Council Member Applicant and Proposal Information Summary Sheet

Council Member: Mississippi	Point of Contact: Gary Rikard Phone: 601-961-5001 Email: gary_rikard@deq.state.ms.us

Project Identification

Project Title: Enhancing opportunities for beneficial use of dredge sediments

State(s): AL, MS, TX	County/City/Region: Gulf Coast Region

General Location: *Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)*

Conservation actions will be implemented across the landscapes within the Gulf Coast Region. See attached map.

Project Description

RESTORE Goals: *Identify all RESTORE Act goals this project supports. Place a **P** for Priority Goal, and **S** for Secondary Goals.*

- P Restore and Conserve Habitat
- S Restore Water Quality
- S Restore and Revitalize the Gulf Economy
- S Replenish and Protect Living Coastal and Marine Resources
- S Enhance Community Resilience

RESTORE Objectives: *Identify all RESTORE Act objectives this project supports. Place a **P** for Priority Objective, and **S** for secondary objectives.*

- P Restore, Enhance, and Protect Habitats
- S Restore, Improve, and Protect Water Resources
- S Protect and Restore Living Coastal & Marine Resources
- S Restore and Enhance Natural Processes and Shorelines
- S Promote Community Resilience
- S Promote Natural Resource Stewardship and Environmental Education
- S Improve Science-Based Decision-Making Processes

RESTORE Priorities: *Identify all RESTORE Act priorities that this project supports. [full text provided in Guidelines: Section A(3)]*

- X Priority 1: Projects that are projected to make the greatest contribution …
- X Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring…
- X Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration ….
- X Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries …

RESTORE Commitments: *Identify all RESTORE Comprehensive Plan commitments that this project supports.*

- X Commitment to Science-based Decision Making
- X Commitment to Regional Ecosystem-based Approach to Restoration
- X Commitment to Engagement, Inclusion, and Transparency
- X Commitment to Leverage Resources and Partnerships
- X Commitment to Delivering Results and Measuring Impacts

RESTORE Proposal Type and Phases: *Please identify which type and phase best suits this proposal.*

___ Project X Planning X Technical Assistance ___ Implementation
X Program

Project Cost and Duration

Project Cost Estimate:		**Project Timing Estimate**:
Total :	**$6,180,000**	Date Anticipated to Start: 11/2015
		Time to Completion: 3 years
		Anticipated Project Lifespan: >20 years

Executive Summary

Enhancing Opportunities for Beneficial Use of Dredge Sediments

Across the Gulf, federal navigation is mandated to maintain certain draft depths for commerce and navigation within Gulf waterways. Federal, state, and local groups undertake dredging activities constantly in the Gulf environment for navigation maintenance, infrastructure, and/or hydrological connectivity. This material traditionally has either been dispersed into the water column away from the dredge site or barged to upland or offshore sites for disposal. However, over the last decade there has been a significant coupling of the dredging of navigation channels (and other operations) with the environmental sustainability of coastal restoration. Gulf-wide coastal shorelines are retro-grading due to subsidence, a lack of sediment accretion, enhanced erosion due to intensity and frequency of storm events, and sea-level rise. Sustainable and effective coastal wetland enhancement is intractably linked with sediment management in coastal ecosystems. Synergistically linking sediment management and habitat creation helps address habitat loss through sustainable resource management of sediment being dredged.

This proposal aims to provide funding across the Gulf towards beneficial use of dredge sediments (BU). The proposal will provide funding towards planning, engineering and design, and permitting for the use of BU within the five Gulf states. The proposal's main purpose is to get sites construction ready so that a significant amount of habitat can be created when additional funds become available. Beneficial Use programs have been in existence for 25+ years in Texas and Louisiana, and served as the model for the 2010 MS BU program. In these successful programs, the knowledge of available dredge material is what triggers the action to accommodate that material such as building of containment. However, there is a significant need for planning prior to the established BU site. Planning requires the identification of BU sites, appropriate prioritization of site selection using environmental characteristics of bathymetry, wave climate, prevailing winds, as well as logistical considerations to accessibility and proximity to dredge sediments. Planning also then allows containment options to be considered based on the environment (as appropriate). Engineering and design is required for both the containment as well as the habitat that will be created. Once designed and sited, permits will need to be acquired through the respective permitting authorities. Once all of these steps are completed containment can be constructed to create the site that will receive BU.

