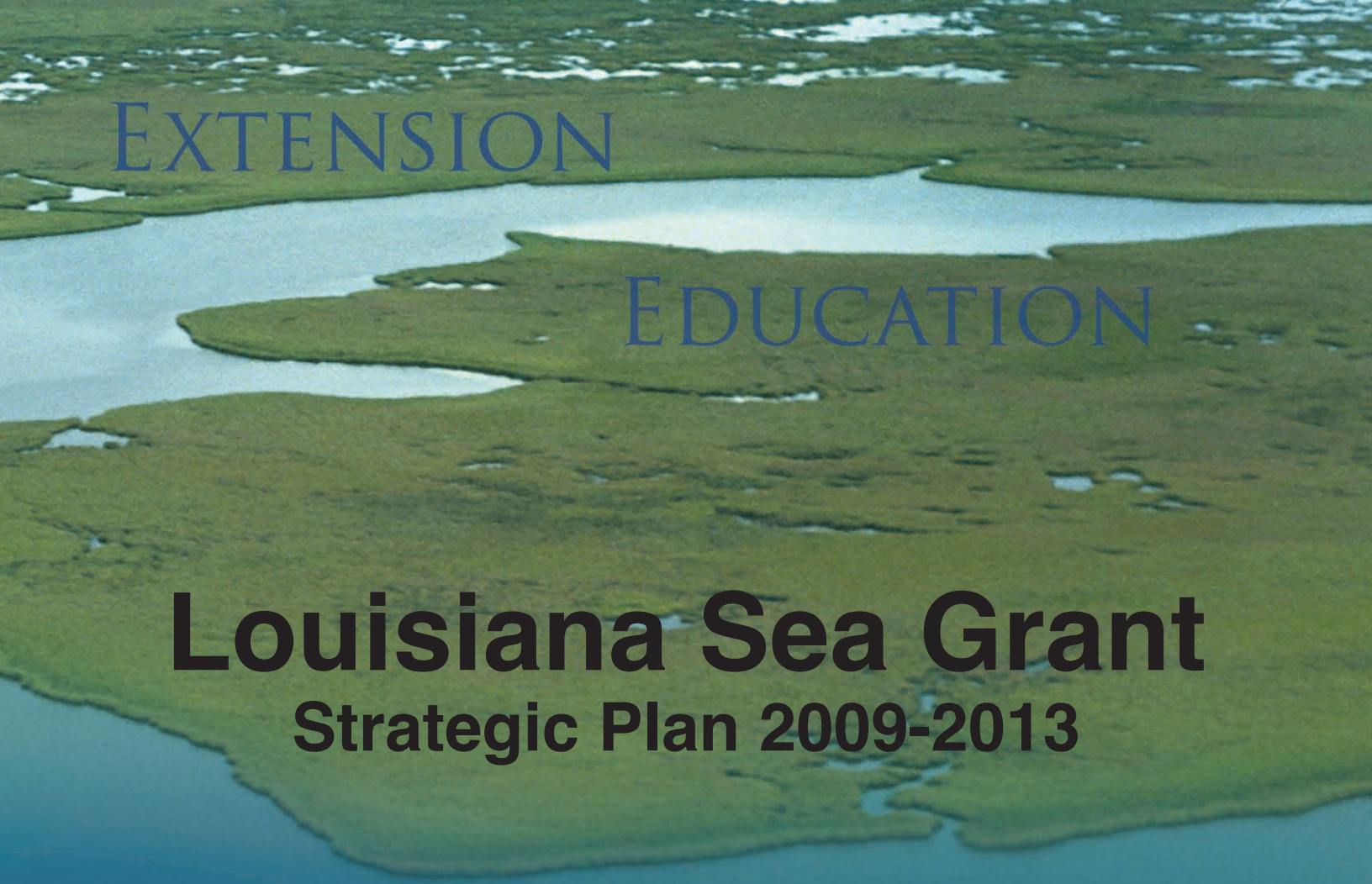

Louisiana Sea Grant

Strategic Plan 2009-2013

RESEARCH

Sea Grant
Louisiana

HISTORICAL OVERVIEW

Louisiana State University was designated a Sea Grant College in August, 1978.

Since 1968, Louisiana Sea Grant has addressed many of the complex and often interrelated ecological, economic and social challenges that affect coastal Louisiana, one of the United States' most dynamic coastal regions. The magnitude of these persistent – and more recently disruptive – challenges and the program's limited resources require a practical and well-defined approach, as well as reliance on partners in an extensive network of state and regional universities, federal and state resource management agencies, and private sector and citizen groups. The scope of Louisiana Sea Grant's activities embraces four main program areas, as many as 13 academic institutions, 19 coastal zone parishes, and numerous partners in state and federal agencies and the private sector that provide matching funds and/or opportunities for collaboration. At any given time, Louisiana Sea Grant either manages or participates in more than 50 research, extension, education and communication projects. These include Omnibus awards; other National Oceanic and Atmospheric Administration (NOAA)-funded projects; program development projects; other federal, state and privately funded projects; and informal partnerships and collaborations.

