



# LOUISIANA UNIVERSITIES MARINE CONSORTIUM

## ANNUAL REPORT FISCAL YEAR 2024

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# A MESSAGE FROM OUR EXECUTIVE DIRECTOR

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Fiscal year 2023-2024 was one of both growth and revitalization for LUMCON. We held the ribbon cutting for our new Blue Works facility at the Maritime Campus on Dickson Road in Houma. That campus also saw the construction of the new boat slip and bulkhead project begin and the legislature allocate additional funding so the new Marine Operations Center will be able to go out for bid in FY25. The legislature also allocated funds to allow the solicitation for the construction of the replacement for the RV Pelican to be released in FY25. LUMCON saw its faculty grow with the hiring of Dr. Havalend Steinmuller who began her appointment at the Marine Center in May and Dr. Zhengchen (John) Zang who will begin his appointment at Maritime Campus in FY25. FY 2024 also saw significant renovations and upgrades to our facilities in Cocodrie including an upgrade to our public spaces at the Marine Center, acquisition of new equipment and instrumentation, upgrades to the furniture in the dorms and apartments, repurposing of the old collections space, and several deferred maintenance projects. Additionally, we were able to hold our first Open House at the Marine Center since before the pandemic and the impacts of Hurricane Ida.

This past year LUMCON continued focus on strengthening collaborations with our consortium members and expanding our partnerships within the state and beyond that strengthen Louisiana's position as a leader in coastal and marine science innovation, collaboration and community action. In March 2024, we held the second annual State of the Consortium meeting on the Houma Maritime Campus which provided a great opportunity to share our new facility and growth plans with our consortium partners and continue to develop new opportunities for members to collaborate moving forward. LUMCON had several new collaborative accomplishments during FY25 in research and in education & outreach programs. The Barataria Terrebonne National Estuary Program (BTNEP) saw Bren Haase join the team as its new director in June. LUMCON and state partners continue to work with NOAA towards the Atchafalaya National Estuarine Research Reserve (NERR) being designated in 2025. Finally, LUMCON has begun to lay out its future plans with the release of our Strategic Plan Framework for the next 5 years which can be found on our website. We are looking forward to continued growth during the coming year.

Sincerely,



Dr. Brian Roberts, Ph.D.  
Executive Director and Chief Scientist

# CONSORTIUM

The [LUMCON Strategic Plan Framework](#) explains LUMCON’s structure, mission, vision, core principles and goals and this annual report is arranged to reflect this organization. LUMCON is a program of the Louisiana Board of Regents whose mission is to promote, facilitate and conduct research and education collaborations among Louisiana’s universities in marine and coastal sciences relevant to the sustainability of coastal and marine environments of the Gulf of Mexico. LUMCON’s vision is “Our coasts and oceans restored and thriving through innovation, collaboration, and community.” This mission and vision are achieved through the implementation of our core principles: **CONNECT**--enhance collaboration by linking the consortium through stronger, federal, state, and local partnerships; **ENRICH**--give back to the community through education and outreach initiatives; and **TRANSFORM**--lead and partner in scientific innovations designed to stabilize and strengthen coastal and marine environments for the state and the nation.

LUMCON is a consortium of all 32 postsecondary institutions (including the members of the Louisiana State University System, University of Louisiana System, Southern University System, and the Louisiana Community and Technical College System (LCTCS)) plus the ten members of the Louisiana Association of Independent Colleges and Universities (LAICU).



LUMCON is unique in the nation in its structure and focus. Its success as a statewide resource requires deep engagement of consortium members, partners, and communities across Louisiana. The consortium's goal is to ensure that Louisiana assumes leadership of coastal and marine science for the nation by leveraging the collective strengths of all of its members and partners to optimize our shared competitiveness at regional, national, and global scales. LUMCON's open and collaborative structure is designed to maximize opportunities for members to engage with each other and LUMCON's core facilities and services.

One of LUMCON's primary goals in FY24 was to continue to focus on the consortium. We hosted the second annual State of the Consortium meeting at the new Blue Works facility on the Houma Maritime Campus in March 2024. We again brought representatives from over 30 consortium member institutions to this productive meeting which began with a presentation of the Strategic Plan Framework and our plans for increasing engagement across the consortium and focused on specific initiatives and collaborations to focus on in the coming year. Our intention is to host these in-person meetings annually with additional opportunities for engagement throughout the year.

LUMCON is strongly committed to helping our consortium members create and maintain an academic pipeline for maritime careers. That is why LUMCON strives to offer accessible, low cost, high-quality, and relevant opportunities in marine science and other STEM disciplines for Louisiana students. LUMCON's E&O programs are playing an integral role in the workforce development component for the NAS Gulf Research Program's MissDelta project co-led by **Louisiana State University** and **Tulane University** that includes collaborations with **Southern University of Baton Rouge**, **Xavier University of New Orleans**, **Grambling State University**, **Dillard University**, **University of Louisiana at Lafayette**, and the Water Institute as well as out of state institutions Jackson State University, Alcorn State University, University of Southern Mississippi, University of Central Florida, and the College of William and Mary. Similarly, Dr. Roberts is on the Workforce Development Team for the NSF Engines (Future Use of Energy in Louisiana (FUEL)) project led by **Louisiana State University** which has a goal to support energy transition and decarbonization through technology and talent development across the state's industrial corridor. Our pre-K to gray education programs continue to fuel this pipeline through the success of our high school residential camps (LUMCON's Estuarine Awareness and Discovery (LEAD) Camp and Field Marine Science (FMS) Camp) and our Teacher Workshops all of which had successful programs in FY24 and are being at least partially supported by the above initiatives.



