FLORIDA RESTORE ACT CENTERS OF EXCELLENCE PROGRAM

2022 Annual RESTORE Council Report

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Executive Summary

In 2022 the Florida RESTORE Act Centers of Excellence Program (FLRACEP) began the process of putting together a 5-year strategic plan to include new competitive requests for proposals focused on RESTORE disciplines related to wildlife ecosystem research and monitoring, restoration, and comprehensive ecosystem observing, monitoring, and mapping.

Chief Scientist, Dr. Raineault, who joined as Program Manager for FLRACEP in October 2021, reviewed FLRACEP's history and achievements, and strategized the research approach with the Program Management Team, taking into account the CERGPs across the Gulf and other RESTORE and Gulf resiliency-focused programs. The Annual All Hands Meeting in January included the Centers of Excellence leads reporting on their research progress, lively knowledge gap assessment discussions, and presentations by each of the Gulf state Centers of Excellence leads. FLRACEP organized a meeting at GOMCON to further the discussion of the restoration impacts knowledge gap, which was raised as an important research opportunity of interest Gulf-wide. This was developed into RFP IV and was released in July. Award decisions were made in November and pending Treasury's acceptance of an application to fund these new Centers of Excellence, research will begin in spring 2023. The Centers will work with end-users in all phases of their programs to contribute new knowledge about restored ecosystems and inform future restoration practices.

A new financial and administrative team joined FIO early in 2022, with Ms. Kelsey Wilkinson (Manager, Fiscal and Business) and Ms. Lauren Taylor (Fiscal and Business Specialist) taking on financial and administrative support for FLRACEP. Staff continue to monitor RFP II, III, and III.5, while working on an amendment to the current Treasury grant and a new grant application. In addition, FIO convened a Science Review Panel for the RFP II Center of Excellence, which is focused on the development of a long-term fisheries monitoring timeseries and technology development. The favorable review and subsequent decision by the Program Management Team awarded continued funding for the program.

The Office of Gulf Coast Restoration has obligated over $8.8M to the FLRACEP program funding four RFPs since the inception of the program.

Background

On August 20, 2015, the Department of the Treasury issued the Florida Institute of Oceanography its first award for the project titled "Florida RESTORE Act Centers of Excellence Program (FLRACEP)" to solicit and issue sub-awards for Florida Centers of Excellence research grants for the eligible disciplines:

1. Coastal fisheries and wildlife ecosystem research and monitoring in the Gulf Coast Region;
2. Comprehensive observation, monitoring, and mapping of the Gulf of Mexico; and
3. Coastal 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 Region.

Priority objectives within these eligible disciplines are defined by the FLRACEP PMT in the specific request for proposal language.

In 2015, FLRACEP selected ten research grant projects at eight Florida Centers of Excellence under RFP I via the peer-reviewed, competitive process detailed in the program Rules and Policies. These projects were completed in 2018 and have resulted in 37 publications to date.

Following the initial RFP release, FLRACEP approved a two-year pilot award to the University of South Florida, for long-term fisheries monitoring Center of Excellence in 2016. The Center is investigating 'Spawning Habitat and Early-life Linkages to Fisheries' (SHELF) and could potentially span 15 years pending successful program reviews. The first of these reviews was conducted in 2018, which extended the SHELF project was extended through 2022 (now February 2023 with a no-cost extension). The SHELF team, led by Dr. Ernst Peebles, submitted a report on SHELF II in the summer of 2022. A Scientific Review Panel of fisheries experts from across the U.S. assembled in St. Petersburg to review the report and the proposal for SHELF III, under the new leadership of Dr. Chris Stallings. Based on the Science Review Panel findings and the Program Management Team's assessment, the proposal was awarded an additional 3.5 years of funding to advance technologies used to collect and barcode fish eggs collected throughout the year to improve understanding of seasonal spawning dynamics and conduct a targeted study to link adult abundances to egg production.

RFP III was announced in January 2019 for $2 million in Centers of Excellence grants across three RA disciplines. As in prior RFPs, disciplines 2 and 5 were eligible, with the addition of RA 1 (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 Region). Six funded Centers of Excellence were awarded, with projects nearing completion in spring 2023 or with a no-cost extension to 2024, due to impacts of the COVID-19 pandemic. An additional RFP III.5 to develop benthic habitat mapping data integration framework for the west Florida Shelf was funded in 2020 and will be completed in 2024.

