Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

RESTORE Council Proposal Document

General Information

Title:
Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

Project Abstract:
Alabama, through the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $24M in Category 2 Council-Selected Restoration Component funding to construct a 100-acre wetland restoration cell in Upper Mobile Bay as the first phase of 1,200 acres of tidal wetlands. This is a continuation of FPL 1 Upper Mobile Bay Beneficial Use Wetland Creation Site project, which funded design and environmental compliance. The primary goal of this project is to restore and conserve habitat by creating and restoring estuarine tidal marsh through the construction of containment and placement of sediment material. This initial cell will accept dredged materials from the Port of Mobile to begin restoring over a century of emergent wetland losses. The project will enhance utilization of navigation channel maintenance sediment and contribute to maximizing use of dredge material for effective and sustainable coastal restoration. The project will support the primary RESTORE Comprehensive Plan goal to Restore and Conserve Habitat by restoring the estuarine marsh through the construction of a semi-submerged containment area and placement of dredge material. Secondary objectives to include: providing habitat for living coastal and marine resources, enhancing community resilience by providing buffer to a main thoroughfare between Mobile and Baldwin Counties, and enhancing the economy of the region by providing cost effective disposal options for the many navigation related industries located along the Mobile River.

FPL Category: Cat2: Implementation Only
Activity Type: Project
Program: N/A
Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the

natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
This proposal is relevant to all four priority criteria. It will directly implement a 100-acre wetland restoration cell as a cornerstone for the 1200-acre project over the next 20 years (Figure 1 attached), ensuring fisheries habitat and long-term ecosystem resilience by maximizing ecological retention of dredged material resources. The project will, as the first phase of the phased creation of 1200 acres of tidal wetlands, become Alabama's largest coastal ecological restoration to date. Proven adaptive design and construction methods will be employed to rebuild ecosystem and community resilience. This will immediately begin rebuilding wetland habitats in Mobile Bay lost to municipal development and riverine infrastructure while solidifying programmatic processes to continue restoration in the face of increasing climate driven losses. Restoration of this lost habitat is regionally important in supporting essential fish habitat (EFH) for many of the nation's most productive and valuable commercial and recreational fisheries and their prey (zuErmgassen et al. 2021).The created wetland habitat will provide enhanced recreational opportunities such as improved birdwatching, fishing, and eco-tourism, and fostering a deeper connection between residents and their environment. The created marsh acts as a natural filter, trapping pollutants and enhancing water clarity. BU is a powerful ecologically and economically logical restoration tool available to address marsh loss and landform change due to sea level rise. The project addresses Mobile Bay National Estuary Program Comprehensive Conservation and Management Plan- Goal for Ecosystem Restoration and Protection (ERP-3.1.a.)- Incorporate a strategy for beneficial use of dredged material (partner with USACE and ASPA).

Project Duration (in years): 3

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment

placement

Location

Location:
Mobile Bay

HUC8 Watershed(s):
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)

State(s):
Alabama

County/Parish(es):
AL - Mobile

Congressional District(s):
AL - 1

Narratives

Introduction and Overview:
This project is a continuation of the FPL1-funded Upper Mobile Bay Beneficial Use Wetland Creation Site planning effort. The planning effort completed design and environmental compliance project requirements. Implementation will expand ecosystem restoration and beneficial dredged sediment management (BU) for ecosystem and community resilience to climate-driven hazards in Mobile Bay. This project will fund construction of the first 100-acre BU cell of a planned 1,200-acre project that will also kick-start the Alabama Beneficial Use Program (ABUP). The project site will accept up to one million CY of dredged materials from the Port of Mobile to begin restoring over a century of emergent wetland losses. It is expected that 350,000 CY/year of Port Authority maintenance material will be available, taking 3-5 years to fill the first 100 acres. The water depth of this first cell is 4-6 feet. Without this project, sediment will be lost to upland disposal sites, removing it from the Mobile Bay system. Large scale creation of estuarine wetlands is critical to increasing habitat diversity and productivity for eight managed species, restoring essential fish habitat, and for directly addressing sea level rise impacts. Project implementation will span years, necessitating multilateral coordination with ongoing dredging operations. This coordination, via the ABUP, will prioritize BU for regionally important restoration across Mobile Bay over institutionalized disposal, which will enable restoration at a fraction of the financial costs of project-specific dredging. The project is locatedin Mobile, who

through nature-based Bayside parks, will have access to wetland habitats and their ecosystem services. These parks are opportunities to engage communities about the economy and environment associated with the industries and jobs the Port supports and the importance of being wise stewards of our sediment resources and the wetlands they can create.

