

A Living Laboratory: Watch the Delta Grow

While the majority of Louisiana's coast is seeing consistent and severe land loss, the Wax Lake Delta has been experiencing the exact opposite.

Watch the Delta Grow (www.watchthedeltagrow.com) is a collaborative, educational project established by the Louisiana Sea Grant College Program (LSG), the LSU College of Human Sciences and Education and the LSU Coastal Sustainability Studio to raise awareness about the rising Wax Lake Delta. Scientists study the area using a myriad of tools and technology to track, record and monitor the environmental conditions of the delta throughout the seasons. These observations provide the opportunity to better understand natural deltaic systems and in turn help inform coastal restoration efforts.

Watch the Delta Grow seeks to put this meaningful data into the hands of students in high school and middle school classrooms.

"We're working with scientists, we're working with designers in the Coastal Sustainability Studio and we're working with educators, like Pam Blanchard," Sea Grant communications coordinator Dani Dilullo explained. "That allows us to bring these different skill sets together, and make a product to educate students in Louisiana schools and the general public on exactly what's going on down there."

Blanchard, associate professor in LSU's School of Education and co-director of the LSU Coastal Roots program, is instrumental in editing and reviewing Watch the Delta Grow lesson plans. "I want the science to be interesting and relevant to the students – I want students to be drawn into science, not afraid to dig deeper," she said.

Students work in small groups to examine data from the Wax Lake Delta in the lessons being created, Blanchard said. "It's called a 'learning cycle'," she added. "We're trying to move teachers away from lecturing students. Within the learning cycle, data exploration is front and center – students aren't reading a paragraph about what they are going to learn, they learn what they need to know from the activity itself."

Lesson topics include storms, diversions and the delta cycle amongst others. The hope is that the website will one day be a go-to tool for middle and high school teachers interested in sharing lessons right from the Louisiana coast.

"We want students to use geology, math skills, graphing and data interpretation," Dilullo said. "The goal is to eventually expand with lessons for elementary and upper high school grades."

"This is some of the newest land in Louisiana, a truly unique thing. In addition to providing these lessons for teachers, I'd love for the program to get to a point where these teachers can actually see the land they are teaching about."

New Extension Agent for Lafourche and Terrebonne Parishes

Nicole Lundberg is Louisiana Sea Grant's new fishery and coastal issues Extension agent for Lafourche and Terrebonne parishes. She began her duties in November.

Lundberg graduated from Juniata College in Pennsylvania in 2012 with a Bachelor of Science degree in environmental science, and then moved to Louisiana to pursue graduate studies at Nicholls State University where she earned a Master of Science degree in marine



and environmental biology in May 2017. During her years as an undergraduate, Lundberg worked in stream restoration and conducted research in stream ecosystems and mercury bioaccumulation. While completing her master's degree, she was a graduate teaching assistant at Nicholls. She later worked as both a citizen science coordinator and a temporary park guide for the Jean Lafitte National Historical Park and Preserve in Thibodaux.

Federal, State Agencies Utilize CERA During Hurricane Season

The 2017 hurricane season was an active one for the Coastal Emergency Risk Assessment (CERA) tool.

The CERA group delivers storm surge and wave predictions for impending or active tropical cyclones in the United States. Based on the Advanced Circulation and Storm Surge model (ADCIRC), the CERA web mapping application provides an easy-to-use, interactive online interface. Emergency managers, weather analysts and GIS specialists can access real-time forecasting results to evaluate the impacts of a tropical storm or to see tide, wind-wave and extra-tropical surge conditions. The advantage of this system is to provide higher spatial resolution of impacts so that vulnerabilities can be evaluated given local conditions.

