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Coastal Clips

A quarterly publication of the Louisiana Sea Grant College Program at Louisiana State University, Baton Rouge

Academy for Commercial Fishermen Set for March

The past two to three decades have been a difficult time for Louisiana's commercial fishermen. A combination of price stagnation due to imports and rising fuel costs has left the industry in decline.

Although Louisiana shrimpers regained some pricing ground in 2013 with a drop in foreign imports and new direct-to-consumer dockside sales initiatives, the industry still remains fragile. "To maintain its historical prominence as a seafood industry leader, Louisiana needs a skilled and proficient workforce of fisheries harvesters, dealers and processors," said Thomas Hymel, Marine Extension agent for Louisiana Sea Grant (LSG) and the LSU AgCenter in Iberia, St. Martin, Lafayette, Vermilion, St. Landry and Avoyelles parishes.

To that end, Sea Grant and the AgCenter will host three Louisiana Seafood Academy/Dock Day events in March for commercial fishermen. The first academy will be March 12-13 in Houma, followed by a Belle Chase program on March 20, and a final academy in Delcambre on March 25-26. Details will be available at *bayoulog.com/louisiana-fisheries*.

During the last 25 years, the sale of Louisiana commercial fishing licenses has decreased by 56 percent. Similarly, more than half the firms in the seafood dealer and processor sector have downsized, consolidated or closed.

"New industry realities require that fishermen, dock owners and processors are equipped to understand business trends and strategies, technologies and policies in order to survive in an increasingly competitive and more regulated trade," said Hymel. "Yet, few resources have been allocated that provide the training and education needed to upgrade the Louisiana industry beyond a commodity producer of bulk seafood. The Seafood Academy and Dock Days help correct that."

The academies will provide opportunities for hands-on learning and are free to all participants.

"Our overall goal is to improve the economic viability and resource stewardship of Louisiana's commercial fishing industry," added Alan Matherne, LSG and AgCenter Marine Extension agent for Terrebonne, Lafourche and Assumption parishes. "Those commercial fishermen who participate in the Seafood Academy will see the benefit."

Extension agent Thomas Hymel.

Law School Students Gain Real World Experience

Current legal interns are (left to right): Casey Pickell, Ian Brown, Jennifer Maybery, Jacob LaBorde and Charmaine Borne. Paige Gallaspy is not pictured. All are students at LSU's Paul M. Hebert Law Center.

Louisiana Sea Grant supports numerous graduate students each year, including those attending the Paul M. Hebert Law Center at LSU, Southern University Law Center, Loyola University College of Law and Tulane University Law School, among others. Currently, six law school students serve as legal interns for LSG's Law & Policy Program.

"Our legal interns gain a great deal of valuable experience while they're with us," said Melissa Daigle, research associate and resiliency specialist with the Law & Policy Program. "They have an opportunity to explore natural resource, ocean and coastal law issues, and often write legal memoranda based on their research."

Interns also have an opportunity to have their work published in the Louisiana Coastal Law newsletter, various law reviews and professional publications. And they often spend time in the field experiencing the state's coastal issues first-hand.

Former students have gone on to positions in the Office of the Louisiana Attorney General, Louisiana Department of Wildlife and Fisheries, Louisiana Supreme Court as well as private practice. Daigle herself served as a legal intern while attending LSU.

Persons interested in the Law & Policy Program or a legal internship can visit *www.lsu.edu/sglegal.*

Ocean Commotion Marks 16 Years

The Louisiana Sea Grant College Program at LSU hosted the 16th annual Ocean Commotion on Oct. 22 at LSU's Pete Maravich Assembly Center (PMAC). Nearly 2,000 students in grades K-8 attended the coastal stewardship exposition.

Ocean Commotion offers students an opportunity to learn about a host of issues that range far beyond sea-exclusive themes in a lively, hands-on learning environment. Exhibit topics included coastal marshes and wetlands, invasive species, local ecosystems, boating safety and Louisiana geology and wildlife. More than 60 presenters from private business; universities around the state; government agencies; and public, non-profit and private educational organizations participate as exhibitors each year.

"It's a great experience for the students," said Dianne Lindstedt, LSG's education coordinator. "They have the opportunity to learn from professionals, but from each other, too. This year we had 16 exhibits run by students in grades 5 through 12. It's a fantastic opportunity to learn how important it is to communicate science and to embrace stewardship of our natural environment.

