of land, water, and living resources in coastal areas as a result of Sea Grant activities. Target: 359
2. Number of acres of degraded ecosystems restored as a result of Sea Grant activities. Target: 57 acres plus 30,000 linear feet of shoreline or stream bank
3. Number of coastal communities who have restored degraded ecosystems as a result of Sea Grant activities. Target: 3

## SUSTAINABLE COASTAL DEVELOPMENT

Coastal communities in Mississippi and Alabama provide vital economic, social and recreational opportunities for hundreds of thousands of Americans, but decades of population migration and coastal hazards have transformed coastal landscapes and intensified demand on finite coastal resources. As the coasts continue to recover and rebuild from the hurricane seasons of 2004 and 2005, there are opportunities for wise use of the finite coastal resources and balanced development to accommodate the more than 930,000 residents and many visitors to the five coastal counties.



A commercial shrimping fleet docks near the Hard Rock Casino in Biloxi, Miss.

One of the greatest threats to our coast is the amount of polluted runoff from urban, suburban and agricultural areas. Poorly planned growth exacerbates the negative impacts from impervious surfaces, reduces and fragments fish and wildlife habitat, and can alter sedimentation rates and flows.

Population growth is also leading to gentrification of coastal communities. Historically important industries, such as commercial and recreational fishing, shipbuilding, water-borne transportation, ports and harbors, public marinas, public access, are being displaced by non-traditional uses. It is essential that water dependent businesses become more competitive and viable alternatives need to be developed so coastal communities can strike a balance between traditional and non-traditional uses.

MASGC will use its research, extension and education capabilities to support the development of sustainable communities that are economically and socially inclu-

sive, have diverse and vibrant economies, and wisely use natural resources.

**Goal:** Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.

### Outcome

Local communities have the information and techniques to enhance waterfront-related economic activities and protect the health of the natural coastal environment.

### Objectives

1. By 2012, the state of Alabama will adopt two management techniques and/or incentive programs to protect working waterfront access for businesses, as recommended by the Alabama Waterfront Access Study Committee.
2. By 2013, a minimum of two communities in Alabama or Mississippi will implement strategies leading to working waterfront access protection.
3. By 2011, three tools identified on the “Accessing the Alabama and Mississippi Coast” website, which provides just-in-time educational information to stakeholders regarding coastal access options, will be adopted by local governments, private landowners, or coastal user.

4. By 2012, an analysis of for-hire fisheries clientele will result in the implementation of new marketing strategies to target underutilized marketing channels.

### Outcome

Coastal communities use a variety of tools and technologies to adopt policies to protect the sustainable ecosystem footprint needed to sustain coastal and marine ecosystems and implement community designs that are compatible with carrying capacity of coastal ecosystem and water resources.

### Objectives

1. By 2013, a streamlined permitting process for homeowners who choose a more sustainable shoreline protection alternative structure will be created. Homeowners will be aware that all projects are site-specific and that living shorelines might not be the best erosion control alternative based on economics, ecological sustainability, or site suitability.
2. By 2011, at least five marinas in Alabama and Mississippi will meet established best management practices necessary to join the Clean Marina program.
3. By 2013, 5000 acres of agricultural production in the Mississippi Delta will have controlled drainage structures implemented in primary aquatic systems adjacent to the agricultural landscape.
4. By 2013, the City of Prichard Planning and Zoning Board will utilize HEC-HMS watershed model to implement new planning ordinances within the 8-Mile Creek Watershed in Mobile County, Alabama.



White sand beaches attract tourists to Gulf Shores, Ala. Estuarine Research Reserve.

### Outcome

Coastal communities and industries have healthy economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.

### Objectives

1. By 2013, two start-up nature tourism businesses will be created in coastal Alabama or Mississippi through technical support and training in science and business.
2. Four existing nature tourism businesses will each increase their profitability by \$2,500 annually during the 2010-2013 time frames due to Sea Grant technical support.
3. By 2013, a MASGC-supported reporting system will allow municipalities and counties on the Alabama and Mississippi Gulf Coasts to annually track the economic impact of nature tourism.