LUMCON had a productive year in engaging undergraduate students within and outside of the consortium. Our STEM Prep program is designed to offer relevant and experiential opportunities for freshman or sophomore-level students that are underrepresented and currently enrolled in a Louisiana institution. Students have the opportunity to learn transferable lab and field research skills through work experience, field trips, and skill development workshops while becoming immersed in a professional STEM career setting early in their academic careers. The summer 2024 cohort consisted of six students from **Baton Rouge Community College, River Parishes Community College, Dillard University, Louisiana Christian University, LSU-Eunice** and **LSU-Baton Rouge**. Our NSF-funded Research Experiences for Undergraduates program hosted its 14th cohort in summer 2024. It consisted of seven interns including a student from **University of New Orleans**. LUMCON's semester courses in fall 2023 (Oceans and Society) and spring 2024 (Changing Coastal Oceans) each set record enrollments. Twenty three students from **University of Louisiana Lafayette, Nicholls State University,** and **University of New Orleans** participated in Oceans and Society and forty nine students from **LSU-Shreveport, Nicholls State University, University of Louisiana Lafayette,** and **University of New Orleans** participated in Changing Coastal Oceans. Additionally, a total of 299 students from **University of New Orleans, LSU-Baton Rouge, University of Louisiana Lafayette, Southeastern University, Tulane University, Baton Rouge Community College** and **Louisiana Tech University** took field trips to LUMCON facilities in FY24 for a total of 3044 LUMCON educator contact hours.

LUMCON faculty continued to excel at establishing collaborative research programs with many of our consortium members. LUMCON faculty had a total of 16 funded research grants which either continued (11) or began (5) in FY24 that included collaborations with scientists from consortium member institutions (**Louisiana State University, LSU Ag Center, University of Louisiana Lafayette, University of New Orleans, Nicholls State University,** and/or **Tulane University--not including all of the institutions included in the MissDelta and NSF Engines (FUEL) projects**). LUMCON faculty published a total of 6 peer-reviewed publications in FY24 that included co-authors from consortium member institutions (**University of Louisiana Lafayette, Louisiana State University, LSU Ag Center,** and/or **University of New Orleans**). Additionally, LUMCON faculty collaborated on numerous unfunded and/or pilot research projects and on the development of proposals with collaborators from these same institutions as well as other institutions within the consortium. During FY24, LUMCON faculty directly supervised a total of 10 graduate students at **University of Louisiana Lafayette, Louisiana State University, LSU Ag Center,** and **University of New Orleans**. Graduate students from **University of Louisiana Lafayette, Louisiana State University, LSU Ag Center, University of New Orleans, Tulane University,** and **Nicholls State University** all conducted research on LUMCON's DeFelice Marine Center grounds and/or used it as a base of operations for conducting their research.



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# INSTITUTION

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The primary institutional goal for LUMCON moving forward is to position itself as a hub for coastal and marine science research, education and community engagement at local, state, regional and national levels. LUMCON showed great progress in this area during FY24. LUMCON has been expanding established partnerships and building new collaborations at both the local and state levels. This involves growing partnerships with local government and native communities on projects ranging from safe harbors, environmental monitoring, and resiliency planning. One example is LUMCON's partnership in the Urban Water @ 10 program. This collaboration with the Tulane ByWater Institute, Greater New Orleans Foundation, Greater New Orleans, Inc, the City of New Orleans Office of Resilience and Sustainability, the University of New Orleans Center for Hazards Assessment, Response & Technology (UNO-CHART), and Waggoner & Ball Architects is focused evaluating the achievements and lessons learned in the ten years since the release of the Greater New Orleans Urban Water Plan in November 2013 and developing recommendations to inform and advance the next decade of Urban Water Plan implementation. For details on this program see: <https://www.gnowater.org/>. LUMCON partnered with the Pointe-au-Chien Indian Tribe (PACIT) as well as LA Sea Grant, and the Gulf of Mexico Coastal Ocean Observing System (GCOOS) to develop a successful proposal to fund the implementation of an expansion of our environmental monitoring program with two new stations that directly benefit the PACIT and their ongoing projects and activities. At the state level, LUMCON continues to collaborate with the Coastal Protection and Restoration Authority (CPRA) on several projects including the designation of the Atchafalaya NERR, contributing to the Coastal Master Plan, participation in the Gulf Coast Carbon working group, and the contribution to numerous research projects. Over the past year, LUMCON has also begun to collaborate with The Water Institute on several efforts including blue carbon assessments, bluetech initiatives, and collaborative research proposals. LUMCON is also partnering with the TWI, the Greater Lafourche Port Commission, and others on the development of the Partnership for our Working Coast (POWC). Finally, LUMCON staff continue to hold numerous advisory panel and board posts at organizations ranging from local, state, national and international levels.

The opening of the Blue Works facility on the Houma Maritime Campus that we share with **Fletcher Technical Community College** has already expanded our ability to serve as a hub for collaboration. Between the lecture hall, exhibit space, large conference rooms, flex spaces, and education labs, LUMCON now has the ability to host groups of varying sizes in Houma. In addition to serving our staff and programs and our consortium partners, this facility provides much needed meeting spaces for the community and expands our ability to serve as a community and collaboration hub.



# LUMCON OPEN HOUSE

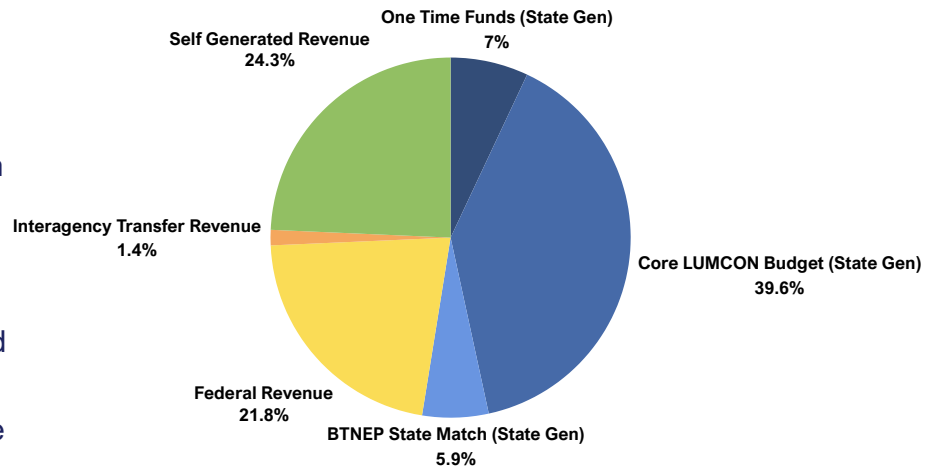
On April 13, 2024, LUMCON was able to welcome back the public to the DeFelice Marine Center for our first Open House event since before the pandemic and the impacts of Hurricane Ida. This important event displayed LUMCON's resilience and commitment to building on its great legacy of accomplishments in coastal and marine science research and education from our Marine Center in Cocodrie which continues to be the premier living laboratory for coastal change for the region and state. The event highlighted the important role LUMCON plays as a community hub with approximately 1000 people touring the facility and vessels and experiencing diverse exhibits, plays, and activities over the 6 hour event. Our staff thoroughly enjoyed engaging with students of all ages at the successful event. We look forward to hosting the community at the Maritime Campus in spring 2025.



