

Using Sponges to Monitor Long-term Pollution

Heavy metals are widespread contaminants in aquatic systems. However, their prevalence and the threat they pose to local ecosystems are not easy to monitor.

In a Louisiana Sea Grant-funded project, Stephanie Archer, assistant professor at Louisiana Universities Marine Consortium (LUMCON); Mary Miller, professor of biology at Baton Rouge Community College (BRCC); and Phoebe Zito, assistant professor at the University of New Orleans (UNO), looked at freshwater sponges as an indicator species for environmental heavy metal concentrations. Freshwater sponges are widespread filter feeders that remove up to 90 percent of the bacteria and viruses from the water they inhabit.

After analyzing 60 sponges from 45 sites, along with water and sediment samples from the same locations, the researchers discovered that more than half of the sponge samples exhibited detectable levels of heavy metals, such as aluminum, arsenic, cadmium, chromium, copper, nickel, lead and zinc. Notably, the sponges often exhibited significantly higher concentrations of heavy metals compared to the water samples, while concentrations in sediments were comparable.

"The initial results of this study suggests that sponges serve not only as effective bio-indicators but also as valuable tools for monitoring long-term pollution in freshwater ecosystems," stated Archer. "The elevated heavy metal levels detected in sponge tissue, particularly in comparison to surrounding water, underscores their remarkable sampling capabilities."

The research team employed Inductively Coupled Plasma Mass Spectrometry (ICP-MS) to quantify heavy metals in water, sponge tissue and sediment samples. A specific focus was placed on *Ephydatia fluviatilis*, the most commonly collected sponge in the study, providing insights into species-specific bio-accumulation patterns. A strong positive correlation was observed between heavy metal levels in water and those in *E. fluviatilis*, particularly for metals such as copper and lead.

Genetic analysis is currently underway for unidentified sponges, as some were challenging to identify due to the absence of gemmosclere spicules – essential microscopic characteristics required for definitive species identification.

One undergraduate-led project within this study investigated the presence of mercury in sponge tissue, although results are incomplete as of this writing. Furthermore, researchers observed malformed sponge structures potentially associated with heavy metal exposure – an area that necessitates further investigation.

Project findings will be shared at the upcoming 2025 World Sponge Community Conference, where the team will present new insights into bio-concentration factors and species-specific heavy metal accumulation.

Coastal Clips

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

Phoebe Zito (right), assistant professor of chemistry at the University of New Orleans, and Tamioka Palmer, a former undergraduate student at Baton Rouge Community College, collect sponge tissue for heavy metal analysis at Big Lake in New Orleans City Park.

Tribal Coastal Resilience Index Tool Now Available

Along the coast, tribal communities have thrived for countless generations, guided by tradition, self-sufficiency and a deep relationship with the natural world. But today, the threats of stronger storms, rising sea levels and other environmental change demand a new kind of preparation. As a result, the Tribal Coastal Resilience Index (TCRI) has been developed by Louisiana Sea Grant (LSG) in collaboration with the Pointe-au-Chien Indian



The Pointe-au-Chien Indian Tribe community.

Tribe (PACIT) and other partners, with support from the U.S. Environmental Protection Agency-Gulf of America Division and the National Oceanic and Atmospheric Administration Gulf of America Regional Collaboration Team.

The self-assessment tool – which can be downloaded from <https://tinyurl.com/msbtic3jy> – is designed to help tribal leaders and community members evaluate their disaster preparedness and resilience using existing community information. The goal is to identify vulnerabilities, guide resource allocation and ultimately strengthen the community's ability to recover from future disasters. Central to this process is the Resilience Index, which measures how quickly a community can restore basic services and functionality after a disaster, rated as low, medium or high.

Communities are asked to define two storm scenarios: a past severe event ("Bad Storm") and a hypothetical event 50 percent more intense ("Future Storm"). These scenarios help assess the impact on critical infrastructure, such as utilities, emergency facilities and transportation systems. The tool also prompts users to consider the location of these assets in flood-prone areas and their functionality post-disaster. Regular updates to the assessment – annually or biannually – are encouraged as conditions evolve.

