

Louisiana Alligators: From Threatened to Thriving

A national conservation success story has emerged from an unlikely place – the swamps of Louisiana. The reversal of fortune seen with the American alligator (*Alligator mississippiensis*) illustrates the benefit of allowing economic and environmental interests to work in tandem.

Amid concerns of a population decline, Louisiana closed its alligator harvest in 1962. The alligator became totally protected five years before being listed as an endangered species. The Louisiana Department of Wildlife and Fisheries (LDWF) then began an extensive study of the state's alligators. For 10 years, they surveyed the population. And after that decade, LDWF felt confident that alligators in Louisiana were doing just fine.

However, a challenge remained to re-open the harvest: the alligator now appeared on the endangered species list. Thankfully, LDWF's research paid off. They successfully lobbied for an exception to the Endangered Species Act. In 1974, alligators were again harvested in Louisiana.

"With the protection during the 1960s, and the associated research, the idea of managing alligators as a renewable resource was developed – with both a wild harvest and the concept of farming that began in the late 1970s," said Mark Shirley, Louisiana Sea Grant and LSU AgCenter Extension agent. Shirley has been assisting land owners, harvesters, farmers and skimmers for the last 30 years.

As the alligator population grew, so did the industry – with the most profitable product being skins for purses, boots, belts and more. Top designers from Gucci and Hermes still travel to Louisiana for quality skins. Over the last decade, the gross value of skins topped half a trillion dollars.

In addition to expanding the market for skins, the alligator industry has been adaptive in creating new markets. For example, now there is a market for meat which grosses millions of dollars annually.

And the population of alligators is doing just as well. LDWF continues its monitoring – both on the farm and in the swamps. They oversee the wild harvest in September and tag and release a percentage of farm-raised juveniles. "Alligators have become one of the most intensively managed wildlife species in the world and one of the most successful conservation stories of any species," said Shirley.

Now it seems that the adaptability that has marked the alligator industry will once again be tested. With both domestic and international markets impacted by global economic uncertainty, luxury items purchases declined last year. As a result, tanneries have a surplus of skins in inventory and are calling for a drastic reduction to this year's harvest. This will translate into lower prices for both farm raised and wild harvested skins.

If past challenges are an indication, the alligator industry will continue to find creative solutions. Shirley said, "The industry has seen this kind of adjustment in the market several times over past decades. Such downturns usually bounce back after a year or two."

One promising avenue is alligator biochemistry. By extracting chemicals from leftover alligator carcasses, researchers at Louisiana State University have been able to extract valuable collagen, keratin and hyaluronic acid. These have applications in wound healing, aging creams, ointments and inflammatory medications. This promising early research could mark another success for the alligator industry.



Twilley Honored by Environmental Law Institute

Louisiana Sea Grant executive director Robert Twilley is the recipient of the 2017 National Wetlands Award for Science Research from the Environmental Law Institute (ELI).

“(Robert) is a world-class wetlands researcher who has been conducting vital research for 35-plus years focused on some of the most impressive global wetland ecosystems,” said John White, who nominated Twilley for the award. “He has conducted research on submerged aquatic vegetation beds in the Chesapeake Bay, on mangrove forests in the southwest Florida Everglades and has participated in both scientific and management positions related to the massive coastal wetland losses of the Mississippi River Delta,” added White, a professor in the College of the Coast and Environment at Louisiana State University.

Over his career, Twilley has produced 150 peer review publications, which generated hundreds of citations. Of note, his work includes the first global carbon budget and a blue carbon value of mangroves. As a defender of wetlands and a leader in wetland science, he has pioneered

a variety of research partnerships, collaborations and outreach projects. He has also testified in several U.S. House and Senate subcommittee hearings and delivered briefings to a variety of other departments in the U.S. government.

“Robert is the entire package – more than just about anyone I can think of in academia,” said Charles Hopkinson, professor in the Franklin College of Arts and Sciences at the University of Georgia. “Not only has he been in university administration, but he has maintained a rigorous and productive scientific research program at the same time.”

“Not only does he do cutting-edge new research, but he also puts equivalent effort into extending that research, in communicating the results to communities and groups that need answers to their questions, and to applying those results to the preservation and restoration of critical wetland habitats of the Americas,” he added. Hopkinson also extolled Twilley’s leadership role in forming the Louisiana Coastal Protection and Restoration Authority, which resulted in the state’s first-ever master plan for coastal restoration.