"Many of the students may have never been to the beach or even seen a swamp or marsh. This may be their first experience with seeing fish and other animals up close. It also benefits the presenters by highlighting how important it is to effectively communicate their work to all audiences."

Students (top) are wowed by a magnified, 3-D view of plankton, while high school volunteers (bottom) share a lesson on modern and fossil sea creatures.

Sea Grant
Louisiana

Research Projects Chosen for 2014

The Louisiana Sea Grant College Program (LSG) intends to support seven research projects for the funding period beginning Feb. 1, 2014.

Below is a synopsis of the projects, along with a list of the principal investigators and their affiliations. Also outlined below are initiatives and objectives LSG's internal departments plan to accomplish during that same cycle.

Field Testing and Technology Transfer of an Alternative Bait for the Blue Crab Fishery

Julie Anderson (Louisiana State University AgCenter, Louisiana Sea Grant)

During the current omnibus cycle, LSG funded a project to determine if waste and by-products produced by the shrimping industry could be converted into bait for crab traps. The next phase of the research will take the bait developed in the lab and test it in real-world situations. Field testing will be conducted at four sites over three seasons, allowing for measurements of the bait's effectiveness across seasonal, temperature and salinity changes. Once field testing has provided confirmation of the usefulness of the new bait, it will be tested by commercial fishermen. Researchers hope to develop a cost-efficient alternative commercial crab bait. Traditional baits mainly consist of wild-caught fish, particularly Atlantic menhaden, which are rising in price.

Forecasting Land Building and Hurricane Flood Risk Reduction by River Diversion in Mississippi River Delta

Qin Jim Chen (Louisiana State University)
Ehab Meselhe (The Water Institute of the Gulf)

A major component of Louisiana's Comprehensive Master Plan includes using river diversions to move water and sediment into areas most susceptible to land loss and erosion. In order to do this efficiently, there are a number of factors that must be considered.

This project proposes to use the combined resources of The Water Institute of the Gulf (TWIG) and LSU to create models that will show the hydrodynamics, sediment transport and morphology, visualizing what will happen when the diversions are completed. By using the Delft3D modeling suite, researchers will look at how diversions will affect the receiving basins in Breton Sound. Once completed, the models will be able to show tidal changes, wave impact and salinity levels. These models can then be used to help coastal managers control the allocation of sediments in order to reduce negative impacts diversions may have on navigation, residents and the coast.

Impact of Climate Change on Louisiana Coastal Ecosystem: Development of Research-Driven Student-Centered Learning Modules

Emad Habib (University of Louisiana at Lafayette)
Jenneke Visser (ULL)
Douglas Williams (ULL)
Yuxin Ma (ULL)

Louisiana's unique coastal ecosystem offers numerous educational opportunities concerning fundamental hydro-ecological processes and how those processes are affected by natural and human impacts. This study proposes to use the coastline as a "teaching laboratory." The researchers will develop a learning tool called "EcoHydroViz," which will include a suite of learning modules with a unique focus on the effect of climate change on Louisiana's coastal ecosystems. These learning modules will allow students to access datasets on future scenarios of climate change, and analyze model simulations to study the impact on the ecosystem, such as changes in water level, salinity and marsh vegetation distributions. Once developed, the lesson modules will be used to educate university-level students about hydrological impacts on ecosystems and better prepare students for the challenges facing the state in coming years.

Improving Region Specific Eastern Oyster Models by Quantifying Physiological Responses to Regional Environmental and Climatic Variability Using a Dynamic Energy Budget Approach

Jerome F. LaPeyre (LSU AgCenter)

The eastern oyster is an integral part of Louisiana's coastal ecosystem for both ecological and economic reasons. With more than 85 percent of global shellfish reefs labeled as functionally extinct, it is important to find ways to protect and enhance this vital natural resource.

By developing a dynamic energy budget (DEB) model specific to the conditions found in Louisiana's coastal waterways, researchers hope to gain a better of understanding of how environmental conditions affect the growth and mortality of the eastern oyster in the northern Gulf of Mexico. The DEB model provides a way of understanding how energy is assimilated and used for maintenance, growth and reproduction according to the individual and its environment. Currently, DEB models for the eastern oyster are lacking in their accounting for all the environmental conditions common to Louisiana's coast, especially temperature and salinity. The model, once produced, can then be used

to determine the effects of climate change and human-caused activity on the state's oyster population, as well as generalized for use in other coastal areas.