During the 2017 hurricane season (June 1 to Nov. 30):

- Texas officials used real-time data as well as models available through CERA to maintain the ferry schedule from Galveston to the Bolivar Peninsula during Tropical Storm Cindy. The decision allowed the Texas National Guard to use the ferry to make residential welfare checks, reducing travel time by about 90 minutes compared to driving all the way around Galveston Bay to reach the Bolivar Peninsula.
- During Hurricane Harvey, the Texas Department of Transportation used CERA storm-surge information to decide when to close the Aransas Pass ferry. Texas Task Force 1 Urban Search and Rescue Response also used CERA to anticipate changes in road access and determine when drivability was possible and when it was not. And the Texas State Operations Center used CERA to conclude it was unnecessary to evacuate an additional 100,000 residents from the Sugarland area, helping keep excessive numbers of cars off the road.
- The U.S. Coast Guard's decision to relocate its District 7 Command Center out of Miami during Hurricane Irma was based on data accessed through CERA. FEMA also used CERA to predict policy holder and other impacts before the storm made landfall. During the storm, CERA had 100,000 unique visitors per day.

CERA was developed through a transdisciplinary Louisiana State University partnership with Louisiana Sea Grant, in collaboration with University of North Carolina.

NASA satellite image of Hurricane Harvey

Research Projects for 2018 Omnibus Announced

Louisiana Sea Grant (LSG) is taking a different approach to the research it intends to support for the 2018-2020 omnibus cycle. In addition to funding three traditional core projects, LSG will also fund four collaborative, integrated research teams. The execution of these projects is subject to the availability of National Oceanic and Atmospheric Administration (NOAA) resources and is scheduled to begin Feb. 1, 2018. Below is a synopsis of the projects, along with a list of the principal investigators and their affiliations.

Core Research:

Development of Restoration Assessment Tools and Educational Products with Drones

Principal Investigator: James Nelson,
University of Louisiana at Lafayette (UL)

The 2017 Coastal Master Plan contains aggressive projects and an ambitious price tag – around \$50 billion. Researcher James Nelson hopes to develop tools to better assess the effectiveness of restoration projects. Previous assessments required hours in the field and boots on the ground; Nelson plans to approach from a different angle. Using a specially equipped Unmanned Aerial Vehicle (UAV) – a drone to most – he will collect and analyze images of coastal Louisiana. “Every picture carries data; we’re going to extract that data,” said Nelson. Currently, the bottleneck on projects like this is the analysis of collected images. This is a gap in the industry. Nelson and his lab will develop a more efficient and timely analysis platform, which has the potential to be highly valuable. Nelson said, “Louisiana is spending billions of dollars on restoration, but we need know what is working and what isn’t. This platform will allow us to more rapidly see how things are responding. We’re running out of time to figure things out. We only have so many resources. Let’s make good decisions.”

Fish Community Profiling on Artificial Reefs: An Environmental DNA Approach

Principal Investigator: Kyle Piller,
Southeastern Louisiana University

Starting in 2003, a series of artificial reefs were constructed in Lake Pontchartrain. The goal of these structures is to provide habitat for fish, and subsequently fishing spots for anglers. However, learning which species are actually using the reefs is a challenge. Hook and line fishing yields a limited sample and visual surveys in the murky water aren’t always productive. Fish

biologist Kyle Piller is hoping to use a relatively new technique to determine which fish frequent the reefs. Aquatic organisms shed DNA in the form of scales, mucus, urine, feces. These cast-offs, collectively termed eDNA, serve as identifiers of which species have been there before. Piller will collect and analyze eDNA from reefs of different ages and different composition to see if fish have a preference. “If the state is going to spend money on habitat augmentation, we want to know if we are getting our money’s worth. This research will give us an idea of which type of material is best for habitat and colonization of fish,” said Piller.

Incorporating Life into Living Shorelines: Can Gulf Ribbed Mussels Reduce Shoreline Erosion and Enhance Restoration Practices?