## Strategies

1. Support research and outreach activities that provide local communities with information and techniques to help them enhance their waterfront-related economic activities, such as commercial and recreational fishing, aquaculture, tourism, energy and port development, without diminishing the long-term health of the natural coastal environment.
2. Support local, regional and national efforts to preserve and increase public access to the nation's beaches and waterfronts through assessment of access needs, analysis of legal issues and technical assistance.



Condominiums go up on Dauphin Island, Ala.

3. Use Sea Grant extension and education capabilities to engage coastal communities in planning processes that support the efforts of community leaders to identify and pursue sustainable economic development policies and programs.

**Goal:** Coastal citizens, community leaders and industries that recognize the complex inter-relationships between social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.

## Outcome

Growth plans, policies and strategies are developed and adopted to protect local and regional natural resources to serve future generations.

## Objectives

1. By 2011, at least 50 area decision makers will become familiar with smart growth practices outlined by the State of Alabama's Non-point Education for Municipal Officials (NEMO) program guidelines. By the end of NEMO workshops, 40 attendees will have increased their knowledge of nonpoint source pollution issues and smart growth practices as measured by pre/post testing.
2. By 2013, two state or local agencies in Mississippi will use newly developed isotope analysis of nitrogen loading estimates from stormwater runoff and wet deposition (rainfall) for planning purposes.

## Strategies

1. Work with NOAA's Office of Ocean and Coastal Resource Management and Coastal Services Center, EPA's Offices of Smart Growth and other federal, state and local partners to disseminate assessment tools, model plans and ordinances, best management practices, alternative development approaches and other techniques that will enable the citizens of our coastal zones to develop their coastal economies in environmentally sound ways.
2. Build local capacity to evaluate cost-benefit trade-offs in the coastal zone through a greater emphasis on socio-economic research, impact studies and other methods of evaluating alternative future scenarios for coastal communities.

3. Foster regional cooperation and partnerships among local government officials, community stakeholders, and regional planning organizations to promote sustainable growth plans and strategies that protect local and regional natural resources that will ensure an abundance of these resources is available to serve future generations.
4. Strengthen Sea Grant's research activities and extension capacity to help coastal communities determine the sustainable carrying capacity of their land, water and other resources through resource assessments, scenario building, modeling and other techniques.
5. Support innovative research on land-use practices and building designs that promote energy and water conservation, coastal-ocean related renewable energy technologies and the creation of other tools to help communities grow in sustainable ways.
6. Work with NOAA's Climate Program Office, coastal programs and other partners to help communities evaluate their ecological footprints and grow in environmentally sustainable ways.

### Performance Measures

1. Number of coastal communities engaged in activities (e.g., visioning, resource inventories, analysis of development policies) or making informed development decisions that address the sustainability of economic and environmental resources as a result of Sea Grant's capacity building, tools, data, technologies, and/or education of community leaders. Target: 4
2. Number of coastal communities and businesses who have adopted/implemented sustainable - economic and environmental - development practices and policies (e.g., land-use planning, working waterfronts, energy efficiency, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities. Target: 7 communities and 11 businesses
3. Economic benefits derived from sustainable coastal policies and practices as a result of Sea Grant activities. Target: \$10 million

## SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Most of the Gulf of Mexico’s economically important marine fish and invertebrate species are heavily exploited. The continued presence of normal and healthy population numbers of living marine resources relies upon healthy and sufficient estuarine and nearshore coastal habitats and ecosystems. The United States has witnessed the decline of many of its major fisheries while seafood consumption is on the rise, resulting in a seafood trade deficit of \$8 billion per year.



Red snapper is an important commercial and recreational fish species.

Alabama and Mississippi are significant seafood harvesting and processing states. In 2007, the dockside value of commercial landings in Alabama and Mississippi exceeded \$88 million, with more than 257 million pounds landed. In 2007, Pascagoula-Moss Point ranked as the sixth highest port in pounds of commercial pounds landed in the United States. In 2006, more than 4,800 jobs were provided in salt-water fishing alone with a total economic input of over \$480 million.