There are five goals within the RESTORE Councils comprehensive plan. This Project addresses one of those goals, Goal #1: Restore and Conserve Habitat. The Project ties in with RESTORE Councils primary objective of Restore, Enhance and Protect Habitat. Under the 2016 Comprehensive Plan update the Council advanced the following commitments:

- Regional ecosystem-based approach to restoration: Resource managers across the Gulf recognize that dredged material should be used as a resource to compensate for coastal erosion, to nourish beaches, to build habitat, and to return areas that have subsided below sea level back to an elevation within the tidal range. Creating and restoring marsh habitat takes advantage of opportunities for mitigating the loss of resources and shorelines by keeping sediment into the system utilizing a regional approach. Such restorative efforts are not only beneficial on a local scale, by retaining and returning sediments into natural systems this provides expanded benefits on larger regional levels. USACE-conducted planning activities utilized a strategy to emphasize the connection between maintenance dredging requirements of the Bay channel, beneficial uses for purposes of ecological restoration, and regional sediment management methods.
- Leveraging resources and partnerships: The State of Alabama has worked with the Mobile Bay Interagency Working Group (IWG) for more than 15 years to evaluate and provide guidance pertaining to alternative sediment management practices in Mobile Bay. The IWG consists of local, State and Federal agencies as well as academia and other non-governmental entities. The approach taken to beneficially use dredged material in conducting restoration practices provides the ability to coordinate and collaborate; integrate numerous tools, technology, and data; leverage funding; and enhance partnerships.
- Engagement, Inclusion, and Transparency: The project includes the support and participation from the diverse stakeholders who live, work, and play in the Gulf Coast region through the establishment of the IWG. Further engagement activities have occurred during project planning and permitting.
- Science-based decision-making: The Mobile Bay IWG evaluated alternative sediment management practices in Mobile Bay. The IWG, consisting of local, state and federal agencies, recommended several sediment management alternatives in the context of BU and environmental restoration (Mobile Bay IWG 2014), including the planning and construction of a long term BU site in upper Mobile Bay. The decisions made pursuant to the project will be based on the best available science, and this project will evolve over time to incorporate new science, information, and changing conditions. Commitment to best available science is evidenced in the previously conducted hydrographic, SAV, and cultural resources surveys.

- Delivering results and measuring impacts: The proposed project which includes monitoring and adaptive management shows the importance of achieving tangible results over a specified time frame and ensuring that funds are invested in a way to benefit the ecosystem of the Gulf of America.

Beneficial use of dredged material builds on the foundation of Working with Nature and Engineering with Nature principles as discussed in the Deer Island Aquatic Ecosystem Restoration Project report (Gerhardt-Smith, et al. 2014).

- Use science and engineering to produce operational efficiencies supporting sustainable infrastructure.
- Use natural processes to maximum benefit, thereby reducing demands on limited resources and enhancing the quality of project benefits.
- Broaden and extend the base of benefits provided by projects to include substantiated economic, social, and environmental benefits (“triple-win” benefits).
- Use science-based collaborative processes to organize and focus interests, stakeholders, and partners to reduce social friction, resistance, and project delays while producing more broadly acceptable projects.

Total Cost: $24,000,000. Implementation is not scalable.

Timeline: 3 years.

Proposed Methods :
The goal of the project is to expand ecosystem restoration and beneficial dredged sediment management for ecosystem and community resilience to climate driven hazards in Mobile Bay. This will be achieved through specific objectives including:

1. Construct the first 100-acres of containment structures for the southernmost and most substantive structures in preparation of receiving BU materials.
2. Perform implementation monitoring to document project performance and required adaptive management measures.

The project will construct the first 100-acre BU cell of a planned 1,200-acre footprint with the capacity for beneficial use placement of dredged material over a 20-year period. This footprint includes intertidal wetland habitat and internal and external containment dike features. Construction of the 1,200-acre footprint would be phased, based on volumes and timing of maintenance dredging activities and would be guided by adaptive design and management. This first cell will establish fundamental protection for the remaining cells to be constructed to the north and is the most substantive structure for the overall project due to the 30-mile fetch and prevailing winds. At the completion of the containment berms and the initial 100-acre marsh, the semi-confined site design will enable the entire site to have full tidal influence and allow marine life conveyance within the site until it is ultimately filled with dredged material and the wetlands are established.

The containment structure encircling this segment will be approximately 7,400 linear feet, constructed at 5-6 feet in height. The marsh is planned for +2-3 feet, with containment constructed at +5-6 feet depending on fetch. The external containment dikes around the initial 100-acre area would be constructed to completely protect the area until it is expanded. There would be a sand berm around the entire perimeter of the 100-acre area with rock riprap revetment to protect it from environmental forces. The revetment would be constructed with varying rock riprap sizes according to the exposure direction from which waves would impact the dike. The revetment rock armoring on the exterior dikes has been designed to address regional sea level rise and to withstand environmental forces such as waves, including during operational and extreme conditions that result in inundation of the site. The site would attenuate waves under all water level conditions. When the site is not inundated, the exterior containment would attenuate wave energy. During inundated conditions such as during high storm surge in a hurricane, the site would also attenuate wave energy as depth-limited conditions occur when waves translate across the site, as the water depths would be shallower than the surrounding bay bottoms. Design considerations incorporated storm impacts and future sea level rise.