There are some inherent challenges associated with BU. These include: 1) availability of BU material, 2) coordination of timing of BU within project lifespans (i.e., containment viability); and 3) the coupling of prioritization of marsh creation as it pertains to ecosystem service benefits with practical options for receiving BU. These three challenges do not affect the planning, prioritization, and engineering and design of the sites to receive BU. However, these factors are explicit in the planning process to determine logistical characteristics of habitat creation.
RESTORE Council partners:

- Alabama
- Texas

RESTORE Council likely collaborators:

- Louisiana, Army, Department of Commerce, Environmental Protection Agency

Enhancing Opportunities for Beneficial Use of Dredge Sediments across the Gulf of Mexico

There are several significant coastal habitats across the Gulf that are losing spatial extents as a result of sediment deficit system. The rejuvenation of these habitats with the beneficial use of dredge sediments (BU) is critical to regain important coastal habitat that provides multiple supporting, cultural, regulatory, and cultural ecosystem services across the Gulf. This will be achieved by being prepared with BU-specific receipt sites across the Gulf. Thus the objective of this proposal is:

1. **To enhance state's abilities to beneficially use dredge sediments.**

The most common habitat type typically created with BU is coastal marsh. Coastal marsh play a vital role in the ecological integrity of open shoreline habitats, but more critically, as components of wildlife habitat and ecosystem health within a broader landscape context of coastal ecosystems (USEPA, 2000). An abundance of research is available on tidal wetlands and their role as foundational habitats within the coastal environment. They provide the base for a host of ecosystem services and benefits such as serving as natural buffers to protect shorelines from eroding, storm surge protection, fisheries production, water quality enhancement by trapping and holding sediment and creating biogeochemical conditions for nutrient assimilation and transformation, faunal support, carbon sequestration, and habitat for a multitude of trophic levels within the ecosystem (Stedman and Hanson 2000; Withers 2002; Mitsch and Gosselink 2007; Constanza et al., 2008; Harrington 2008; USEPA 2008; Barbier et al., 2011; Mendelssohn et al., 2012). Furthermore, coastal marshes are located at the ecotone between land and open water habitats and thus interact in quantitatively important ways within both adjoining units of the coastal landscape (Valiela et al., 2000). The coastal wetlands of the northern Gulf of Mexico comprise some 41% of total US coastal wetlands (Turner 1990), and are experiencing the highest national rates of wetland loss in the country (Dahl 2011). Between 1998 and 2004 wetland loss rates in the Gulf of Mexico were 25 times higher than anywhere in the US (Stedman and Dahl, 2008). Similarly, we see significant loss of sediment and sand from beaches and barrier islands. There are numerous factors attributed to this loss including subsidence, compaction of sediments and oil/gas extraction, lack of sediment accretion, enhanced erosion due to intensity and frequency of storm events, development in upper portions of the watersheds, and sea-level rise (Dahl 2011). In order to combat these factors, there must be an important link between sediment management and coastal wetland restoration (Parson and Swafford, 2012; Khalil et al., 2012; ERG 2014).

One source of readily available sediments across the Gulf is dredge material. Dredging of sediments in estuaries has a long history in Gulf Coast ports with most material being used for urban, industrial, and commercial expansion as well as for navigation and flood water management purposes (Landin 1997). This material traditionally has been either dispersed into the water column away from the dredge site or is barged to upland or offshore sites to be disposed. However, since wetlands have been afforded various state and federal coastal regulatory measures over the last three decades there has been a significant impetus for beneficially using the spoils of dredging activities to restore, create, and/or enhance wetland sites for wildlife and fisheries habitat. In the Gulf of Mexico it is estimated that only about 30% of all material dredged from federal channels in the Gulf states is used beneficially and very little of the privately funded dredging is used for

beneficial purposes (Parsons and Swafford 2012). Based on these findings and recommendations from the Gulf of Mexico Alliance, Habitat, Conservation and restoration Team (GOMA HCRT 2010), the Gulf Regional Sediment Management Plan was initiated for managing sediment resources and making informed, management decisions (Khalil et al., 2012). This effort has been a motivation for Gulf states and federal entities to re-evaluate how their dredge material is used and in some cases, such as Mississippi, to modify laws (MS House Bill 1440; §49-27-61) to ensure material is kept in the coastal system.

Science of Beneficial Use of Dredge Sediments

Intentional restoration of coastal marshes using BU has been occurring since at least 1969 (Seneca et al., 1976; Broome et al., 1989). Over the last 40+ years this has become more common practice (Streever 2000) and science has provided better results for construction approaches that are sustainable (e.g. elevations, breakwaters, plantings, wave energies) and methods for making these sites biologically productive (e.g. birds, fisheries, storm protection) (Turner and Streever 2002; Byrnes and Berlinghoff 2011). Scientific research associated with these successes provide a good basis for current foundational coastal restoration programs that are designing sustainable marsh projects.