The most important research and outreach challenges that Lousiana Sea Grant will face during the next decade will likely relate to sustainability of communities and ecosystems in the hurricane-prone coastal zone bordering the northern Gulf of Mexico. The 2005 tropical storm season, with hurricanes Katrina and Rita, and the 2008 storm season with Hurricanes Gustav and Ike, have revealed much about the region's increasing hurricane vulnerabilities and associated secondary impacts. Eighty-five percent of Louisiana's population – Louisiana Sea Grant's primary constituency – resides in this region, which is also a major locus of strategically important maritime, refining, and petrochemical manufacturing industry.

The program can do this most effectively by actively continuing to both identify and recruit prospective faculty at all of the state's universities and by establishing and maintaining partnerships with other state and federal agencies and private companies to supplement limited resources.

INSTITUTIONAL SETTING

The Office of Sea Grant Development (OSGD) is an administrative unit of Louisiana State University, charged with management responsibility for Louisiana Sea Grant. Federal Sea Grant omnibus funds are administered according to NOAA guidelines, i.e., 50 percent of the omnibus award is allocated for competitive, peer-reviewed research projects, and the balance is used for extension, education, communications, administration, and program development projects. The OSGD also administers a state budget that underwrites full-time support for permanent employees associated with the program's administrative, extension, education, and communications functions.

Important elements of Louisiana Sea Grant's planning environment are the state's four public management systems of higher education, which, in turn, are governed by the Board of Regents. Each of the four systems has its own management board. The Louisiana State University and A&M System has 11 institutions on eight campuses; the University of Louisiana System has eight institutions; the Southern University and A&M System has five units on three campuses; and the Louisiana Community and Technical College System has 42 campuses. Also governed by the Board of Regents is the Louisiana Universities Marine Consortium (LUMCON), a coastal facility and cooperative multi-institutional program that conducts research and educational activities in marine sciences. In addition, the Louisiana Association of Independent Colleges

Telemetry bouy used in a study of trout migration

and Universities has 11 private institutions, of which Tulane University is the largest. Sea Grant-funded research has been conducted through many of these academic institutions, with Sea Grant education opportunities offered to students enrolled in them.

PROJECT SOLICITATION & SELECTION

The goals and objectives identified in this Strategic Plan comprise the principal guidance provided to both researchers and outreach personnel concerning topics that the program will address during the next funding cycle.

An effort is made to state objectives in fairly general terms to provide reasonable latitude for researchers to exercise creativity in their applications, while remaining sufficiently focused to selectively channel funding resources into those areas that the planning process has identified as holding the greatest potential impact. Louisiana Sea Grant employs a two-step, competitive process for project selection: (a) A Request for Preliminary Proposals, listing the program's priorities and administrative guidance, is widely circulated to known researchers and academic institutions in Louisiana. Interested researchers are encouraged to submit four-page preliminary proposals that address issues related to both goals and the objectives in the strategic plan. Applications received by a stipulated deadline are screened by a panel of experts on the basis of applicability and responsiveness to strategic plan objectives. (b) Authors of the highest-ranked preliminary proposals are invited to submit expanded proposals, which are widely circulated for scientific peer review. Strenuous efforts are made to secure at least three reviews for each proposal, which are required for evaluation by a technical review panel of outside experts. Once the proposals to be funded have been selected, an Implementation Plan is prepared to briefly describe the rationale for each project and explain how it addresses a need identified in the Strategic Plan.

CONNECTING WITH USERS

Guidance for Louisiana Sea Grant leadership is provided by a program Advisory Council and two advisory panels – the Sea Grant Legal Advisory Panel and Education Advisory Panel. All three groups have been actively involved and particularly helpful in planning program response. Additionally, all Sea Grant Extension agents have topical and/or multi-parish advisory committees.

One of the important ways the program connects with users is through their participation on preliminary proposal screening panels and technical review panels for full proposals. For preliminary proposal screening, program administration engages people who have a broad knowledge of particular issues associated with various topical areas. For technical review of full proposals, program administration selects people with both a broad knowledge of issues and current scientific strength.

Louisiana Sea Grant also is focused on enhancing regional activities in research, extension, communication and education.