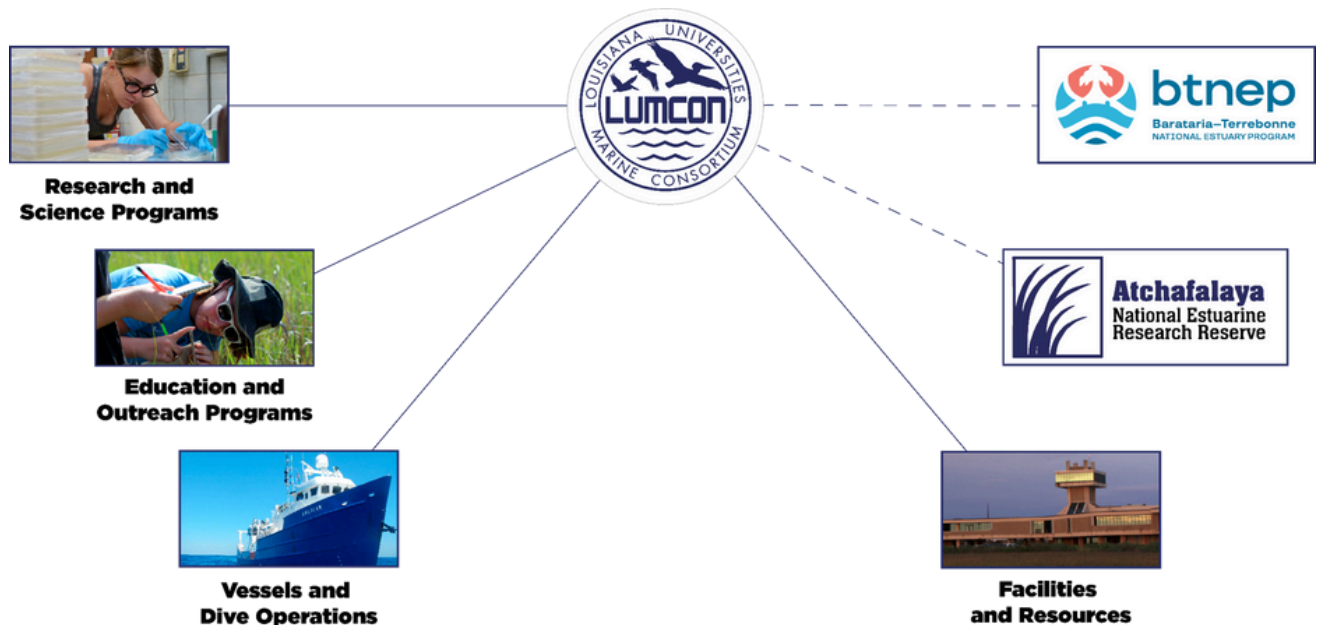
# FINANCES AND DEVELOPMENT

LUMCON’s total revenues in FY24 (\$14.3M) were higher than FY23 (\$11.2M) reflecting an increase in state funding support as well as LUMCON’s continued recovery from Hurricane Ida in FY22. Since then, LUMCON has made strides in rebuilding facilities and replacing necessary equipment to build total revenue comparable to FY21 (\$14.2M). With new grants awarded during the past two fiscal years it is anticipated that the federal revenue will increase in FY25.

## LUMCON Total Revenue



**LUMCON is a physical presence and statewide resource** located on the coast that consists of research and science programs, education and outreach, facilities (Marine Center in Cocodrie and Maritime Campus in Houma), and vessels and dive operations. It also serves as the host state agency for two federally supported affiliates (Barataria-Terrebonne National Estuary Program and the soon to be designated Atchafalaya National Estuarine Research Reserve).



The remainder of the annual report is divided into distinct sections representing each of these components of LUMCON.





# RESEARCH AND SCIENCE

## MEET THE FACULTY



**DR. STEPHANIE  
ARCHER**



**DR. MARSHALL  
BOWLES**



**DR. KEVIN  
DU CLOS**



**DR. ALEX  
KOLKER**



**DR. GUILLAUME  
RIECAU**



**DR. BRIAN  
ROBERTS**



**DR. HAVALEND  
STEINMULLER**

In FY24, the faculty at LUMCON made significant strides in research, collaboration, and education, contributing to a deeper understanding of coastal and marine ecosystems. LUMCON faculty participated in 29 continuing and 9 new research grants during the year (Appendix A). Research activities resulted in 12 scientific publications during FY24 (Appendix B). The faculty also gave 18 invited seminars and an even larger number of contributed presentations at conferences during this past year.

Dr. Havalend Steinmuller joined the LUMCON faculty with her laboratory based at the Marine Center in Cocodrie in May 2024. Dr. Steinmuller earned a BS and MS from LSU and PhD from the University of Central Florida. She completed postdoctoral work at UCF, Florida International University, Utah State University and Florida State University. She began her first faculty appointment at Dauphin Island Sea Lab in January 2023 prior to joining us at LUMCON in FY24.

Brief highlights of the research activities of individual faculty members follow:

Dr. **Stephanie Archer's** Benthic Ecology Lab focused on three main projects during FY24: 1) Assessing how pre-existing conditions control the impact of multiple stressors in sea grass beds, 2) tracking biodiversity on oyster and artificial reefs in Louisiana's estuaries, and 3) assessing whether or not sponges act as natural passive samplers of heavy metals.



Dr. **Marshall Bowles** led several oceanographic research expeditions in the Gulf of Mexico exploring methane fluxes (and other biogeochemical cycles) from the sea floor. His team also focused on describing patterns in and controls on methane and greenhouse gas fluxes from Louisiana coastal marshes. Dr. Bowles served as lead instructor for “Changing Coastal Oceans”.

Dr. **Kevin Du Clos**'s primary research foci of FY24 were on diatom sinking and oyster larval abundance. An ongoing project examines how diatoms control their sinking speeds in response to changing conditions. His group also started a weekly program to quantify oyster larval abundance using a flow-through imaging system with the goal of supporting oyster restoration work.