Some of the earliest research came from the largest source of dredging operations, the US Army Corp of Engineers (USACE), and included published reports and workshop proceedings on approaches to construction such as proper elevations, use of breakwaters, planting techniques, addressing different wave climates, and costs (Barko et al., 1977, Landin 1980, Landin 1997, Allen and Shirley 1988, Knutson et al. 1990, Shafer et al. 2003). The work by the USACE led to more ecologically focused research for comparing the value of created versus natural marsh (Shafer and Streever 2000; Edwards and Proffitt 2003; Llewellyn 2008). Collectively, results indicate that dredge material marshes can provide some of the function of natural marshes (e.g. plant communities, elevation/topography, geomorphology, soil nutrients) but do not replace all of the function of lost natural marshes (Streever 2000; Turner and Streever 2002). Related to biological benefits to specific resources, research has found that these created marsh habitats from dredge materials are important for bird habitat, however not necessarily the same species assemblages as natural marshes (Melvin and Webb 1998; O'Connell and Nyman 2010). For nekton, studies have indicated that created marsh can be functionally equivalent to natural marsh in providing edge habitat as long as marsh elevation and tidal flooding are created to accommodate these species (Minello and Webb 1997; Minello and Rozas 2002; Rozas et al. 2005).

Much of the ecological research led to different techniques for building marsh habitat with dredged material, such as marsh terracing and thin-layer dredging placement. For example, dredge material placed in terraces and/or mounds creates good habitat for fish and birds (Rozas and Minello 2001; O'Connell and Nyman 2010). The technique of placing a thin-layer of dredge material into degraded marshes has successfully been shown to increase elevation and create soil conditions conducive to increase marsh structure and function (Ford et al 1999; Mendelssohn and Kuhn 2003; LaPeyre et al 2009; Ray 2007). The succession of research over the time on the physical techniques and biological perspectives of BU projects gives a great basis for implementing these types of projects in a diverse set of scenarios across the Gulf.

Beneficial Use Program Steps and Challenges

Beneficial use programs have been in existence for 25+ years including the USACE Civil Works dredging projects and in the States of Texas and Louisiana. From these programs we have learned the important steps and many of the potential challenges associated with these projects (USEPA & USACE 2007). In successful programs, the knowledge of available dredge material is what triggers the action to accommodate that material. In many cases, the material has to be contained in a suitable way. This requires significant planning prior to establishing a BU site including the identification of BU sites, appropriate prioritization of site selection using environmental characteristics of bathymetry, wave climate, foundation sediments, water flow, sediment transport, prevailing winds, as well as accessibility and proximity to dredge sediments. Engineering and design is also required for the containment as well as the habitat that will be created (e.g. elevations, tidal creeks and pools). Once designed and sited, permits need to be acquired through the respective permitting authorities.

As can be seen in the aforementioned steps, there are some inherent challenges associated with using dredged material to create coastal marsh. These projects suffer from three main logistical issues: availability, timing and location, and scale of dredging and material use (USEPA and USACE 2007). The availability of material is the trigger for a project to be developed, but the timing and the physical location of activities have to be coordinated. Site locations need to be reasonably close to dredging activities to cut down on costs (Turner and Streever 2002). In the cases where containment is essential, the coordination of timing of dredge material within project lifespans (i.e., containment viability) is an added logistical issue. It can be particularly challenging to couple the need to create ecosystem service benefits with practical options for receiving BU. These challenges may prohibit the creation of habitat in a timely fashion, or in the most ideal location, but is potentially the most cost-effective and sustainable way to build new habitat.

The coupling of good research-based science which is now available for understanding the best way to physically create marsh to meet ecological project goals and the jurisdictional impetus to retain valuable sediment within our coastal systems, has produced an ideal scenario to implement important coastal wetland restoration in response to those resources most affected by the Deepwater Horizon oil spill. *The main objective of the proposal is to establish beneficial-use-specific receipt sites across the Gulf*. Good planning, timing, and engineering based on our scientific knowledge of successful projects and BU programs will allow avoidance of risks and uncertainties and result in a net gain in coastal marsh habitat (Turner and Streever 2002) to reverse the trending losses in the Gulf of Mexico (Dahl 2011). *This establishment of BU receipt sites demonstrates a commitment to science-based decision making in ensuring that the sites are placed in priority areas, as well as designed and engineered to be sustainable landscape features.*

Beneficial Use Identified in Regional Management Plans

There have been several sentinel documents on strategies to coastal restoration that highlight the beneficial use of dredged sediments as a priority investment to an ecologically and economically sustainable coastal habitat. The Gulf Coast Ecosystem Restoration Task Force (GCERTF, 2011) has identified restoring and conserving near-shore habitats, with a focus on marshes as a major action, under one of the four main restoration goals. Similarly, USFWS Vision document

(USFWS, 2013) highlights restoring landscapes and interrupted sedimentary processes by incorporating beneficial use of dredged material, direct dredging, and erosion protection on public and willing private lands. The Ocean Conservancy (OC, 2011) recommends reestablishing wetland vegetation and fish and waterfowl habitats in obsolete canals by backfilling with dredged material from spoil banks or using other sources of material compatible with site characteristics. Furthermore, the National Audubon Society (NAS, 2012) highlights the importance of using dredge sediments for creating marsh and thus establishing bird nesting, roosting and feeding areas. This opportunity is specifically called for as a strategic solution by Wildlife Mississippi's strategic document *Restoring the Mississippi Gulf Coast: A Strategic Plan for People, Wildlife, and the Economy* (Smith 2014).

Several documents have highlighted the need and economic values in using BU including the Gulf of Mexico Alliance Habitat Conservation and Restoration Team (GOMA HCRT 2009, 2010), the Gulf Regional Sediment Management Master Plan as well as the Final Master Plan for the Beneficial Use of Dredge Material for Coastal Mississippi and Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi (CH2M HILL, 2011*a, b*).

Beneficial Use in Meeting RESTORE Act Priority Criteria

The priority criteria associated with the RESTORE Act look to highlight projects and programs that will achieve comprehensive ecosystem restoration across the Gulf. This proposal of creating construction ready BU receipt sites across the Gulf is an opportunity to: 1) create a significant amount of habitat in a cost-effective manner across the Gulf that *would combine to make one of the greatest contributions to restoring and protecting coastal wetlands and habitats of the Gulf Coast region;* 2) *substantially contributing to Gulf-wide restoration* by increasing the spatial footprint of restored habitat; 3) BU, the use of BU, paying for the differential cost of utilizing dredge materials, habitat restoration, and regional sediment management are all programs and projects that are cited in numerous comprehensive plans across the Gulf towards **sustainable** Gulf restoration; and 4) by undertaking due diligence of planning, prioritization, and engineering and design work that is cognizant of environmental and anthropogenic stressors BU projects will be **foundational** in maintaining *long term coastal resiliency of habitats and coastal wetlands.*

In order to undertake foundational habitat creation in the Gulf of Mexico, several steps need to be undertaken to create sites that are construction ready.

PROPOSAL OBJECTIVE

Objective #1: To enhance state's abilities to beneficially use dredge sediments

Within each state there is significant opportunity to enhance the ability to capture BU. However, in order to capture BU, there are several initial steps that need to occur. These steps are ubiquitous across the Gulf, with only the nuances of construction, types of material, and the use of containment and living shoreline technologies serving as differences to the types of habitats built across the Gulf. The initiation of BU receipt sites across the Gulf that are construction ready is a *commitment to a regional-based approach to ecosystem restoration.* The following are the logical steps in each State to become construction ready:

Planning and site prioritization

Site selection for marsh creation projects with BU can be influenced by many factors. Below several sites have been identified that are the initial, foundational sites for BU. In addition to these sites being identified, a formalized set of criteria to date has not been created by respective BU programs nor by any other agency to prioritize marsh creation sites. Lessons learned from current state-specific sites will be utilized to develop these criteria and guidelines. It is envisioned that this task will assist the state and federal agencies across the Gulf, as well as the BU programs of the individual states in site selection beyond those identified in this project. Important criteria to consider include physical and climatic characteristics of sites, dredge material characteristic, as well as other considerations. Examples include the following:

- Physical: Area of historical extent, slope and depth of existing conditions (i.e., bathymetry), shoreline retreat rates (calculated from aerial imagery)
- Climate: Prevailing wind direction, sea-level rise
- Dredge: Material type available, location of dredge material (i.e., cost effectiveness of transport – potential for direct dredge, upland sources, etc.)
- Political considerations: Community acceptance; location overlap with other activities

During this planning and prioritization phase it is also envisioned that each state, as well as communicating between states where applicable (i.e., Pascagoula / Mobile Rivers for Mississippi and Alabama; Pearl River for Mississippi and Louisiana), will create a list and schedule of available dredge materials to enhance the use of BU. This list needs to be revisited, updated, and kept current for success of future projects.

Determination of site characteristics through engineering and design

With the site locations that have been chosen, the specifics around the dimensions of the containment, the marsh, and any living shoreline / breakwater structure if applicable based on any data acquired, will need to be created. Some of the key questions posed to each site will include:

- What environmental variables would determine selection of hard versus soft containment?
- Are there opportunities to "double-up" containment with breakwaters (depending on height of the structure) if going the hard containment route?
- In what scenarios would a living shoreline/breakwater be appropriate for protection of new marsh?

Planning results, key environmental variables, and prioritization materials will be utilized to determine the best containment options, the need for a breakwater, and the marsh characteristics needed at each location. It is anticipated that dredge material availability, including type, location and timing, wave climate, and prevailing winds will help in determining adequate containment and possible breakwater required at the site. Bathymetry and dredge material type will help to determine final elevations needed for marsh establishment and the amount (in yds^3) of dredge material required for marsh dimensions. Engineering, design, and key planning steps will be undertaken to ensure the sustainability of any future construction project. Under this task the appropriate engineering and design will occur for each marsh creation site identified under *Action*

1. Depending on the BU site location, varying degrees of engineering and design will be needed. Marsh elevations will be determined in consultation with respective federal authorities but likely be aimed at an intertidal elevation to maximize ecological value of restored marsh for wildlife and fisheries use.

Environmental compliance and permitting
For each marsh location the appropriate environmental permitting for the construction of containment, marsh, and living shoreline (if applicable) will need to be secured. Appropriate state and federal agencies through the respective BU forums (BUG Groups etc.), will be engaged to understand permitting requirements. This engagement with BU forums will not just occur at the environmental compliance and permitting phase, but rather be inclusive from planning. *This commits the proposal to engagement, inclusion, and transparency for how sites were selected, built, and engineered for sustainability.*

Gulf State Needs for Beneficial Use

Mississippi
Mississippi's BU program has firmly established several areas in which it has been diligently working. There are several areas that have already been identified as potential BU sites, but lack of funding has limited further progression on these sites. Mississippi sites that planning, engineering and design, as well as environmental compliance and permitting will take place on include:

Lower Escatawpa: There have been extensive losses of the predominantly *Juncus* marsh complexes of the lower Escatawpa River near its confluence with the East Pascagoula River. At least 500 acres of marsh have converted to non-vegetated shallow water bottoms since the 1950's. Marsh losses vary considerably within the system. There are large interior areas where relative elevations have subsided to the point they no longer sustain marsh but are typically less than 1 to 2 ft. deep. Areas closer to the main channel of the Escatawpa exhibit more dynamic losses. Here, areas relatively close to the marsh fringed banks that were marsh just a few decades ago now exhibit water depths exceeding 5 ft. These two scenarios will require different approaches to ensure efficient and sustainable restoration. For the large interior areas, thin layer pumping strategies would be most effective. The existing marsh would serve as the primary containment augmented as needed by soft structures comprised of straw bales, coir logs, etc. The main channel "edge" areas will require engineered protective/containment structures due to the greater depths and higher energy. Dredge materials could be place by pumping or mechanically (bucket) depending on the specific project size and surrounding bathymetry. In all, there are a large variety of project choices in this area that are well suited to capturing materials from a wide variety of local and regional dredging projects over an extended period of time.

Back Bay Biloxi: Although not as dramatic as the lower Escatawpa, there have been extensive losses of *Spartina* / *Juncus* marsh in Biloxi's Back Bay. There are some interior subsided marsh areas but the majority of the restoration needs in this area are of the channel or lake edge variety. Water depths will vary considerably depending on the location and aspect but the sites are readily accessible for restoration using materials that have typically been landfilled at the Harrison County facility on Bayou Bernard Industrial Canal. There is extensive fishing and recreational boating in this area so wake energies will be a factor in some of the designs. At the same time, the high level

of resource use here makes it particularly attractive for actions that will enhance fisheries productivity and fishing opportunities.