FLRACEP recently finalized a competitive grants process to award over $2M in funding to researchers through RFP IV. Each of the 3-year Centers of Excellence will focus on understanding the impacts of restoration projects along the Florida Gulf coast. End-user collaborators, required as part of the project team, will work with the researchers from the project's inception to ensure the applicability of the research to future restoration efforts. These awards will be formally announced in the winter of 2023 with project start dates in spring 2023. An additional goal of this RFP, which was scoped during several public sessions, including discussion with all Gulf States Centers of Excellence, is to address restoration impacts because the topic central to RESTORE goals and could be studied across the Gulf, leading to future synthesis efforts.

Programmatic Elements

Award Recipient

The Florida Institute of Oceanography (FIO) is an Academic Infrastructure Support Organization (AISO) of the State of Florida established by the Florida Board of Governors (BOG). Under a Memorandum of Understanding ratified by the member organizations and approved by the BOG, the University of South Florida (USF) assumes the role of host university, and fiscal accounting functions are administered by USF and overseen by the USF Board of Trustees. FIO was name the Gulf Coast State Entity to administer Florida's RESTORE Act Centers of Excellence Program. The FLRACEP includes the following organizational elements:

PROGRAM OFFICE:
FIO serves as the FLRACEP Program Office. The FIO Director is the Principle Investigator (PI) for the FLRACEP Program. As the PI, the FIO director is responsible for program funds and performance. The FLRACEP's organization includes a Chief Scientist (formerly Program Director), who reports to the FIO Director and is responsible for programmatic tasks that the Gulf coast state entities must perform. These programmatic responsibilities include coordination of competitive selection process for Florida Center of Excellence grants; developing award terms and conditions and monitoring performance based on required deliverables and metrics; coordination with other Gulf restoration programs as mandated by the guidelines and RESTORE Act; and monitoring the success of the Centers of Excellence. The Chief Scientist also represents the Florida Centers of Excellence on regional coordination efforts (e.g., NOAA RESTORE Science Program advisory working group, etc.). The FLRACEP Program Office works directly with the FIO Manager of Fiscal and Business to ensure funds appropriately allocated for use.

PROGRAM MANAGEMENT TEAM (PMT): This is an independent body that provides the FLRACEP guidance and engages in the development of program strategic plan, funding strategies, solicitation reviews and funding approval. The PMT includes the FIO Director and other senior-level advisors elected by the PMT members. The PMT were selected based on their knowledge of Florida and Gulf of Mexico regional science, technology, and the FLRACEP program needs. Program Management Team members are not eligible to submit or participate on FLRACEP grants or contracts. The duties of the PMT include developing and approving science concepts to solicit FLRACEP Requests for Proposals, reviewing and ranking Letters of Intent, selecting proposals to receive funding, participating in annual all-hands meetings, and other ad hoc tasks as determined by the PMT Chair and board members.

SCIENCE REVIEW PANEL (SRP): The SRP is an ad hoc team responsible for technical review of grant proposals. The SRP is nominated by the FIO Director and approved by the PMT members; the Panel will consist of science and technology experts not involved in any proposals, from in and outside Florida. In the event of a conflict regarding the FIO Director, then the PMT shall select the SRP members.

CENTERS OF EXCELLENCE: FLRACEP establishes Centers of Excellence through a competitive award process to produce outputs and outcomes that address the eligible disciplines. The Requests for Proposals (RFP) and subsequent award terms and conditions define the Principal Investigator and Grantee institution roles and responsibilities. Each Center of Excellence project must produce at least one peer-reviewed journal article at the conclusion of the project.

PARTNERS: Program partners to be engaged both informally and under formal agreements include, but are not limited to: other Gulf coast state entities and their CERGPs; other RESTORE Act components (sections 1603 and 1604); National Fish and Wildlife Foundation Gulf Environmental Benefit Fund; National Academies of Science Gulf Research Program; Natural Resources Damage Assessment and Restoration Program; Gulf of

Mexico Research Initiative; North American Wetlands Conservation Act, Gulf Program Fund; Florida Department of Environmental Protection; Florida Fish and Wildlife Conservation Commission; Florida Gulf Coast Counties; and other programs that may be funded by future litigation or settlements.