The 100-acre site would be divided into two 50-acre areas with internal dikes and would be filled with maintenance dredged material from nearby sources at a later date.

Recent mapping efforts indicate there are 6,200 acres of estuarine emergent marsh in Upper Mobile Bay/Lower Mobile-Tensaw Delta area (MBNEP, 2020). This project would support an increase in this habitat type as well as add more creeks and protected areas conducive to SAV growth that have been lost in the last 70 years. Without this project, valuable sediments would be lost to upland areas and would not contribute to the creation of coastal wetlands.

The project USACE permit is pending (SAM-2021-00246-DCH). Based on environmental and design considerations, the selected project design is the least environmentally damaging practicable alternative with the least direct, indirect, or cumulatively adverse impacts on physical, biological, or human use resources in one 1,200-acre wetland creation site. This site location minimizes affects to cultural resources and avoids SAV; is a sufficient distance from the airport and Mobile Ship Channel; provides local entities with enough capacity for their dredged material for the next 20 years; and creates valuable intertidal wetland habitat. The design minimizes linear feet of external containment to maximize wetland habitat and reduce conversion of water bottom to hard substrate and is located at water depths that reduce costs. The project would have long-term beneficial impacts on the recovery of intertidal wetland habitat in Alabama.

Environmental Benefits:

The Mobile Bay and Mobile Harbor navigation channels are terminal repositories of sediments transported downstream from several riverine systems and consists of mostly fine grain sediments. Current management practices place dredged materials in permitted upland areas or

offshore disposal site, leading to concerns about the loss of sediments in the system and the resulting shoreline erosion and recession of wetlands in the north and west portions of Mobile Bay (GCRC, 2015). Since 1986, approximately 4 million cubic yards of material has been removed from the Mobile Bay navigation channel annually and transported and disposed of as much as 40 miles offshore at an annual cost of about $12 million. Offshore disposal of the channel sediment results in the removal of the material from the Bay's natural sediment system. The effect of this sediment loss can be seen in recession of wetlands and submerged aquatic vegetation (SAV) beds in the north and west portions of the Bay (Byrnes et al. 2013). Establishing beneficial use sites within Mobile Bay will contribute to much-needed conservation of various ecological resources that exist in the Bay system and for estuarine habitat restoration through the beneficial use of dredged sediments. It is anticipated that SAV will become established along the protected shorelines of the containment berms and open areas of the marsh cells. Creating the tidal marsh will accomplish restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, and coastal wetlands of the Gulf Coast region.

Additionally, this project will directly benefit State or federally listed threatened and/or endangered species such as the Gulf sturgeon, Alabama Red-Bellied Turtle, and West Indies Manatee. By conducting this project, sediments which have traditionally been removed from the Mobile Bay littoral transport system will be placed back into the natural sediment system and used for habitat restoration.

Best available science throughout this proposal underwent review in the FPL 1 proposal Beneficial Use of Dredged Material to Create Emergent Tidal Marsh in Upper Mobile Bay project. Alabama elects to use the existing BAS review materials for the new 2026 FPL funding proposal given that this proposal includes implementation of the same scope of work discussed in the FPL 1 proposal. Based on the previous BAS review, modifications were made to the final proposal submitted under FPL 1, which is acknowledged in the BAS response document.

Metrics:

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 100

Narrative: construct 100-acre BU site

Risk and Uncertainties:

Sea-level rise and storm surge are two risks and uncertainties to project implementation performance. Storm surge associated with hurricanes and tropical storms poses a threat to containment berms and tidal marsh during and after project construction. Estimates of the quantity of dredged material available for marsh fill have been based on the Mobile Bay Federal navigation channel and other ASPA and private smaller dredging events. The containment berm at BU site may be susceptible to accelerated erosion due to ship wake and other hydrodynamic

processes. Engineering and design of containment utilized best practices from similar projects and is based on best available science and factors such as wave and wind energies to minimize these risks as much as possible.

Regarding the potential for adverse effects related to sedimentation and hydrology, both a 2-D and 3-D hydrodynamic model of the 5-river system that feeds Upper Mobile has been conducted during the design phase of the project. Results of these modeling efforts resulted in acceptance by the USACE regulatory and navigation team in determining no adverse effects of sedimentation and hydrology. Modeling data indicated no adverse effects on the ship channel or the adjacent SAV. Turbidity will be contained within containment structures, and all ADEM water quality conditions will be stipulated to the contractor. These stipulations will require that turbidity in the mixing zone be less than 50 NTUs above background, and construction monitoring will be mandatory.