Dr. **Alex Kolker** continues to study the development of Neptune Pass which is the largest offshoot of the Mississippi River to develop in almost a century. He has also become increasingly involved in studying climate technology and blue economy.

Dr. **Guillaume Rieucou**'s Coastal Behavioral Ecology Lab focuses on fish and marine mammals ecology and conservation. Many of his current research activities employ an ARIS high-resolution imaging sonar. Dr. Rieucou also serves at the lead instructor of LUMCON's “Oceans and Society” course offered each fall semester.

Dr. **Brian Roberts**'s Ecosystem Ecology and Biogeochemistry Lab had a busy year with projects focused on marsh vegetation and gas flux dynamics, ribbed mussels as a living shoreline augmentation, wetland methane fluxes at local, landscape and national scale, methane fluxes from marine sediments, dredging impacts on primary production and nutrient cycling, and urban water.

Dr. **Havalend Steinmuller** began her LUMCON faculty appointment in May 2024. Her efforts have been focused on setting up her research laboratory, initiating and maintaining collaborations both within and external to the consortium, and writing proposals.

Collectively, these efforts reflect LUMCON's commitment to advancing coastal and marine science and fostering collaborative research that addresses pressing environmental challenges through innovation.



# EDUCATION AND OUTREACH

In FY 24, we continued to invest in expanding our programs and partnerships to further remove barriers so learners can concentrate on becoming highly skilled STEM professionals that will build Louisiana's prestige as a leader in coastal and marine science fields. The initiatives that we focused on this past year aimed to expand our community's access to STEM education. Through these activities, we impacted learners by inspiring them to explore coastal and marine science with the perspective that they have a significant role in how we understand our environment, envision future advancements in technology and data science, inspire our future ocean exploration, and expand the traditional thinking of what coastal and marine science careers look like. Our commitment to serving learners is a core value and part of LUMCON's mission. The integration of the LUMCON research and education programs has become part of the foundation of our institution. While the practice of combining research activities with teaching in an educational setting is not new, LUMCON does it differently because each learner engaged in education activities becomes a part of the research community contributing to our understanding of Louisiana's coastal and marine environments that are tangible and relevant. Providing experiences where learners can see the effect of their contributions helps to develop trust in science, build confidence in their ability to understand and do science, gain a deeper understanding of the complex ecosystems and the issues that affect them, and develop critical thinking skills and job-readiness skills.



**Career-Connected Learning Programs**

LUMCON emphasizes mentorship to help students and young professionals navigate STEM pathways. Our Graduate Student Fellowship, REU, STEM Prep, and Student Instructor programs connect mentors with students, preparing them for the workforce through training and professional development. By engaging high school and undergraduate students in peer mentorship, we foster a community that supports future STEM leaders tackling complex environmental challenges.

**NEW COLLABORATIVE INITIATIVES**

**Deepening Engagement through New Partnerships**

This year, LUMCON's Education & Outreach (E&O) team focused on strengthening partnerships to better serve our community and adapt to Louisiana's educational needs. Collaborating with consortium members allows us to offer effective programs for diverse learners.

**Ripple Effect Partnership**

Partnered on a NAS-GRP project to integrate water-related field experiences into 9th-grade environmental science at five Collegiate Academies, impacting roughly 3,750 students over the next five years.

**STEM Library Lab Collaboration**

Partnership engaged 174 New Orleans area students in coastal science research activities in FY24 through funding the Brown Foundation Ready-to-Go program, with expanded opportunities planned for FY25.

**Mississippi River Delta Transition Initiative**

LUMCON is providing opportunities to help improve the future quality of the research workforce by training and mentoring a new, more diverse generation of young science professionals through our role in this \$22M, five-year NAS-GRP project on the geological, economic and cultural future of the Mississippi Delta.

**NSF Coastal Methane Research**

LUMCON is providing place-based education experiences to empower students and the public on wetland methane dynamics through this collaboration with researchers at the University of Tennessee, University of Kentucky, Rowan University, LSU and LUMCON on this 5 year project.



# GROWING OUR REACH AND IMPACT

Our Houma facility, Blue Works, is an expansion that will help LUMCON realize new ways to support and achieve its mission in education by expanding our expertise in engineering and technology-focused research within the state to lead the way into new and exciting scientific research that benefits us locally, nationally and globally. Programs at Blue Works began in FY 24. The Blue Works programs are designed to help Louisiana residents learn more about the scientific research being conducted on Louisiana’s coast and the Gulf of Mexico. These are opportunities for people to interact with a LUMCON scientist and educators in a new and exciting facility. Blue Works programs will include Science Talk seminars, summer camp programs, after school program, homeschool marine science semester, field trip programs, and community workshops.



**205**

CREDITS AWARDED TO CONSORTIUM MEMBER STUDENTS



**299**

UNDERGRAD AND GRAD STUDENTS SERVED THROUGH FIELD EXPERIENCES



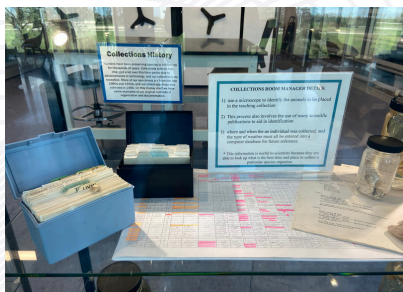
**592**

K-12 STUDENTS SERVED THROUGH FIELD EXPERIENCES



**1,630**

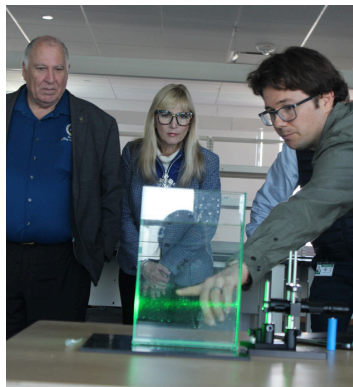
TOTAL PUBLIC ENGAGEMENTS THROUGH EVENTS AND WORKSHOPS



# FACILITIES AND RESOURCES

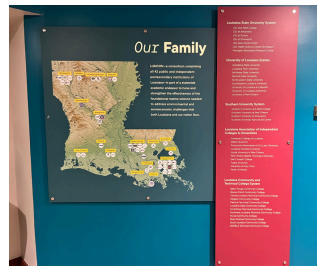
## BLUE WORKS FACILITY RIBBON CUTTING

On December 7, 2023, LUMCON celebrated the ribbon cutting of the new Blue Works facility, located on the Houma Maritime Campus it shares with Fletcher Technical Community College in the center of Terrebonne Parish's maritime industry. This state-of-the-art maritime center marks a significant expansion of LUMCON's research and capabilities in engineering and technological approaches to coastal issues rather than a relocation. The facility houses cutting-edge research and education laboratories, spaces for collaborative working groups or meetings, formal and non-formal meeting spaces, a flexible lecture hall, a large exhibit space, a library, our newly revitalized natural history collections, and pond access. Blue Works strengthens LUMCON's mission to enhance its impact in the region, fostering closer ties with the community while providing new opportunities for scientific innovation and education through industry partnerships.