STRATEGIC PLANNING PROCESS

The Cross-cutting Goals, Focus Areas, Goals and their explanatory materials included in the Louisiana Sea Grant Strategic Plan for 2009-2013 are derived from a document titled "NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge." Louisiana Sea Grant was charged by the National Sea Grant Office with bringing its strategic plan into alignment with the national plan. The program has

attempted to do so while being mindful of the unique issues and problems facing coastal Louisiana.

Students use a Scope-on-a-Rope at Sea Grant's annual Ocean Commotion event held each fall at LSU.

The strategies applied to achieve the Goals of this plan were identified and prioritized with input from the following: (1) the Gulf of Mexico Research Planning Project, (2) a scientific telephone survey conducted by the LSU Public Policy Research Laboratory in July and August 2008 in 18 of the coastal parishes served by Louisiana Sea Grant Extension personnel, (3) Louisiana Sea Grant's Marine Extension personnel and faculty, (4) Louisiana Sea Grant's Advisory Council, (5) Louisiana Sea Grant's Academic Advisory Panel, and (6) Louisiana Sea Grant administrative personnel.

Gulf of Mexico Research Planning Project. The Gulf of Mexico Research Planning Project (http://www.masgc.org/gmrp/index.htm) is one of eight NOAA Sea Grant-funded, region-based research planning efforts in the United States. The four Gulf of Mexico Sea Grant College Programs (Florida, Louisiana, Mississippi-Alabama, and Texas) worked with state and federal agencies, universities, non-governmental organizations, and private industry/business in the pan-Gulf of Mexico arena both to identify and prioritize research and information needs and to develop a strategic research plan to collaboratively address the most pressing needs. Initially, the current research priorities in the Gulf were identified with a review of existing strategic and implementation plans developed by organizations that either sponsor or conduct scientific research.

A matrix developed from the synthesis of existing plans served as a starting point for gathering broad-based stakeholder input through workshops (including a Feb. 26, 2008, workshop on the LSU Baton Rouge campus that attracted more than 100 attendees), interviews, and Web-based surveys. This additional input identified research needs not currently addressed and set priorities to the final array of research needs. Stakeholder participation was of the utmost importance in determining the research priorities and information needs in the Gulf of Mexico. The success of this effort was highly dependent on the involvement of all organizations that participate in both Gulf of Mexico research and information dissemination. The draft Gulf of Mexico Research Plan (GMRP), which highlights the stakeholder-defined research priorities for the region, has been completed and is being circulated for review and comment. An implementation plan, which will help interested organizations (including Louisiana Sea Grant) determine how their research agendas can both complement and benefit from the GMRP, will be completed by fall 2008.

The top 20 research needs identified both in the GMRP and at the Baton Rouge workshop were adapted, and sometimes combined, to produce strategies included among the Goals below.

Public Policy Research Laboratory Survey. This survey was designed to gauge public awareness and support of Louisiana Sea Grant and its efforts to serve Louisiana's coastal communities. Respondents were randomly selected from the following parishes: Cameron, Calcasieu, Iberia, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, St. Mary, St. Martin, St. Tammany, Tangipahoa, Terrebonne and Vermilion. Each of these parishes is located in the coastal zone and served by Louisiana Sea Grant personnel (area agents and specialists). The Public Policy Research Lab conducted the survey between July 17 and Aug. 12, 2008. Calls were conducted from noon until 9 p.m. Monday through Friday, 10 a.m. to 6 p.m. on Saturday, and noon to 8 p.m. on Sunday. Telephone numbers were selected using random digit dialing and final results were based on 628 completed interviews. The cooperation rate was 33 percent, meaning that 33 percent of calls in which a potential respondent was contacted yielded a completed

interview. Basic demographics indicated that respondents to the survey tended to be female, better educated, and with a higher income than the Louisiana coastal population as a whole.

When asked to identify in an open-ended format the most important challenges confronting Louisiana's coastal communities, a substantial plurality (48.1 percent) of respondents identified issues related to either coastal restoration or wetlands loss. The next most common response (16.2 percent) was the "don't know" option, followed by hurricane and storm protection (9.2 percent), and rebuilding levees (8.3 percent). When asked which specific Sea Grant goals would be of greatest importance to their local communities, respondents identified addressing wetland loss and restoration (65 percent), ensuring a safe and sustainable supply of Louisiana seafood (64 percent), and protecting the livelihoods of fishers and people who depend on the Gulf for a living (60 percent) as most important. Managing coastal and Gulf ecosystems (50 percent), applying research to inform policy decisions that affect coastal communities (45 percent), and ensuring recreational and tourism opportunities (36 percent) were least important.

Louisiana Sea Grant Extension personnel developed storm surge models and shared them with coastal community members.