Response of Louisiana Black Mangrove to Climate Changes: Learning from the Past to Predict the Future

Kam-biu Liu (LSU)

Understanding what Louisiana's coast looked like 2,000 years ago could give the state some insight into the future as climate change and coastal management initiatives begin to have an impact. By creating a pollen record of vegetation changes across Louisiana's coast, this project will provide a means of predicting the future changes in distribution and abundance of mangroves across Louisiana's coast as the climate warms. The replacement of salt marsh grass by mangroves possibly offers many advantages for coastal restoration, as mangroves can help to reduce erosion and build land through trapping sediment in their dense root structures.

The research will focus on two specific time periods: the Medieval Warm Period, which lasted from about 950 to 1250 A.D., and the Little Ice Age from 1550-1850 A.D. Specifically, the project will look at the presence of black mangroves along the state's coast during these periods. Mangroves exist in tropical and subtropical climates and come in three varieties: red, white and black. Currently, Louisiana has few populations of black mangroves and none of the red or white variety, but this may not have always been the case. As temperatures are expected to rise due to climate change, current mangrove populations could increase, but there may also be a migration of new species into Louisiana. Quantification of the past will provide the necessary information to plan effectively for the future of coastal Louisiana.

A Novel Technique to Measure Nitrogen Fluxes in Newly Formed and Restored Marshes and Tidal Creeks: Developing Realistic Ecological Metrics for Eutrophication Assessment and Nutrient Budgets

Victor Rivera-Monroy (LSU)
Kanchan Maiti (LSU)

Eutrophication occurs in water bodies when there is an increase in nutrients, which can lead to excessive algal blooms that deoxygenize the water. It is a natural process but can be exacerbated by human activity such as farming that produces agricultural runoff.

The Louisiana Comprehensive Master Plan includes river diversions that could alter the nutrient supply in some areas. This project will employ new technology in the form of a High Vertical Resolution Profiler System (HIVERPROS) sediment profiler and two benthic chambers to collect sediment and water samples from the bottom of water bodies, providing data lacking in previous studies. The HIVERPOS will allow sediment to be profiled *in situ*, or at the water bottom, as opposed to having to bring the samples to the surface, which can cause gas release and loss from jostling and interaction with the atmosphere. By keeping the samples at the bottom, a better picture of the actual level of nutrients can be gleaned, providing better information when choosing denitrification processes.

Marker-Assisted Selective Breeding to Produce Dermo-*Resistant Eastern Oysters*

Qinggang Xue (LSU AgCenter)
Jerome F. LaPeyre (LSU AgCenter)
John Supan (LSG, LSU)

Finding a method to effectively choose healthy oysters for selective breeding to combat the deadly oyster disease *Dermo* is the focus of this project. Traditional methods of selective breeding, which include choosing surviving members of a disease-ridden population, may not provide the best option, as there is an increased chance of a reduction in genetic diversity due to inbreeding. Over time, disease resistance could be lost as inbreeding oysters has been found to impair immunity resistance to diseases and stressful environments.

The researchers propose to use a newly discovered family of protease inhibitors, cvSI, as a marker for determining the suitability of an oyster for selective breeding purposes. The new inhibitors were discovered by the researchers in a previous Louisiana Sea Grant-funded project, and it appears to work to defend against the parasite *Perkinsus marinus*, which causes *Dermo*. To test the hypothesis, oysters will be collected from wild populations in coastal Louisiana. They will then be measured for cvSI activity, and the top 10 percent and bottom 10 percent in terms of activity will be used. Another 50 oysters will be selected randomly. Each group will be bred at the Louisiana Sea Grant Oyster Hatchery on Grand Isle and the progeny tested for susceptibility to *Dermo*.

"These research projects show great promise in helping solve some of our state's real-world issues," said Robert Twilley, Louisiana Sea Grant executive director. "But research is just one leg of the Sea Grant stool. The two other legs – education and outreach – are also an integral part of our program." Under the education and outreach umbrellas fall LSG's Extension Program, Law and Policy Program, Education Program and Communications Office.

With Extension agents and specialists located throughout the coastal zone, Louisiana Sea Grant aids stakeholders in solving a myriad of issues – from pond management to commercial fishing vessel fuel efficiency. Areas of emphasis for Extension in the coming two-year cycle include providing professionalization training for the commercial fishing industry, as well as facilitating dialogue between public and private interests debating large-scale coastal restoration strategies and their potential economic impacts.