# Marine Center Revitalization

Prior to hosting Open House in April 2024, LUMCON embarked on a project to revitalize and upgrade the public spaces of the DeFelice Marine Center through the assistance and support of the Board of Regents. Hurricane Ida caused extensive damage to the Marine Center which required replacement of many walls and contributed to the degradation of many of the displays in the facility. Through this project we were not only able to repair damage areas but we were able to provide engaging content and wayfinding that greatly improves the experience for those that both work at and visit the Marine Center. The images below provide a few glimpses of our revitalization efforts. We look forward to showing them to you in person on your next visit to Cocodrie.



## OTHER IMPROVEMENTS

### Marine Center Roof Replacement

In August 2023, the project replacing the roofs of both LUMCON's DeFelice Marine Center and maintenance building was completed. The project involved installing a more durable, weather-resistant system to safeguard the building and ensure continued operations.



### Marine Center Apartment and Dorm Furniture Upgrades

In June 2024, LUMCON completed a comprehensive upgrade of the furniture in 24 on-site apartments and dorms. The below images show some of the improvements in dorm rooms.



### Marine Center Wet Lab Foundation Repairs

In FY24, LUMCON began critical foundation repairs for the Wet Lab, addressing damage caused by Hurricane Ida. The contract was awarded to United Restoration and Preservation, Inc., with construction starting on April 1, 2024, and an expected completion date of October 2024. These repairs will facilitate the completion of our renovation to our Wet Lab facilities..

### Maritime Campus Bulkhead and Boat Slip Project

In Fiscal Year 2024, LUMCON began construction on a new bulkhead and boatslip project to provide essential docking for the RCRV Gilbert R. Mason and RV Pelican Replacement. Awarded in FY24 and expected to be completed in early 2025, this project represents the second phase of LUMCON's build out on the Maritime Campus. The next phase will include the construction of the new Marine Operations Center which will go out for bid in FY25.





# VESSELS AND DIVE OPERATIONS

## R/V PELICAN

LUMCON's flagship University-National Oceanographic Laboratory System vessel, R/V Pelican, conducted 164 operational days in FY24. This July, R/V Pelican welcomed its first official UNOLS MATE intern in over five years. This internship was focused around learning the responsibilities of a sea-going marine technician such as deck operations, data collection, computer network management, and radio communications. The intern was able to participate in two



annual, highly regarded research projects: Dr. Rabalais' hypoxia and ocean acidification survey along the Louisiana and Texas coasts, as well as Dr. Fitzsimmons' acoustic mooring cruise around the entirety of the Gulf of Mexico. UNOLS Research Vessel Technical Enhancement Committee was highly impressed by the level of training received during this internship.



**ROV Beagle is used to observe and collect corals**

## R/V POINT SUR

Owned by the University of Southern Mississippi and managed by LUMCON, R/V Point Sur successfully conducted 128 research days sailing out of Cocodrie, LA and Gulfport, Mississippi. R/V Point Sur also welcomed their first official UNOLS MATE intern in over five years and taught them invaluable skills onboard three unique cruises: one performing coral restoration using an ROV, one surveying fish populations using a MOCNESS net, and one collecting mud samples using different sediment cores.

## R/V ACADIANA AND SMALL VESSELS

LUMCON's signature education vessel, R/V Acadiana, sailed a total of 41 days conducting research and an additional 33 days focusing on educational purposes. LUMCON's small vessel fleet aided researchers and educators in wetland and nearshore coastal activities for a total of 264 day trips. These trips included 97 for education, 164 for research, and 3 for outreach activities.



## R/V GILBERT R. MASON

The third vessel in the National Science Foundation's Regional Class Research Vessel fleet, the R/V Gilbert R. Mason, will be jointly operated by the Louisiana Universities Marine Consortium (LUMCON) and the University of Southern Mississippi to support the Gulf-Caribbean Oceanographic Consortium. All three vessels are being built in Houma at Bollinger Shipyard. Scheduled for delivery by January 2027, the vessel is expected to begin full oceanographic operations in January 2028.



*The superstructure of R/V Gilbert R. Mason in transit from Amelia to Houma*



## R/V PELICAN REPLACEMENT

The Louisiana Legislature made additional funding available during the spring 2024 legislative session that allows for the state to work forward with the selection of the shipyard to construct the new 125 foot long vessel. Once the contract is signed, it is anticipated that the build will take two years to complete.

## DIVE OPERATIONS

In 2024, the LUMCON Diving Safety Program supported Consortium member projects through scientific diver training, diving oversight, and activity management. Spring training included divers from LSU and LUMCON, utilizing UNO's pool and conducting dives at Vortex Springs, Florida. Dr. Holstein's LSU group collaborated with NOAA and TAMUG on multiple dive trips to the Flower Garden Banks National Marine Sanctuary, Texas. Locally, dives in Terrebonne Bay during Spring, Summer, and Fall focused on oyster reef production and ecology, led by the Archer Lab at LUMCON and the Glaspie Lab at LSU. The Diving Safety Office provided administrative support, including dive planning, documentation, and equipment assistance from the LUMCON Diverlocker.



# BTNEP

## BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

In FY24, the BTNEP team continued its mission of protecting and restoring the Barataria-Terrebonne National Estuary through several core programs and initiatives: improving water quality, combating invasive species, cultivation of native plants for use in restoration projects, protecting wildlife and the habitats they rely on, improving community resilience and sustainability through education, outreach, and volunteer efforts, and improving engagement and reach with stakeholders and citizens within and beyond the estuary.