Awareness of and support for proposed offshore fish farming efforts were also polled. Just under a quarter of respondents (24.5 percent) reported that they were aware of plans to develop offshore fish farms. Awareness was higher among respondents who were members of environmental groups (50 percent). More males (36.3 percent compared to 17.1 percent of females) said they were aware of plans to develop offshore fish farms. Despite the fact that only a quarter of respondents reported being aware of plans to develop offshore fish farms, a clear majority (58 percent) support their development in the Gulf of Mexico off Louisiana. Support for the development of fish farms was stronger among males, the less educated, and as residents live closer to the coast.

Louisiana Sea Grant Marine Extension Personnel and Faculty. This diverse group is composed of 15 highly educated, personally motivated scientists with specialties including fisheries, aquaculture, watershed management, resource economics, and disaster planning and management. While some of these personnel are located on the LSU campus, others are assigned to and reside within specifically designated areas composed of two to several coastal parishes. Each was provided with a draft of this document and asked for comments and suggestions to improve its content based on their experiences with their local constituencies.

Louisiana Sea Grant Advisory Council. The 16-member Louisiana Sea Grant Advisory Council (http://laseagrant.org/about/council.htm) is composed of distinguished representatives from academia, private industry, state and federal government agencies, and non-governmental organizations. All Council members received a draft of this document in September 2008 and a meeting of the Council was convened by the Executive Director later that month at which the goals and strategies suggested from the above sources were discussed. Those in attendance shared their diverse perspectives both on future priorities for the program and on strategies for achieving program goals. Several management agencies that have members on the Council — Louisiana departments of Wildlife and Fisheries, Environmental Quality, and Natural Resources — were particularly valuable in providing focus for the Goals and Strategies. In addition, the Council agreed with the staff's assessment that a focused approach to the future is essential, considering available resources, the specific needs of the state's coastal region, and institutional capabilities. There was consensus among those present that Louisiana Sea Grant can play a more significant role in helping integrate the research and outreach efforts of state and federal agencies. The Council encouraged interdisciplinary research and focused public education campaigns to address an array of coastal issues and their social, economic, and ecological impacts. The issues

ranged from new resource management approaches to water quality problems associated with river diversions and nonpoint discharges.

Louisiana Sea Grant Academic Advisory Panel. The eight-member Louisiana Sea Grant Academic Advisory Panel is composed of academicians/scientists representing Louisiana State University, University of Louisiana at Lafayette, Southern University, University of New Orleans, Nicholls State University, and the Louisiana Universities Marine Consortium (LUMCON). Each was solicited for comments and suggestions concerning the Goals and Strategies outlined in a draft copy of this document.

Louisiana Sea Grant Administrative Personnel. The Goals and Objectives stated in the Louisiana Sea Grant College Program 2006-2008 Strategic Plan Outline (http://www.laseagrant.org/pdfs/StrategicPlan_06-08.pdf) provided a starting point for the 2009-2013 Strategic Plan. Following distillation and evaluation of this document by the administrative section of Louisiana Sea Grant, several of the Objectives were deemed to still maintain their relevance, both now and into the near future, and were included as Strategies in this document.

The administrative section of Louisiana Sea Grant is no mere group of bureaucrats, rather they are scientists and observers with many years of experience in research in coastal Louisiana and the Gulf of Mexico. Their insights were applied to fine-tune the input from the above sources.

PLANNING PROCESS CONCLUSIONS

Louisiana Sea Grant's strategic plan for 2009-2013 was shaped by several recurring themes, including the hurricanes of 2005 and 2008, that emerged from the aforementioned planning process. They are (in priority order):

- Louisianans are proud both of their coastal fisheries and of the contributions these products make to the unique cuisines found in our coastal communities and cities. Efforts should be made to rebuild degraded fishery habitats, to responsibly and efficiently harvest our fishery resources, and to ensure that our seafood continues to be safe for our consumption and enjoyment.

- Unlike coastal communities in other states that are undergoing significant change associated with growth in population, Louisiana's coastal communities are experiencing changes driven by other socioeconomic and environmental factors. The issues of coastal community resiliency and sustainability and the preservation of distinctive coastal cultures are at the forefront.

- Coastal wetlands are continuing to disappear, causing problems for Louisiana's human and natural systems. The consequences of Mississippi River water diversions, land subsidence, and rising sea levels due to global climate change will drive decision making in Louisiana for years to come.

- In Louisiana, water has always been perceived as a never-ending resource. Recent circumstances, however, suggest otherwise, and issues of water availability, quality, and use are imminent.

CROSS-CUTTING GOALS

Managing Louisiana's coastal and Gulf of Mexico resources in ways that balance human needs with environmental health requires progress in three fundamental areas:

- A need for better information about how Louisiana's coastal and Gulf ecosystems function and how human activities affect coastal and Gulf habitats and living resources;

• A need for management and decision-making processes that are based on sound information, involve everyone who benefits from the beauty and bounty of Louisiana's coastal resources, and include mechanisms to evaluate trade-offs between human and environmental needs.