Principal Investigator: Brian Roberts,
Louisiana Universities Marine Consortium (LUMCON)
Co-PIs: Ariella Chelsky (LUMCON) and Anthony Rietl (LUMCON)

Wetland loss in Louisiana is occurring faster than anywhere in the country. Brian Roberts noted, “Down at LUMCON, we see the loss outside our windows every day.” Roberts hopes to demonstrate the potential benefits for living shorelines in many of the vulnerable coastal areas. A living shoreline takes advantage of living organisms to promote marsh stabilization. In contrast to sea walls and revetments, living shorelines maintain the connectivity of a marsh to its adjacent waters. On the U.S. East Coast, Atlantic ribbed mussels and marsh grasses have been shown to complement each. When found together they work synergistically to shore up the wetland. In the Gulf, mussels had previously been overlooked because it was assumed that they weren’t abundant enough. However, recent research seems to indicate otherwise, and Roberts and his lab are seeking to add mussels into the coastal restoration conversation. “Our best hope of long-term sustainability is going to require a holistic ecosystem approach,” said Roberts. “We’re interested in seeing if adding Gulf ribbed mussels will enhance these living shoreline projects.”

Integrated Research:

Communicating Climate Tools to Coastal Stakeholders

Principal Investigator: Jean “Renee” Edwards,
Louisiana State University (LSU)
Co-PIs: Alan Black (LSU), Barry Keim (LSU) and Andrea Miller (LSU)

Louisiana was the last state added to NOAA’s Sea Level Rise Viewer, due to the abundance of levees across the state and the uncertainty of how these would

(Continued on next page)

Coastal Connections Cultivates Science Communicators

Louisiana Sea Grant (LSG) held its annual Coastal Connections Competition on the Louisiana State University-Baton Rouge campus in September. It drew an applicant pool of 17 students representing four different departments. After whittling the field down, 12 students presented their work and its implications to a public audience.

Coastal Connections encourages graduate students to think about their research in a different way. Typically, the results of their work are presented at conferences to audiences of similar disciplines. This competition, however, is geared toward the general public so students have to adapt their discussion, remove jargon and present to a group of non-specialists.

Students are also restricted on time and content. Coastal Connections forces students to distill their research into a clear, compelling oration of no



Pictured left to right are Jay Grymes, chief meteorologist for WAFB-TV (competition judge); Julie Butler, Robert Twilley, Louisiana Sea Grant executive director; Hollis Jones; Prosanta Chakrabarty, LSU associate professor of biological sciences (judge); Yaping Xu; and Amy Clipp, who helped write both of the state’s Coastal Master Plans (judge).

more than three minutes with the use of only two slides.

The top three finalists (below) each received \$500 of research travel award money:

- Julie Butler, Department of Biological Sciences, presented *A Little Fish in a Big, Noisy World*.

- Hollis Jones, Department of Biological Sciences, presented *Effects of Temperature and Salinity on Crassostrea virginica Feeding Physiology and Oxygen Consumption*.

- Yaping Xu, Department of Anthropology, presented

Determine Soil Moisture through Satellite and Geoinformation Data to Predict Flood in Louisiana.

All 12 presentations are available for viewing at www.youtube.com/playlist?list=PLQ88m0vBBX01HLSZv6qlpw0GT05T10oh_&disable_polymer=true.

impact sea level rise scenarios. If NOAA was uncertain about climactic impacts in our state, it's safe to assume that emergency managers have a challenge in evaluating all the variables and making critical decisions. Renee Edwards and her team are hoping to make their jobs a little easier by evaluating a variety of predictive tools available and helping connect emergency managers to them. "We want them to find the right tool and know how to use it," said Edwards. "Some tools are technical and can be intimidating to learn on your own." Edwards and her team will also work with another trusted source for climate information – broadcast meteorologists. Her research team is hoping to see which messages resonate most strongly with coastal residents. "In Louisiana, we are so vulnerable to climate and weather events."

Managed Aquifer Storage and Recovery in Coastal Louisiana

Principal Investigator: Emad Habib, (UL)

Co-PIs: David Borrok (Missouri University of Science and Technology), JoAnne DeRouen (UL), Kari Smith (UL) and Frank Tsai (LSU)

Reservoirs in southwestern Louisiana have long been used for domestic, agriculture and industrial purposes. Overtime, this depletes the aquifer. This is particularly troublesome on the coast because two additional problems accompany it: subsidence and salt water intrusion. Emad Habib and the project team are hoping to improve the situation by developing a plan for Aquifer Storage and Recovery (ASR). "This is a unique opportunity," said Habib. "We have an abundance of surface waters – we all see it when it floods. We don't want to lose this water to the Gulf of Mexico when it can help fight subsidence and salt water intrusion." Habib will be focusing on a pilot site in the Chicot Aquifer in Vermillion Parish. Surface waters can be stored and filtered in engineered wetlands before being injected back into the aquifer. In addition to evaluating the ecological and engineering feasibility of this project, Habib and his team will also work with stakeholders. Currently, the aquifer is being overdrafted by 1.3 million cubic meters per day. While this technology has been used elsewhere, for successful application in Louisiana, local residents need to fully understand the benefits of ASR.

Development of a Sustainable Southern Flounder Fishery in Louisiana

Principal Investigator: Stephen Midway (LSU)

Co-PIs: Joseph West (LDWF) and Jack Issacs (LDWF)

The Louisiana Legislature mandates the assessment of certain commercial and recreational species to monitor how a species is doing. Currently, there hasn't

been enough information collected to say how well southern flounder are doing. "Sustainable fisheries are built on good information, and currently we lack reliable data on southern flounder," said fisheries biologist Steve Midway. His research team will be working directly with Louisiana Department of Wildlife and Fisheries (LDWF) to fill this information gap. Together they will sample fish, interview fishermen and rely on long-term institutional knowledge in fisheries. The scientists will determine a fish's age and maturity by looking at a small tissue sample, while recreational fishermen interviews will determine who fishes for them and where. The culmination of this research project will be a southern flounder fishing tournament in Lake Calcasieu, hoping to build even further enthusiasm for the flounder fishery. "In addition to being delicious, flounder are a popular recreational species in other Gulf states. We have a chance to build that here," said Midway.

Educating Louisiana's Future: Boosting K-12 Instruction of Coastal Environments

Principal Investigator: Jill Trepanier (LSU)

Co-PI: Pamela Blanchard (LSU), Edward Bush (LSU AgCenter), Andy Nyman (LSU AgCenter), Mark Shafer (LSU AgCenter and LSU)

Louisiana's coastline has faced many hazards – hurricanes, floods, subsidence and climate. Through decades of change, trees stood watch and took notes. These sentinels contain valuable information and a team of researchers is hoping to tap into this previously unused data. "When it comes to risks - if a tree faces it, coastal residents will face it too," said Jill Trepanier. "We're using trees to tell us information about the past. We've only been collecting temperature data for, at most, just over one hundred years. Trees can help us understand climate on a longer scale." In addition to collecting data and conducting field experiments, the scientists will partner with Pam Blanchard from LSU's Coastal Roots program to engage Louisiana classrooms. STEM enrichment can set students on a lifelong path of learning. One student on this project is a former Coastal Roots student and has carried his early inspiration onto the university in pursuit of a PhD. The researchers hope to spark similar interests as they advance our understanding of what climate has done and could do on our coastal plain.

Louisiana Fisheries Forward Summit 2018

The Louisiana Fisheries Forward Summit will be Tuesday, March 6, 2018, at the Pontchartrain Center, 4545 Williams Blvd., Kenner.

This free expo is the state's premier commercial fishing and seafood industry event, attracting hundreds of commercial fishermen, seafood dealers, processors and others. This year's Summit will be structured as an expo, with an open trade show and ongoing demonstrations repeated throughout the day.

Produced by Louisiana Sea Grant, the LSU AgCenter and the Louisiana Department of Wildlife and Fisheries – with other industry partners – it is part of the Louisiana Fisheries Forward (LFF) education initiative.

For more information, visit www.LaFisheriesForward.org/summit.



The 2016 fisheries summit in Kenner.

20th Annual Ocean Commotion Held

Louisiana Sea Grant (LSG) hosted the 20th annual Ocean Commotion on Oct. 24 at LSU's Pete Maravich Assembly Center (PMAC). More than 1,600 elementary and middle school students from 32 schools participated in the one-day educational fair.

"Ocean Commotion is our program's premier outreach event when it comes to elementary and middle school education," said Robert Twilley, LSG executive director. "It never ceases to amaze me as students' faces light up learning about our state's coast and its importance to our nation."

"It's a great experience for the students," said Dianne Lindstedt, LSG's education coordinator. "Students have the opportunity to learn from professionals, but from each other, too. Typically, several exhibits are run by fifth to twelfth grade students, providing a wonderful 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."

"Ocean Commotion is an interesting mix of ingenuity and total chaos, but that glow you see on the kids' faces is what it's all about," said Alaric Haag, a volunteer at the first Ocean Commotion.

"Participating in Ocean Commotion as an eighth grader continues to impact me today," said Rachel Ellis, now a junior and engineering major at LSU. "I loved learning about the diverse land and sea creatures native to Louisiana. The activities were hands-on and some exhibits had skeletons, skins and life size replicas of real animals. It piqued my interest and left me wanting to learn more about the beauty of the environment and how to conserve it."

Ocean Commotion offers students an opportunity to learn about a host of issues that range far beyond ocean-exclusive themes in a lively, hands-on learning environment. Topics include 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.

This year, three individuals and six exhibitors were honored for participating in every Ocean Commotion since the coastal stewardship fair was first held in 1998. Those participating for the past 20 years are:

- Pam Blanchard, associate professor in the College of Human Sciences and Education. Blanchard also is an Ocean Commotion founder
- Ron and the late Jackie Bartels with the Louisiana Chapter of Safari Club International
- Dauphin Island Sea Lab
- Louisiana Department of Agriculture and Forestry
- Louisiana Department of Wildlife and Fisheries
- U.S. Department of Agriculture Natural Resources Conservation Service
- Safari Club International
- LSU Department of Oceanography and Coastal Sciences



Ocean Commotion founder Pam Blanchard inspects her 20-year participation award at the Coastal Roots Exhibit.

Message from the Executive Director

If you've been keeping track, it's been a whirlwind of anniversaries for Sea Grant.

In 2016, the National Sea Grant Program celebrated its 50th anniversary. As you'll discover in the pages of this newsletter, Ocean Commotion – Louisiana Sea Grant's principal K-12 education event – celebrated its 20th anniversary in October. This summer Marsh Maneuvers – a coastal stewardship program for high school students sponsored by LSG – will mark 30 years. And come fall of 2018, Louisiana Sea Grant (LSG) will commemorate its own golden anniversary.

All these milestones seem like an opportunity for a grand celebration – something we excel at in Louisiana. But the reality is Louisiana Sea Grant's work isn't done even after 50 years.

Students in kindergarten through graduate school still benefit from LSG programming from education and outreach to research support. Sea Grant outreach personnel continue to provide our seafood industry and coastal communities with training and solutions to the challenges they face. And the research Louisiana Sea Grant funds answers real-world issues in our state. It seems that these core values to our mission never grow old.

Our research portfolio that begins Feb. 1 – also written about in this issue – features a number of Integrated Research and Engagement projects.

This is a new approach for LSG, funding research teams that build integrated approaches across social, engineering, design and ecological disciplines to address the complex environmental and social issues affecting coastal Louisiana. A more integrated approach to discovery will also help us improve the impact of our outreach.

With the highest rates of relative sea level rise in the nation, our research solutions today will guide coastal communities in planning for tomorrow by shaping adaptation strategies. At Louisiana Sea Grant, we not only want to challenge our university research community to develop creative strategies that promote adaptation to changing environmental, economic and social systems, but also to lead the nation in the application of theory into practice. We plan on celebrating this integrated approach to research and outreach in the future as well.

Robert Twilley, Ph.D.
Executive Director
Louisiana Sea Grant College Program





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Louisiana State University
Sea Grant Building
Baton Rouge, LA 70803-7507

Robert Twilley,
Executive Director

Editors: Roy Kron, Dani DiIullo, M.B. Humphrey
and Race Picou Art: Robert Ray

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Ain't it a Wonderful Life! Happy Holidays