Beneficial use of dredged material is commonplace in Port cities (Cornwell et al. 2020, Davis, et al. 2022; Davis et al. 2024, DiGiacomo et al. 2022). This Upper Mobile Bay Beneficial Use project design is based on the USACE Poplar Island (Cornwell et al. 2020), MD lessons learned (http://www.poplarislandrestoration.com/Home/About). The design was modified for the upper Mobile Bay system, planning for softer containment features and freshwater habitat design for tidal creeks and pond habitat enhancement. Elevations of wetlands and plant species selection have been based on local research in the area to ensure the engineered habitat reaches full production efficiently.

Regarding risk of lack of suitable BU material, the USACE dredges over 1 million cubic yards (mcy) from the upper end of the Mobile River project annually and has determined the percent of sand/fines mix is favorable for developing the initial 100 acre shallow water bottoms into tidal marsh within a short amount of time. Upon completion of berm construction, borrowing of suitable on-site material, followed by barging the remaining course grain sand required from the existing USACE stockpiles along the Black Warrior Tombigbee River System. These sand stockpiles are located approximately 80 river miles north of the tidal marsh footprint. Access channels will be constructed in the shallow areas for delivery of the sand and armament materials. The current plan is to construct the containment using RESTORE funding followed by the placement of approximately 1 mcy of suitable Federal channel material (Upper Mobile River) using USACE operations and maintenance dredging funds. Given the proximity of the site to the Mobile Harbor Upper River sumps, the initial 100-acre site meets the Federal Standard with regards to the least cost, environmentally acceptable and legal guidelines.

Monitoring and Adaptive Management:

Baseline pre-monitoring will include reference site vegetation and elevation monitoring metrics. Construction monitoring includes as-builts from the construction contractor that will be utilized as the baseline for the containment structure for the 100-acre site. Implementation monitoring is

requested with this grant to monitor performance metrics of the containment structure to determine if this structure is performing as designed. Monitoring performance criteria will include structural-based metrics: elevation and position of containment structure. Implementation monitoring may also potentially include elevation of wetland platform from first lift of material utilized beneficially (depending on timing).

Data Management:

To the extent practicable, all data generated will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amenable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets, notebooks, and photographs will be retained by the ADCNR. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved. Data will be made publicly available and accessible on a website that is still to be determined.

By the time this project is in the implementation phase, ADCNR will utilize a publicly-accessible data repository. Data collected from the planning, environmental compliance, implementation and monitoring phases of this project will be stored in this repository.

Collaboration:

This project was identified as a high priority and received initial funding through the Federal RESTORE Act Bucket 2 FPL 1. Category 1 planning activities carried out by the USACE build on collaborative efforts initiated by the Mobile Bay Interagency Working Group (IWG), which consists of local, state and federal agencies as well as various non-governmental entities. Alabama Port Authority, Long-term Dredged Material Management Plan (2023) identified this project as a short-term and long-term ecologically sound solution to dredged material management as opposed to ocean dumping. This project complements many of the existing and on-going coastal marsh restoration and living shoreline initiatives occurring around the Mobile Bay.

Public Engagement, Outreach, and Education:

Over 15 years ago the Mobile Bay Interagency Working Group (IWG) started developing this project which included ADCNR, Mobile Bay National Estuary Program (MBNEP), APA, USACE, and several local NGOs. In 2013, the IWG led by USACE submitted the planning and

engineering and design of the project to the Federal RESTORE Council. Additionally, a formal outreach and engagement plan for the project was developed and implemented over the last several years including creation of a dedicated website to provide project information (www.uppermobaywetlands.com), establishing a dedicated email for subscribers, providing social media updates, formal letters, fact sheets, and providing press releases, hosting a virtual meeting, one-on-one meetings with key stakeholders, and providing information through MBNEP. USACE joint standard permit process has also included extensive outreach to stakeholders to inform design and respond to public comment.

Leveraging:

Funds: $63,000,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: obtained by the USACE for managing their dredge material

Environmental Compliance:
In anticipation of utilizing federal funds for construction, an Environmental Assessment (EA) is required for funding of the implementation of the project. In June 2023, an EA was prepared to define potential benefits and environmental consequences related to the proposed implementation of the Upper Mobile Bay Beneficial Use Wetland Creation Site Project to determine the least environmentally damaging and therefore most beneficial, practicable alternative.

The EA complies with requirements set forth under the National Environmental Policy Act (NEPA) of 1969, the regulations of the Council on Environmental Quality's (CEQ) Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation (ER) 200-2-2. Three primary phases of work were involved to assess the potential environmental impacts of the proposed project.
• Scoping process which led to consensus on important project and environmental issues within a project footprint.
• The Alternatives Descriptions (Section 2), which led to the development of specific alternatives, analysis of the alternatives, and identification of a least environmentally damaging practical alternative (preferred alternative) (Section 3).
• Environmental Documentation – including the selection of a preferred alternative identified in the EA and FONSI.

The project USACE permit is pending (SAM-2021-00246-DCH).