• A need for Louisiana citizens who understand the complexities of coastal environments and the interactions between human use and the health of coastal ecosystems;

To facilitate progress in these areas and to help Louisiana understand, manage, and use its coastal and Gulf resources wisely, central, cross-cutting goals have been recognized. The three goals reflect the value of Louisiana Sea Grant's integrated approach to research, extension, and education. They provide the foundation of Louisiana Sea Grant's work and are integral to the success of this five-year plan.

Research Goal: Sound scientific information to advance understanding of the nature and value of Louisiana's coastal and Gulf resources, to identify new ways to conserve and use these resources, and to support evaluation of the environmental impacts and socioeconomic trade-offs involved in coastal decision making

Short-term economics often influence coastal decision makers to act without understanding long-term social, environmental, and economic consequences. Ecosystem functioning and values, emerging economic opportunities, and the social and economic costs and benefits of various human activities need to be translated into factors understood by the general public in order to achieve sustainable uses of coastal environments. Louisiana Sea Grant has a long history of generating cutting-edge research and supporting technological innovations related to informed conservation and use of coastal and ocean resources.

Strategies

• Support research to generate the scientific, technical, and legal information needed to increase understanding of Louisiana's coastal and Gulf processes; support the development of new businesses, products, tools, and technologies; and answer the most pressing questions related to Louisiana's coastal and Gulf resource conservation, use, and management at the state and regional levels.

• Play a leadership role within and outside of the Louisiana Sea Grant network in increasing the amount of socioeconomic research available to help decision makers evaluate socioeconomic trade-offs and assess risks to the future health and productivity of Louisiana's coastal and Gulf resources.

• Integrate, translate, and disseminate research findings and technological discoveries to Louisiana's citizens, industries, and leaders who need them to capitalize on opportunities and make wise management decisions.

Education Goal: An informed public that understands the value and vulnerability of coastal, ocean, and Great Lakes 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

The 2004 U.S. Commission on Ocean Policy Report emphasized that restoring and sustaining Louisiana's coastal and Gulf environments requires an informed citizenry who understands the value and vulnerability of these resources. The state also needs scientists, planners, developers, engineers, and people involved in all water-related enterprises who understand the interactions between human activities and ecosystem health. NOAA has made ocean and aquatic literacy a strategic priority. Sea Grant has been a leader in K-12, undergraduate, graduate, professional, and technical education in coastal and Gulf-related areas for decades. Sea Grant is committed to playing a leadership role, in partnership with the NOAA Office of Education

and others, to advance coastal and Gulf literacy. This can be done both by capitalizing on Louisiana Sea Grant's strong university partnerships and by using its education and extension capacities to develop educational programs for schools, professional education, and workforce training.

Louisiana Sea Grant Education Coordinator Dianne Lindstedt uses 3D photography to demonstrate the City of New Orleans' elevation relative to surrounding water bodies.

Strategies

- Advance Louisiana's coastal and Gulf literacy through formal and informal learning opportunities in our schools, museums, aquariums, and other educational forums such as the online, digital collections of the Aquatic Commons and the National Sea Grant Library.

- Use Louisiana Sea Grant's strong university partnerships both 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.

- Collaborate within NOAA and with other partners to build public awareness about critical coastal and Gulf issues using the integrated research, extension, education, and communication capacities of the entire Sea Grant network.

- Advance environmental stewardship through teaching, training and inclusion of age-appropriate marine and coastal subject matter in Louisiana's K-12 curriculum.

- Develop undergraduate, graduate and continuing education curricula in rapid response to both man-made and natural disasters and in assessment of their socioeconomic consequences on coastal environments, communities, and industries.

Extension Goal: Decision-making processes that involve the full-range of Louisiana's 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

The continuing challenges facing Louisiana's coastal residents increase the complexity of coastal decision making and create greater potential conflict among users at a time when coastal decision making remains fragmented and narrowly focused. Louisiana Sea Grant's long-standing relationships with a wide variety of stakeholders in Louisiana's coastal communities and its reputation as a source of unbiased information enable the organization to play a leadership role in promoting effective information sharing, consensus building, and integration of efforts in the coastal arena. Sea Grant can enhance its effectiveness by working closely with other NOAA coastal programs through regional research alliances and by employing international, national, and regional ocean observation systems.

Strategies

- Use Louisiana 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.

• 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.

• 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.

• Develop and deliver information relevant to coastal and marine fisheries, sustainability and safety to citizens and leaders of Louisiana's coastal communities.