Award Subrecipient(s)

Current Award Recipients

The current project was awarded under Grant number RCEGR020005 in July of 2016 and the award was extended to January 31, 2024. In addition to the continuance of the SHELF II Center of Excellence, FLRACEP awarded seven additional research projects under the RFP III and RFP III.5 solicitation. A brief description of all the current sub-recipients are listed below (status reports are available upon request):

RFP II -Center of Excellence (Continuance)

- **PI Name:** Dr. Ernst Peebles, University of South Florida
  Award Amount: $750,000 over three (3) years (research project may be renewed upon scientific review and approval by the Program Management Team) ***Award Amount-**reduced by a total of $99,000 due to elimination of ship time and was reflected in the 12/2021 approved Scope of Work.
  Title: Spawning Habitat and Early-Life Linkages to Fisheries (SHELF, phase II)
  Abstract: This project has the potential for applying novel approaches to long-term monitoring of fisheries in the eastern Gulf of Mexico. The monitoring program consists of annual surveys of planktonic fish eggs that are collected as they drift in the waters of the West Florida Shelf (WFS), offshore of Florida's Gulf Coast. The eggs are identified using DNA barcoding, which is a novel approach. A specific objective of the monitoring effort, in addition to locating important fish spawning areas, is to produce a time series that will detect changes in the amount or location of spawning by individual fish species, and to detect changes in fish-egg community composition over time, such as that brought about by climate change, fishing, or changes in habitat quality.

RFP III -Centers of Excellence

- **PI Name:** Dr. Randy Wells, Mote Marine Laboratory
  Award Amount: $364,432 over three (3) years*
  Title: Health and movements of Florida's Gulf dolphins
  Abstract: Research proposal is expected to address important research gaps regarding movement patterns, habitat use, and health for the two dolphin species that regularly inhabit the coastal and/or shelf waters off Florida's west coast, bottlenose (*Tursiops truncatus*) and Atlantic spotted (*Stenella frontalis*). We will conduct capture-release health assessments to establish baselines and serve as the basis for comparison to inshore dolphins to assess health status. Capture will provide opportunities for collection of samples for genetic, environmental contaminant, and diet analyses, as well as for attaching satellite-linked time-depth-recording tags. These tags will provide information on ranging and habitat use patterns, along with dive patterns relative to health. Relationships between dive patterns and health will be investigated as potential behavioral proxies for assessing health of dolphins tagged without capture. Continuation of a long-term collaborative photo-identification matching system and repository, GoMDIS, will facilitate identification of sources of stranded dolphins, and range shifts in response to environmental changes. Findings will be provided to NMFS Southeast Fisheries Science Center, Southeast Regional Office, and Marine Mammal Health and Stranding Response Program, for consideration for management action, and for incorporation into their congressionally mandated Marine Mammal Stock Assessment Report

- **PI Name:** Ms. Kelly Sloan, Sanibel Captiva Conservation Foundation
  Award Amount: $233,334.34 over three (3) years
  Title: After the Tide: Characterizing the Sublethal Effects of a Catastrophic Red Tide in Nesting Sea Turtles

Abstract: Blooms of toxic algae occur almost annually in the Gulf of Mexico and pose a significant and persistent threat to sea turtles and other marine life. These blooms start naturally in the Gulf but are fed and perpetuated by harmfully high nutrients in the water washing into the Gulf from anthropogenic sources on land. Eutrophication of our waterways is a serious concern and stabilizing the oceanic habitat is critically important in the conservation of many vulnerable species. The bloom that started in October 2017 and ended in early 2019 was so severe that it resulted in the largest number of sea turtle deaths ever attributed to a single red tide event. The mass mortality of sea turtles associated with this event clearly demonstrates the acute impacts of brevetoxicosis. The proposed study is to empirically investigate the effects of this bloom on the health and reproductive success of nesting sea turtles. In addition to learning more about the insidious effects of red tide blooms on sea turtles, the data will be used to raise awareness and inform policies that promote heightened water quality standards and healthier oceans.

