FLORIDA SEA GRANT

DIRECTORY OF PROJECTS

Sea Grant
Florida

DIRECTORY OF PROJECTS

Florida Sea Grant funds two types of projects. (1) **Research** projects are awarded on a biennial basis for two years following a rigorous review process in accordance with the National Sea Grant Competition Policy (Nov. 2020). We typically fund 6-8 projects per biennial cycle, each receiving $200,000 in federal funding that is matched with $100,000 in non-federal funds for a $300,000 joint investment per project. (2) **Program Development** (PD) projects are awarded on an ad hoc basis following internal review by the management team, typically following a request for proposals. PD projects are intended to fund rapid response to emerging coastal issues and seed/pilot projects needed to justify larger, additional studies. PD projects also allow FSG to support a broad and balanced portfolio of projects that address the most pressing marine and coastal issues.

Healthy Coastal Environments

Healthy coastal environments are the foundation for the quality of life and economy of Florida's coastal communities. The sustainability and health of habitats and good water quality in the coastal zone will determine the future of the state's recreational and commercial fisheries and aquatic products industries, recreational boating and diving, beach-related recreation, tourism, nature observation and a myriad of other natural and societal values that support a thriving economy. However, increasingly rapid coastal development, and other human activities and behaviors have led to congestion, water quality degradation, shoreline erosion and loss of critical habitat. Major issues affecting coastal ecosystems at this time include extreme variability in flows of fresh water into estuaries, pollution of coastal waters with nutrients, and loss, fragmentation or degradation of coastal habitats.

Human impacts threaten not only the ecosystems, their biodiversity and their functions, but also human uses such as beach going, boating, and tourism as well as fishing and production of aquatic products (e.g., clams, oysters and sponges). In addition to existing threats, climate change poses further and less-understood challenges for coastal habitats, water quality and coastal economies.

Florida Sea Grant will provide the targeted science, outreach and education that is required to address existing and emerging issues affecting our natural coastal zone and we will work with partners and stakeholders to identify feasible and effective solutions and adaptation options.

HCE Goals

- Provide information to resource managers and local governments in support of decision-making that protects and sustains natural coastal habitats, including water quality and quantity and dependent flora and fauna.
- Engage citizens in environmental monitoring and enhancement to promote awareness of the condition of coastal ecosystems and societies role in sustaining natural resources.
- Provide science-based approaches to mitigate impacts or to adapt to changes in climate such as sea level rise.

HCE Research Projects

Green infrastructure prioritization and conditions assessment for climate change adaptation in the Indian River Lagoon Watershed

Project number: R/C-S-73

Funding awarded: FY22-FY23

PI: Jason Evans, Stetson University

The overall goal for this project is to assist Brevard County with the implementation of green infrastructure interventions that help support a more resilient local community, economy, and ecological system within the IRL watershed. This goal supports – and follows directly from – Brevard County's commitments as a signatory to the East Central Florida RRAP. Our overall methodological approach will be to

implement an innovative applied workflow of advanced geospatial analysis in support of enhanced climate resilience, water quality improvement, and ecosystem services quantification in support of habitat conservation and restoration in Brevard County's Indian River Lagoon Watershed. These methods include: 1) development of land cover changes using SLAMM Version 6.7 for Brevard County under sea-level rise projection curves adopted by Brevard County through the RRAP; 2) landscape suitability and optimization modeling for green infrastructure implementation through the Marxan conservation planning software; 3) technical evaluation of priority locations for green infrastructure identified by Marxan through a validation process involving UAS data collection and iterative community feedback; and 4) applied development and sharing of data, visualizations, and outreach materials to support community efforts for green infrastructure implementation. These methods will be implemented through a participatory process that includes outreach to multiple community stakeholders, generally following "structured community engagement" for green infrastructure planning. As argued persuasively, the most effective strategies for green infrastructure implementation cannot be accomplished with a single tool, but instead involve utilization of multiple tools in "an iterative process involving input and response from the community".

Controlling Pyrodinium outbreaks in the Indian River Lagoon Estuarine System (IRLES) using low-cost biochars prepared from sargassum

Project number: R/C-E-60

Funding awarded: FY22-FY23

PI: Reza Tofiq, Florida Institute of Technology

The overall objective of this two-year project is to control IRLES's HABs on low-cost biochars. This project has significant economic, environmental, management, and social benefits. In 2014, total annual economic output of the IRLES was about $9.9 billion, which includes living resources, marine industries, recreation, resource management, and defense and aerospace. These industries supported more than 72,000 jobs. Although many jobs are related to defense and aerospace, number of visitors are directly proportional to tourism-related jobs. In fact, the IRLES estimated that one job can be created with every 85 visitors in the IRLES-region. HABs therefore could negatively affect tourism and the associated economic inputs of this region. This project offers protection of thousands of square feet oyster bed. With the assistance of extension, we will communicate with other shellfish businesses to collect information on the economic impact due to the past HABs at IRL. This proposed HAB control technology and associate data will be available to IRLES management, which will offer as an integral part of the watershed planning and risk assessment efforts to control Pyrodinium or any other HABs in the IRL and other aquatic ecosystems. The proposed research will improve risk assessment, management, and sustainability by: (1) developing economically viable and environmentally sustainable HAB control technology, and (2) providing management entities with a clear direction on the technical understanding and cost estimation associated with the use of technologies to prevent and control HABs. Unlike the conventional technologies, where costly and toxic chemicals and materials are used to control HAB impacts, our proposed "low-risk high-gain" technology can potentially reduce HAB and toxins from water at relatively minimal financial and environmental costs.

A promising Florida Red Tide control strategy: combining stakeholder input and benthic surveys to evaluate impacts of clay flocculation

Project number: R/C-E-61

Funding awarded: FY22-FY23

PI: Kristy Lewis, University of Central Florida

This study will investigate the use of clay application on marine sediment chemistry and benthic communities to justify future large-scale application as a red tide control

strategy. The proposed project will be the first quantitative assessment of the impacts of clay as a bloom control on various aspects of the benthic environment in Sarasota Bay. This research is needed to determine whether clay is an appropriate method for emergency red tide response protocols in coastal waters. Since bloom control is such a complex and controversial topic, it is crucial to have quantitative information on the impacts using a data-driven approach. Throughout the study, project investigators will coordinate with the end users mentioned above to iteratively incorporate their feedback. This information will be used to ensure the most pressing concerns to support or refute the use of clay in a HAB response will be considered in this study. Subsequently, this information could then be included in future iterations of the SBEP Comprehensive Conservation and Management Plan (next anticipated plan in 2024) if they see fit. The proposed project will also have an exclusive focus and impact on advancing Diversity Equity and Inclusion (DEI) in marine science by engaging the local community and students from underserved universities.

Optimizing the coupled human and natural system benefits for public land acquisitions in the east central Florida coastal zone: An applied spatial planning and ecosystem services approach

Project number: R/C-S-69

Funding awarded: FY20-FY21

PI: Jason Evans, Stetson University

This project will use the Sea Level Affecting Marshes Model (SLAMM) to create land cover change model that mechanistically simulates the transformation of coastal habitats due to the projected impacts of sea-level rise. SLAMM integrates multiple datasets and processes that include elevation, slope, tidal datum shifts, erosion, sediment accretion, storm tide overwash, and existing land cover within a spatial context. The model then creates a transition matrix of land cover change at time-steps and sea-level rise scenarios defined by the user. Outputs of SLAMM include spatially explicit land cover change projections and areal extents of specific land cover classes for the user-defined years and scenarios. Recent evaluations indicate that the model shows good technical performance in projecting land cover changes associated with subsidence and sea-level rise and is an effective tool for long-term conservation planning prioritization in areas at risk of sea-level rise.

Citizen science detection and quantification of Florida red tides via personal smartphone- enabled PCR Technology

Project number: R/C-E-58

Funding awarded: FY20-FY21

PI: Cynthia A Heil, Red Tide Institute Mote Marine Laboratory

Blooms of the toxic dinoflagellate Karenia brevis in the eastern Gulf of Mexico (GoM) are among the most predictable harmful algal blooms (HABs), significantly damaging local and state economies, shellfish aquaculture and human and environmental health. Monitoring Karenia blooms in the GoM is challenging for a number of reasons: the potentially large areal extent of blooms, their occurrence in diverse marine environments, the large number of water samples required for effective monitoring, the legally (FDA) mandated reliance by states on microscope identification of K. brevis for regulatory-related (e.g. shellfish bed closure) monitoring purposes, and the difficulty in taxonomically identifying Karenia to the species level using traditional microscopy. The logistical, fiscal and labor resources required for monitoring these blooms are thus large. To meet these extreme needs, several molecular and optical K. brevis detection technologies are in various stages of testing and ground-truthing by resource managers, including a handheld NASBA K. brevis ‘tricorder’ sensor and the HABScope (an Omax microscope linked to an Apple iPod that uses image recognition to identify and quantify K. brevis). Each has advantages (e.g. sample through-put) and disadvantages (e. g. preparation time and level of expertise required for the tricorder, field sample accuracy for the HABScope).

DIRECTORY OF PROJECTS

There is thus an ongoing well-defined need for new public-friendly, automated, web-interfaced detection methodologies that can provide accurate and timely cell monitoring data to both state (e.g. FWRI), regional (GCOOS) and federal (NOAA) agencies involved in Karenia monitoring. The overarching goal of the project is to develop and validate qPCR technology for the detection of Karenia brevis and Karenia mikimotoi and, working with state (FWC FWRI HAB group) and regional (GCOOS) monitoring groups, assess its appropriate use and integrate this technology into HAB Citizen Science monitoring programs in the Gulf of Mexico.

HCE PD Projects

Pilot study to evaluate sargassum composting for soil amendment applications in municipal landscaping

Project number: PD-20-04
Funding awarded: 2020
PI: Ashley Smith, University of Florida

Extending the impact of the partnership for PROS (plastic-free restoration of oyster shorelines)

Project number: PD-21-18
Funding awarded: 2021
PIs: Savanna Barry and Mark Clark, University of Florida

Exploring the potential for upstream Copper-based algaecide application to exacerbate downstream eutrophication and compromise shellfish production and safety

Project number: PD-21-03
Funding awarded: 2021

PI: Christine Angelini, University of Florida

Use of chemical algaecides for the control of Karenia brevis blooms

Project number: PD-21-14
Funding awarded: 2021
PI: Dail Laughinghouse, University of Florida

Managing toxic cyanobacteria bloom biomass impacting coastal ecosystems

Project number: PD-21-12
Funding awarded: 2021
PI: Ed Phlips, University of Florida

Sustainable Fisheries & Aquaculture (SFA)

There is an ever-increasing public demand for wild-caught and farm-raised seafood. Certain fisheries in US waters are recovering from past over-exploitation, some fisheries are still being over-exploited on a global scale, and there are issues related to the environmental impacts of fishing (such as bycatch) and product substitution of seafood. As the capacity of the ocean to increase supplies of wild stocks to meet demand (for both commercial and recreational uses) is limited, aquaculture provides a promising alternative to satisfy domestic demand and generate an increase in demand for seafood that can be farmed.

The potential for an economically-viable new food industry highlights the need for a comprehensive program targeted at enhancing the value chain through helping to ensure the sustainability of the stocks, educating consumers so that they can make informed choices about the harvest and purchase of seafood products, and training seafood professionals in methods to ensure that the seafood we eat is safe. Further, there are opportunities identified in emerging research for aquaculture production of

aquatic food products that are more tolerant of extreme environmental events, and for producing non-food products that collectively support a new Blue Economy. Such products could be market oriented (e.g., ornamental species, sponges, baitfish, etc.) or restoration oriented (e.g., corals, bivalves, sea grasses, etc.). There is a tremendous opportunity to help new businesses develop and thrive through research and training to help identify and overcome bottlenecks.

Florida Sea Grant will support an integrated program of research, outreach and education to support the environmental and economic sustainability of the commercial harvesting of wild aquatic products and newly emerging aquaculture products.. Florida Sea Grant will also continue to support research and outreach on sustainable recreational fishing that accounts for a large percentage of the catch of many marine species in Florida.

SFA Goals

- Conduct programs to facilitate sustainable commercial and recreational fishing and develop a skilled and knowledgeable fisheries workforce.cement to promote awareness of the condition of coastal ecosystems and societies role in sustaining natural resources.
- Develop methods and approaches that support sustainable and economically viable aquaculture and aquatic product industries.
- Promote the quality, safety and integrity of seafood products that are sold or consumed in Florida to increase the profitability and market value of the industries.
- Investigate effects of extreme weather events and climate change on aquatic products and industries, and develop products that are more tolerant of extremes and/or develop adaptation options for affected industries.

SFA Research Projects

Developing optimal release strategies for the protected Goliath grouper (Epinephelus itajara) relevant to recreational fisheries in Florida.

Project number: R/LR-B-61

Funding awarded: FY22-FY23

PI: Angela Collins, University of Florida

Weighted descent is currently a recommended release practice for reef fishes in the Gulf of Mexico and is now required in federal waters of the South Atlantic. Fortunately, there have been several recent developments in pressure-sensitive descender devices that have been shown to be effective release methods for groupers captured in deep water. While commercially available descending device options are currently inadequate for most adult sized Goliath groupers (>1m TL), companies such as SeaqualizerTM have developed beta-models for very large fishes. For the proposed work, we will collaborate with established recreational fishing partners to catch and release Goliath groupers using descending gear, including but not limited to the Seaqualizer prototype, across a range of depths. Underwater releases will be filmed with GoPro cameras fitted to the descending line to document success of descending techniques. Additionally, deck activities during the catch and release process will be recorded to evaluate ease of handling processes and develop realistic recommendations for anglers faced with descending Goliath grouper that have experienced barotrauma. An existing framework of acoustic receivers are deployed at common fishing sites on the Gulf coast of Florida and will be utilized to monitor a portion of descended fish electronically after catch and release. These acoustic data will validate survival of descended fish and allow for a comparison of behavior between the descended fish and those vented individuals. Key to achieving this will be partnering with recreational fishermen, who we will engage directly to understand the fate of these discards. Working with seasoned reef fish anglers will be cost-effective because they provide us with: 1) a number of well-equipped vessels available as research platforms, 2) realistic information regarding catch composition,

fish condition, and general handling techniques, 3) an institutional memory available for planning an efficient and effective sampling design, and 4) feedback from a dominant user group regarding this study's design, progress, results, and final conclusions.

Optimizing the full cycle aquaculture production of red snapper, Lutjanus campechanus, for technology transfer to the private sector

Project number: R/LR-A-66

Funding awarded: FY22-FY23

PI: Dan Benetti, University of Miami

The proposed project will successfully advance the red snapper aquaculture industry from its current state of demonstrated technical feasibility into the domain of active commercial feasibility. The University of Miami Experimental Hatchery and the UF Whitney Laboratory have multiple tank arrays that feature various styles of aquaculture systems including recirculating aquaculture systems (RAS), flow-through, and ponds that can be used to test red snapper grow-out performance in each key type of system. The project will also provide industry partners with access to red snapper seedstock for testing. Coupling this extensive repository of in situ growout performance with the results seen at UMEH and the Whitney Laboratory will be the most meaningful step in the development of an aquaculture industry around red snapper. Not only will prospective farmers have the opportunity to assess the potential growout options that best meet their capabilities and location, but existing farms will be able to incorporate strategies from other growers in order to optimize their own approach.

Evaluating abiotic and biotic factors affecting clam seed production in Florida

Project number: R/LR-A-63

Funding awarded: FY20-FY21

PI: Shirley Baker, University of Florida

Co-PI: Leslie Sturmer, University of Florida

Over the last five years, sales of molluscan shellfish have increased as the national economy recovered and consumer confidence in Gulf of Mexico seafood was restored. However, a downturn in Florida production of hard clams has been observed over the same period and is directly related to difficulties experienced by Florida shellfish hatcheries in providing a consistent supply of seed. A variety of factors, including poor water quality, disease, and toxins, may account for the decline in seed health and subsequent supply. However, diversity in location, water source, food source, and operation scale, has made it challenging to extricate the potential causes of seed loss in Florida, and whether losses incurred can be traced to one or two over-arching causes or are the result of a wide variety of unrelated issues. Without a comprehensive monitoring and assessment plan to explore seed production problems, it will be very difficult for the industry to discover solutions. The goal of this project is to understand and alleviate seed mortality in hatcheries and nurseries, which is imperative to the sustainability of the Florida shellfish aquaculture industry. The hypothesis is that a comprehensive evaluation of a broad range of abiotic and biotic factors in hard clam Mercenaria mercenaria seed production facilities will allow hatchery and nursery operators to make informed management decisions to improve seed health and increase production. Further, the proposed two-year monitoring and assessment program will provide a baseline for future reference. Baseline data can be used to correlate those factors that contribute to successful as well as unsuccessful production runs. Hatchery and nursery operators will be provided with access to information, protocols, tools, and resources to implement their own health management program.

Improving management and harvest practices in the Florida stone crab fishery

Project number: R/LR-B-78

Funding awarded: FY20-FY21

PI: David Chagaris, University of Florida

The United States stone crab fishery operates primarily along Florida's Gulf Coast, as well as the Florida Keys and southeast Florida. The fishery is one of the most valuable in Florida, with over $30 million in revenue generated annual. Currently, the Florida stone crab fishery is in critical condition. Three decades of high exploitation combined with ineffective management, red tides, and hypoxic 'dark water' events have resulted in a depleted stone crab population. From 2002 to 2017, landings averaged 2.6 million pounds, which is 26% lower than historical highs, and 2018 is on track to be the worst stone crab season ever, due to the severe and persistent red tide that occurred off southwest Florida. It is also recognized that proper understanding and correction of some common practices can have significant impacts towards improving the survival of individual crabs and the overall sustainability of the fishery. For instance, wounding associated with poor technique in claw removal was found to be a significant predictor of survival, and many crew are not trained in proper claw removal. It is also common for live crabs to be stored on the deck until all traps have been retrieved, sometimes in excess of 6 hours and allowed to desiccate in sunlight. The relationship between effort and landings show that an asymptote was reached at around 1991-1993 when approximately 700,000 traps were in the fishery. Since then, effort has nearly doubled but landings have declined. This is a strong indicator of inefficiencies and overcapacity in the fishery and suggests that revenues can be maintained or increased at far lower costs. This project will develop new models of stone crab population dynamics and bioeconomics of the fishery, conduct workshops to promote best harvest practices and identify stakeholder supported management initiatives, and work with managers to implement these models into policy development.

SFA PD Projects

A pilot study of sponge enhancement and restoration in the tarpon springs region of Florida

Project number: PD-21-11
Funding awarded: 2021
PI: Don Behringer, University of Florida

Elucidating metabolic pathways predicting mass mortality events in marine larval fish culture

Project number: PD-21-13
Funding awarded: 2021
PI: Matt DiMaggio, University of Florida

Direct and indirect effects of snook climate-induced range expansion on Suwannee River estuary sport fishes

Project number: PD-21-15
Funding awarded: 2021
PIs: Mike Allen and Will Patterson, University of Florida

Resilient Communities & Economies

Most of the population of Florida and most of the state's gross domestic product are associated with coastal and ocean-based economies. Over 16 million people live in the coastal zone and their assets, quality of life and safety are at high risk from natural hazards. The state frequently is impacted by the intense wind, storm surge and heavy rainfall from tropical storms and hurricanes, causing coastal and inland flooding. Sea-level rise is routinely causing flooding of certain coastal urban and residential areas, has reduced the extent of certain coastal habitats, is creating issues with saltwater intrusion to coastal wellfields, and is anticipated to have major impacts on the state's economy. Florida also has experienced the negative consequences of

man-caused disasters, in particular the Deepwater Horizon oil spill in the Gulf of Mexico.

Florida Sea Grant will continue to support an integrated program of research, outreach and education to help stakeholders - residents, businesses, communities, planners and agencies - understand and employ best management practices and policies for sustainable development and for preparing for and responding to hazards and disasters. This includes informing citizens and communities about adaptation options to climate change and other adverse environmental events (e.g., harmful algal blooms or HABs), especially those that affect underserved members of society.

RCE Goals

- Support planning and policy research to help coastal communities rebound from disasters and become more resilient and adaptive to emerging environmental hazards and threats.
- Develop engineering-based tools, information and guidance to protect coastal infrastructure during extreme weather events.
- Support actions that promote sustainable use of waterfronts and waterways for the benefit of water-dependent businesses and communities.
- Inform coastal residents and visitors about practices and behaviors that contribute to sustainable coastal communities.

RCE Research Projects

Robust design of green infrastructure for shoreline resiliency and habitat restoration: applying probabilistic hydrodynamic modeling to predict site-scale suitability for living shorelines

Project number: R/C-E-59

Funding awarded: FY22-FY23

PI: Kelly Kibler, University of Central Florida

Application of green infrastructure, such as living shoreline, may address shoreline erosion and climate adaptation while simultaneously achieving Sea Grant priorities related to water quality and fisheries. However, when organisms are utilized as ecosystem engineers in the context of green infrastructure, projects must be designed to match site conditions with organisms that are robust to the range and frequency of hydrodynamic forces characterized at the site scale. This is often a challenging task for practitioners, as both pieces of information needed (habitat thresholds of species and site-scale hydrodynamic characterization) may be unknown and challenging to obtain. Nevertheless, failure to implement robust designs will inevitably lead to unsuccessful stabilization efforts. While it is unrealistic to expect that every project will be successful over the long term, unsuccessful adaptation efforts are not only an inefficient use of resources but also damage public trust in adaptation efficacy. The proposed research is aimed at improving the science behind green infrastructure design to enhance success and impact of shoreline stabilization using nature-based method. The project will create a living shoreline prioritization model and hydrodynamic habitat suitability models for 240 miles (384 km) of estuarine shorelines in central to south Indian River Lagoon and Lake Worth Lagoon and will transfer the technology to end-users for direct application to adaptation planning, design and engineering in Indian River, Martin, St. Lucie and Palm Beach Counties.

Prioritizing spatial justice in neighborhood revitalization: Adaptation and resilience building in Jacksonville

Project number: R/C-S-72

Funding awarded: FY22-FY23

PI: Jason Von Meding, University of Florida

This project targets the interface of development, climate change adaptation, and

social injustice. The goal of the project is to integrate community-designed spatial justice principles into Jacksonville's infrastructure planning. Because we understand that geographical inequalities are created and reproduced by dominant policy positions, the rights of the dispossessed to participate in decision-making about spatial transformation is a critical element of social justice. When opportunities to participate fully in the transformation of society–and space—are limited, injustice is recreated. Research efforts must therefore be led by the racialized groups that have been excluded from making claims about space, resources, and civic and spatial justice, despite often being most impacted by system failures. A diversity-centered approach will enable more uniquely tailored and justice-serving solutions for the future; and, this project presents an opportunity to align with ongoing local efforts towards revitalization (e.g., Emerald Trail project). In order to assess the extent to which Jacksonville's urban core infrastructure meets the needs of residents of disenfranchised neighborhoods, and how new investment can be a catalyst for social progress, the UF/EWC researchers will work in two groups based on expertise relating to aspects of spatial justice: 1) Built Environment, and 2) Community Psychology and Health. This project will honor the true value of historically Black neighborhoods in Jacksonville, focusing on healing and creating opportunities to thrive. We propose not only a research project but a long-term partnership that centers residents of under-threat Black neighborhoods as principal creators and owners of knowledge related to the community.

Hurricane fragility characterization of coastal elevated structures using large-scale experimentation and recent damage survey data

Project number: R/C-D-25

Funding awarded: FY20-FY21

PI: Amal Elawady, Florida International University

The research will advance the fundamental knowledge and address current science gaps related to the aerodynamics of coastal elevated houses. There are dissimilarities occurring in the stochastic wind loading acting on the surfaces of elevated structures compared to their non-elevated (slab-on-grade) counterparts that have never been addressed in the literature. Risk assessment models are lacking realistic wind loading information on elevated structures which will be obtained using wind testing. Using existing data sets on post-hurricane damage to identify typical elevated structures in Florida, this study will conduct large-scale wind testing to determine surface pressure coefficients on walls, roof, and floor of elevated structures and develop a set of surface contour maps of wind pressures. Empirical fragility functions will then be used to assess the performance of current coastal structures in Florida. Building code committees, for the first time, will be able to implement new guidelines to address wind loads on coastal elevated structures. The outcomes are expected to offer economic benefits to the People of Florida and other states by enhancing current design codes to reduce hurricane-induced damage in coastal communities -- a high priority towards economic prosperity.

Salty Urbanism Adaptation: Using natural and nature-based features to enhance ecosystem services and quality of life in response to sea-level rise

Project number: R/C-S-70

Funding awarded: FY20-FY21

PI: Jeffrey Huber, Florida Atlantic University

ADaPT: "Adaptation Design and Planning Tool for Urban Areas in the Coastal Zone" is a project that addressed long-term design and planning solutions by helping communities visualize potential adaptation solutions at the scale of the neighborhood. The Salty Urbanism Adaptation project would build on ADaPT by including the short-term investments needed to implement first phase approaches. While comprehensive plans are being formulated to address policy and planning at large scales and within municipal and county-wide regulatory frameworks, Salty

DIRECTORY OF PROJECTS

Urbanism Adaptation intends to develop a menu of urban design and ecosystem service modeling approaches at the property, street, and neighborhood scales to achieve enhanced redundancy, distribution, and resiliency of the overlaid living infrastructure. The first step toward achieving this greater goal is through the granular mapping and modeling of the urban and coastal ecological landscape, along with weighted parameterization of modeled adaptation choices, to facilitate a unified and science-based approach to an otherwise haphazard and piecemeal progression of restoration. These model outcomes will be applied to various scenarios of adaptation and "business as usual" and will be coupled with architectural, engineering, ecological, and urban design solutions specifically tailored to mitigate hazard, support healthy nearshore ecosystems, and facilitate resilient coastal communities.

Quantifying the effectiveness of resilience planning for affordable housing in coastal Florida by assessing local planning frameworks

Project number: R/C-S-71

Funding awarded: FY20-FY21

PI: William O'Dell, University of Florida

Housing is the critical link in building community resilience at the nexus of personal well-being, public health, social equity, and economic stability. However, with accelerating sea level rise, coupled with the potential for more intense storm events, housing stock all along the U.S. coast is at risk. Nowhere is this more apparent than in the State of Florida where affordable housing residents in flood prone coastal communities are doubly vulnerable. They are vulnerable to coastal flooding and they are vulnerable to the economic and social costs of dislocation, relocation, and in situ adaptation that results from repetitive and storm-induced flooding. This double vulnerability provides critical challenges for community resilience, but also presents opportunities for people, neighborhoods, and communities to better prepare for both repetitive and extreme flooding. While Florida is one of the nation's leaders in preparing for a changing coast across many scales of planning and governance, the connection between resilience and social equity, and specifically affordable housing, is often overlooked. This project aims to better understand how well local affordable housing plans and programs are aligned with a community's risk reduction and resilience goals or may be mis-aligned due to competing priorities. In addition, plan effectiveness is determined by a correlation to physical and social vulnerability. (The hypothesis is that better integrated planning networks are inversely correlated to vulnerability, including the vulnerability of affordable housing stock and residents.) The assessment process builds upon the state-of-the-art planning and hazard mitigation research conducted at the Texas A&M University's Institute for Sustainable Communities.

RCE PD Projects

Exploring green infrastructure's role in flood mitigation through neighborhood scale streetscape design

Project number: PD-21-16
Funding awarded: 2021
PIs: PI: Ebru Ozer, Florida International University

Feasibility assessment of special management areas to enhance recreational fisheries and habitat.

Project number: PD-20-09
Funding awarded: 2020
PIs: Savanna Barry, University of Florida

Identification and prioritization of green stormwater infrastructure research needs in Miami, Florida.

Project number: PD-20-10
Funding awarded: 2020
PIs: Ali Ebrahimian, Florida International University

Environmental Literacy & Workforce Development (ELWD)

The actions of people can have large negative or positive effects on habitats, wildlife and water quality in the Florida coastal zone, particularly because of the close proximity of a huge population and the sensitivity of those natural environments to human and natural impacts. Therefore, in addition to active resource management, it is critical that residents, businesses and tourists understand the values of our natural coastal habitats and of good water quality, as well as take actions to protect and sustain them through what often are simple changes in lifestyle.

Florida Sea Grant has captured the essence of those lifestyle changes in a book called *A Practical Guide to Estuary-Friendly Living*, and will continue to carry out a comprehensive statewide program to educate people about appropriate actions. There also is a large workforce in the coastal zone that can benefit from training provided by Sea Grant – training that is either required for them to remain employed or in business, or training that can help them advance in their careers. This training goes hand-in-hand with actions that protect the coastal environment and ensure safety of marine aquatic products.

Florida Sea Grant will continue its active programs in environmental literacy and workforce development, expanding it to include a greater array of opportunities for K-12 STEM education and recent graduates to transition into the coastal workforce through targeted internship programs. Greater efforts will also be made to reach Spanish speaking stakeholders.

ELWD Goals

- Residents and tourists will be informed about behaviors and take actions that reduce their negative effects on the coastal zone, and they will participate more actively in beneficial activities.
- Training will be provided to the coastal workforce that is beneficial and sometimes required for continued employment, or that can result in enhanced employment opportunities.
- Youth will be educated in STEM disciplines, threats and actions that can be taken to preserve natural environments, and opportunities to enhance natural resources for the benefits of coastal economies.

ELWD PD Projects

Providing opportunities for experience and entry into aquaculture in the Indian River Lagoon

Project number: PD-21-09
Funding awarded: 2021
PIs: Holly Abeels, University of Florida

Oyster aquaculture experience and development of a new farming system

Project number: PD-21-10
Funding awarded: 2021
PIs: Chris Verlinde, University of Florida

Enhancing public awareness of and supporting investment in offshore aquaculture in the Gulf of Mexico

Project number: PD-21-17
Funding awarded: 2021
PI: Laura Tiu, University of Florida

Dr. Charles Sidman
Associate Director for Research,
Florida Sea Grant

phone: 352-392-5870
email: csidman@ufl.edu

Sea Grant
Florida