In June, BTNEP welcomed Bren Haase as the program’s new director. Bren joins the team with over 30 years of experience in coastal wetlands ecology, restoration, and regulation in the private sector and with the state and federal government.



**BTNEP Director  
Bren Haase**

### Program Highlights and Initiatives:

This year, BTNEP completed the Bayou Folse and Bayou Lafourche watershed restoration projects in collaboration with the Louisiana Department of Environmental Quality (LDEQ), improving water quality in the region. The projects led to the repair or replacement of 250 home sewage systems, the inspection of 355 systems, and the completion of monthly water sampling and 418 outreach events. Invasive species management efforts included mapping the spread of invasive tilapia, developing a predictive model for giant salvinia, and working to identify the seed source of purple loosestrife in the lower MR delta. BTNEP also initiated a program to manage invasive plants at the Woodlands Conservancy and launched a Head Start program for the threatened diamondback terrapin. Additionally, the BTNEP Native Plant Nursery produced over 100,000 native plants for coastal restoration, supporting critical projects like the CPRA’s Spanish Pass Ridge and Marsh Creation Project and the Greater Lafourche Port Commission’s marsh creation site.



# BTNEP

## COMMUNITY OUTREACH AND COMMUNICATION EFFORTS

POLLINATOR HABITAT EFFORTS: ENCOURAGE LOCAL CITIZENS TO CREATE POLLINATOR HABITATS AT HOME



1,560

Pollinator plants distributed



896

Seed packets distributed



NATIVE GREENS PROJECT INVESTIGATES THE IMPACT OF HUMAN-INDUCED LAND COVER CHANGES AND URBAN-SUBURBAN ECOSYSTEMS

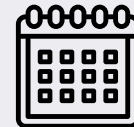
### COMMUNICATIONS AND SOCIAL MEDIA GROWTH



8,735 FOLLOWERS



2,050+ SUBSCRIBERS



20,000 CALENDARS DISTRIBUTED



BAYOU LAFOURCHE

300+

VOLUNTEERS

9.22 TONS

TRASH REMOVED

ELMER'S ISLAND

86

682 LBS



# Appendix A: LUCMON Grants in FY 2024

## CONTINUING GRANTS

**Archer SK.** Assessing Which, When, and Why Fishes Use Artificial Reefs Through Passive Acoustics and Capture Based Methods, Louisiana Sea Grant's Artificial Reef Research Assistantship Program, 2022- 2023, \$106,668

Bourgeois R, Bockus A, **Archer SK.** Determining product quality parameters to expand market potential for Louisiana invasive carp”, US Fish and Wildlife Service, 2023-2023, \$92,513 (LUMCON portion \$39,010).

**Bowles MW, Roberts BJ,** Maiti K, Meile CD. Methane efflux from river influenced coastal marine sediments, National Science Foundation, Division of Ocean Sciences, Chemical Oceanography, 2022-2025, \$1,038,171.

**Conover M, Bowles MW.** 2024 Coding for Marine Sciences Workshop, Brown Foundation, 2023-2024, \$18,125.

DeGrandpe M, **D’Andrilli J,** Payn RA, Peipoch M. Collaborative Research: LTREB Renewal - River ecosystem responses to floodplain restoration, NSF Long Term Research in Environmental Biology, 2023- 2028, \$599,599 (LUMCON portion \$143,000).

Demars B, Karlsen SR, Jackson-Blacke L, **D’Andrilli J.** QUANTOM – QUANTification of Dissolved Organic Matter and the Metabolic Balance in River Networks: Mechanisms and Model Simulations of CO2 Emissions, Norwegian Research Council Program, 2021-2024, NOK 11,912,304 (LUMCON portion \$130,000)

Engel AS, **Roberts BJ, Bowles MW,** Schutte CA, Huang H, Justic D, Mariotti G, Yeager K. Methane dynamics across microbe-to-landscape scales in coastal wetlands, National Science Foundation, Frontier Research in Earth Sciences, 2022-2027, \$2,949,601 (LUMCON portion \$944,902).

Gemmell B, Karp-BossL, Wheeler G, **Du Clos KT.** Novel imaging, physiology and numerical approaches for understanding biologically mediated, unsteady sinking in marine diatoms, NSF GEO-NERC, 2021– 2024, \$472,846 (LUMCON portion \$102,756).

Glaspie C, **Archer SK,** Dance M, D’Sa E, Giordano S, Gayanilo F, Klieber K. Louisiana Deltaic Estuaries MBON: Sea level Rise Sentinels, NOAA’s Marine Biodiversity Observatory Network, 2023-2028, \$1,749,971 (LUMCON portion \$425,152).

Haggarty D, Dudas S, Mouy X, **Archer SK,** English P, Juanes F, Halliday W, Gauthie S. Passive Acoustic Methods for Improving the Monitoring of Vulnerable Rocky Reef Fishes, Fisheries and Oceans Canada: Competitive Science Research Fund, 2021-2024; \$398,355 CAD (LUMCON portion \$0)

**Hamdi J.** Organic Matter Export, Processes, and Transformations Drive Carbon Cycling Patterns in the Arctic Ocean, NSF Office of Polar Programs Postdoctoral Proposal Fellowship, 2021-2023, \$160,000 (Supervisor: Dr. **Juliana D’Andrilli,** host institution: LUMCON)

Holmquist J, **Roberts BJ,** et al. (8 total PIs). Data-Model Integration for Monitoring and Forecasting Coastal Wetland Carbon Exchanges: Serving Local to National Greenhouse Gas Inventories, NASA CMS, 2019-2024, \$1,123,976 (LUMCON portion \$160,000)

Hopkins B, David S, **Rieucan G.** Habitat Use and Trophic Ecology of Alligator Gar in Restored Mississippi River Floodplains, National Fish and Wildlife Foundation, 2020-2023; \$400,000 (LUMCON portion \$109,484)

**Kolker AS**, Weathers HD, Swann CS. Neptune Pass Sediment Mass and Volume Balance: An Approach To Evaluate Delta Splay Development in Bay Dennesse and Quarantine Bay, Louisiana. Funded By Louisiana's Coastal Protection And Restoration Authority, and the National Wildlife Federation, 2022-2024; \$103,048 (LUMCON portion \$63,233).