Approved permits, applicable documentation and final EA will be submitted when received

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Byrnes, Mark R. et al. 2013. Sediment Dynamics in Mobile Bay, Alabama: Development of an Operational Sediment Budget.

Cornwell, J.C., Owens, M.S., Staver, L.W., and Stevenson, J.C., 2020. Tidal marsh restoration at Poplar Island I: transformation of estuarine sediments into marsh soils. Wetlands 40, 1673–1686. doi: 10.1007/s13157-020-01294-5

Davis, J., Currin, C., and Mushegian, N., 2022. Effective use of thin layer sediment application in Spartina alterniflora marshes is guided by elevation-biomass relationship. Ecol. Eng. 177:106566. doi: 10.1016/j.ecoleng.2022.106566

DiGiacomo A.E., Giannelli R., Puckett B,. Smith E., Ridge J.T. and Davis J., 2022. Considerations and tradeoffs of UAS-based coastal wetland monitoring in the Southeastern United States. Front. Remote Sens. 3:924969. doi: 10.3389/frsen.2022.924969

Gulf Coast Recovery Council (GCRC). (2015). Response to Public Comment on Draft Initial Funded Priority
List. 83pp.

Gerhardt-Smith, J., J. MacDonald, S. Rees, and N. Lovelace. 2014. Deer Island Aquatic Ecosystem Restoration Project. ERDC-TN-EWN-TBD. Engineering Research Development Center, Vicksburg, MS

Mobile Bay National Estuary Program (MBNEP). (2020). FINAL Report. A Standard Habitat Classification
Scheme and Habitat Mapping Products Change Analysis 2001/2001 and 2015/2016. Report prepared by Geosyntec and Moffatt & Nichol.

Mobile Bay National Estuary Program (MBNEP) (2020). Submerged Aquatic Vegetation Mapping in
Mobile Bay and Adjacent Waters of Coastal Alabama in 2019. Mobile, AL: MBNEP.

Zu Ermgassen, P. S., DeAngelis, B., Gair, J. R., zu Ermgassen, S., Baker, R., Daniels, A.,

MacDonald, T. C.,Mekley, K. Powers, S., Ribera, M., Rozas, L. P., and J. H. Grabowski (2021). Estimating and applying fish and invertebrate density and production enhancement from seagrass, salt marsh edge, and oyster reef nursery habitats in the Gulf of Mexico. Estuaries and Coasts. Special issue: concepts and controversies in tidal marsh ecology revisited. https://doi.org/10.1007/s12237-021-00935-0.

Budget

Project Budget Narrative:
A total of $24,000,000 is being requested from 2026 FPL to fund construction of a 100-acre containment structures for the southernmost and most substantive structures in preparation of receiving BU materials. This project is not scalable. The funds being requested are solely intended to be used for construction/implementation. Any additional leveraging and cost sharing, from respective entities or additional Deepwater Horizon related funding streams are not part of this request. An estimated 78% is being requested for construction and project implementation. An estimated 20% is being requested for contingency. An estimated 2% is being requested for monitoring and adaptive management activities to ensure progress is made towards habitat improvement.

Total FPL Project/Program Budget Request:
$ 24,000,000.00

Estimated Percent Monitoring and Adaptive Management: 2 %

Estimated Percent Planning: N/A

Estimated Percent Implementation: 78 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 20 %

Is the Project Scalable?:
No

If yes, provide a short description regarding scalability.:
N/A

Environmental

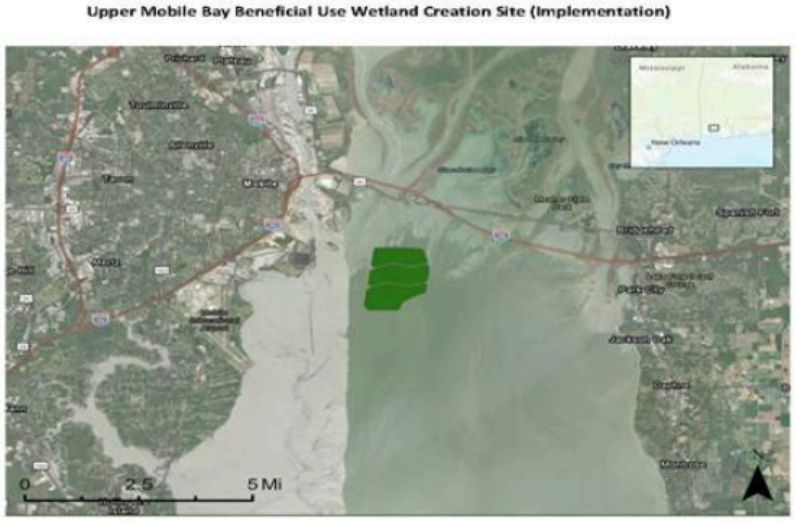
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	USACE is federal lead agency. USACE permit application submitted (SAM-2021-00246-DCH).
Endangered Species Act	Yes	Gulf Sturgeon and Alabama redbellied turtle are in project area and covered in the EA and consultation with USFWS is complete. Green sea turtles, Kemp's ridley sea turtles, loggerhead turtles, Gulf sturgeon, and giant manta ray are in project area and are covered in the EA and the NOAA NMFS Southeast Regional Office Expedited Consultation document. Consultation with NOAA NMFS is complete.