These three cross-cutting goals have been a foundation of Louisiana Sea Grant's work since it was established, and they are fundamental to success in the focus areas outlined in this plan. The more specific goals and strategies outlined in the focus areas build on these cross-cutting goals, generating the knowledge and creative solutions needed to address challenges and opportunities related to healthy coastal ecosystems, sustainable coastal development, a safe and sustainable seafood supply, and hazard resilience in coastal communities.

Louisiana Sea Grant aided in the marking and mapping of marine debris left by hurricanes Katrina and Rita.

Focus Area: HEALTHY COASTAL ECOSYSTEMS

The maintenance and restoration of healthy ecosystems is fundamental to life along Louisiana's Gulf coast. Coastal development, overfishing, sea level rise, coastal subsidence, loss of barrier islands, and other factors have resulted in water quality degradation and hypoxia, decline of fisheries, wetlands loss, proliferation of invasive species, reduced storm and surge protection, and a host of other challenges. Louisiana's invaluable coastal wetlands and forests have suffered most severely from the combined effects of man's activities and nature's whims. To restore and preserve the state's coastal ecosystems, we must promote innovative research that will increase our understanding of ecosystem function and implement appropriate designs for restoring lost function. Louisiana Sea Grant has previously identified information gaps, set research priorities, and coordinated information and technology transfer as necessary, however, much remains to be accomplished. Louisiana Sea Grant, coupled with its regional consortia, nationwide networks, and international contacts, is ideally situated to help Louisiana address ecosystem health issues at the appropriate local, state, regional, national, and international levels.

Goal: Sound scientific information to support ecosystem-based approaches to managing and restoring Louisiana's coastal environment

The full potential of ecosystem-based management approaches will be realized with better understanding of current conditions, basic ecosystem processes, interactions of coastal and upland land uses on the health of coastal and Gulf environments, and the importance of healthy ecosystems to healthy fisheries. It is also necessary to develop the skills to transform new knowledge and understanding into sound management principles and practices. Louisiana Sea Grant will continue to build the necessary scientific foundation both by supporting research that produces useful information related to ecosystem health and by accelerating the transfer of this information to coastal residents, resource managers, businesses and industries.

Louisiana Sea Grant assisted the fishing community of Delcambre in securing hurricane recovery grants.

Strategies

• Establish benchmark costs and benefits of coastal marsh restoration and protection projects, including impacts on the economies and cultures of coastal communities.

• Rebuild Louisiana's wetlands with river diversion and sediment conveyance projects that optimally manage and allocate sediments, minimally impact native flora and fauna, and positively affect water quality.

• Predict, detect, monitor, and understand both harmful and beneficial algal blooms with existing and newly developed methodologies and technologies.

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

The negative consequences of ecosystem degradation and tropical storms on natural resources, local economies, and human health are familiar to most residents of coastal Louisiana. The motivation to apply ecosystem-based management approaches to alleviating Louisiana's coastal challenges will require additional interaction with a wide variety of audiences. Louisiana Sea Grant's strong research and extension capabilities must provide both scientific information on and technical assistance with ecosystem-based management. Outreach and education capabilities also must engage citizens in stewardship activities that promote healthy ecosystems. Such efforts should be expected to result in regional and other collaborative approaches that address problems not only in Louisiana, but also extending beyond traditional geographic or governmental boundaries.

Strategies

• Reduce potential negative effects of climate change/variability, hurricanes, and development on the Louisiana coast with predictive models developed, refined, and applied in partnership with NOAA entities such as National Weather Service and Coastal Services Center.

• Model impacts of coastal restoration projects on residents and economies considering both the potential socioeconomic implications of the projects themselves and the desirable socioeconomic alternatives of such projects.

• Engage and educate Louisiana residents and community leaders about both their relationship with the marine and coastal environments and the critical need for conservation and restoration of same.

Goal: Restored function and productivity of Louisiana's degraded ecosystems

Over the past few decades, Louisiana's coastal areas have experienced deterioration of nursery habitats for fish populations, loss of wetlands, closure of oyster beds, and proliferation of invasive species. Louisiana Sea Grant will help reverse these trends by identifying and assessing impaired ecosystems and supporting the development of new policies, technologies, and processes that promote restoration of ocean and coastal ecosystems in ways that balance the needs of the natural systems with the needs of the humans who inhabit them. Louisiana Sea Grant will engage its network of extension, education and communication specialists both to provide technical assistance and to share new information and technologies with local, state, regional, national, and international partners.

Strategies

• Restore damaged and lost wetlands to the functional equivalent of natural ecosystems based on realistic ecological metrics, hydrologic requirements, and design criteria.

Louisiana Sea Grant's research on marsh grasses like Spartina alternaflora are an important element of coastal restoration in Louisiana.