Lavaud R, **Archer SK**, Callum B, La Peyre J. Continuous measurement of valve movements to monitor grow-out conditions of farmed oysters, Louisiana Sea Grant's Aquaculture Program, 2022-2024, \$117,789 (LUMCON portion \$5,986).

Lewis J, **Roberts BJ**, Ferris MT, Meselhe E, van Bael S. SRS-RN:Hybrid Water Infrastructure and Regional Sustainability - Planning a Convergence Science Approach in Greater New Orleans, NSF Sustainable Regional Systems Research Networks Program Track 2 Planning Grant, 2022-2025, \$149,343

**Malbrough JD, Roberts BJ**. R/V Pelican Ship Operations CY 18 - 23. National Science Foundation OCE-1827654, 2018 - 2025, \$5,011,266

Morley JW, Ajemian MJ, **Archer SK**, Baskett M, Ciannelli L, Duffy E, Nelson MW. Ecosystem Mismatch in Fisheries Vulnerability to Climate, Lenfest Ocean Foundation, 2020-2023, \$299,335 (LUMCON portion \$12,609)

Nelson J, **Roberts BJ, Rieucan G**, Xu K, Johnson D. Ecological Function and Recovery of Biological Communities Within Sand Shoal Habitats Within the Gulf of Mexico, Bureau of Ocean Energy Management, 2019-2024, \$2,299,985.

Polito MJ, Hooper Bui L, Swenson E, Jenson O, Martin C, **Roberts BJ**. Linking Community and Food-Web Approaches to Restoration: An Ecological Assessment of Created and Natural Marshes Influenced by River Diversions, Northern Gulf Institute, 2022-2024, \$119,007 (LUMCON portion \$39,082)

Polito M, **Roberts BJ, Rabalais NN**, et al. (9 total PIs). Linking Community and Food Web Approaches to Restoration: An Ecological Assessment of Created and Natural Marshes Influenced by River Diversions, NOAA RESTORE, 2017-2023, \$2,040,845 (LUMCON portion \$429,521)

Polito MJ, Swenson E, Lopez-Duarte P, **Roberts BJ, Rabalais NN**, Martin C. Planning for a Fresher Future: Implications of River Management Practices on Saltmarsh Restoration Projects in Coastal Louisiana, USGS South Central Climate Adaptation Science Center, 2021-2024, \$299,998 (LUMCON portion \$66,014)

**Roberts BJ**. Can Ribbed Mussels Augment Coastal Restoration Projects in a World of Rising Seas?, Louisiana Sea Grant/LA Coastal Protection and Restoration Authority CSAP Program, 2021-2024, \$80,000

**Roberts BJ, Conover JP**. REU Site: Interdisciplinary Research Experiences in Louisiana's Changing Coastal Environments, NSF OCE, 2022-2025, \$529,225

**Roberts BJ, Malbrough J**. Collaborative Proposal: Proposal for the Operation of Regional Class Research Vessel #3 in the Gulf of Mexico, Caribbean Sea, and Southwestern Atlantic Ocean, NSF, 2019-2025, \$3,173,061

**Roberts BJ, Archer SK**. RAPID: Securing the LUMCON natural history collection, a vital Gulf Coast resource, National Science Foundation, Division of Biological Infrastructure, 2022-2024, \$199,102.

**Roberts BJ**. Stauffer B. Building a network of nutrient sensing in the northern Gulf of Mexico, Gulf Coast Ocean Observing System, 2022-2024, \$75,000.

Stedmon CA, Qiao J, Sejr M, Osburn C, **D'Andrilli J**, Granskog M, de Steur L, Dodd P. New Insight on Ocean Circulation and Fate of Organic Carbon in the Arctic Ocean, Danish Research Council, 2019-2023, DKK 6,078,488 (LUMCON portion \$10,000)

Stoner EW, **Archer SK**, Whitman ER. RUI: The Role of Ecological Memory in Nearshore Seagrass Beds Affected by Multiple Stressors, NSF Biological Oceanography, 2021-2024, \$676,239 (LUMCON portion \$86,496).

## NEW GRANTS

**Archer SK**, Miller M, Zito P. LOI: Sponges as passive samplers for heavy metals in freshwater and brackish systems. BTNEP-BIL. 2023-2026, \$107,342, (LUMCON portion \$34,000).

**Archer SK**, Miller M, Zito P. Sponges as passive samplers for heavy metals in freshwater and brackish systems. Louisiana Sea Grant - Omnibus Funding, 2024-2026, \$193,409, (LUMCON portion \$50,993).

Bentley S (LSU), Allison M (Tulane), 47 co-PIs including **Roberts BJ, Conover M**. “The Mississippi River Delta Transition Initiative (MissDelta)”, National Academics of Science, Gulf Research Program, 2023-2028, \$22,000,000 (LUMCON portion \$887,136)

**Du Clos KT**. LA Sea Grant Undergraduate Research Opportunities Program: Tracking oyster larval abundance and settlement to enhance oyster restoration in coastal Louisiana, 2024-2024 (LUMCON portion \$3,500).

**Kolker AS**, Weathers HD, Swann CS. Neptune Pass, Science For A Large River Outlet. Funded By The National Wildlife Federation, 2023-2024, \$100,000, (LUMCON portion \$33,000).

Maas A (LSU) etal (team of 50 partners including **LUMCON**). NSF Engines: Louisiana Energy Transition Engine “Future use of Energy in Louisiana (FUEL)”, National Science Foundation, 2024-2033, \$160,000,000

**Rieucan G**. Monitoring the recovery of ecological functions of restored living shorelines in a South Louisiana salt marsh using imaging sonar, EPA- Barataria-Terrebonne National Estuary Program Clean Water Act section 320, 2024-2026, \$49,865.

**Roberts BJ**, Nelson J, **Rieucan G**, Xu K, Johnson D. Ecological Function and Recovery of Biological Communities within Sand Shoal Habitats within the Gulf of Mexico-extension, Bureau of Ocean Energy Management, 2024-2027, \$1,798,596 (LUMCON portion \$702,922)

Rodgers A, **Rieucan G**, David S. The Past, Present and Future of Lower Mississippi River Restoration: Adaptive Management for Floodplain Restoration; Improving Aquatic Connectivity and Reforesting the River; Charting a Course for Future River Restoration, National Fish and Wildlife Foundation – Lower MS Alluvial Valley Restoration Fund 2023, 2024-2027, \$433,090.15 (LUMCON portion \$54,323).