National Historic Preservation Act	Yes	An assessment of the potential impact of the proposed project on historic properties that are within the proposed project's Area of Potential Effect (APE) has been completed and submitted to the Alabama State Historic Properties Office and the USACE. No adverse impacts to cultural resources are anticipated. Consultation is ongoing.
Magnuson-Stevens Act	Yes	Consultation complete.
Fish and Wildlife Conservation Act	Yes	Consultation in progress.
Coastal Zone Management Act	Yes	Consultation in progress.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.

Clean Water Act (Section 404)	Yes	Extensive coordination has taken place with USACE since 2021 for a Standard Individual Permit. USACE consultation is ongoing. Consultation with the state (Alabama Department of Environmental Management) is completed and the Water Quality Certification has been received.
River and Harbors Act (Section 10)	Yes	Extensive coordination has taken place with USACE since 2021 for a Standard Individual Permit. Consultation is ongoing.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	Yes	No take is anticipated and a determination of not likely to adversely affect was concurred with by NOAA NMFS and USFWS. Consultation complete.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.

Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Upper Mobile Bay BU Map

Other Uploads

GIS Data_1:
Mobile_Bay_BU_GIS_Template_.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4081/86

Council Staff Review: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

FPL Internal Staff Review

Project/Program	Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)		
Primary Reviewer	Matt Love	Sponsor	Alabama
EC Reviewer	John Ettinger	Co-Sponsor	

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded project.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes

Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Alabama applied BAS reviews that were completed upon proposal in previous FPL. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Proposal seeks only FPL Category 2 funding.

Summary of Best Available Science Review: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

The Upper Mobile Bay restoration proposal was generally well received by reviewers and is supported by peer-reviewed and publicly available information. The project aims to create 100 acres of wetland using dredged sediment, building on previously vetted planning efforts and informed by collaborative input from the Mobile Bay Interagency Working Group. Reviewers agreed the proposal is grounded in sound science and aligned with RESTORE Council goals, particularly regarding habitat restoration. Methods were described as scientifically sound and cost-effective, leveraging lessons from similar past projects. However, one reviewer called for more detail on how the project would impact sediment dynamics and turbidity, especially around the shipping canal, and noted that some cited sources were missing from the reference list. Concerns were also raised about the lack of specificity in the proposal's water quality (WQ) monitoring strategy, including which parameters would be measured and how success would be evaluated. Despite these gaps, the project was acknowledged for its strong environmental benefits, clearly defined goals, long-term planning considerations, and thorough data management strategy, including adaptive management. One reviewer emphasized the need for improved articulation of hydrological, sediment, and WQ components, but overall, the proposal was considered scientifically justified and well-structured.

Summary of Alabama Response to BAS Comments: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

The State's response to the BAS comments addresses several key points related to the monitoring and planning of the proposed project. It clarifies that water quality (WQ) parameters will not be specifically monitored, and general references to "wetlands improving WQ" will be removed if necessary. The approved monitoring plan focuses on plant monitoring, with federal approval already secured. Regarding environmental modeling, extensive 2-D and 3-D hydrodynamic models were conducted during the permitting process to assess the effects on sedimentation and hydrology in Upper Mobile Bay. These models confirmed that the project would not adversely affect the ship channel or submerged aquatic vegetation (SAV), and turbidity will be controlled within containment structures, meeting the required water quality conditions. The planning effort primarily involved data collection, evaluation, design, and environmental compliance, without including project implementation details. The response also mentions that wetlands are assumed to improve water quality, though no direct WQ monitoring is planned beyond construction, which will comply with ADEM conditions. Additionally, the project's design incorporates lessons learned from other wetland creation projects, such as Poplar Island, and is tailored to the specific conditions of the upper Mobile Bay, with habitat enhancement features like tidal creeks and ponds.

Best Available Science Review Forms: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: In state
Date of Review: September 13, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

Relevant and recent information from projects successfully completed in the northern Gulf Coast region were appropriately used to justify this project's objective and method to create 100 acres of habitat in Upper Mobile Bay with dredged sediment.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposed project directly benefits the Gulf Coast region, particularly the Mobile Bay area and nearby disadvantaged and underserved communities.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Literature sources include a variety of publication types, ranging from peer-reviewed journal articles to technical reports documenting completed projects. The sources are represented fairly and appropriately support the objectives and methodologies stated in the proposal.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	

Uncertainties and risks are described over a range of timescales in terms of impacts to the project (such as storms, boat wake, and sea level rise) and impacts of the project (such as quantity of dredge material available for fill).