- **PI Name:** Dr. Hannah Vander Zanden, University Florida
  Award Amount: $364,432 over three (3) years*
  Title: Health and movements of Florida's Gulf dolphins
  Abstract: Loggerhead sea turtles were negatively impacted by the Deepwater Horizon Oil Spill in addition to suffering effects from numerous other anthropogenic stressors, such as fisheries bycatch, climate change, and red tide events in U.S. waters of the Gulf of Mexico (GoM). Population models designed to quantify the effects of these stressors, as well as to evaluate the resultant impacts to coastal ecosystems of declining sea turtle recruitment or population size, require accurate estimates of age, growth, longevity, and mortality. Furthermore, there are vast gaps in our knowledge of marine habitats and environments utilized by different loggerhead life stages and the timing of transition between habitats. The proposal will use novel radio and stable isotope techniques to validate loggerhead sea turtle age and longevity estimates, as well expand the types of long-term trophic records that can be obtained from various loggerhead tissues (e.g., eye lenses, bone, and scutes). Objectives of the study include 1) evaluating eye lenses as a new method to age sea turtles and track lifetime isotopic histories, 2) characterizing scute growth rates, and 3) developing region-specific population models for the GoM using updated parameters estimated with results of this study. Approaches developed and data generated during this study will have direct conservation benefits to loggerhead sea turtles in the GoM. These approaches will be applicable to the conservation of loggerheads in other global regions, as well as for the study of other sea turtle species around the globe.

- **PI Name:** Dr. Matthew Deitch, University Florida
  Award Amount: $499,997 over three (3) years*
  Title: Predicting benefits in Panhandle Estuary Systems: A partnership to quantify impacts, stressors, and outcomes using Adaptive Management Frameworks.
  Abstract: Over the course of the grant, County staff, local conservation groups, and other stakeholder collaborators in the St. Andrew, St. Joseph, Choctawhatchee, Pensacola, and Perdido Bays will work to develop Estuary Programs following the USEPA National Estuary Program model. The goal of each Program is to develop a strategy to protect and restore estuaries through management or restoration actions that reduce anthropogenic impacts on these systems. This project will enhance and build on existing partnerships between local academic researchers with expertise in watershed science and estuary science and local Estuary Program developers. These partnerships will provide meaningful scientific input and rigor in identifying and implementing methods to assess impacts and stressors in each system. Project outputs include conceptual models and adaptive management frameworks intended for use in Comprehensive Conservation and Management Plans (CCMPs); and collaborative efforts (e.g., outreach materials, grant proposals) to support long-term Estuary Program goals.

- **PI Name:** Dr. Katherine Mansfield, University of Central Florida
  Award Amount: $339,867 over three (3) years
  Title: Understanding genomic, behavioral, and microbial drivers of ontogenetic shifts in early sea turtle foraging ecology and habitat use.
  Abstract: The research will use novel technology and approaches to understand early sea turtle habitat use, ecology, and underlying drivers by which young turtles recruit from offshore into West Florida

coastal waters in the Gulf of Mexico. This group's prior work shows oceanic turtles from the Shelf exhibit plasticity in habitat selection and global gene expression profiles, which likely accompany plasticity in foraging and gut microbiota. Researchers will look to determine what the underlying drivers of these shifts through finer-scale genetic characterizations and by establishing a framework for understanding gene-by-environment interactions to better quantify management needs for these protected species.

- **PI Name:** Dr. Cameron Ainsworth, University of South Florida
  Award Amount: $308,279 over two (2) years*
  Title: Using ecosystem modeling to understand the impacts of seagrass restoration and red tides on sea turtles, marine mammals and seabirds of the West Florida Shelf.
  Abstract: The project will utilize an end-to-end ecosystem model, Atlantis-GOM, to evaluate the ecosystem effects of seagrass coverage under different possible futures of toxic and non-toxic algal bloom frequency and severity in the West Florida Shelf region and the Gulf of Mexico Large Marine Ecosystem. Assessing both the direct and indirect impacts of seagrass coverage as may manifest through changes in the available amount or quality of prey or through changes in predation risks. The Atlantis-GOM ecosystem model permits a spatial analysis of the ecosystem effects of seagrass coverage and algal blooms within the following broad spatial domains: the Big Bend, the Tampa/Charlotte Harbor area, Southeastern Florida, and the Florida Keys. The spatial distributions of the focal marine mammal, seabird and sea turtle species and species groups, as well as those of their prey and competitors, will be critical to represent. The majority of these spatial distributions will be provided by a previous Florida RESTORE Act Centers of Excellence Program (FLRACEP) project, which used statistical models to predict distributions based on environmental variables. The outputs of the proposed project will benefit State and Federal end users who manage protected species and habitats. Outputs can help determine the scale of seagrass restoration required to offset negative impacts of increasing algal blooms on mammals, seabirds, and sea turtle populations.

* Requested no-cost extensions to initial grant period.

RFP III.5 -Center of Excellence

- **PI Name:** Dr. Anna Braswell, University Florida*
  Award Amount: $349,722.89 over three (3) years**
  Title: Developing a Standardized Framework for Data Integration and Distribution on the West Florida Shelf.
  Abstract: Despite past and ongoing efforts from regional, state, and federal governments to study Florida's marine ecosystems and resources and repeated calls for a standardized approach to map them, there is currently no general framework for guiding research, management, and conservation of benthic resources in Florida. There is a critical need to have a descriptive, spatially-explicit cyberinfrastructure representing Florida's seafloor environments at multiple scales that can serve management, conservation, and research efforts, and that aligns with existing national and international efforts. To build such cyberinfrastructure, we need to reach community agreement on a framework to support effective and dynamic aggregation of current and future seafloor mapping data. This Center of Excellence will be expected to manage efforts to (1) review existing and successful frameworks for marine data integration and distribution around the world, (2) review existing standards, protocols, and guidelines for data collection, integration, and distribution, (3) get community agreement on the structure of a framework for data integration and distribution on the West Florida Shelf, and (4) build a cyberinfrastructure to support the chosen framework, i.e., to upload, standardize, visualize, and access benthic data of the West Florida Shelf. Three workshops will be organized to get community input. The cyberinfrastructure will be open-source, compatible with existing national and international frameworks, and adhere to FAIR (Findable, Accessible, Interoperable, Reusable) principles.

*Dr. Anna Braswell took over leadership of this project when Dr. Vince Lecours left UF for another university position. Dr. Lecours remains a co-P.I. on the project.
**Requested a no-cost extension on initial grant period.

Prior Award Recipients

The PMT previously selected ten research projects to address the Coastal Fish and Wildlife Research and Monitoring eligible activity under RFP I for 2-year research grant awards, and one project from an existing Center of Excellence (USF) to address long-term fisheries monitoring as a part of the comprehensive observation, monitoring, and mapping of the Gulf of Mexico eligible activity under RFP II. Final research reports are available upon request.

Publications

No new publications have been reported by the RFP III Centers of Excellence in 2022, however several are submitted or in-prep. One publication has been published from RFP III Centers to-date:

Deitch, M.J., H.N. Gancel, A.C. Croteau, J.M. Caffrey, W. Scheffel, B. Underwood, J.W. Muller, D. Boudreau, C.G. Cantrell, M.J. Posner, J. Bibza, A. McDowell, B. Albrecht, 2021. Adaptive management as a foundational framework for developing collaborative estuary management programs, Journal of Environmental Management, 295, DOI: https://doi.org/10.1016/j.jenvman.2021.113107.

Seven new publications were reported from the RFP I and II Centers of Excellence in 2022:

Ault, J.S., Smith, S.G., Johnson, M.W., Estes, J., Bohnsack, J.A., DiNardo, G.T., Grove, L.J.W., McLaughlin, C., McDonough, V., Seki, M.P., Miller, S.L., Luo, J., Crosby, M.P., Simpson, G., Feeley, M.W., & Acosta, A. 2022. Length-based sustainability risk analysis of the southern Florida USA coral reef fishery. Fisheries Research 249: 106210.