In addition to infrastructure, the assessment explores community self-sufficiency, the protection of historic and cultural sites, the resilience of natural resources and the role of social and economic systems. It allows tribes to document strengths, identify areas for improvement and outline barriers – such as funding or regulatory and permitting processes for potential projects. The final Resilience Index serves as an internal planning tool and is not designed to be used for comparing communities.

"Resilience isn't just about surviving the storm; it's about coming back stronger. This assessment helps communities understand where they stand today and where they can focus their time and financial resources to strengthen their community for future generations," said Melissa Daigle, research attorney with LSG.

As part of the process of developing the TCRI tool, the collaboration team conducted a pilot TCRI workshop with the PACIT last fall. Based on the findings from that workshop, a community-based resilience project was identified and implemented with project funds in early 2025 that focused on strengthening a bulkhead boat dock used during storms, and retrofitting homes to better withstand wind impacts – all of which were damaged during Hurricane Ida. This work enhanced the tribe's capacity to protect critical infrastructure and housing against future storms, safeguarding community livelihoods and safety. The project benefited tribal members who rely on boats for fishing and vulnerable homes facing wind damage. The developed TCRI tool can be applied to resilience efforts in similar communities around the region.

For more information or assistance, contact Daigle at mtrosc2@lsu.edu.

Bui Moves into New Territory

Louisiana Sea Grant and LSU AgCenter marine extension agent Thu Bui has moved to a new territory.

She had covered St. Mary, Iberia and Vermillion parishes since 2007. She recently moved into the territory covered by Mark Shirley, who recently retired. That territory includes Acadia, Allen, Beauregard, Cameron, Calcasieu, Evangeline, Jefferson Davis, Lafayette and St. Landry parishes. Until someone is hired to fill her previous territory, she'll provide support to both areas.



Sims Joins LSG Education Program



Ferriday native Ocatvia Sims is Louisiana Sea Grant's newest education coordinator through Serve Louisiana AmeriCorps.

She is a graduate of Nicholls State University in Thibodaux, has served in the U.S. Navy, was an aquatic invasive species prevention technician with the National Park Service and was an AmeriCorps member in Minnesota.

"As a native of Louisiana with a degree in marine biology, I have been deeply involved in estuarine and marsh restoration efforts," Sims said. "I've contributed to oyster

reef deployments, native tree plantings and marsh grass installations through collaborations with the Coalition to Restore Coastal Louisiana, the Nature Conservancy and Common Ground Relief – all in an effort to preserve and restore Louisiana's vulnerable coastline."

"Ultimately, I hope to pursue a Ph.D. in marine sciences and work for a mission-driven nonprofit organization that serves both the environment and the people who depend on it," she added.

New Ocean Guardian Schools Announced

Four Louisiana schools have now been recognized as Ocean Guardian Schools by the National Oceanic and Atmospheric Administration (NOAA) – in partnership with the National Marine Sanctuary Foundation – for their hands-on, student-led ocean and watershed conservation efforts.

École Pointe-Au-Chien in Bourg became Louisiana's first Ocean Guardian School in 2023. Focused on coastal stewardship, students are restoring local ecosystems by planting native seedlings and promoting the protection of Louisiana's fragile coastline. This year, West Feliciana High School, along with the 4-H Coastal Clubs at Morgan City and Patterson High Schools, are joining the Ocean Guardian network.

West Feliciana High School will lead a campus-wide waste reduction effort based on the "6 Rs" (refuse, rethink, reduce, reuse, rot, recycle). Students will label storm drains to raise awareness about marine pollution, establish composting and recycling programs, improve trash storage, adopt sustainable purchasing practices and launch zero-waste lunches using reusable and compostable materials.

