Louisiana's RESTORE Center of Excellence Research Grants Program
FY2022 Annual Report to the RESTORE Council

Executive Summary

The second Request for Proposals cycle (RFP2 cycle) of the RESTORE Act Center of Excellence for Louisiana (LA-COE) involves managing four Graduate Studentship awards and four Research Awards. During FY2022, a semi-annual webinar was held in April, a RESTORE Act Center of Excellence session was hosted at the Gulf of Mexico Conference (GoMCon) in April, and an All-hands meeting and Executive Committee meeting were held in August. Research subrecipients also submitted their first performance progress report (PPR) in February and the second one in August. The details of those awards, results, reports, and any available data, as well as how this research can inform the Louisiana Coastal Protection and Restoration Authority Coastal Master Plan is routinely updated on the LA-COE RFP2 cycle webpage: https://thewaterinstitute.org/la-coe/funded-research-rfp2.

Programmatic Elements

Award Recipient

Given the provisions of the RESTORE Act requiring that Centers of Excellence must focus efforts on a selected set of disciplines, the LA-COE focuses on the following:

- Coastal and deltaic sustainability, restoration and protection, including solutions and technology that enable citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast region
- Coastal fisheries and wildlife ecosystem research and monitoring in the Gulf Coast region
- Sustainable and resilient growth, economic, and commercial development in the Gulf Coast region
- Comprehensive observation, monitoring, and mapping of the Gulf of Mexico

The status of performance and annual accomplishments include: (1) managing eight research subawards, (2) reviewing subrecipients' performance progress reports (PPRs), (2) sponsoring Gulf of Mexico Conference (GoMCon) 2022 and coordinating with other Centers on a Center of Excellence session at GoMCon, (3) hosting a semi-annual webinar to provide training on data management requirements and best practices for subawardees , 4) hosting a LA-COE All-hands Meeting 2022 and an Executive Committee meeting in person, (6) assessing and reporting on progress using defined metrics that address federal reporting requirements, including reports to the U.S. Department of Treasury was also conducted, and (7) operating the LA-COE according to the Standard Operating Procedures (SOP), including website management, data management, coordination with other Centers of Excellence, and dissemination of information.

During the RFP2 cycle, LA-COE requested semi-annual PPRs from subawardees. Following the submission of each PPR, LA-COE also requires the Technical Points of Contact (TPOCs) to do check-in meetings with Principal Investigators (PIs) and CPRA Liaisons for individual projects within 30 days after PPR submission. LA-COE has been managing eight research subawards by reviewing the semi-annual PPRs for technical content (via the Technical Point of Contact) and to

ensure research results will help implement the Louisiana Coastal Master Plan (via CPRA Liaisons). LA-COE reviewed and approved semi-annual PPR#1 (August 1, 2021 – January 31, 2022) and PPR#2 (February 1, 2022– July 31, 2022).

LA-COE hosted the first semi-annual webinar (#1) on April 20, 2022. Updates were provided from Dr. Giulio Mariotti on his project "Quantifying marsh edge erodibility as a function of salinity and water chemistry and assessing possible effects of the Gulf Intracoastal Waterway in Barataria Bay," and Dr. John White and Mercedes Pinzon on their project "Dynamics of nitrogen and phosphorous cycling across Barataria Basin." The meeting also provided information on data management for principal investigators and details on upcoming LA-COE events, and Christian Ariza-Porras was introduced as LA-COE's data manager. To assist researchers with managing their data, producing metadata, and supporting the inclusion of their data into a public repository, a "Data Management Best Practices" document was released on in March 2022. A webpage was developed titled, "Resources for RFP2 Research Subrecipients" to provide information to researchers about the various requirements including data management, semi-annual progress reporting, and how to submit their reports. LA-COE has also been preparing for other major activities occurring in 2023. The next semi-annual webinars in April/May 2023 will be organized by LA-COE, NOAA RESTORE and Louisiana Sea Grant, with a focus on the co-production of actionable science. LA-COE is also planning to host a session at the State of the Coast conference in May 2023.

The LA-COE's All-hands Meeting occurred on August 11, 2022 at the Center for Coastal and Deltaic Solutions in Baton Rouge, Louisiana. This meeting is held annually in Baton Rouge with mandatory participation by at least one PI from each award. The PI describes their research progress-to-date and upcoming activities. This meeting promoted collaborations and informed research progress from RFP2 funded research projects. There were eight total presentations provided by either PIs or graduate students. Each 10-minute presentation focused on how their current research could support the Coastal Protection and Restoration Authority's (CPRA) implementation of the Coastal Master Plan. During the All-hands Meeting, there was also a short presentation introducing the co-production of science, and how a workshop is being planned and co-hosted by LA-COE, NOAA RESTORE Science Program, and Louisiana Sea Grant. At the end of meeting, a questionnaire was provided to all attendees (N=45) to solicit written feedback from attendees for overall evaluation of the 2022 All-hands Meeting. A total of 31 participant voters responded to the survey questions (1 – poor, 5 – excellent) including:

1. Quality of pre-meeting preparation and communication (mean score: 4.3)
2. Clarity of All Hands Meeting objectives (mean score: 4.5)
3. Quality of provided materials (mean score: 4.5)
4. Meeting organization and conduct (mean score: 4.8)
5. Room setup and general facilities (mean score: 4.3)
6. Overall evaluation of the meeting (mean score: 4.4)

The Executive Committee Meeting occurred after the All-hands Meeting. Meeting participants included senior research officials from Louisiana universities and research organizations, including Brian Roberts (Louisiana Universities Marine Consortium), Giovanni Piedimonte (Tulane University), Robert Moreau (Southeastern Louisiana University), and Sam Bentley

(Louisiana State University). Bridget Cotti-Rausch with the U.S. Department of Treasury also attended the LA-COE Executive Committee Meeting. The Executive Committee Meeting involved a lunch and open discussion with the research officials, LA-COE, and CPRA. The meeting's goal was to gain feedback about the 2022 All-hands Meeting, review progress toward success metrics targets of the RFP1 and RFP2 cycles, review the grant process for the RFP2 cycle, and begin planning for the RFP3 cycle.

LA-COE was a proud sponsor of the Gulf of Mexico Conference (GoMCon) on April 25-28, 2022. A LA-COE booth was displayed at GoMCon 2022 to highlight the LA-COE grant program and RFP2 funded projects through April 25-28, 2022. The LA-COE coordinated with other Centers on a Center of Excellence session on April 27th, 2022 at GoMCon. In addition, meetings were also conducted at that conference with other Centers of Excellence as well as the U.S. Department of Treasury.

LA-COE and CPRA participated in the Treasury RESTORE Act Webinar: Leveraging Treasury RESTORE Funds to Support Climate Resilience on March 7, 2022. Marla Nelson presented on her research from RFP 1 cycle, "From Adapting in Place to Adaptive Migration: Designing and Facilitating an Equitable Relocation Strategy."

LA-COE quantifies program impacts. Since 2015, LA-COE has supported 45 undergraduate and graduate students, as well as post-docs, and generated 8 theses and dissertations, 18 journal article publications, and 8 publicly available datasets. LA-COE has been working with RFP1 PIs during June and July 2022 to complete RFP1 data management by October 31, 2022. A few PIs have experienced unexpected delays in getting data approved from open-access repositories (e.g., NCEI). Additionally, LA-COE has begun sending out Quarterly Newsletters by e-mail. The most recent issue was sent out on August 31, 2022. Each issue provides updates on LA-COE activities and funded research projects.

LA-COE will continue to operate the Center according to the SOP, including regular meetings with CPRA (monthly and/or bi-monthly depending on schedules) and phone calls as needed, website maintenance, data management, coordination with other Centers of Excellence, and addressing federal reporting requirements, including reports to the U.S. Department of the Treasury and other dissemination of information.

Award Subrecipient(s) Selected for Funding:

Graduate Studentship

1. **Tulane University, Dr. Torbjörn Törnqvist**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast.
    - Research project undertaken: Projecting 50 years of relative sea-level rise in coastal Louisiana.
    - Subaward executed in October 2021.

- Summary: This research will build on recent advances in the understanding of the drivers and rates of subsidence in coastal Louisiana by quantifying rates and their spatial variability as well as conducting an assessment of geocentric sea-level rise. The goal is to reduce uncertainties in estimates of present-day and future projections of relative sea-level rise.

2. **Louisiana State University, Dr. John White**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Comprehensive observation, monitoring, and mapping of the Gulf of Mexico.
    - Research project undertaken: Dynamics of nitrogen and phosphorous cycling across Barataria Basin.
    - Subaward executed in October 2021.
    - Summary: This project will assess the nitrogen and phosphorus cycling in Barataria Basin especially as it relates to various benthic substrates that have varying organic matter content, extractable nutrients and microbial activity that can affect surface water quality. Data from this research can improve ecosystem models that are being used for freshwater diversions and for proposed sediment diversions, specifically with water quality and nutrient loading predictions.

3. **Louisiana State University, Dr. Celalettin Ozdemir**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast.
    - Research project undertaken: Improving the design and construction practice of marsh creation projects.
    - Subaward executed in October 2021.
    - Summary: Marsh creation projects are prioritized in the 2017 and 2023 Coastal Master Plans for Louisiana. The proposed study aims at addressing knowledge gaps in the design and construction practice of marsh creation projects by using integrated field data collection, laboratory experimentation, and numerical modeling to better understand consolidation and transport properties of the dredge material.