The seafood industry faces many challenges and opportunities. The global marketplace, trade policies, safety regulations, energy costs, food security concerns, waste handling and limited seafood supplies are issues that require evaluation and the development of solutions, where needed. MASGC will help commercial and recreational fishermen overcome these challenges. MASGC also will help the public make seafood decisions based on nutritional benefits, product quality and management practices.

MASGC will use its research, extension and education capabilities to improve the safety of seafood, educate consumers on choosing nutritious and sustainable products, and expand sustainable practices for seafood harvest and aquaculture production.

**Goal:** A sustainable supply of safe seafood that meets public demand at affordable prices.

### Outcome

Natural and human threats to the long-term viability of wild fish populations are minimized.

### Objectives

1. By 2011, five charter boat captains will adopt improved mitigation strategies leading to the reduction of fishery interactions with bottlenose dolphins.
2. By 2012, 15 charter boat captains and 1,000 private fishermen will adopt improved fish handling techniques to improve survival of regulatory discards of red snapper and other recreationally important species.

### Outcome

A viable domestic aquaculture industry with acceptable environmental impacts is supported.

## Objectives

1. By 2012, three bait dealers in Mississippi and/or Alabama will report an increase of 100 shrimp per delivery surviving to be sold live.
2. By 2013, at least two shellfish farmers each with annual minimum gross sales of \$25,000 will be established in coastal Alabama.
3. By 2013, at least 200 individuals will be able to identify at least three differences between coastal shellfish aquaculture and other forms of aquaculture.
4. By 2011, four shrimp farmers (food and bait) will increase production by 100 pounds per acre on farms totalling 200 acres leading to an overall increase in production of 20,000 lbs., worth more than \$20,000, through optimization of salinities and temperatures.
5. By 2012, one sea urchin diet will be commercialized leading to \$50,000 in new revenue.
6. During 2010-2013, 10,000 people working in the aquaculture industry will save a total of \$200,000 annually through the use of the Aquaculture Network Information Center (AquaNIC).



Shrimp boats and charter boats dock in Bayou La Batre, Ala.

## Strategies

1. Use Sea Grant's research, extension, education and communication capabilities to develop and disseminate essential knowledge about natural and human threats to the long-term viability of wild fish populations, to identify ways to minimize these threats and to use ecosystem-based fisheries management and other innovative approaches to accomplish this.
2. Conduct integrated research, education and outreach activities to support a viable domestic aquaculture industry with acceptable environmental impacts, in ways that are consistent with national objectives, building on the leadership role Sea Grant plays in this area.
3. Work with NOAA's National Marine Fisheries Service, other federal and state partners, and the seafood industry to enhance the management and productivity of wild fisheries.

**Goal:** A healthy domestic seafood industry that harvests, produces, processes and markets seafood responsibly and efficiently.

## Outcome

Fishermen are knowledgeable and employ efficient fishing techniques.

## Objective

1. Shrimpers in Mississippi and Alabama will save \$100,000 in operating costs during the 2010-2013 time frame through 1) the use of fuel-saving gear, 2) better use of BRDs and TEDs, 3) more efficient use of catch preservatives, and

- 4) increased knowledge of and compliance with state and federal fishery management regulations.

### **Outcome**

Seafood availability and profitability increases.

### **Objective**

1. By 2011, one novel technique will be used to depolymerize chitin in seafood waste for biodiesel production by the seafood industry.

### **Outcome**

The seafood processing industry learns and understands techniques and processes to ensure the production and delivery of safe and healthy seafood.

### **Objectives**

1. Annually during 2010–2013, employees from 15 seafood processing plants will become Hazard Analysis Critical Control Point (HACCP) certified leading to a savings of \$1,000 per plant.
2. By 2013, 300 new and existing seafood processing plant employees will improve their knowledge, skills and abilities about sanitation control procedures.