## Appendix B: LUMCON Publications in FY2024

**Brooks CN**, Field EK. 2024. Microbial community response to hydrocarbon exposure in iron oxide mats: an environmental study. *Frontiers in Microbiology*. 15:1388973. doi:10.3389/fmicb.2024.1388973

**D'Andrilli J**, Romero CM, Zito P, Podgorski DC, Payn RA, Sebestyen SD, Zimmerman AR, Rosario-Ortiz FL. 2023. Advancing chemical lability assessments of organic matter using a synthesis of FT-ICR MS data across diverse environments and experiments. *Organic Geochemistry*. 184: 104667. doi:10.1016/j.orggeochem.2023.104667

**Du Clos KT**, Gemmell BJ. 2024. Does the settling column method underestimate phytoplankton sinking speeds? *Royal Society Open Science*. 11(2): 231455. doi:10.1098/rsos.231455

Gartelman A, Xu K, Maiti K, Liu H, Moran K, Wilson C, **Roberts BJ**, Nelson JA. 2024. Sedimentation processes and morphological changes in a dredge pit and surrounding environment on Ship Shoal in the northern Gulf of Mexico. *Marine Geology*. 470: 107128. doi:10.1016/j.margeo.2024.107218

Keppler FW, Engel AS, Bui LM, Lopez-Duarte P, Martin C, Olin J, Polito MJ, Rabalais NN, **Roberts BJ**, Swenson EM, et al. 2024. Coastal wetland restoration through the lens of Odum's theory of ecosystem development. *Restoration Ecology*. 32(3):e14072. doi:10.1111/rec.14072

Munnely RT, Castillo JC, Handegard NO, Kimball ME, Boswell KM, **Rieucou G**. 2023. Applications and analytical approaches using imaging sonar for quantifying behavioural interactions among aquatic organisms and their environment. *ICES Journal of Marine Science*. 81(2):207-251. doi:10.1093/icesjms/fsad182

Oken KL, Able KW, de Mutsert K, Fodrie FJ, López-Duarte PC, Martin CW, McCann MJ, Olin JA, Polito MJ, **Roberts BJ** et al. 2023. Fishery closures, more than predator release, increased persistence of nearshore fishes and invertebrates to the Deepwater Horizon oil spill. *Estuaries and Coasts*. 46(7): 1907-1922. doi:10.1007/s12237-023-01246-2

Raabe JM, Kurtay G, **Fontenot A**, Greene S, Martignette AJ, Milbrandt EC, **Roberts BJ**, Stauffer BA. 2024. Operation and integration of a commercially available nitrate sensor in Gulf of Mexico estuarine monitoring programs. *Environmental Technology & Innovation*. 35:103676. doi:10.1016/j.eti.2024.103676

Ramos EA, Jones B, Austin M, Collom KA, Eierman L, Melo-Santos G, Castelblanco-Martínez N, Renee Arreola M, Okrucky R, **Rieucou G**. 2023. Signature whistle use and changes in whistle emission rate in a rehabilitated rough-toothed dolphin. *Frontiers in Marine Science*. 10: 1278299. doi:10.3389/fmars.2023.1278299

Rodriguez-Pinto II, **Rieucou G**, Handegard NO, Boswell KM, Theobald JC. 2024. Environmental impacts on visual perception modulates behavioral responses of schooling fish to looming predators. *Journal of Experimental Biology*. 227(6):jeb246665. doi:10.1242/jeb.246665

Sutherland KR, Damian-Serrano A, **Du Clos KT**, Gemmell BJ, Colin SP, Costello JH. 2024. Spinning and corkscrewing of oceanic macroplankton revealed through in situ imaging. *Science Advances*. 10(20):eadm9511. doi:10.1126/sciadv.adm9511

Tack NB, **Du Clos KT**, Gemmell BJ. 2024. Fish can use coordinated fin motions to recapture their own vortex wake energy. *Royal Society Open Science*. 11(1): 231265. doi:10.1098/rsos.231265



# Appendix C: LUMCON Mentees in FY2024

## Graduate Students

### ***MS students:***

Robert Bergeron, NSU (Rieucou)  
Finella Campanino, LSU (Archer)  
Alexander Douwes, ULL (Roberts)  
Maris Griffin, NSU (Roberts)  
Skylar Liner, LSU (Roberts)  
Jackie Valladares, UGA (Roberts)  
Siyah Yongue, LSU (Archer)

### ***PhD Students:***

Allison Noble, LSU (Archer)  
Adam Quade, UNO (Rieucou)  
Yanilla Salas-Ortiz, UNO (Archer)

## Postdocs

Chequita Brooks (Bowles)  
Stacy Calhoun-Grosch (Roberts)  
Yaolin Guo (Roberts)

## Undergraduate Students

### ***NSF REU Interns***

Vanessa Lima, University of Miami (Archer)  
Shannon Larkan, Florida Gulf Coast University (Roberts)  
Lauren McDonald, Iowa State University (Archer)  
Leflore Press, University of New Orleans (Rieucou)  
Phoenix Savage, University of Illinois, Chicago (DuClos K)  
Reed Stevenson, Maine Maritime Academy (Roberts)  
Summer Zamora, Jacksonville State University (DuClos B / Archer)

### ***STEM Prep Students***

Sophia Cummings, Louisiana State University (Du Clos)  
Brittoni Johnson, Dillard University (Roberts)  
Memphis Powell, Louisiana Christian University (Archer)  
Nicholas Teegarden, Baton Rouge Community College (Archer)  
Adalyn Thibodeaux, LSU-Eunice (Rieucou)  
Jasia Young, River Parishes Community College (Roberts)

# Appendix D: LUMCON Donors FY2024

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Dale E. Boger  
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Ronald L. Callais / Allied Shipyard  
Vincent A. Cannata / Cannata's  
Leonard C. Chabert / American Marine and Wire Rope Supply, Inc.  
Chevron  
Michel H. Claudet  
Community Foundation of Acadiana  
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Dr, John Sweeney  
Synergy Bank  
Terrebonne Parish Consolidated Government  
Dale C. Thompson / Volute, Inc  
Mr. and Mrs. Heinke Earl Trapp  
Jane Tucker  
Hazel Turlington  
Alex Warneke  
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