Throughout its history, the Law and Policy Program has provided LSG's stakeholders with relevant and timely legal information on topics such as commercial and recreational fisheries issues, coastal access, water

quality and natural hazards resilience. During the next two years, the program plans to work with policy makers to help address statewide water security policy, to revise the *Louisiana Hazard Mitigation Guidebook* published in 2008, and to educate communities about the evolution of the National Flood Insurance Program. The program also will work with parish and municipal leaders in preparing for and responding to legal risks related to climate change and will educate property owners about risks from future climate variability and coastal storms.

LSG's Education Program has helped improve ocean, coastal and aquatic literacy with teacher workshops, student activities, lesson plans, and the annual Ocean Commotion environmental stewardship fair. For the next 24 months, the Education Program plans to update and adapt existing LSG classroom materials to meet new Common Core and state science standards, while continuing to offer professional development opportunities for teachers. It also will continue to provide ocean science literacy opportunities to K-12 teachers and students.

Louisiana Sea Grant's Communications office provides a variety of support to other elements of the program – editing, publication design and photography services; website design and maintenance; as well as publicizing and promoting Sea Grant events and activities. Communications also produces, and will continue to produce, videos about programmatic accomplishments and matters of interest to stakeholders, collect and transcribes oral histories for use by researchers and others, and produce news releases and other publications that help educate and inform the public on coastal issues.

The LSG research proposal solicitation process began in late 2012 with a call for statements of interest that addressed topics in the program's current Strategic Plan. Statements of interest were reviewed by a screening panel, and authors of the highest ranked statements were invited to submit full proposals. However, authors of the lower ranked statements were advised that any full proposal submitted would be fully and fairly evaluated. Full proposals were subsequently examined by external peer reviewers. The external peer review panel scored and ranked the proposals, and provided its recommendations to the program. LSG selected the proposals for funding based on the merit recommendations provided by the panel and the programmatic fit of the proposed research to LSG's Strategic Plan.

On the Web:

Louisiana Sea Grant Strategic Plan -
http://www.laseagrant.org/pdfs/StrategicPlan_14-18.pdf

Louisiana Sea Grant Research Database -
http://appl003.lsu.edu/seagrant/collaresh.nsf/About?OpenForm

Message from the Executive Director

The year is coming to close – as is an omnibus cycle for Louisiana Sea Grant. On Feb. 1, 2014, we begin a new funding phase from the National Oceanic and Atmostpheric Administration and begin supporting a new slate of university-based research projects and Sea Grant initiatives.

At any given time, Louisiana Sea Grant manages or participates in more than 50 research, extension, education and communications projects across our state's coastal landscape. Research supported by Sea Grant and our partners have bolstered the understanding of important commercial and recreational marine species, identified and refined critical coastal restoration processes, and helped communities deal with challenges of adapting to a dynamic and threatened coast.

Our education programs support graduate students who work directly with Sea Grant-funded scientists, provide undergraduates with their first university-level research experience, and introduce K-12 students to the importance of coastal stewardship. In our communities, Louisiana Sea Grant Extension agents and specialists are recognized as unbiased brokers of credible science-based information, providing policy makers, local officials and residents with the facts they need to make decisions. We have one of the only legal research groups in the state that helps construct effective policies for the coastal zone.

All those efforts will continue – and grow – during the next funding cycle.

New research will address topics ranging from commercial fisheries issues to better understanding climate change. As Restore Act funding becomes available, Sea Grant Extension will help facilitate the discussions concerning large-scale coastal restoration strategies and possible economic impacts. The Law and Policy Program will work with state officials in developing water security policies for Louisiana. Classroom materials will be updated to meet Common Core and state science standards by our Education program.

The list is long and wide-ranging, but one thing is clear. Louisiana Sea Grant is hard at work for our state.

Robert Twilley, Ph.D.
Executive Director
Louisiana Sea Grant
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State of the Coast Registration Open

The Coalition to Restore Coastal Louisiana will host the third State of the Coast Conference March 18-20, 2014. The conference will feature three days of presentations, keynote speakers and networking with experts focused on providing information about Louisiana's changing coastal ecosystem and the communities and economy it supports.

More than 900 attendees are expected to participate, representing a diverse group of parties interested in coastal Louisiana including scientists, land owners and managers, officials from various levels of government, industry and business leaders, and concerned citizens and students.

The conference will be held at the Ernest N. Morial Convention Center in New Orleans. Early registration continues through Jan. 19, 2014. For more information, visit *http://www.stateofthecoast.org.*