Focus Area: SUSTAINABLE COASTAL DEVELOPMENT

Coastal communities provide vital economic, social, and recreational opportunities for thousands of Louisianans, but population migration, especially since Hurricanes Rita and Katrina, have transformed the coastal landscapes and intensified demand on finite coastal resources. The increase in population along the north shore of Lake Pontchartrain has resulted in new housing developments, recreation facilities, and other business activities. These changes are placing tremendous pressure on coastal lands, water supplies, and traditional ways of life. To accommodate more people and activity, and to balance growing demands on coastal resources, the state must develop new policies, institutional capacities, and management approaches to guide the preservation and use of coastal and ocean resources. Louisiana Sea Grant will engage a diverse and growing coastal population in applying the best available scientific knowledge and use its extension and education capabilities to support the development of healthy coastal communities that are economically and socially inclusive, are supported by diverse and vibrant economies, and function within the carrying capacity of their ecosystems.

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

Marine resources and coastal access sustain local economies in Louisiana through fisheries and aquaculture, seafood processing, trade, energy production, and tourism and recreation enterprises. The state's ports and waterways continue to accommodate trade, staging areas for off-shore industries, tourism and recreational boating, and fishing fleets. At the same time, coastal land loss, the ravages of Hurricanes Katrina and Rita, and a weakened economy are displacing both traditional water-dependent industries and their employees and diminishing water and beach access for all Louisiana residents. Vacant industrial buildings and obsolete infrastructure facilities can be refurbished for new marine enterprises, public access, and planned mixed-use developments that bring both employment to residents and enjoyment to visitors. Louisiana Sea Grant's long-standing relationships with coastal communities and industries make it ideally suited to provide information, tools, and techniques to support working waterfronts, responsible energy development, the development of accessible recreation and tourism activities, and adoption of sustainable development practices.

Strategies

• Support socioeconomic analyses of coastal communities that identify and communicate employment alternatives, such as either transitioning to new local employment or applying traditional skill and knowledge to the aquaculture of finfish and shellfish.

• Engage and educate residents of Louisiana's coastal communities in processes that identify and pursue sustainable economic development policies and programs.

Goal: Louisiana coastal communities that make efficient use of land, energy, and water resources and protect the resources needed to sustain coastal ecosystems and quality of life

Among the biggest challenges facing Louisiana's coastal communities, most notably along the north shore of Lake Pontchartrain, is how to manage growth and development without diminishing the health of the ecosystems upon which these communities depend. This is reflected in concerns about climate change and its potential negative effects on these communities. To respond to such challenges at a local and regional level, communities are seeking ways to use land and water, generate energy, and dispose of waste that will preserve environmental health and economic vigor. Determining the amount of the land, water, and other natural resources needed to sustain healthy communities is an essential first step in establishing sustainable policies and growth practices. Only when the dimensions of this environmental footprint are identified can coastal communities understand what their carrying capacities are and what will be needed for generations to come. Louisiana Sea Grant and its university partners are in a unique position to conduct research and develop models and forecasts that will help communities with this process.

Strategies

- Invest the citizens of coastal communities in responsible water management policies and practices through the development and delivery of relevant educational and media appropriate materials and programs.

Goal: Louisiana coastal citizens, community leaders, and industries that recognize the complex interrelationships among social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.

The pressures on Louisiana's ocean and coastal resources continue to grow. Our citizens and decision makers have an urgent need for tools that will help them evaluate the implications of land use changes, coastal development pressures, and increased resource use in approaching the policy and management decisions they face. Regional cooperation and coordinated land use and watershed planning are essential. Louisiana Sea Grant's well-established role as a trusted broker among a wide range of interests makes it a key player in providing sound information for decision-makers, convening stakeholders to seek common ground, and facilitating the development and implementation of new coastal policies, plans, management approaches, and consensus-building strategies.

Strategies

- Design and implement outreach programs on sustainable use of coastal resources for community leaders and industry.

Focus Area: SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Louisiana has experienced a decline in many of its major fisheries while seafood consumption nationwide has been simultaneously on the rise, largely due to both competition from inexpensive imported seafood products and the high cost of fuel for fishing vessels. Louisiana Sea Grant, through its research, extension, and education activities and work with industry partners, has helped to stabilize and improve many sectors of our fisheries industry. According to the NOAA Aquaculture Program, mariculture (aquaculture of saltwater species) is in its infancy in the U.S., amounting to just over $1 billion of a $70 billion worldwide industry. This is especially so in Louisiana. Mariculture creates important new opportunities to meet the increased demand for seafood, but a number of questions need to be addressed for its full potential

to be realized. Seafood safety is a growing concern as international trade increases and fish diseases and contamination of imports loom as larger problems. Louisiana Sea Grant has key roles to play in advancing public understanding of the nature of these problems and opportunities. Through the use of its research, extension, and education capacities, Louisiana Sea Grant will support the kind of informed public and private decision making that will lead to a sustainable supply of safe seafood long into the future.