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Reasonable justification is provided in the proposal for the implementation of this project. For example, the proposal references using best available science to reduce uncertainty in hydrodynamic forcing estimates and best practices (since this is an implementation proposal) to minimize risks through lessons learned.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal provides justification for using science to maximize information both now and in the future. In the present-day, information on recently completed projects will be leveraged as lessons-learned and best practices for this initial phase. In the future, the proposal acknowledges science evolves and that new science, information, and changing conditions will be incorporated.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal references using best available science to reduce uncertainty in hydrodynamic fording estimates and best practices (since this is an implementation proposal) to minimize risks through lessons learned from similar projects. The project also has previously established several modes of communication through which these risks and uncertainties can be conveyed.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
While this project would be “Alabama’s largest coastal ecological restoration to date” (quoted from the proposal), the sponsor (ADCNR) is well-known to have implemented many similar projects. A map obtained from their website shows 153 restoration projects, most of which are located in the Mobile Bay area and many that are similar to the proposed project.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The project goal is clearly stated throughout the proposal (restore and conserve habitat) and supported with defined objectives (creating and restoring estuarine tidal marsh with dredged material). These goals and objectives directly meet the RESTORE Council’s Goal #1 to Restore and Conserve Habitat.	

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes

Comments:

The proposal follows the implementation plan previously developed to construct the southernmost containment structures to protect the newly-placed dredged material for this project from waves, boat wake, and storm surge. The methods are adaptable, taking into account sea level rise and future phases of this project. Using BU and the methods/design proposed will reduce the overall cost of dredging, and funds for USACE to manage dredge material are leveraged.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

The project will restore some of the emergent wetlands lost over the last century with benefits including habitat creation, increases in habitat diversity and productivity, enhances in community resilience, water quality improvement, and reduction in the economic and environmental impacts of dredging and disposing of dredged sediments.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

This project aligns with Goal #1: Restore and Conserve Habitat with measures of success including constructing a 100-acre BU site to restore wetlands; monitoring during pre-project, construction, and implementation phases; following a detailed data management plan; enhancing collaborations among public, private, and academic entities; and continuing to involve the public through an existing outreach and engagement plan.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Project vulnerability is described in both short- and long-term time frames. Long-term risks are mitigated through planning and design for changing conditions (i.e. the containment structures are designed at elevations that account for rising sea levels), monitoring the project before, during, and after construction, applying adaptative management practices and construction methods, and incorporating science as it evolves through the duration of the project.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

An Environmental Assessment was completed in June 2023 to capture direct, indirect, or cumulatively adverse impacts of physical, biological, or human use resources of this project and alternatives. Of the alternatives considered in the EA, the proposed project is the cited as the least environmentally damaging practicable alternative, and justification for this conclusion is provided in the proposal.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes

Comments:

Best practices from recently completed similar projects, conclusions from the recently completed EA of this project, and recently collected data at and near the project site are examples of recent information cited in the proposal.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
Specifically, the proposal cites the report on the Deer Island Aquatic Ecosystem Restoration beneficial use of dredged materials project and lists four 'lessons learned' to be implemented in this project. These points leverage the successes (and failures) of the Deer Island project to reduce risks and uncertainties of the proposed project.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
A detailed data management plan is provided in the proposal. The monitoring plan is also comprehensive, covering pre-construction, construction, and implementation phases. Monitoring data are described in the data management plan. Those data will be used to evaluate project performance, adapt management activities as needed, and inform design and implementation for future phases of this project.	

Please summarize any additional information needed below:
The proposal is well-written and packed with information and justification for each of the points above. Statements made in the comments are directly from the proposal, as I understood it. I did not identify a deficiency in the quality, objectivity, or integrity of the information presented. The information provided was sufficient, in my opinion, to evaluate the use of best available science on this project proposal.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Out of State
Date of Review: 10/09/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
Most of the proposal objectives have been well explained. Yet, some components of the proposed methods, particularly linked with the water quality (WQ) improvement goals need to be better characterized. What would be the goals for the monitoring, which WQ parameters will be selected, where are the monitoring sites and frequency, etc.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information that was provided is directly pertaining to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
There are a few unreferenced documents presented in the proposal but not present in the reference list: Page 4, Mobile Bay IWG 2014; Page 7, Long-term Dredged Material Management Plan (2023). The Environmental Assessment (EA) cites on page 7 is also not listed in the Reference List, I am not sure if this is already published.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
Most risks have been identified in the proposal, but one risk that could be better discussed is how the future implementation of the wetlands would change the sediment migration dynamics near the area, both during episodical coastal storms and throughout a typical hydrological year. A question I have is whether this placement would influence sediment accumulation in the vicinity of the shipping canal. Another risk is the potential increase in turbidity in the water when sediments are replaced within the bay, which has been linked with environmental impacts. The EA assessment may have considered potential turbidity impacts, but stating this with the Risk and Uncertainties section would be useful.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Yes, the proposal provides information that justifies the need based on public reports and a technical publication	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
For the most part, the answer is yes. The portion that needs more detail and information is on the management of environmental data.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	