“One of the greatest contributions we can make as scientists is cultivating the next generation of scientists who will pick

up the torch from us and continue into the future, building on the historical work of folks long gone,” said K.R. Reddy, graduate research professor and chair of the Soil and Water Sciences Department at the University of Florida. “Dr. Twilley believes strongly in this philosophy and has graduated more than 20 graduate students who are working on wetland issues all over the United States. In addition, he has mentored five international graduate students who have taken their wetland lessons into the international arena,” Reddy stated.

“Personally, when I first arrived at LSU about 13 years ago as an assistant professor, Dr. Twilley was the first one to meet with me and pledge his support and mentoring,” added White. “This was a remarkable gesture given I had only met him once as a student at a conference, where he was only too happy to discuss my research.”

Twilley earned his B.S. and M.S. degrees from East Carolina University in biology. He earned his Ph.D. from the University of Florida in plant ecology/systems ecology. He is a professor in the Department of Oceanography and Coastal Sciences at LSU, and was named Louisiana Sea Grant College Program executive director in 2012.

“Robert is passionate about extending locally important research to the myriad of stakeholder groups in coastal Louisiana. I think he’s taken an already good Sea Grant program to the next level of excellence,” added Hopkinson.

Now in its 28th year, the National Wetlands Awards has recognized more than 200 individuals from across the country for their exceptional and innovative contributions to wetland conservation.

“The recipients of the 2017 Awards are on the fore-front of protecting wetland resources in the face of climate change and development,” said ELI president Scott Fulton. “Through their dedication and achievements, they inspire wetlands protection across the country and worldwide.”

With its non-partisan, independent approach, ELI promotes solutions to tough environmental problems. The Institute’s unparalleled research and highly respected publications inform the public debate and build the institutions needed to advance sustainable development. For more information on other 2017 National Wetlands Award winners, visit <http://elinwa.org/2017-national-wetlands-awards-winners>.



Robert Twilley

St. Bernard Parish Enlists Black Mangroves to Combat Coastal Erosion

In April, St. Bernard Parish Government's (SBPG) Coastal Division and volunteers from multiple agencies and institutions planted 1,000 black mangrove trees in the eastern Biloxi Marsh. This is the first project of the St. Bernard Parish Black Mangrove Planting Program, a collaboration between the SPBG Coastal Division and several schools and organizations, to address coastal erosion issues.

"What I love about this project is that the use of black mangroves was suggested to us by some fly fisherman who do charters in the proposed site area. We took their suggestion and ran with it," John Lane, SPBG Coastal Division executive director said.

Jerry Graves, coastal advisor for the SPBG Coastal Division, admitted there was some initial doubt.

"We began visiting the Biloxi Marsh in search of existing healthy black mangrove stands," Graves said. "After locating them on the eastern outlying islands of the Biloxi Marsh, we began reaching out to black mangrove researchers throughout the state. Researchers were surprised to learn that black mangroves were able to survive at the latitudinal coordinates we were finding them."

The black mangrove – a native plant species that can grow up to nine feet – has seen steady expansion across coastal Louisiana since 1990. While mangroves are found in warmer climates, the black mangrove is the most tolerant to colder conditions.

The northern expansion of black mangroves in St. Bernard Parish immediately piqued everyone's interest, Graves said. The SBPG Coastal Division then initiated a black mangrove planting program through an informal partnership with the University of Louisiana at Lafayette, Nicholls State University, the LSU AgCenter, Chalmette High School, the Louisiana Department of Agriculture and Forestry and local business and organizations like Low Tide Charters, the Save Louisiana Coalition, and the Meraux Foundation.

The project's focus is to increase black mangrove habitat in St. Bernard Parish for the purpose of: restoring/creating essential fish habitat, increasing the overall health and resilience of the coastal ecosystem, and reducing risk to life and property in the region by enhancing natural storm surge defenses. The planting program consists

of four primary components: (1) propagule collection and cultivation, (2) greenhouse management, (3) strategic site selection and planting, and (4) monitoring.

"This is the perfect project where the entire community can get involved, get their hands dirty, have fun and make a difference," Lane said.