### **Strategies**

1. Engage harvesters, recreational fishermen, producers and managers in the development of research and management innovations related to the condition, use and conservation of the natural resources they depend on.
2. Support research, development and transfer of new technologies to keep the domestic seafood industry financially competitive and environmentally responsible.
3. Work with the seafood industry to develop new products and innovative marketing approaches to increase seafood availability and profitability.
4. Enhance training and technical assistance programs related to the application of standards for safe domestic and imported seafood.

**Goal:** Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption and who understand how to evaluate the safety of the seafood products they buy.

### **Outcome**

U.S. seafood consumers have a better understanding of fisheries management, including sustainable fisheries, and can apply this knowledge when evaluating sustainable seafood choices.



A boat docks in Bayou La Batre, Ala.



## Objectives

1. During 2010-2013, more than 3,000 constituents will each incorporate/adopt at least five new fishing techniques or management guidelines in their operations.
2. By 2013, more than 1,000 community action group members will apply the concept of shifting baselines in their role as advocates of habitat restoration and sustainable fishing.

## Outcome

U.S. seafood consumers have an increased knowledge of the nutritional benefits of seafood products, know how to judge seafood safety and quality and can apply this knowledge to make better choices when purchasing seafood.

## Objective

1. By 2013, 5,000 people will access information through MASGC outreach and education programs on seafood nutrition and sustainable fishing practices, and 250 of them will apply the information to their seafood purchases.



A man fishes near Spanish Fort, Ala.

## Strategies

1. Develop educational programs and materials that enhance the American public's understanding of what is required to maintain sustainable domestic fisheries and to build the public's awareness of differences in the quality, safety and nutritional benefits of different seafood products so they will be informed advocates and consumers.
2. Work in close coordination with the National Marine Fisheries Service and other federal partners to develop information portals that give access to factual information on seafood safety.

## Performance Measures

1. Economic (market and non-market) and societal benefits (jobs created and retained) derived from the discovery and/or application of new fishery production and management models or techniques that lead to increased sustainability and productivity from the fishery. Target: \$365,000
2. Number of fishermen, resource managers and seafood businesses (harvesters, aquaculturists, processors and recreational fishermen) who adopt and implement responsible harvesting and processing techniques and practices. Target: 4,008
3. Number of producers, distributors and consumers of seafood who modify their practices using knowledge gained in fishery sustainability, seafood safety and the health benefits of seafood. Target: 1,552

## HAZARD RESILIENCE IN COASTAL COMMUNITIES

Mississippi and Alabama experienced devastating losses due to natural hazard events in 2004 and 2005. Hurricanes Ivan and Katrina caused the loss of more than 1,800 lives and damages that exceeded \$96 billion. In 2005, more than 275,000 housing units were damaged or destroyed in Mississippi and Alabama from Hurricanes Katrina, Rita and Wilma. The losses included 90 percent of housing units in Hancock County, 68 percent in Harrison County, 64 percent in Jackson County, 30 percent in Mobile County and 7 percent in Baldwin County.

Coastal communities must balance population and ecological change while adopting resilience strategies for acute events such as hurricanes and oil spills, and chronic events, such as sea-level change. This involves long-term planning to prepare for and quickly recover from hazards. It is also essential that residents of coastal communities understand coastal risks and learn what they can do to reduce their vulnerability and respond quickly and effectively when events occur. Increasing community resilience has direct impact on the coastal residents behavior, health and finances.

Sea Grant will use its integrated research, training and technical assistance capabilities and its presence in coastal communities to play a major role in helping local citizens, decision makers and industries plan for hazardous events and optimize the ability of their communities to respond, rebuild and recover.



Community leaders work toward resilience.

**Goal:** Widespread understanding of the risks associated with living, working and doing business along the nation's coasts.

### Outcome

Coastal decision makers benefit from improved risk communication (e.g. better understanding of emergency forecasting, evacuation plans, rip-current and surf-zone hazards, etc.) and understand the benefits of coastal hazard risk planning.

### Objective

1. By 2012, 20 local decision makers will be able to identify best practices and recommendations for improving risk communication in coastal communities based on strengths and weaknesses in the current system and characteristics of specific communities in the coastal population.