Again, for the most part the risks have been communicated. There are two components that would need more information. First, the sediment placement and creation of wetlands can influence local sediment accumulation in the vicinity of the shipping canal, and the effects should be studied with a hydrodynamic study. Another risk is the potential increase in turbidity in the water when sediments are replaced within the bay, which has been linked with environmental impacts. While the EA assessment developed in the context of this project may have considered potential turbidity impacts, this was not clearly stated this with the Risk and Uncertainties section.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The project is a continuation of a FPL1-funded Upper Mobile Bay Beneficial Use Wetland Creation Site planning effort. It Is not clear if the effort entailed actual implementation of coastal wetlands.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Yes, the implementation goals are clear.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	

For the most part, the answer is yes. The use of sediments within Mobile Bay rather than transport upland can be cost-effective and provide other indirect benefits such as reversing the coastal wetland loss in the area.

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Need more information
Comments:	
Most environmental benefits of the implementation of wetlands in northern Mobile Bay are clearly articulated. The discussion that could have been improved is linked to how these wetlands would improve water quality. As an example, what are the sources of the contaminants, and what types of contaminants, would be improved with the implementation of the project.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
Aligned with Question D above, the proposal allocates 2% of the budget to monitor progress to water quality improvement, but what/where/etc. will be monitored and related metrics are not specified.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	

Yes, this is discussed in the proposal adequately and is mostly adequate. Long-term change in sediment dynamics in northern Mobile Bay created by the implementation of the wetlands could be better articulated.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, this is discussed in the proposal adequately.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, this component is well addressed in the proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information

Comments:
While the potential causes for failure and benefits were discussed, examples of failures and successes of coastal marsh implementation was not directly evaluated.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
Data Management strategy is adequate, and monitoring is partially adequate. Whereas the structural integrity of the project will be monitored, water quality aspects were not well detailed.	

Please summarize any additional information needed below:
This is a very good initiative that should be supported, in my point of view. The hydrological, sediment dynamics, and water quality aspects could be better articulated, though.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Out of Gulf
Date of Review: 26 September 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
This is a proposed implementation phase of a previously vetted site planning effort. Revisions from that multi-level review have been incorporated. Coordination and planning have included a multi-governmental agency/stakeholder group- the Mobile Bay Interagency Working Group (IWG), and builds on concepts developed by Gerhardt-Smith et al., for beneficial use of dredged material in ecological restoration.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposed implementation plan appears to have been very well reviewed by local, state, and federal entities to ensure the methods are appropriate for local site-specific characteristics. A USACE permit for the project has been submitted (pending), and will provide an additional layer of oversight.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
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Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
This proposal seeks a long-term solution to dredge material disposal by treating what in the past has been considered waste for ocean dumping into a resource for ecosystem creation/restoration. There is a clear plan for approaching this in sections over many years, and adaptive management plans will ensure necessary modifications will be made. Implementation monitoring is included in the requested project scope. Major climate and physical factors that are major risks have been accommodated.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
See comment above.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The IWG review of this project incorporates extertise from local, state and federal agenecies familiar with the needs, implementation, and risks associated with the project, including state of the art beneficial use of dredge material. The Pending USACE permit review will add an additional layer of oversight.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	

See comment under Question B.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
See comment under Question B.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Not only are there clear goals and objectives for the proposed project, the project also will provide the foundation for a long-term solution to dredge spoil disposal and ecological benefit well beyond the scope of this implementation project.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	

The proposal is the implementation phase of a well vetted site planning project, will input and review from multiple levels of government and private stakeholder groups covering dredging, engineering, and environmental impacts.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

The upper Mobile Bay delta region is a rich ecological component of the Mobile Bay estuary and regional offshore environment, provide nursery habitat for commercial and non-commercial species. Regional loss of wetland habitat will be mitigated by the beneficial use of dredge material to add to this rich ecological engine. Although not mentioned, migratory waterfowl and other avian species will also benefit.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

There are clear goals and objectives that are measurable. Implementation monitoring is included in the project, along with an appropriate data management plan. Monitoring will feed directly into adaptive management.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Long term climatic risks are part of the reason for this project, and as such are a strong motivational force behind the proposed work. The project implementation appears to moving forward with their eyes wide open to future risks.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The review of site planning phase and development of this implementation phase project have been well vetted by numerous agencies focused on local conditions, needs, and risks.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
There is a clear monitoring program that involves a sufficient data amanagement plan feeding into a long-term adaptive management plan.	

Please summarize any additional information needed below: