

FLORIDA GULF OF MEXICO RESTORATION PROJECT SUBMITTAL FORM

Submit by Email

Form Purpose and Instructions:

- To assist the project proposal and review process, please complete this Submittal Form. Completion of the Form will contribute to the appropriate information being completely and accurately submitted for each project.
- Take as much space as needed for each question, but please keep responses as focused as possible. It may assist you to review all the questions before addressing any one question.
- If you have multiple projects – please submit one Form for each project.
- When you have completed the form hit the submit button in the upper right hand corner. Once your Form is successfully submitted, you will receive a confirmation email from the Florida Department of Environmental Protection.
- Submit all back-up maps, information, etc. to Restoration.Projects@dep.state.fl.us
- To submit updated information, please fill out this form and update fields as needed.

All of the following are **Required Fields** for project updates

New Project

☐

Update to Previous Submittal

☒

Project #

183-061713

Project Name

GIREC Proposal 2: Facilities Construction and Operations

Contact Information: *(Include at least one name, phone number, email address, and organization name if applicable)*

Daniel R. Brown, 850-934-2613, daniel_r_brown@nps.gov
Richard A. Snyder, 850-474-2086, rsnyder@uwf.edu

Project Location:

(Include a map, if possible, and the city, county, watershed, longitude/latitude dec.deg, Parcel # if Applicable)

Gulf Islands National Seashore Florida District, Naval Live Oaks Area; Santa Rosa county;
30.3641N, 87.1308W

Project Description:

(Describe all aspects of the project)

The proposed project would provide a permanent home for the new Gulf Islands Research and Education Center (GIREC). GIREC represents an innovative partnership between the University of West Florida (UWF) and Gulf Islands National Seashore (GUIS) to better engage scientists, students, and the public in essential environmental research and science education. Construction of the Center will promote (1) the basic science needed to support the restoration and conservation of Gulf Coast ecosystems impacted by the Deep Water Horizon oil spill, and (2) increase student access to high-quality, hands-on STEM education to promote student achievement and environmental stewardship. (See attached GIREC proposal 2)

Estimated Project Costs:

(Describe the estimated costs of the project, including any assumptions for contingency and ongoing operations/maintenance. Identify other secured funding sources such as matching funds, in-kind contributions or state/federal dollars. In addition, if possible, complete and submit the Cost Appendix Sheet associated with this Form)

To promote science based resource management and hands-on STEM education we are requesting \$13.4 M to support (1) construction of the Center, including research labs, classrooms, and an environmental Discovery Center to replace the existing GUIS Visitor Center; and (2) five years of operational support to ensure development of a sustainable, integrated research and science education program. (See attached GIREC proposal 2)

Other Funding:

(Indicate if the project is submitted for any potential funding or if it may be used to leverage additional funding, if so, please describe the funding source [e.g. State/Federal Grants])

A separate proposal to establish a Discover Science grants program to promote essential research, teacher training, and student participation in GIREC programs will be submitted for consideration for RESTORE Act and NFWF funding (GIREC Proposal 1: Science Program Development). Construction of the Center will greatly enhance UWF and GUIS' ability to secure external funding to support GIREC's research and education goals. Potential funding sources for individual research and education programs include the National Science Foundation, US Department of Education, National Marine Fisheries Service, and National Park Foundation. To support GIREC program development the NPS has initiated hiring for an Education Specialist to lead development of GIREC's STEM based educational programs and UWF has provided an initial two years support for a Project Coordinator to facilitate GIREC development. (See attached GIREC proposal 2)

Technical Feasibility:

(Describe the technologies involved and any relevant past experience or proven success with similar projects)

The partners have the capacity and expertise to design, construct, and operate the facility for the intended purpose. Further, GIREC is an expansion and coordination of existing outreach, education and research activities of the partners, and the existing national network of Research Learning Centers (RLC) can provide patterns of operation and assistance that can be modified to this situation. (See attached GIREC proposal 2)

Conflicts or Complements to Existing Efforts:

(Describe any ongoing activities in the project implementation area, if the project is part of another plan, and why the project does or does not interfere with that work. Please consider how the project may complement existing local, regional, and state efforts/plans/objectives)

GIREC's mission to facilitate research and education with a focus on regionally important ecological resources and issues is directly in-line with UWF and NPS public service mandates. Proposed research, monitoring, and education programs will compliment and enhance existing activities at partner institutions. Talks are currently underway with area universities, colleges, state and federal agencies, and non-governmental organizations to ensure successful

coordination of efforts. (See attached GIREC proposal 2)

Complies with Federal, State, Local, and Tribal Laws/Regulations:

(Describe any concerns or potential conflicts)

State, federal, and county regulations will be followed in all construction activities and research programs.

Readiness for Implementation:

(Describe if the project has had any design or permitting work started or

completed [attach permits or design work]. Please address any issues that may delay start or finish of the project)

The partners are already pursuing the administrative structure need to establish GIREC as a nationally recognized center for Gulf of Mexico coastal research and science education. UWF and GUIIS are jointly working to ensure a suite of integrated research and education programs will be operational by the time funding for construction is available. We anticipate immediate action upon approval.

Environmental Benefits:

(Describe the nature, magnitude, and timing of any environmental benefits attributable

to the project. If possible, describe potential environmental performance measures [e.g. pollutant reduction].

Please address any potential environmental impacts associated with implementing or maintaining the project [e.g. loss of a habitat or conversion of habitat from one type to another during implementation])

GIREC will be designed to support a flexible response to evolving resource issues, with an emphasis on water quality, fisheries and wildlife restoration, and coastal flood protection.

Specific program goals include:

- Directed research to improve fisheries and wildlife management
- Improved coastal sand management and coastal flood protection
- Continuous water quality monitoring in Santa Rosa Sound and Escambia Bay
- Enhanced environmental science education and training

- Development of Citizen Science and Environmental Stewardship programs
- Construction of a Water Quality Portal to provide real-time water quality data to the public (See attached GIREC proposal 2)

Economic and Social Benefits:

(Describe the economic and social benefits including those related to the project's improved ecosystem services and any estimates on jobs created or preserved)

Construction of the Center will strengthen Gulf Coast economies and communities by promoting sustainable resource management, enhanced STEM education, and regional tourism. For every dollar invested in national parks there is a return of ten dollars in regional economic activity (NPCS 2011). GIREC will also increase UWF's profile, boosting student enrollment and faculty recruitment. Specific economic and social benefits include:

- Hands-on STEM educational opportunities tied to learning benchmarks
- Targeted STEM outreach to schools with a high-percentage of at-risk students
- Annual internships, student research grants, and STEM education workshops
- Directed research to improve coastal resource management
- Promotion of Gulf Coast tourism and increased national exposure for GIREC partners

(See attached GIREC proposal 2)

Community Resilience:

(Describe if the project assists Florida's ability to anticipate, withstand, or recover from hazards or threats [e.g. hurricane preparedness, establishing living shorelines])

GIREC will prioritize research to address (1) declining water quality, (2) fisheries and wildlife restoration, and (3) coastal flood protection. To strengthen existing water quality monitoring in the Pensacola Bay watershed GIREC will establish and maintain a network of continuous, multi-parameter water quality monitors in Santa Rosa Sound and Pensacola Bay. GIREC will also work to promote the critical research needed to assess and manage threatened Gulf of Mexico coastal and estuarine populations, including the identification of essential habitat, accurate assessment of stock boundaries and stock abundance, and expected recovery time of impacted populations. To assist state and federal management agencies in overcoming the historic challenges of protecting vulnerable barrier islands, coastal dunes, beaches, and wetlands from frequent high-intensity storms, a Geomorphologist will be hired with expertise in sediment transport dynamics and coastal flood hazard mitigation. (See attached GIREC proposal 2)

Public Acceptance:

(Describe any known or potential public approval or opposition to the project)

When discussed with agency administrators, managers, teachers, and the general public, the responses to the proposed project has been overwhelmingly positive, suggesting there will be strong public acceptance and engagement in GIREC programs.

Additional Information you wish to provide:

(Please include any maps, designs, drawings, photos or background resources that may assist in completely and accurately understanding the project. If these are too large to attach here, please email them to

Restoration.Projects@dep.state.fl.us

See attached GIREC proposal 2 for more details

Cost Appendix Sheet

Cost Item

Cost Estimate

Planning

Contracts	
Feasibility	
Engineering, Design, Land Rights & Bid Prep	
Restoration Plan	
Site Visits & Cost of Site Selection	
Administration, Overhead and Indirect	
Other	

Planning Subtotal:

Construction

Contracts	
Administration & Mobilization/Demobilization	
Other	

Construction Subtotal:

Monitoring

Contracts	
Data Collection	
Monitoring Administration	
Other	

Monitoring Subtotal:

Project Cost

Supervision	
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Subtotal:

Contingency (<i>traditionally calculated at 10% of the subtotal</i>)	0
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TOTAL:

0

Estimated Costs by Year

Year 1	10,300,000
Year 2	590,000
Year 3	604,000
Year 4	616,000
Year 5	629,000
Year 6	641,000

GIREC Proposal 2: FACILITIES CONSTRUCTION AND OPERATION

Contact Information

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Project Location

Gulf Islands National Seashore Florida District, Naval Live Oaks Area; Santa Rosa County (Figure 1)



Gulf Islands Research and Education Center: A conservation, research, and science education partnership between Gulf Islands National Seashore and the University of West Florida

Project Description

The proposed project would provide a permanent home for the new Gulf Islands Research and Education Center (GIREC). GIREC builds on the long-standing partnership between the University of West Florida (UWF) and Gulf Islands National Seashore (GUIS) to support the Seashore in the conservation and restoration of Gulf Coast ecosystems, and the University in its mission to provide access to high-quality educational opportunities that improve the economy and quality of life in the region. Through GIREC, UWF and GUIS will work to implement innovative, integrated environmental research and education programs that bring scientists, students, and the public together to conduct essential science and high-impact STEM education. A separate proposal (GIREC Proposal 1: Program Development) will be submitted to provide essential base funding to support implementation of GIREC research and education programs.

Construction of GIREC will promote much needed research into environmental issues impacting northern Gulf of Mexico marine and coastal ecosystems, including water quality, fisheries and wildlife conservation, and sand resource management. GIREC education and research programs will be highly integrated to provide students and the public with hands-on experience with the methods and tools of scientific research (see GIREC Proposal 1: Program Development). Schools with a high percentage of at-risk students will be the focus of GIREC STEM educational outreach. GIREC will as well provide an attractive venue for regional workshops and symposium, and the Center will be promoted nationally as a destination for coastal research and environmental education.

To more effectively promote science based resource management and improved STEM education, development of GIREC requires (1) construction of the Center, including research labs, classrooms, and an environmental Discovery Center to replace the existing GUIS Visitor Center; and (2) five years of operational support to ensure development of a sustainable, integrated research and science education program.

The Partners

Gulf Islands National Seashore

Gulf Islands National Seashore manages 160 miles of coastline from Cat Island Mississippi to Okaloosa Florida (Figure 2). The Seashore is the 9th most visited US national park with nearly 5 million visitors in 2012 (Table 1), and visitors to the Seashore are a major regional economic driver.

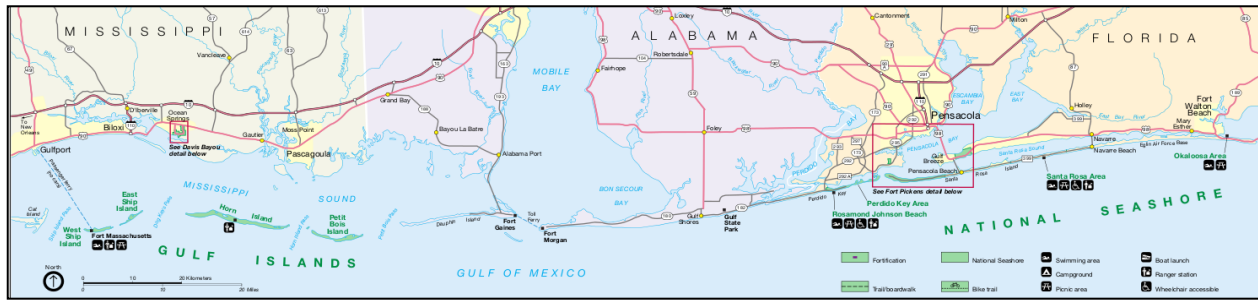


Figure 2. Map of Gulf Islands National Seashore including coastal and estuarine habitat in Mississippi and Florida.

The Seashore is managed as both a nature preserve and an outdoor classroom for exploring the natural and human history of the Gulf of Mexico's barrier islands and coastal environments. The Seashore protects the habitats, breeding grounds, and migratory stop-over sites for more than 300 species of birds, and manages habitat for more than 106 animals, including six species of marine mammals.

Essential coastal habitats under GUIs management include barrier islands, beaches, dunes, wetlands, forests, seagrass beds, oyster reefs, and other submerged marine habitats. Ten species found in the Seashore are listed as threatened (t), endangered (e), or species of special concern (ssc). State or federally listed wildlife protected by the Seashore include the Perdido Key beach mouse (e), the corn snake (ssc), and the gopher tortoise (ssc). Threatened or endangered wildlife nesting on the Seashore's beaches include the piping plover (t) and four species of sea turtles (e). The Seashores wetlands and salt marshes are important habitat to the American alligator (t), and the shallow sea grass beds provide a source of food and protections for the manatee (e) and essential nursery habitat for many commercially important fish.

Table 1: NPS 2012 recreational visitor ranking (US NPS 2012 Summary Report)

Park	Rank	Visitors
Blue Ridge PKWY	1	15,205,059
Golden Gate NRA	2	14,540,338
Great Smoky Mountains NP	3	9,685,829
George Washington MEM PKWY	4	7,425,577
Lake Mead NRA	5	6,285,439
Lincoln Memorial	6	6,191,361
Natchez Trace PKWY	7	5,560,668
Gateway NRA	8	5,043,863
Gulf Islands NS	9	4,973,462
Delaware Water Gap NRA	10	4,970,802

The GIREC partnership comes at a critical time for the Seashore. Impacts from the Deepwater Horizon oil spill as well as those from high-intensity storms, invasive species, and increased urbanization threaten the Seashore's resources, habitats, and species. Construction of GIREC will promote the research and biological monitoring programs that are needed to support science-based resource management and planning. Construction of GIREC will as well support GUIs' efforts to move away from traditional interpretation programs towards goal based experiential and hands-on stewardship, citizen science, and environmental educational. These changes will enhance connections between GUIs resource management, research, and education, and increase research and educational opportunities for area student and the public.

To support proposed GIREC research initiatives, GUIs plans to hire a Ph.D. level marine biologist, one permanent biological technician, and several seasonal biological technicians. Planned science based activities in part include the identification, protection, and restoration of all species within the Seashore

that are listed under the Endangered Species Act. To support GIREC educational programming, the Seashore will hire a professional level education coordinator and two education technicians.

University of West Florida

The University of West Florida is a fast growing, comprehensive Research University with a current enrollment of nearly 13,000 undergraduate and graduate students. The University was the first school in the United States to feature a Marine Biology undergraduate major and marine biology and coastal research continue to be a major focus at the undergraduate and graduate levels. Annually, University faculty secure more than \$20 million in grants to support research and educational programs. In 2012 these included support for research from the National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA), National Institutes for Health (NIH), Department of Environmental Protection (DEP), Gulf of Mexico Alliance (GOMA), and the Gulf of Mexico Research Initiative's (GoMRI).

The University's excellence in environmental research is best exemplified by the Center for Environmental Diagnostics and Bioremediation (CEDB), which will coordinate development of the Center and related research programs with UWF's Departments of Biology, Environmental Studies, and Archaeology. In the last eight years CEDB has been awarded more than \$18 million in research grants resulting in 72 research publications with contributions to the fields of Estuarine and Marine Ecology, Biogeochemistry, Fisheries Biology, Environmental Restoration, Microbiology, and Environmental Toxicology. CEDB's research has played a critical role in early assessment of the impacts of the Deepwater Horizon oil spill, including monitoring for oil in GUIs, and research to characterize regional marine productivity (Deep Sea to Coast Connectivity in the Eastern Gulf of Mexico; Deep-C) and biodiversity (Center for Integrated Modeling and Analysis of Gulf of Mexico Ecosystems; C-Image).

CEDB faculty and affiliate researchers have a long-history of conducting the basic science required to support effective science-based natural resource management. Some recent examples include:

- Synthesis of water quality data for Gulf of Mexico coastal parks
- Acoustic tracking of coastal fishes
- Assessing the restoration success of transplanted seagrass
- Tracking post-hurricane dune vegetation recovery
- Characterizing the impacts of storm surge flooding on coastal water quality
- Measuring the economic benefits of artificial reefs

This work reflects a fundamental emphasis on using modern research methods to better understand and manage marine and coastal systems. With regional, state, and federal partners CEDB will work to promote development of GIREC into a nationally recognized center for coastal research and education.

The Gulf Islands Research and Education Center (GIREC)

Construction of GIREC will foster an integrated, collaborative approach to long-term Gulf of Mexico marine and coastal conservation and environmental education by (1) providing much needed research facilities and classrooms for local and visiting scientists, students, and the public; (2) directing research

to high-priority environmental issues; (3) creating a venue for the exchange of research findings and technical expertise; and (4) by providing high-impact STEM educational opportunities for area students. The Center and related research and education programs will be promoted nationally through the National Park Service, the national network of Research Learning Centers, and Academic Scientific Societies. GIREC will as well provide a high-profile venue for the promotion of regional tourism and will enrich the experience of visiting tourists through construction of a new Visitor Center for the Seashore. The new Visitor Center (Gulf Islands Discovery Center) will be staffed by uniformed National Park Service employees and will include interactive exhibits emphasizing the region's unique natural and cultural history.

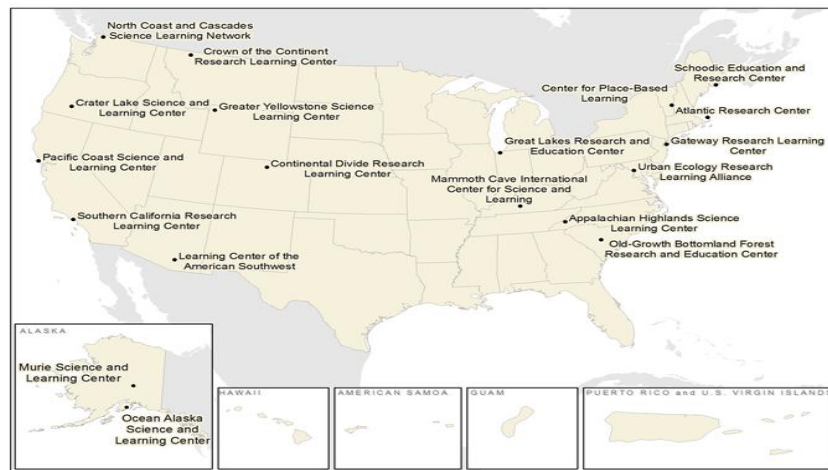


Figure 3. Location of 19 Research Learning Centers (US Dept. of Interior graphic)

Nineteen National Park Service Research Learning Centers (RLCs) have been established to promote research and education opportunities within each of the nation's unique eco-regions; however, none have been established to serve the National Parks located on the Gulf of Mexico (Figure 3). The overall objective of RLCs is to support the mission of US National Parks by facilitating research within the parks and by integrating research findings into park resource management and educational programs. Each year national RLCs in collaboration with partner institutions involve thousands of scientists and tens of thousands of students in park-based research. In 2012 these efforts resulted in over 200 peer-reviewed scientific publications and more than 90 reports supporting sustainable resource management. Research Learning Centers also regularly host in-park workshops, seminars, and symposia to develop regional scientific expertise and bring current scientific information to resource managers, science educators, and the public.

Established in 2002, the Southern California RLC (SCRLC) provides an example of the ability of research learning centers to enhance regional environmental research and educational programming. The SCRLC currently includes more than 70 education and research partnerships, and 36 individual funding partnerships. Together these partnerships have allowed the SCRLC to develop innovative programs to support the Park's conservation initiatives and to promote science education in regional schools. Recent examples of the SCRLC supported projects include technology training workshops for teachers, urban minority service learning, and more than a dozen Citizen Science resource inventory and monitoring

projects (Figure 4). In 2010, hundreds of students from across southern California participated in SCRLC programs that included contributions by more than 30 scientists. At the same time 114 people participated in Citizen Science projects, and 35 students conducted independent research within the park. Work supported by the SCRLC resulted in 25 peer reviewed research papers with contributions to park resource management. The successful model for integrating research and educational programs demonstrated by the SCRLC and other RLCs will be implemented at GIREC to improve resource management and STEM education across the region.



Figure 4. 2010 SCRLC Urban Minority Service Learning Program.

The Gulf Islands Research and Education Center reflects UWF and GUI's shared commitment to establish a state-of-the-art research and education center focused on the natural and cultural resources of Gulf Islands National Seashore and northern Gulf of Mexico. GIREC will be promoted as a destination for research, symposia, and workshops related to Gulf Coast resource management, k-12 teacher training, citizen science and service learning. Resident and visiting scientists will contribute valuable expertise to the management of Seashore's natural and cultural resources, and will expand education opportunities for students from communities in West Florida, Alabama, and Mississippi. GIREC will particularly benefit at-risk students by increasing opportunities for hands-on STEM based learning that integrates technology and field science.

The 22,000 square foot Center will be designed to meet Gold LEED rating, and will include:

- Applied research labs (biogeochemistry, molecular biology, geomorphology, and multi-use)
- Multi-purpose teaching lab and dedicated K-12 e-learning classroom
- Science Studio to accommodate classes and events for up to 200 students and park visitors
- Housing for up to 30 visiting students and scientists
- New GUI Visitor Center highlighting the region's unique natural and cultural history

Applied Research Labs: The research labs will support priority interdisciplinary research by resident and visiting researchers. The labs will include two biology research labs to meet core molecular and biogeochemical analytical research needs; a wet lab with running seawater, flow tanks, and flow tables to support marine and aquatic organismal research; two flexible multi-use labs to enhance partnership opportunities and to allow GIREC to adapt to future research needs; and a teaching lab to provide high-impact experiential learning for visiting students and the public. The teaching lab will be linked with the e-learning classroom and Science Studio to support interactive instruction and provide a flexible venue for workshops and classes.

The science labs will include core analytical equipment to enhance regional scientific capacity and to attract scientists interested in conducting research on the Gulf Coast. Example equipment to be provided includes high-throughput genetic cyclers, broad spectrum spectrophotometer and

fluorometer, fluorescent and epi-fluorescent microscopes, microscopic digital imagers, and bioinformatics computational facilities.

elearning Classroom: The classroom will accommodate up to 30 students and will meet the most current elearning standards to provide engaging instruction and an ability to interact with remotely linked classes across the Gulf Coast region while also allowing students to connect with national and international science experts. Whether on-site or linked remotely, students will work with GIREC and NPS staff and scientists on topics ranging from endangered species conservation to large-scale processes like nutrient cycling and water-quality. Educational programs will integrate the Seashore's natural and cultural resources to stimulate students' academic and social growth, and to promote conservation of the natural environment. Activities and educational materials will be developed by NPS Educational Specialists in collaboration with UWF and visiting researchers, and will emphasize regionally important environmental issues. Students will also be encouraged to conduct independent research on a topic of their choosing. Example student led projects at other Research Learning Centers have included tracking pollution in rivers (Figure 5) and restoring habitat for threatened and endangered species.



Figure 5. Great Lakes Research Learning Center students monitoring Lake Huron water quality.

Student and Visiting Scientist Housing: GIREC will include a combination of dorms and private rooms to provide affordable short-term housing for up to 30 people. A shortage of housing options has limited the number of interns, scientists, and student groups that are able to conduct park-based research and participate in Seashore related educational programs. Construction of GIREC housing would triple the available housing at GUIS, dramatically increasing the effectiveness of the Seashore's research and education programs.

Science Studio: To provide an accessible venue for the dissemination of research findings and to enhance the Seashore's capacity to host visiting K-12 student groups GIREC will include flexible studio space to accommodate groups ranging from 20 to 200 people. In 2012, over 100 in-park Science and Education workshops, seminars, and symposia were hosted by national Research Learning Centers on topics ranging from the control of invasive species (Southern California RLC) to enhanced technologies for STEM education (Great Lakes RLC). Development of similar programs at GIREC will enhance regional scientific expertise, while also increasing K-12 student participation in park-based learning by allowing the Seashore to simultaneously provide engaging, high-impact instruction to as many as five student groups.

Gulf Islands Discovery Center: The Discovery Center will replace the existing GUIS Visitor Center and will be the primary location for visitors to learn about the Seashore's resources, activities, and management. The new Discovery Center will include a series of interactive exhibits designed by UWF and GUIS in partnership with the Florida Public Archaeology Network (FPAN), a unit of UWF's Division of Anthropology and Archaeology. Displays will showcase the unique natural resources of the Gulf Coast

and the history of natural resource use in the region. Permanent and rotating exhibits will highlight interactions between humans and the environment from the early Native American inhabitants to modern times, with particular emphasis on historic changes in resource use and sustainability. To increase public understanding of water quality issues the Discovery Center will include a permanent real-time display of water quality data from Santa Rosa Sound and Pensacola Bay. A series of rotating exhibits will highlight other ongoing park-based research, and will be made available for off-site exhibition to promote greater science literacy and environmental awareness.

Supporting Facilities: To promote creative approaches to address GIREC's research and educational goals office space will be provided for both GIREC and GUIs staff. Offices will be designed with shared common areas and options for small group meeting to foster collaboration and an easy exchange of information between scientists, resource managers, and Education Specialists. Construction of the offices will allow GUIs to relocate staff currently working at Fort Pickens where access is regularly restricted due to flooding from storm surge and heavy rains. Office space will be leased to GUIs and will help offset annual operating expenses.

To facilitate access to research sites and to give student groups an opportunity to explore the surrounding sea grass and oyster reef habitats GIREC will include diving facilities and a dock on Santa Rosa sound with slips for a large-capacity pontoon boat and two research boats. Dive and boating operations will be managed by the UWF Marine Services Center which has provided 20 years of effective, safe support for marine and coastal research.

UWF-GUIS Land Exchange: To provide developable lands for GIREC, GUIs has proposed to convey 414 acres of pine-oak woodlands in Gulf Breeze to UWF in exchange for 152 acres of undeveloped barrier island habitat on Santa Rosa Island (Figure 6). The Santa Rosa Island parcel is located east of Pensacola Beach between the heavily developed Portofino Island Resort and the protected GUIs Santa Rosa Area. The property is currently managed by UWF and development plans are perennially considered. The addition of the Santa Rosa Island property to the National Park System will ensure long-term protection for this vulnerable barrier island habitat and living resources.

The diversity of habitats on the property includes fore and back dunes, swales, maritime and flatwood forest, marshes, and tidal creeks (Liebens 1998). The vegetation consists of a diverse mix of specialized plants that are adapted to the nutrient poor, dry conditions common to barrier islands. Dune building grasses are common and their growth has led to development of a nearly continuous dune ridge along the Gulf of Mexico which has limited storm-induced shoreline erosion in the area (Liebens 1998). The beach provides important nesting habitat for endangered Green Sea Turtles and the dunes are critical habitat for the endangered Santa Rosa Beach Mouse.

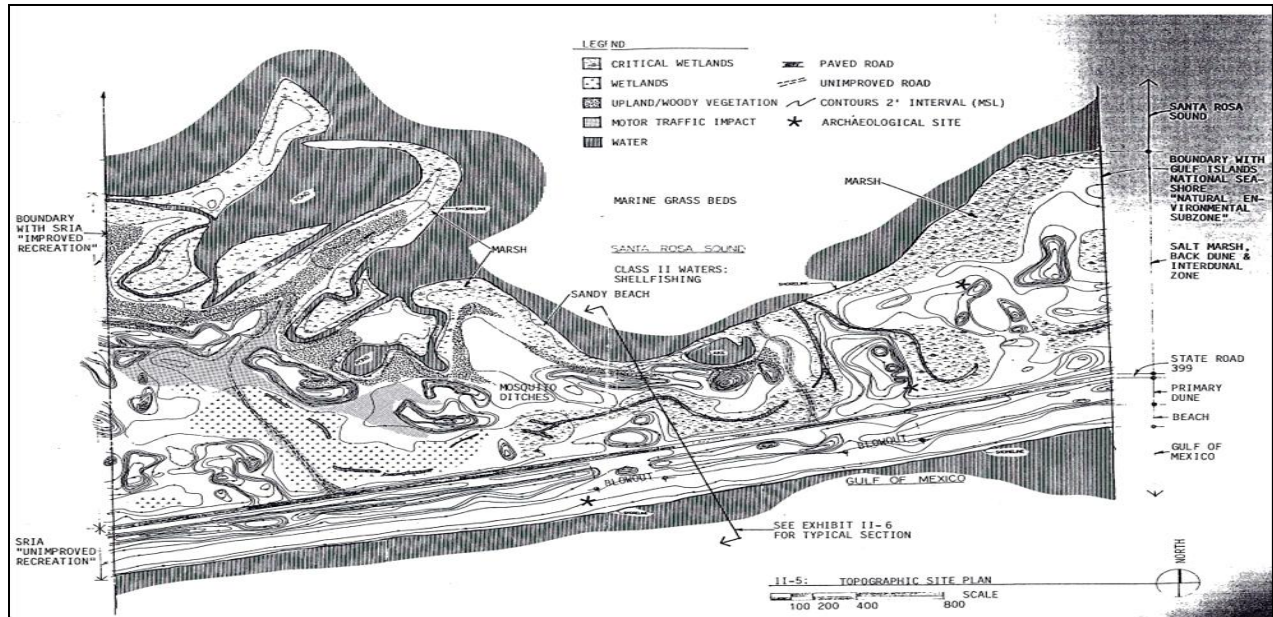


Figure 6a. 152 acre Santa Rosa Island property currently managed by UWF (Liebens et al. 1998).



Figure 6b. GUIS Naval Live Oaks Area with the 414 acres proposed for the land swap (highlight) and proposed construction site for GIREC south of highway 98 (white circle).

Along Santa Rosa Sound there is an extensive tidal creek and sand bar system that supports a diverse community of nesting and feeding birds such as coots, loons, ducks, and shorebirds including endangered piping plovers (Figure 7; Liebans 1998). The tidal creeks and adjacent seagrass meadows provide an important nursery ground for many fish, including popular commercial and sport fish (Heck et al. 2003).



Figure 7. UWF's Santa Rosa Island property. A. Looking west towards Portofino Island Resort. B. Tidal creeks connected to Santa Rosa Sound.

Transfer of UWF's Santa Rosa Island property to GUIS would help protect essential barrier island habitat and resources by placing the Santa Rosa Island parcel under National Park Service management. In return GUIS would convey 414 acres on the east end of the Naval Live Oaks Area to the University specifically for construction of GIREC and development of research and educational programs centered on the unique natural resources and management challenges of the Gulf Coast region. Construction has been proposed for GIREC on previously developed land south of highway 98 (Figure 2b). Impacts from construction will be further mitigated by utilizing existing access roads and parking.

GIREC Programs: Integrating Research and Science Education

Science and education specialists at GIREC and GUIS will work with regional and national partners to develop a comprehensive, integrated research and educational program focused on the unique habitats, species, and natural resources of the northern Gulf (see GIREC Proposal 1: Program Development). The core goal of the program will be to engage scientists, students, and the public in research addressing critical Gulf Coast environmental issues. Programs will be designed to support a flexible response to evolving issues with specific emphasis placed on developing research and education programs to address declining water quality, fisheries and wildlife restoration, habitat restoration, and coastal flood protection. In each case scientists will partner with GIREC and GUIS Education Specialists to create opportunities for students and the public to participate directly in research. To enhance environmental stewardship and understanding of the scientific process, current research findings will be integrated into educational and outreach programs. Staff from GIREC will also work with partner agencies from across the region to enhance the value of existing and planned research programs to the Seashore and the region. Partners include the Florida Public Archaeology Network which has agreed to assist with development and implementation of educational programming highlighting the history of natural resource use along the northern Gulf Coast.

Water Quality: To strengthen existing water quality monitoring in the Pensacola Bay watershed GIREC staff will establish a network of five multi-parameter water quality monitors in Santa Rosa Sound and

Pensacola Bay (Figure 8). Following National Water Quality Council recommendations water quality measures including chlorophyll, turbidity, and total nitrogen will be continuously tracked in real-time. The resulting data will help identify water quality issues and will improve water quality management. To improve public awareness of water quality issues live streaming water quality data will be incorporated into interpretive displays in the newly designed GUIS Visitor Center (Gulf Islands Discovery Center). Real-time water quality data will also be accessible on the internet via GIREC's Water Quality Portal which could be used by fisherman to determine safe times and locations to fish. To promote a collaborative whole watershed approach, GIREC staff will work with federal and state agencies to support integration of data from GIREC water quality monitoring network with data from multiple sources to provide a coherent assessment of the condition of and trends of regional coastal and estuarine water quality. The resulting integrated measures of water quality will improve the information available to researchers and resource managers, including in the NPS Vital Signs Inventory and Monitoring Program Vital, EPA Integrated Water Quality Assessment, and Florida DEP's Regional Water Quality Monitoring Councils.

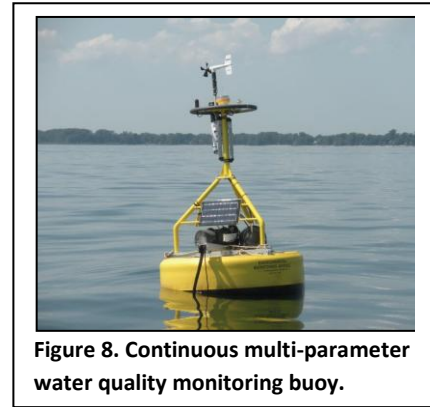


Figure 8. Continuous multi-parameter water quality monitoring buoy.

Fisheries and Wildlife Restoration: GIREC will promote the essential research needed to assess and manage threatened Gulf of Mexico coastal and estuarine populations. To support the conservation and restoration of Gulf Coast fisheries and wildlife a Conservation Biologist will be hired with expertise in stock assessment and population biology. The primary goal of the Conservation Biologist will be to work with partner institutions from across the region to enhance existing research programs and to develop new research initiatives focused on identifying the key factors responsible for the maintenance and restoration of northern Gulf of Mexico fisheries and threatened coastal populations. Priority issues include identification of essential habitat, accurate assessment of stock boundaries and stock abundance, and expected recovery time of impacted populations. Partnerships being developed to support a park-based Conservation Biology program include NOAA National Marine Fisheries Service (NMFS; Figure 9; characterization of shark pupping and nursery habitat in Northwest Florida), the University of Miami (assessing the impact of ocean currents on the resilience of northern Gulf Coast estuarine fish populations), and NPS Inventory and Monitoring Program (diversity and distribution of reptiles and amphibians within GUIS).



Figure 9. NOAA Gulf of Mexico Shark Pupping and Nursery survey.

Coastal Flood Protection: To assist GUIS in overcoming the historic challenges of maintaining 160 miles of vulnerable barrier islands, coastal dunes, beaches, and wetlands GIREC will hire a Geomorphologist with expertise in sediment transport dynamics and coastal flood hazard mitigation. Recent research has demonstrated significant degradation of barrier island habitats in Mississippi and Alabama due to ineffective management of sediment resources, including land-loss related to channel maintenance and disruption of natural along shore sediment transport (Morton 2008). The GIREC Geomorphologist will

work with faculty from the UWF Department of Environmental Studies along with scientists and engineers with the US Geological Service (USGS) and US Army Corps of Engineers to characterize the dynamics of near shore and onshore sand transport within GUIs and adjacent lands. This research will build off the technical framework presented in the Gulf of Mexico Alliance Gulf Regional Sediment Management Master Plan (Martin 2009) to establish guidelines for the effective management of sediment resources within the Seashore, including successful integration of dredging and beach renourishment projects into the natural geomorphological processes. Development of sediment management guidelines for GUIs will make the application of federal and state restoration funds more efficient, and will improve coastal community resiliency and protection.

Hands-on STEM education: A focus for GIREC outreach will be elementary and secondary schools from across the region that serve primarily minority and low social economic status (SES) communities. Dropout rates are high and levels of achievement are low in these communities (Rumberger 1995); yet, because of funding constraints few opportunities currently exist for off campus experiential learning activities, which have been shown to improve student learning and engagement in course material.

In Escambia County schools with the highest minority enrollment, 40 to 45% of students failed to graduate (Florida Department of Education 2011). Of those graduating, less than 25% will attain a college degree (Ryan and Siebens 2012). Low high school and college graduation rates decrease the chances of finding a job and increase the likelihood of being poor and relying on public assistance (Rumberger 2011). Strategies identified to increase student retention and progression on to higher education include increasing school-community collaborations to provide students with meaningful experiential learning opportunities (Cantor 1997). As the extent of experiential learning increases so does student engagement in the material, class attendance, and overall achievement (Felder et al. 1998).

Development of GIREC will allow UWF and GUIs to leverage funding from the NPS, National Science Foundation (NSF) and other federal and state agencies to provide greater access to high-impact education programs for K-12 students from across the northern Gulf Coast region. Discussions are underway with Escambia County Science Specialist Kim Walden and Santa Rosa County Mathematics and Science Coordinator Wesley Underwood to develop annual teacher training workshops and a comprehensive science educational program for GIREC that meets current educational benchmarks. The goal of GIREC educational programs will provide students with engaging hands-on experience with the tools and methods commonly used in environmental science. To increase at-risk student achievement and STEM education, GIREC Discover Science grants program will provide funding to cover student transportation costs associated with participation in GIREC programs. The grants program will also be used to support up to six student research internships each year. Interns will work side by side with UWF and GUIs scientists collecting data to promote the conservation and protection of vulnerable coastal ecosystems.

Citizen science: GIREC will prioritize development of a Citizen Science program to engage volunteers of all ages, many with little or no prior scientific training, in collecting data related to important regional environmental issues (Figure 10). Citizen Scientists gain a greater sense of environmental stewardship



Figure 10. Citizen Scientist conducting a survey of seagrass habitat.

and a deeper knowledge about the natural resources in their community, while contributing valuable information to assist in natural resource management. Levels of participation in GIREC Citizen Science program will vary between projects and individuals depending on their interests, but in each case participants will gain a better understanding of the scientific process and the challenges of successfully managing natural resources in the face of increasing impacts.

Because funding constraints have historically limited the scope of GUIs' research and monitoring programs, increased community participation in research can play an important role in generating the data needed to effectively plan management actions. Some of the programs being developed for GIREC Citizen Scientists include research to improve seagrass and oyster reef habitat restoration, and field studies to better understand the potential impacts of climate change on estuarine and coastal communities. GIREC Citizen Scientists will also have an opportunity to work with scientists from the NPS Inventory and Monitoring Program on multi-park projects designed to identify invasive species and monitor ecologically critical communities, including: insects, amphibians, and reptiles.

Estimated Project Cost (\$13.4 M)

GUIs and UWF are proceeding in laying the administrative foundation for GIREC partnership in advance of a physical home for the Center. This request is to provide that home and five years operational support to establish GIREC as a nationally recognized center devoted to Gulf of Mexico coastal, estuarine, and marine research and K-12 education (Table 2).

Table 2. Estimated construction and five years operations budget for the Gulf Islands Research and Education Center (\$13,419,000). A. 2016 estimated planning and construction budget (3% estimated annual increase thereafter). B. Five year operating budget starting in 2016, including essential staff.

A.

Project Cost Codes	2016
Land (appraisals, surveys, titles)	\$ 39,338
Permits and Fees	\$ 143,464
Design & engineering	\$ 430,393
Site Development	\$ 133,680
Building Construction	\$ 5,941,321
Commissioning/testing	\$ 44,560
FF&E (furniture, fixtures, equip)	\$ 130,709
Core Equipment	\$ 1,005,008
Discovery Center exhibit construction	\$ 327,818
Boat Dock (allowance)	\$ 546,364
Parking/access (allowance)	\$ 109,273
Project Contingency	\$ 1,485,330
Total Planning and Construction	\$ 10,337,257

B.

Operations Cost Codes	2016	2017	2018	2019	2020
Operations and Maintenance	\$ 180,976	\$ 184,595	\$ 188,287	\$ 192,053	\$ 195,894
Staff Salary and Student Internships	\$ 383,754	\$ 391,429	\$ 399,258	\$ 407,243	\$ 415,388
Workshops and Travel Grants	\$ 27,591	\$ 28,143	\$ 28,706	\$ 29,280	\$ 29,866
Annual Operations	\$ 592,321	\$ 604,168	\$ 616,251	\$ 628,576	\$ 641,147
Total Five Year Operating Costs					\$ 3,082,463

Other Funding

Base funding for GIREC will foster the development of a grant supported research and education program, enhancing regional environmental research, stewardship, and STEM education.

The NPS has initiated hiring for an Education Specialist who will work with GIREC to develop STEM based educational programs that provide students hands-on experience with the tools and methods of environmental science. UWF has provided an initial two years support for a Project Coordinator to facilitate development of the Center.

The Florida Public Archaeology Network has agreed to assign one intern to assist in the development and implementation of educational programs that highlight the historic interactions between humans and the environment within the Gulf Coast region. This work builds off of FPANs effective engagement of the public and student groups in research and cultural resource stewardship. FPAN staff will help to incorporate a historical perspective of Gulf Coast resource use into interactive exhibits for the new Gulf Islands Discovery Center, educational programs for visiting students, and educational materials including lessons and videos. FPAN will also assist with establishing teacher workshops focused on the Seashore's archaeology and biology, and training workshops in cultural and natural resource protection for park rangers, city/county land managers, and law enforcement.