### Outcome

Coastal decision makers are aware of existing and available hazard-related data and resources (i.e. wave gauge, water level/tide gauge, weather station data, etc.).

### Objective

1. Annually, beginning in 2011, 100 state and local emergency managers, floodplain managers and other public hazard personnel working in the coastal areas of the five Gulf States will obtain storm information through customized Web portals and social-networking sites.

**Outcome**

Coastal opinion leaders and decision makers take proactive measures to ensure that hazards, risks and vulnerabilities are communicated to property owners and prospective purchasers.

**Objectives**

1. By 2011, at least 25 Mississippi coastal religious leaders and mental health providers will increase their abilities to help others prepare for and respond to coastal hazards.
2. By 2012, more than 10,000 homeowners will adopt at least two recommendations to minimize structural damage to their home and out-buildings from tropical storms.

**Outcome**

Coastal communities can access and utilize data and innovative and adaptive tools and techniques to minimize hazard risks (e.g. planning and construction BMPs, standards, resiliency index, retrofits, flood-zone maps and freeboard).

**Objectives**

1. By 2011, 15 coastal communities in Alabama, Mississippi and Louisiana will identify weaknesses in their resilience by completing the coastal Community Resilience Index.
2. By 2011, at least five Mississippi and Alabama coastal communities or resource managers will use customized sea level rise models developed in collaboration with NOAA, USGS and USACE and disseminated by MASGC.
3. By 2013, twenty middle-grade or high school educators throughout the Gulf of Mexico states will use SimHurricane in the classroom to teach students about hurricane risk and climate change. It is anticipated that each educator will teach about 150 students per year, on average, such that 3,000 students will use SimHurricane each year.
4. By 2013, three Gulf coast communities will be using the parameterized projection models developed at the three pilot locations for engineering analysis and decision-making.
5. By 2013, ten Gulf coast communities will use aspects of the developed parameterized surge and wave models and/or socioeconomic geospatial tools for engineering analysis and decision-making.
6. By 2013, 20 people will use HEC-HMS watershed model as a tool to assess areas suitable for development in a way that minimizes impacts of flooding.



Houses stand on Dauphin Island in the aftermath of Hurricane Katrina.

**Outcome**

Communities are safe from hazards in their homes and places of work and experience minimum disruption to life and economy after a natural hazard event, through the use of risk-wise behavior that considers all hazards.

**Objectives**

- 1. By 2012, at least 45,000 Gulf Coast residents will implement best-management practices on storm preparation, natural hazard mitigation, flood prevention and post-disaster recovery.

- 2. By 2012, hurricane protection of 20 coastal residential buildings will be increased through the use of an innovative non-intrusive advanced fiber composite connection system to create effective continuous load paths from roof to walls and walls to foundations.

**Strategies**

- 1. Conduct research to assess hazard-related risks and increase the availability and usefulness of hazard-related information and forecasting for citizens, industries, and decision-makers in coastal communities.
- 2. Work with marine commercial enterprises to assess the risks associated with doing business in coastal areas in the context of hurricanes and other coastal storms, climate-related changes, and dramatic changes in port and international trade activities.

- 3. Work with the NOAA Climate Change Program and other public and private sector partners to develop comprehensive education/literacy programs on the immediate and long-term effects of climate-related changes, and other hazardous events, on human safety and property along the coast, and how to prepare for and survive them.

Goal: Community capacity to prepare for and respond to hazardous events.

**Outcome**

Coastal decision makers have the knowledge and skills to assess local risk vulnerability and respond with appropriate policies and regulations.

**Objectives**

- 1. By June 2012, three communities will become more disaster resilient by implementing the National Flood Insurance Program’s Community Rating System.
- 2. By 2013, four city or county attorneys in Mississippi and/or Alabama will have completed a disaster audit to improve coastal hazard resiliency.



Community leaders talk about their needs in relation to sea-level rise.