4. **University of Louisiana at Lafayette, Dr. Jorge Villa**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast.
    - Research project undertaken: Patch-scale effects of acute saltwater intrusion on carbon fluxes in a simulated coastal freshwater marsh environment.
    - Subaward executed in October 2021.
    - Summary: This project aims to evaluate the effects of acute saltwater intrusion events on carbon fluxes and elevation in wetland areas dominated by two

common upper estuary freshwater plants. Results of this work could help inform the morphology model used in Integrated Compartment Model, and suggest how these wetland species are influencing carbon cycling, which can be used in evaluating strategies in the Coastal Master Plan.

Research Awards

5. **Nicholls State University, Dr. Jonathan Willis**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast; & Coastal fisheries and wildlife ecosystem research and monitoring in the Gulf Coast region
    - Research project undertaken: Ecological and social ridge dynamics in the Barataria-Terrebonne basins
    - Subaward executed in October 2021.
    - Summary: This project will develop data-driven models for ecological roles, processes, and trajectories of restored ridges, natural ridges, and spoil banks as well as examine relevant socio-ecological dynamics of ridge landforms in coastal zone of the Barataria-Terrebonne estuary of southeastern Louisiana. The human dimensions portion of the work will include examining the impact of event-driven environmental changes such as storms on communities' stability and sustainability. The goal is to determine physical/habitat characteristics and dynamics of natural and restored ridges and assess the human activity dynamics of ridge communities.

6. **Louisiana State University, Dr. Giulio Mariotti**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast.
    - Research project undertaken: Quantifying marsh edge erodibility as a function of salinity and water chemistry, and assessing possible effects of the Gulf Intracoastal Waterway in Barataria Bay.
    - Subaward executed in October 2021.
    - Summary: The research will use a combination of hydrodynamic and biochemistry modeling, intensive field studies, and landscape modeling to evaluate the role of salinity and river inputs in influencing marsh edge erosion. Results will include a marsh edge erosion model to predict marsh loss 50 to 100 years in the future under different salinity and water chemistry scenarios, with emphasis on nutrient loading from the Gulf Intracoastal Waterway.

7. **Louisiana State University, Dr. Carol Wilson**
    - Researcher role: Help implement Louisiana's Coastal Master Plan

- Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast.
- Research project undertaken: Subsurface stratigraphic controls on subsidence and carbon sequestration in Mississippi Delta diversion receiving basins
- Subaward executed in October 2021.
- Summary: This work will investigate and improve understanding of the heterogeneous geological framework that drives differential consolidation rates, and thus subsidence and organic matter sequestration in the delta. These geological conditions will be added to future modeling and mitigation work using a suite of observational field and laboratory analyses. Research will include analyses within marsh, bay, and paleochannel sub-environments in Barataria Basin of southeast.

8. **The Data Center of Southeast Louisiana, Dr. Robert Habans**
    - Researcher role: Help implement Louisiana's Coastal Master Plan.
    - Eligible discipline: Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast; Sustainable and resilient growth, economic, and commercial development in the Gulf Coast region &Comprehensive observation, monitoring, and mapping of the Gulf of Mexico.
    - Research project undertaken: Past and future migration in coastal Louisiana: Modeling the impact of flood exposure and economic change with microdata on households and businesses.
    - Subaward executed in October 2021.
    - Summary: This study will explore the relationship between discrete flood events and cumulative risk, changing locations of jobs and businesses, and household migration in coastal Louisiana. The team will develop a modeling approach to assess storm and flood-related migration that leverages new sources of business and residential microdata to support population and asset growth scenarios associated with the Coastal Louisiana Risk.

Financial Elements

Award Recipient

The RESTORE Act Center of Excellence Research Grant Program award to CPRA was issued on May 01, 2020 with a total amount of $3,109,063. A Cooperative Endeavor Agreement dated June 01, 2020 was executed between CPRA and The Water Institute of the Gulf (The Water Institute) to administer the award with a current contract value of $3,109,063. Invoices from The Water Institute total $1,035,812.05 through the period ending September 30, 2022, including subaward expenditures.

Award Subrecipient(s)

As a result of a competitive and peer-reviewed request for proposal process, subrecipients of research awards were selected. The subrecipients and associated subaward amounts are provided below:

Number	Subrecipient	Subaward Amount
1	Tulane University	$99,909.68
2	Louisiana State University	$91,798.00
3	Louisiana State University	$95,760.00
4	University of Louisiana at Lafayette	$86,318.79
5	Nicholls State University, The Coastal Center	$495,368.00
6	Louisiana State University	$497,849.00
7	Louisiana State University	$499,675.00
8	The Data Center of Southeast Louisiana	$426,544.00

Gulf Coast Ecosystem Restoration Council Elements

Leveraging Multipliers

LA-COE participates in bimonthly conference calls with the Gulf of Mexico Restoration and Science Programs Coordination Forum that allows for funding organizations in the Gulf region to discuss their programs, share ideas, and promote collaborations. In addition, coordination meetings with the RESTORE Council, NOAA RESTORE and others were scheduled at GoMCon to facilitate discussions to leverage resources.