Sea Grant researcher John Supan investigates ways to breed superior oysters at the hatchery on Grand Isle, La.

Goal: A sustainable supply of safe Louisiana seafood to meet public demand

Ensuring a sustainable supply of safe seafood requires an understanding of the effects of overfishing, past management decisions, and climate change on Louisiana's wild fish populations, as well as the role ecosystem-based fisheries management can play. It also requires better understanding of the range of complex issues related to developing the domestic mariculture industry. Louisiana Sea Grant will make major contributions by supporting research that provides the knowledge needed to understand the factors stressing fisheries and the complexities of mariculture development. Louisiana Sea Grant will also translate and transfer useful research findings through extension and education activities to ensure responsible and productive use of these resources in the future.

Strategies

- Restore important native recreational and commercial finfish and shellfish populations by identifying and protecting habitats essential to their reproduction, feeding, habitation, and growth to marketable size.

- Develop practices, technologies, and systems designed for enhanced, more efficient operation of mariculture facilities with minimal impact on coastal and oceanic environments and habitats, on natural fisheries, and on the people who depend on natural fisheries.

Goal: A healthy Louisiana seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently

A healthy seafood industry requires harvesting techniques that minimize both waste of non-target species and damage to marine habitats. This requires development of value-added products, enhanced quality assurance, and education about how to market under-utilized species. Louisiana Sea Grant will involve harvesters, recreational fishermen, producers, and managers in being responsible stewards as well as successful entrepreneurs. Louisiana Sea Grant will support development of new technologies and participate in collaborative efforts to increase the range of seafood products produced, enhancing Louisiana's competitiveness in global markets.

Strategies

- Develop new processing technologies, value-added products, innovative waste management practices, and byproduct uses that maximize the quality, safety, and utilization of Louisiana's seafood products.

• Promote seafood harvesting strategies that both maximize efficiency and profitability and minimize environmental impacts.

Focus Area: HAZARD RESILIENCE IN COASTAL COMMUNITIES

Sea level rise, the increased number and intensity of coastal storms, the ongoing threat of oil spills, and other natural and human hazards are putting more people and property at risk along Louisiana's coast, with major implications for human safety and the economic and environmental health of coastal areas. It is essential that residents of coastal communities understand these risks and learn what they can do both to reduce their vulnerability and to respond quickly and effectively when destructive events occur. Louisiana 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 and rebuild.

Goal: Widespread understanding of the risks associated with living, working, and doing business along Louisiana's coast

Communities and businesses are increasingly vulnerable to hazardous events brought on by climate-related changes, land use changes, and increased economic activity in coastal waters. There is a great need for information and tools to help communities assess the risks they face and identify the options available to them to minimize those risks. Louisiana Sea Grant will support the work of NOAA's Climate Program Office and its climate impact and adaptation-related activities. Louisiana Sea Grant will work with other federal, state, and local partners, the banking and insurance industries, and others to develop forecasting and risk assessment tools, economic and environmental impact models, and other mechanisms that will help families, businesses, communities, and regions understand their risks and take them into account in making personal, business, and community-related decisions.

Strategies

• Investigate interactions among sea level rise, subsidence, and storm surge, including implications for saltwater intrusion, coastal flooding, agriculture, human health and safety, and cultural changes.

• Develop models of successfully resilient communities, including contributions of community demographics, economic base, insurance coverage, building codes, education programs, heath care resources, fishery infrastructure, and development.

Goal: Community capacity to prepare for and respond to hazardous events in Louisiana

It is not enough for communities and businesses to understand their vulnerabilities. They must act on this knowledge and become more resilient, or the human and economic losses will continue to mount. Individuals, businesses, and communities need to develop comprehensive emergency preparedness and response plans that increase their resiliency and enable them to respond effectively. Louisiana Sea Grant will contribute to this by building a sound knowledge base to improve forecasting capabilities; by identifying development and best management practices that reduce the vulnerability of people, buildings and businesses to coastal hazards; and by advancing ways communities can manage and recover from these events when they occur.

Strategies

• Facilitate implementation of improved land use and waterfront planning, building codes and disaster preparedness in Louisiana coastal communities by developing and distributing best practices information.

• Understand, quantify, and predict impacts of both natural features, including wetlands and upland vegetation, coastal/nearshore morphology, beach dunes, and barrier islands, and man-made structures in providing defense against tropical storms and storm surges.

New Orleans' failed levees and floodwalls contributed to the severe storm damage suffered by many Louisiana Sea Grant constituents.