3. After participating in Legal Program Continuing Legal Education short courses on flood insurance during 2010-2013, 13 of 60 attendees will apply their new knowledge of laws and regulations governing coastal floodplain development, developing case law and innovative policies to improve coastal resiliency.
4. By 2011, two chambers of commerce and two city governments in the Gulf of Mexico will use a business recovery model to quantify parameters influencing business return after a disaster and by businesses as a planning, mitigation and recovery tool.
5. By 2012, two coastal communities in Mississippi or Alabama will incorporate sea level rise data into their comprehensive and/or hazard mitigation plans.
6. By 2013, 175 local attorneys, planners, and officials along the Gulf Coast will have received a minimum of 525 hours of continuing education credit on the current state of regulatory takings doctrine and its impact on innovative planning for sea level rise.

### Strategies

1. Help public and private decision makers create and adopt policies, plans and ordinances to reduce risks, manage catastrophic events and speed recovery.
2. Create and disseminate, in partnership with NOAA's National Weather Service and other entities, integrated demographic and coastal hazard information databases that help measure human vulnerability in specific coastal regions, support hazard-related planning activities and facilitate disaster relief efforts.
3. Conduct research and communicate information on how the use of natural features and new technologies can help communities prepare for and mitigate the impacts of hazardous events.

### Performance Measures

1. Number of coastal communities and citizens provided with information/trained in local hazard resiliency and hazard mitigation tools, techniques and best practices. Target: 15 communities and 55,145 citizens
2. Number of coastal communities and citizens who adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events. Target: 12 communities and 10,000 citizens

### CROSS CUTTING

Goal: Sound scientific information to advance understanding of the nature and value of our coastal and ocean resources; to identify new ways to conserve and use these resources; and to support evaluation of the environmental impacts and socio-economic trade-offs involved in coastal decision-making.

#### Outcome

High-priority regional research questions are answered through the collaborative efforts of research sponsors and researchers via multidisciplinary projects.

#### Objective

1. By 2013, MASGC will partner with 20 federal, state and local programs to fund \$4 million in extramural regional research priorities identified in the Gulf of Mexico Research Plan to address hazard and climate resilience and water-quality issues.

#### Strategies

1. Support research to generate the scientific, technical, and legal information needed to increase understanding of coastal and ocean processes; support the development of new businesses, products, tools, and technologies; and answer the most pressing questions related to coastal and ocean resource conservation, use, and management at the state and regional levels.
2. Play a leadership role within and outside of the Sea Grant network in increasing the amount of socio-economic research available to help decision makers evaluate socio-economic trade-offs and assess risks to the future health and productivity of coastal and ocean resources.
3. Integrate, translate and disseminate research findings and technological discoveries to the citizens, industries and leaders who need them to capitalize on opportunities and make wise management decisions.

Goal: An informed public that understands the value and vulnerability of coastal and ocean resources and demands informed science-based decisions about the conservation, use and management of these resources, and a well-trained workforce that will make this a reality.

#### Outcome

High-quality, well-trained young professionals fill vacancies created from the retirement of the marine science workforce and are prepared to address contemporary marine and coastal science, management and policy issues.

#### Objectives

1. During 2010-2013, 12 masters and doctoral students and three fellows will enter the coastal and marine science, management and policy workforce.

- By 2012, two new scholastic aquaculture/aquascience programs will be initiated in middle or high schools in Alabama and/or Mississippi, which will report 10 participating students continuing their education beyond their senior year.

### Outcome

People of all ages understand coastal and ocean environments; identify the need for stewardship of healthy ecosystems; value sustainable coastal development that balances multiple uses; make seafood choices considering nutritional benefits and fisheries management practices; and understand natural and human caused coastal hazards.