Dominique Seibert – an Extension agent with Louisiana Sea Grant and the LSU AgCenter in St. Bernard, and volunteer at the first planting event – echoed those sentiments.

"It's a wonderful experience to be part of an ongoing coastal restoration project that includes SBPG, high school students, and members of the community. Projects like these have multiple benefits, and with our vanishing coastline, this community has really come together to make a difference," Seibert said.

Black mangroves perform a number of essential functions in coastal wetlands, including providing nursery and nesting habitats for various species. However, it is the root system of the plant that led the SPBG Coastal Division to consider black mangroves for its first line of defense in tackling land loss. The extensive root system has the potential to strengthen and sustain the shoreline, and in turn, protect life property and infrastructure.

"We have estimated that every 1,500 black mangroves planted can protect one linear mile of shoreline. Additionally, mature black mangroves will naturally release approximately 500 propagules each year," Graves said. "We are confident that barring any major hurricanes or significant climactic changes, the program will provide a substantial nature-based defense to coastal erosion and land loss in the targeted areas."

Chalmette High School students are growing 1,500 black mangroves for planting in 2018.



Volunteers assess an area before planting black mangroves during St. Bernard Parish's first planting event held in April.



Coastal Connections Takes the Show on the Road

This spring Louisiana Sea Grant (LSG) took its Coastal Connections Competition on the road to the University of Louisiana at Lafayette and Nicholls State University. The competitions showcased the research efforts and implications of 11 finalists at each university.

University of Louisiana at Lafayette winners:

Jaylyn Babitch, *Untangling phytoplankton from estuarine food webs*

Ryan James, *Anti-predator responses may alter energy dynamics in coastal habitats*

Claudia Laurenzano, *The role of fiddler crabs as indicators of food web responses to environmental change*

Nicholls State University winners:

Alexa Ballinger, *Population characteristics of crayfish in two hydrologically different Louisiana river-floodplain systems*

Kellyn LaCour-Conant, *Long-term Deepwater Horizon impacts on salt marsh plant-invertebrate relationships*

Megan Nepshinsky, *Feeding areas of breeding Royal terns on Isles Dernieres Barrier Islands Refuge*

Coastal Connections encourages graduate students to think and communicate about their work in a different way. Typically, research results are presented at conferences to audiences of similar disciplines. At these events, technical language is pervasive and methods are scrutinized. This competition cuts through the academic rhetoric. Students have to adapt their discussion to the general public, remove jargon and talk about the big picture.

The competitors are also restricted on time and content. Coastal Connections forces students to distill their research into a clear, compelling oration of no more than three minutes with the use of only two slides.

The top three finalists each received \$500 of research travel award money. This year's diversity of applicant's areas of study was reflected in the awardees.

The Coastal Connections Competition will return to the Louisiana State University on Sept. 22 for its annual fall competition. Plans are underway for a New Orleans-wide competition for next spring.



Left to right: Robert Twilley, Claudia Laurenzano, Ryan James, Jaylyn Babitch, Ken Krauss, Cherry Fisher May and Ana Osland



Left to right: Aimee Hollander, Craig McClain, Simone Theriot-Maloz, Kellyn LaCour-Conant, Alexa Ballinger, Megan Nepshinsky, Bruce Murphy and Robert Twilley

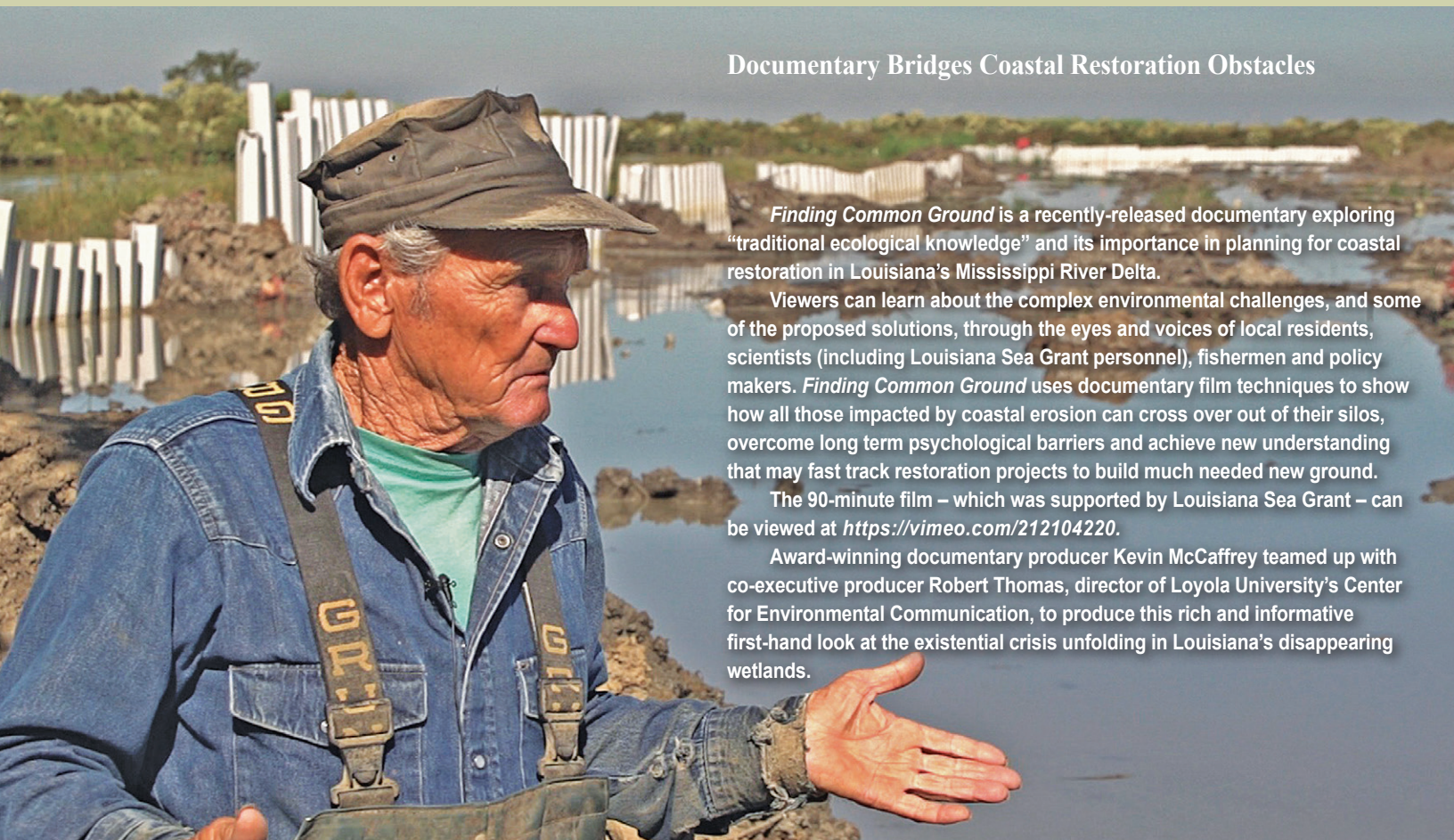
Documentary Bridges Coastal Restoration Obstacles

Finding Common Ground is a recently-released documentary exploring "traditional ecological knowledge" and its importance in planning for coastal restoration in Louisiana's Mississippi River Delta.

Viewers can learn about the complex environmental challenges, and some of the proposed solutions, through the eyes and voices of local residents, scientists (including Louisiana Sea Grant personnel), fishermen and policy makers. *Finding Common Ground* uses documentary film techniques to show how all those impacted by coastal erosion can cross over out of their silos, overcome long term psychological barriers and achieve new understanding that may fast track restoration projects to build much needed new ground.

The 90-minute film – which was supported by Louisiana Sea Grant – can be viewed at <https://vimeo.com/212104220>.

Award-winning documentary producer Kevin McCaffrey teamed up with co-executive producer Robert Thomas, director of Loyola University's Center for Environmental Communication, to produce this rich and informative first-hand look at the existential crisis unfolding in Louisiana's disappearing wetlands.



A Special Message from the Director of Louisiana Sea Grant

We are asking you – our stakeholders – to help Louisiana Sea Grant tell our story in response to a proposal in Washington, D.C., to eliminate the Sea Grant program. In March, the President sent Congress a request for drastic cuts to federal investments related to everything from the environment to health and human services and education.