Technical Feasibility

Development of GIREC will be aided by support from national network of RLC partners, which include hundreds of universities, K–12 schools, non-profit organizations, community groups, agencies, and a range of NPS programs. By engaging partners in park-based research, scholarship, and educational activities GIREC will be able to leverage in-kind funding and support for research and educational programming. As an example, the Coastal Southern California Science and Learning Center was established in 2002 as a virtual center with no dedicated facilities. By 2010 they had developed over 70 research and education partnerships and 36 funding partnerships supporting an annual budget of just over \$250,000.

Environmental Benefits

Construction of GIREC by UWF in partnership with GUIs will promote long-term sustainable management of the region's coastal, estuarine, and marine habitats by increasing protection for

vulnerable barrier island habitat and species, and by providing a scientific foundation for regional resource management needs, public outreach, and educational activities both inside and outside of the Seashore. GIREC research facilities will be designed to support a flexible response to evolving resource issues, with specific emphasis on water quality, fisheries and wildlife restoration, and coastal flood protection (see above “Integrated Research and Education Program”). The GIREC Education Program will emphasize hands-on K-12 STEM education focused on the region’s unique natural and cultural resources.

Specific GIREC environmental benefits include:

- Directed research to improve fisheries and wildlife management
- Improved coastal sand management and coastal flood protection
- Continuous water quality monitoring in Santa Rosa Sound and Escambia Bay
- Enhanced environmental science education and training
- Development of Citizen Science and Environmental Stewardship programs
- Construction of a Water Quality Portal to provide real-time water quality data to the public
- Conservation of 152 acres of undeveloped barrier island habitat on Santa Rosa Island

Environmental Impacts

An exchange of UWF’s vulnerable barrier island property for developed land currently within GUIS will minimize impacts from construction and operation of GIREC. State and Federal environmental and historical resource regulations will be followed in all construction activities. Permits are required for scientific use of GUIS resources, and one role of GIREC staff would be to facilitate the permit process for visiting scientists.

It is anticipated that the benefits derived from a fully functioning Research Learning Center will outweigh any impacts resulting from facility construction. Nonetheless, impacts will be minimized by constructing the Center on previously developed lands, and by using existing access roads and parking.

Economic and Social Benefits

Development of GIREC will strengthen Gulf Coast economies and communities by promoting research to support the sustainable management of Gulf Coast resources, and by providing enhanced learning opportunities for K-12 students and the public. GIREC will as well enhance the Seashore as a national ecotourism and citizen scientist destination, and increase UWF’s profile which will boost student enrollment and faculty recruitment. Moreover, for every dollar invested in national parks it has been there is a return of ten dollars in regional economic activity (NPCS 2011).

Specific economic and social benefits of GIREC will include:

- Hands-on STEM educational opportunities tied to learning benchmarks for regional K-12 classes
- Targeted STEM outreach to schools with a high-percentage of at-risk students
- Increased experiential learning opportunities for regional University and College students

- Annual internships and student research grants
- Workshops and symposium for teachers, resource managers, and the scientists
- Directed research to improve coastal resource management
- Increased national exposure for UWF and regional GIREC partners
- Promotion of Gulf Coast tourism through national parks and NPS Research Learning Centers.

Community Resilience

Community and ecological resilience are tightly linked (Adger 2000). GIREC will promote community resilience by supporting sustainable resource use and conservation through direct research and improved environmental education. For natural systems, sustainability decreases as ecological stressors increase (Adger 2006). GIREC will address prevalent regional stressors through support for scientists and students conducting research on Gulf of Mexico coastal, estuarine, and marine systems. Examples of proposed GIREC initiatives with direct benefits to sustainable resource use are detailed above (see “Environmental Benefits”).

Indirectly, GIREC will support improved resilience for communities across the northern Gulf Coast by promoting greater STEM education and environmental stewardship through in-park activities, educational field trips, volunteering opportunities, and K-12 outreach. STEM based environmental education activities and materials will be developed by GIREC and NPS Educational Specialists in collaboration with resident and visiting scientists. Through GIREC students will gain valuable experience with current scientific methods and equipment, and will in turn be better prepared for academic success. The most promising students will be encouraged to conduct independent research through GIREC Internship and Grants program. Student led projects at other RLCs have made important contributions to natural resource management. Some examples include tracking pollution levels in local rivers and restoring habitat for threatened and endangered species.

Compliments to Existing Efforts

The mission of GIREC to facilitate research and education with a focus on regionally important ecological resources and issues is directly in-line with UWF and NPS public service mandates. Development of GIREC would strongly compliment existing programs at both institutions. GIREC will integrate and manage a research program for scientists and students from UWF and across the country. This activity would provide a scientific foundation for improved regional resource management, public outreach, and educational activities. GIREC programs would offer distinctive learning opportunities for students of all ages, enhance community engagement for UWF and NPS staff, support the development of high-quality services and infrastructure, foster recruitment of dedicated high-quality staff and scientists, and address pressing regional environmental and social issues.

Development of GIREC will as well compliment and promote existing, innovative research, monitoring, and education programs at partner organizations. Collaborations are being built with regional universities, colleges, state and federal agencies, and non-governmental organizations to ensure successful coordination of efforts. Developing collaborations include the US EPA lab in Gulf Breeze,

NOAA National Marine Fisheries Service, US Fish and Wildlife, Florida Department of Environmental Protection (DEP), University of Miami, Florida State University, University of Southern Mississippi, and Escambia and Santa Rosa County School Districts.

Compliance with Laws and Regulations

State and Federal environmental regulations would be followed in all construction activities and research programs.

Readiness for Implementation

The partners are ready for immediate implementation of the pre-construction engineering and design phases of the project.

Public Acceptance

When discussed with agency administrators, managers, teachers, and the general public, the responses to the proposed project have been overwhelmingly positive, suggesting public acceptance and engagement in GIREC and would provide many opportunities to promote greater public environmental awareness and stewardship.

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