Blank, N., S.D. Brooke, B.K. Walker, Spatial variation in hard bottom coral communities of the coastal west Florida Shelf. Bulletin of Marine Science. 98(0). https://doi.org/10.5343/bms.2022.0009.

Garner, S.B., K.M. Boswell, J.P. Lewis, J.H. Tarnecki, W.F. Patterson III, 2019. Effect of reef morphology and depth on fish community and tropic structure in the northcentral Gulf of Mexico. Estuarine, Coastal and Shelf Science. 230.

Vecchio, J.L., E.B. Peebles, 2020. Spawning origins and ontogenetic movements for demersal fishes: An approach using eye-lens stable isotopes. Estuarine, Coastal, and Shelf Science, 246. https://doi.org/10.1016/j.ecss.2020.107047.

Vecchio, J.L., J.L Ostroff, E.B. Peebles, 2021. Isotopic characterization of lifetime movement by two demersal fishes from the northeastern Gulf of Mexico. Marine Ecology Progress Series, 657: 161-172. https://doi.org/10.3354/meps13525.

Vecchio, J.L. and E.B. Peebles, 2022, Lifetime-scale ontogenetic movement and diets of red grouper inferred using a combination of instantaneous and archival methods. Environmental Biology of Fishes. https://doi.org/10.1007/s10641-022-01210-2.

White, A.L., Patterson III, K.M. Boswell, 2022. Distribution of acoustic fish backscatter associated with natural and artificial reefs in the Northeastern Gulf of Mexico. Fisheries Research, 248. https://doi.org/10.1016/j.fishres.2021.106199.

Financial Elements

Award Recipient

Budget narrative: Treasury's award in February of 2019 totaling $1,951,733 for the 2019-2023 performance period included $750,000 to fund the second phase of the University of South Florida (USF) SHELF Center of Excellence. FLRACEP requested two additional amendments with funds to support the six research projects under RFP III and one project under RFP III.5 and extended the performance period to January 31, 2024. The total amount of funds FLRACEP requested from Treasury was $4,458,072.88. For the calendar year, approximately $815,512 has been expended.

	Amended Award RCEGR020005-01-03	**Additional Funds Requested**	**Amount Expended in CY 2022**
Categories			
Salaries and Wages	487,769.00	0.00	107,470.07
Fringe Benefits	160,961.00	0.00	37,788.69
Total Personnel Costs	648,730.00	0.00	145,258.76
Equipment	0.00	0.00	0.00
Supplies	5,500.00	0.00	484.00
Travel	32,900.00	0.00	2,530.79
Construction	0.00	0.00	0.00
Other	337,210.00	0.00	21,454.05
Contractual (subawards)	3,213,427.64	0.00	628,811.40
Total Direct Costs	4,237,767.64	0.00	798,539.00
Indirect Costs	220,305.24	0.00	16,973.01
Total Approved Budget	4,458,072.88	0.00	815,512.01

Award Subrecipient(s)

As COVID-19 restrictions have been lifted, the Centers of Excellence have been able to start or resume research project activities. In total, the Centers have expended $628,811.40 in calendar year 2022. Due to the impacts that the COVID-19 pandemic had on research and project delays, many Centers of Excellence have requested no-cost extensions to ensure completion of their research projects. These extensions have been granted by the PMT and the FLRACEP submitted a no-cost extension request to Treasury in November 2022 to accommodate the Centers no-cost extensions.

Gulf Coast Ecosystem Restoration Council Element

Leveraging Multipliers

No FLRACEP projects or elements have leveraged RESTORE Act funding streams to the best of our knowledge, due in part to the differences in priority areas, timing of projects, and areas of focus. FLRACEP staff continue to work with other restoration science funding entities to explore opportunities for collaboration and leveraging. In 2022 FLRACEP met with Gulf Centers of Excellence and the National Academy of Sciences Gulf Research Program to discuss areas of mutual interest for research. Restoration impacts was identified as a topic across the Gulf that could benefit from research and future synthesis efforts. This led to the development of RFP IV for FLRACEP. The Gulf States Centers of Excellence and FLRACEP also drafted a synthesis network document to share with the broader Gulf coordination forum.

This report will be made available on: https://www.fio.usf.edu/research-programs/centers-of-excellence-program/