### Objectives

- By 2013, at least 40,000 young and adult learners will benefit from their educators' increased content knowledge in the four focus areas, and 180 scientists will gain an enhanced understanding of how children learn through workshops and institutes that emphasize the focus areas.
- During 2010-2013, at least 150 educators who attend content knowledge workshops will teach content derived from Sea Grant's focus areas.
- During 2010-2013, approximately 50,000 pages will be downloaded from the COSEE:CGOM Web site, and 20 revised and/or new lesson plans relevant to the four focus areas will be placed on the site annually.
- During 2010-2013, pre-college students will enhance their environmental literacy while participating in inquiry-based educational programs and field trips in the three MASGC Informal Education Centers, and participation in the programs will increase by 12 additional groups annually from a 2008 baseline of 268 groups (61-MEC, 102-ESC, and 105-DISL).
- During 2010-2013, public visitation will increase by 300 guests annually at the three MASGC Informal Education Centers, with a 2008 baseline of approximately 4,000 at the MEC, 71,000 at the DISL, and 5,000 at the ESC.
- From 2010 through 2013, one hundred and fifty additional underserved and underrepresented students and teachers will participate in all Sea Grant educational activities/programs, going from a baseline of 400 to 550.
- Three external (non-NOAA) and two internal (NOAA) new education collaborations will be developed collectively during 2010 through 2013 by the three MASGC Informal Education Centers.
- By 2013, over 100,000 Mississippi and Alabama residents will increase their understanding of coastal and marine resource issues. As a result, 25,000 will adopt at least one new practice leading to improved stewardship of the coastal environment.



Students learn about ecosystems during Discovery Sea Camp in Mississippi.

### Strategies

1. Use Sea Grant's strong university partnerships to create new research and education opportunities in marine and aquatic science for undergraduate and graduate students and to develop information products and training opportunities that will help build the workforce capacity for coastal-related jobs and professions.
2. Advance coastal and ocean literacy through formal and informal learning opportunities in our schools, museums, aquariums and other educational forums, such as the on-line, digital collections of the Aquatic Commons and the National Sea Grant Library.
3. Collaborate with NOAA and other partners to build public awareness of ocean and coastal issues using integrated research, extension, education and communication capabilities of the entire Sea Grant network.

Goal: Decision-making processes that involve the full-range of coastal interests, that integrate efforts of public and private partners at the federal, regional, state, and local levels, and provide mechanisms for establishing common understandings and generating outcomes that balance multiple interests.

### Outcome

Representatives from the full range of coastal interest can easily and effectively provide input for critical coastal and marine decisions, which are used when introducing or revising policy and management actions.

### Objective

1. By 2011, NOAA's ability to engage with constituents through a regional engagement pilot in the areas of nutrients/hypoxia and climate/resiliency will lead to 100 constituents who can identify 10 NOAA programs working in these two areas based on a 50-percent improvement in the Kellogg Engagement Test scores through coordination among the MASGC, National Maritime Museum of the Gulf of Mexico (GulfQuest), the Gulf of Mexico Alliance, and NOAA Gulf of Mexico Regional Collaboration Team.

### Strategies

1. Use Sea Grant's research, extension and education capabilities to encourage and support the creation of public decision-making processes that minimize overlap, maximize effectiveness and provide an integrated response to coastal problems and opportunities.
2. Build consensus on complex issues, such as coastal land use, energy development, public access, invasive species control and climate change impacts, by supporting cutting-edge research, building broader understanding among various constituency groups and convening diverse groups of stakeholders to work together to find common solutions.
3. Strengthen partnerships to promote national, regional and issue-related collaboration among federal and state programs and other partners in order to support more effective and integrated coastal decision-making.



## Performance Measures

1. Number of graduate students and fellows supported by MASGC that enter the coastal and marine science, management and policy workforce. Target: 15
  2. Number of extramural dollars applied to research and outreach that addresses Gulf of Mexico regional Priorities. Target: \$4 million
  3. Number of people that use information gained from MASGC educational opportunities. Target: 40,000
  4. Number of private businesses; local, state, and federal agencies; academic institutions; and NGOs who participate in NOAA regional team programs in climate and natural hazard resiliency and hypoxia/nutrient. Target: 50
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## MASGC MEMBERS



THE UNIVERSITY OF  
**ALABAMA**



**Mississippi State**  
UNIVERSITY



**JSU**  
JACKSON STATE UNIVERSITY





**MASGP-09-027**

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hazard resilience in coastal communities • healthy coastal ecosystems  
safe and sustainable seafood supply • sustainable coastal development