"These projects show what's possible when students are empowered to lead," said Ali McMillan, education coordinator with Louisiana Sea Grant and liaison to West Feliciana High School. "They're not only protecting their local environment but also building a culture of stewardship that extends beyond the classroom."

At Morgan City and Patterson High Schools, student-led Coastal Clubs are focusing on watershed restoration. Their shared projects will include removing invasive species, planting native vegetation, restoring fish habitats, stabilizing streambanks and revegetating local creeks.

"Empowering students to protect our oceans isn't just education, it's change. Through Ocean Guardian Schools, we're helping young people become champions of the planet, one small action at a time," said Thu Bui, Marine Extension agent with Louisiana Sea Grant and the LSU AgCenter. Bui is the liaison to the two schools' 4-H Coastal Clubs.

"It's inspiring to see students across Louisiana taking action to protect their watersheds and coastal ecosystems," said Dani DiIullo, education director at Louisiana Sea Grant. "Through the Ocean Guardian School program, students are gaining the knowledge and skills to be lifelong environmental stewards."

The Ocean Guardian School program, managed by NOAA's Office of National Marine Sanctuaries and funded by the National Marine Sanctuary Foundation, empowers schools to protect local watersheds and marine ecosystems through environmental projects that engage students, educators and communities in significant ways. Louisiana Sea Grant (LSG) serves as the state's liaison for the Ocean Guardian schools. LSG identifies, recruits and supports the schools throughout the process.

Learn more at: https://sanctuaries.noaa.gov/education/ocean_guardian.



Volunteers – including Louisiana Sea Grant personnel – recently helped with some cleaning and paint-prep work at the École Pointe-Au-Chien Ocean Guardian School.

Submerged Aquatic Vegetation Restoration Research Findings

Submerged aquatic vegetation (SAV) ecosystems support many desirable fish and wildlife species, improve water quality and provide shoreline stabilization – all while sequestering carbon in soils. Yet, SAVs are vulnerable to a litany of environmental changes, sea level rise and coastal development. Nowhere is that more apparent than in the Pontchartrain Basin.

With the goal of uncovering the best means of SAV restoration in the basin, Eva Hillmann, professor of biology at Southeastern Louisiana University, and her research team embarked on a two-year study funded by Louisiana Sea Grant – *Seed to Seagrass: Planting and Seeding Re-Enforce Submerged Aquatic Vegetation Habitat Resiliency in the Pontchartrain Estuary*. What they discovered is encouraging.

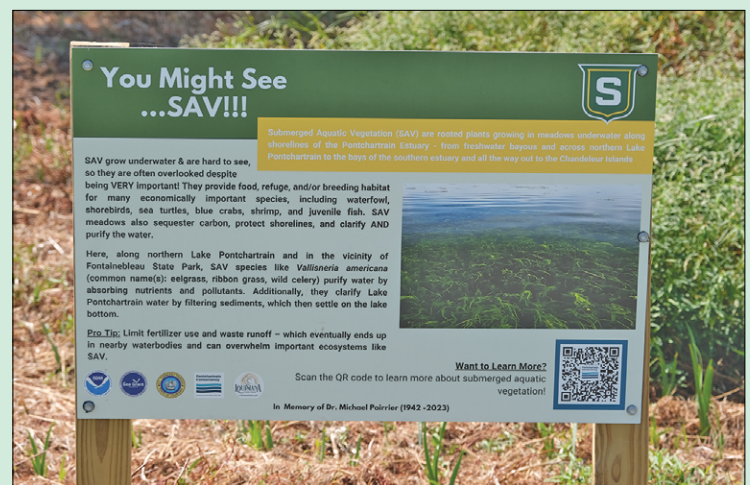
"The big takeaway is that after a year, survival rates in the three restoration sites studied were 25 to 35 percent," said Hillmann. "That aligns with survival rates globally. So, we know we're on the right path."

"We also found that the restoration technique – transplanted bare root seedlings compared to hessian bag wrapped seedlings – didn't matter as much as which species was targeted. One species performed better each time in each area," Hillmann added.

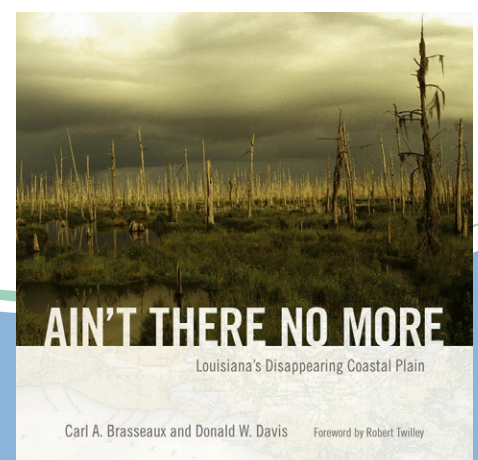
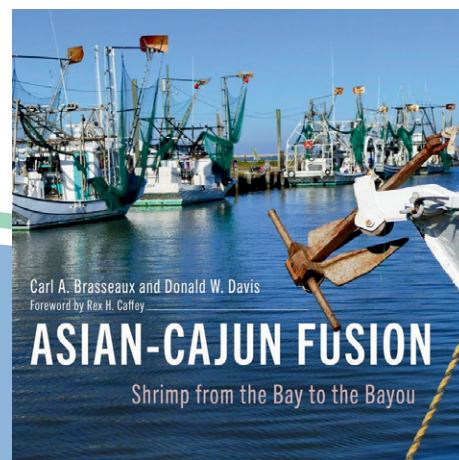
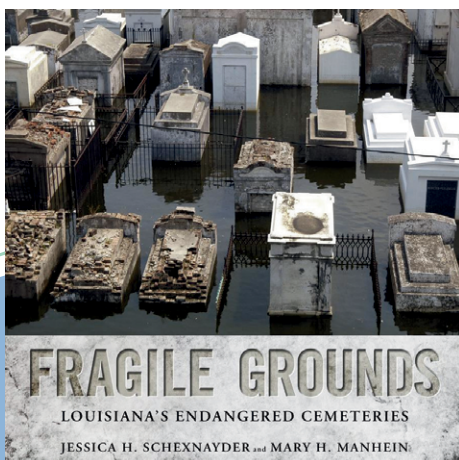
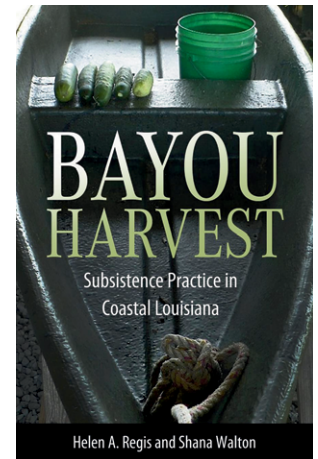
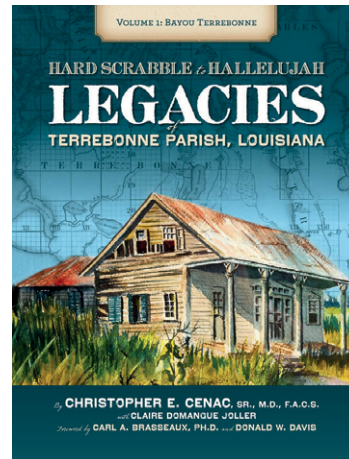
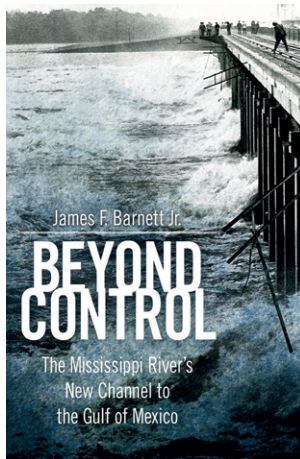
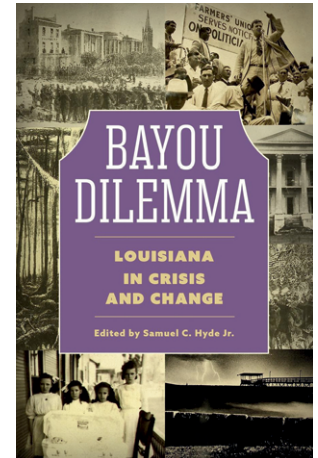
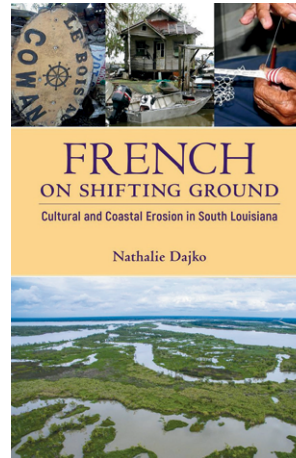
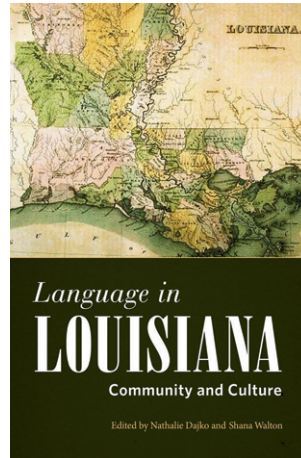
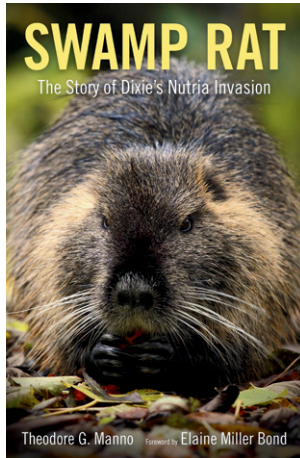
At each of the three restoration sites, two dominate SAV species were evaluated: the Chandeleur Islands, shoal grass (*Halodule wrightii*) vs. turtle grass (*Thalassia testudinum*); nearshore Lake Pontchartrain, widgeon grass (*Ruppia maritima*) vs. wild celery (*Vallisneria americana*); and Big Branch National Wildlife Refuge, wild celery vs. Eurasian milfoil (*Myriophyllum spicatum*). Shoal grass was the more resilient species at the Chandeleur Islands site. Wild celery fared the best at the other two sites.

Although the restoration technique wasn't a factor in plant survival, seeding is less costly and less time consuming compared to hand transplanting SAVs – making it the preferred method for larger-scale restoration efforts. In greenhouse experiments, Hillmann's team found that wrapping seeds in burlap with sediment appears to be the best approach. She hopes to field-test that premise in a future Sea Grant-funded project.

For the nature enthusiast interested in learning more about SAVs, educational signage has been installed at three locations – Fountainebleau State Park, Camp Salmen Nature Park and the Slidell Fishing Pier – that summarizes the importance of submerged aquatic vegetation with SAV specifics for that location. The signage, part of Hillmann's Sea Grant project, also includes a QR code to even more material online.



One of the SAV signs at Fountainebleau State Park





America's Third Coast Series

This series offers readers important insights into a timely discussion on restoring and rehabilitating the Gulf Coast with the coastal population, for the first time, at the forefront of the nation's consciousness.



Scan to order!



PAPERBACK TITLES ARE IN BOLD

| <u>Qty.</u> | <u>Title</u> | <u>List Price</u> |
|-------------|---|-------------------|
| _____ | Ain't There No More | \$30.00 |
| _____ | Asian-Cajun Fusion | \$35.00 |
| _____ | Bayou Dilemma | \$30.00 |
| _____ | Bayou Harvest | \$25.00 |
| _____ | Beyond Control | \$25.00 |
| _____ | Fragile Grounds | \$30.00 |
| _____ | The Gulf of Mexico Research Initiative | \$25.00 |
| _____ | French on Shifting Ground | \$35.00 |
| _____ | Hard Scrabble to Hallelujah, Volume 1: Bayou Terrebonne | \$80.00 |
| _____ | Language in Louisiana | \$30.00 |
| _____ | The Mississippi Gulf Coast Seafood Industry | \$28.00 |
| _____ | Swamp Rat | \$28.00 |
| _____ | Teche | \$25.00 |

ORDER ONLINE

www.upress.state.ms.us

BY PHONE

(800) 737-7788 or (601) 432-6205

BY FAX

(601) 432-6217

BY MAIL

University Press of Mississippi
3825 Ridgewood Road
Jackson, MS 39211-6492

SHIPPING AND HANDLING

US: \$5.00 for the first book, \$3.00 each additional book

International: \$10.00 per book

SALES TAX

8% sales tax for orders in Mississippi

SHIPPING INFORMATION

Name _____

Address _____

City _____

State/Zip _____

Phone _____

E-mail _____

METHOD OF PAYMENT

Shipping _____ Subtotal _____

MS Sales Tax _____ Total _____

☐ VISA ☐ American Express ☐ Discover
☐ MasterCard ☐ Check or Money Order payable to
University Press of Mississippi

Card No. _____

Exp. Date _____ Security Code _____

Name on Card _____

Signature _____

3825 Ridgewood Road / Jackson, MS 39211-6492

Orders: 1-800-737-7788 / Fax: 1-601-432-6217

www.upress.state.ms.us

AMERICA'S
THIRD
COAST



LOUISIANA STATE UNIVERSITY

Louisiana Sea Grant College Program

Sea Grant Building • Baton Rouge, LA 70803-7507

Non-Profit Org.
U.S. Postage
PAID
Permit No. 733
Baton Rouge, LA



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

Julie Lively,
Executive Director

Editors: Roy Kron, Hannah Bellone.
Art: Robert Ray

The Louisiana Sea Grant College Program is part of the National Sea Grant College Program maintained by the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. Sea Grant, a unique partnership with public and private sectors, combining research, education and technology transfer for public service, is the national network of universities meeting changing environmental and economic needs of people in our coastal, ocean and Great Lakes regions.

© Louisiana Sea Grant College Program. Articles within this publication or quotations from them may be used or reproduced for educational purposes with a formal credit to the Louisiana Sea Grant College Program. This publication or portions of it may not be used, printed or electronically transmitted for other purposes without authorization from the Office of Communications, Louisiana Sea Grant. Please send a copy of all materials in which this publication or any portion of it is reproduced to the Office of Communications, Louisiana Sea Grant.

Please send change of address, subscription requests, and correspondence to *Coastal Clips*, Louisiana Sea Grant Communications Office, Louisiana State University, Baton Rouge, LA 70803. (225) 578-6564. *Coastal Clips* is published four times a year. Subscriptions are free upon request. Visit us online at www.laseagrant.org.

NUMBER 68
FALL 2025

Coastal Clips

Adopt-a-Pond Training

This summer, 10 teachers from nine schools across St. Tammany Parish came together to bring AgScience and stormwater ecology to life as part of the Adopt-a-Pond program for teacher professional development. During the workshop, teachers rotated through four interactive stations that displayed engaging student activities:

- Wildlife (touch boxes, animal tracks and wildlife scat identification)
- Agriculture and wetland soil sampling and analysis
- GIS games (mapping and watershed analysis)
- Watershed and water quality analysis

Teachers also participated in a hands-on planning session to help bring outdoor learning into their classrooms and learned how to plan field trips that align with science standards to spark student curiosity in natural local landscapes. Participating teachers came from six junior highs – Creekside, Fifth Ward, Lee Road, Boyet, Monteleone and Fontainebleau – and three high schools – Salmen, Mandeville and Mandeville.