One of the programs slated to be cut in the Fiscal Year (FY18) budget is the National Sea Grant College Program. If Congress approves this, we and the services we provide our state could be gone in a matter of months.

This cut would immediately eliminate funding dedicated to providing scholarships and fellowships to Louisiana college students, immediately stop research project funding addressing critical issues affecting Louisiana's economy and environment, and immediately end our ability to provide huge benefits to the state as summarized in the "Putting Science to Work" document (<http://tinyurl.com/kjldtpx>). The same would happen in each of the other 32 Sea Grant programs around the nation.

Sea Grant is lauded for its ability to responsibly use federal dollars, leveraged with private, local and state dollars, to address coastal issues identified as most important by our state constituents. Here in Louisiana, our coastal issues need every investment from the federal government that we can secure in order to deal with the significant threats to the seventh largest delta ecosystem in the world – the Mississippi River Delta – which brings wealth to our nation.

I want you to know that there is strong bipartisan support for Sea Grant in Congress. There has been for 50 years. I'm optimistic that this proposed impact will not happen to Sea Grant because of our strong support in Congress.

But this is where we need your help. It takes your support to tell our story to Congress about our value to the nation.

The President only makes requests for the federal budget – it is Congress that takes action when it comes to developing the budget. While the strong support for Sea Grant by members of Congress has not changed, the services in research and outreach to coastal communities are facing

drastic cuts in FY18. If members of Congress receive an outpouring of supportive letters and emails from people who deeply value our Sea Grant program, it will make a significant difference.

If you want to contact members of Congress about Sea Grant, we have letter templates with sample wording at www.laseagrant.org/about/did-you-know/ that you can download and personalize.

Please note that hard copy letters take months to arrive in Congressional offices. Because of that, Louisiana Sea Grant has made arrangements to have letters of support that are mailed, emailed or faxed to our offices hand-delivered to Congress. Simply send them to the address below my signature. If you want to email us your letter, please send it to rkron@lsu.edu.

If you wish to contact your representatives in Washington, D.C., directly, you can search for House of Representatives members email addresses at www.house.gov/representatives and Senate members at www.senate.gov/general/contact_information/senators_cfm.cfm. Some Congressional offices have online forms for receiving comments.

Thank you,

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Sea Grant Undergraduate Researchers Receive Awards

Two Louisiana Sea Grant-sponsored undergraduate students won awards at the Fourth Annual Louisiana State University Discover Day held in April. Both are 2016 Undergraduate Research Opportunities Program (UROP) students at LSU.

Amanda Fontenot won first place in the Science, Technology, Engineering and Math (STEM) category for her research poster titled *Eroding Wetland Soils in Coastal Louisiana's Barataria Bay Could Impact Future Climate and Sea Level Rise*. She also won a Tiger Choice Award, which is a people's choice honor. Fontenot's UROP faculty sponsor was John White.

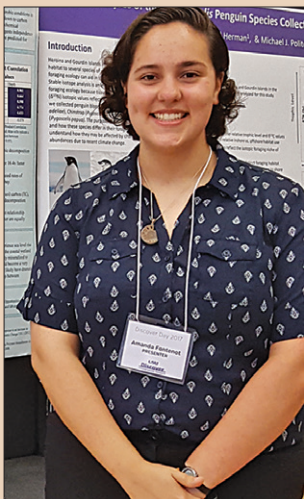
Shannon Matzke took home first place for her oral presentation *The Effects of Nutrient and Sediment Availability on Spartina patens Productivity*, also in the STEM category. Her UROP faculty sponsor was Tracy Quirk.

LSU students from all disciplines and colleges are eligible to compete in LSU Discover Day. Faculty and staff serve as judges.

"I congratulate both Amanda and Shannon," said Robert Twilley, LSG executive director. "UROP is one of the more effective ways for Sea Grant to stimulate research by supporting undergraduate students."

The Louisiana Sea Grant College Program established UROP in 1992. It provides talented undergraduate students interested in pursuing advanced studies in marine-related disciplines with hands-on research experience. Projects receive funding in the range of \$1,500-\$2,500. Applications are accepted each fall (due date is typically early December) for projects starting the following March.

For more information about UROP, visit <http://sg-webrhel.lsu.edu/research/student-research/urop/>.



Amanda Fontenot



Shannon Matzke



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