Bayou Caddy: The USACE Mobile District has been engaged in extensive efforts to reign in erosion of Chenier and marsh habitats at the tip of Point Clear on the south side of Bayou Caddy. This area, from Bayou Caddy south and west to the East Pearl River has the highest coastal erosion rates in Mississippi, topping 40 ft. per year in some cases. There is an excellent opportunity to augment the USACE efforts and add additional marsh habitat in this immediate area by leveraging sheltered water areas created by the post-Katrina placement of concrete structures from the Bay St. Louis Bridge. This sheltered area could potentially allow the restoration of approximately 80 acres of marsh using materials dredged from Bayou Caddy or other nearby parts of Hancock County. Marsh would enhance fishing along the already popular concrete "reef" and could significantly dampen wave energy reaching the tip of Point Clear.

Tennessee Pipeline: The goal of this project is to restore approximately 45 acres of estuarine tidal marsh which will collaterally restore the hydrology of two major bayous as well as sheet/ tidal hydrology for an approximately 12,000 acre marsh complex. This restoration will occur through the filling of a large floatation channel cut through tidal marshes to build the Tennessee Gas Pipeline in the early 1960's. Decades of boat traffic, tidal flux and storms have steadily enlarged the canal which now measures up to 200 feet wide by 1.5 miles long and covers approximately 45 acres. This canal and the dredge material sidecast during its construction have disrupted the natural hydrology of the area by allowing a direct outflow of tidal waters into Heron Bay and by disrupting sheet flow across the marsh. This outflow bypasses the filtering function of the tidal marsh of household and other waste streams resulting in poor water quality in Heron Bay. The infrastructure for this project is primarily the dikes/containment that will be needed to redirect the flow of the natural bayous across the existing canal. These dikes will also serve as containment structures or cells for dredge material which will be placed into the canal. The northernmost bayou (Campbell's Inside Bayou) has silted in due to flow disruption by the pipeline canal and will likely need to be dredged to the west, if necessary, to re-establish navigation to the LaFrance marina and associated community. The primary task will be to plug the canal at LaFrance (northern extent), both banks of the two natural channels (midpoints), and its terminus at the Mississippi Sound. They would be vegetated with storm resistant trees, shrubs and grasses similar to the nearby Chenier ridges such as Point Clear Island. Reclaimed dredge material could then be pumped into the areas between the plugs to establish marsh.

New Round Island: New Round Island represents the first step in a large scale restoration of Mississippi's last significant non-barrier island. New Round Island involves the restoration of marsh, Chenier, maritime forest and beach/shorebird habitats on the relict north shoal of the remaining natural island. The remaining 20 acre natural portion of Round Island is privately held and is eroding rapidly to the extent it may disappear in the next decade. However, it cannot be manipulated until agreements are executed with the owners. The currently permitted footprint for New Round Island is 220 acres of which only about 30 have been utilized. Additional funding is needed to fully engineer and design the sand containment dikes and to optimize the resulting sheltered basin to receive a portion of the abundant dredged materials often being discarding in open water from routine maintenance and expansion of the Port of Pascagoula and Bayou Casotte.

Ultimately, the project could yield a protected interior marsh complex of over 100 acres with the balance of habitats optimized for shorebirds or other high value conservation targets.

KGI: The KGI project will restore approximately 1,500 acres of coastal island habitats including roughly 1,000 acres of tidal marsh with the balance composed of Chenier, beach/dune and maritime forest. It would also offer protection for some of Mississippi's most rapidly receding shorelines and provide excellent near-shore recreation and fishing opportunities. The current project concept calls for a partial containment structure constructed significantly of stockpiled sands from USACE dredging projects on the Tenn-Tom and Black Warrior River systems in Alabama. The project would be located in relatively deep (6 to 10 ft.) waters on a relict shoal of the Grand Batture Islands. This location is approximately 1.5 miles southeast of Chevron Pascagoula. This location takes advantage of potentially firm substrates from the former emergent islands while staying well clear of Chevron and the Grand Bay NERR. It is also close enough to the Port of Pascagoula to enable the project to build off additional materials generated in the course of maintenance and expansion dredging of the Port and its navigation channels. Built to its full extent, potentially 30 to 50 million cubic yards of dredge sediments could be repurposed for restoration instead of being discarded in deep water outside of the Mississippi Sound.

Alabama

Alabama's implementation of habitat restoration through BU is one of several priorities for coastal restoration in the state. Dredged materials would primarily come from the maintenance of the Mobile Harbor Navigation Project and similar maintenance dredging activities. However, the use of sandy sediments currently stored in upland dredged material disposal sites along the Black Warrior-Tombigbee River system is also proposed. These efforts are consistent with the goals and objectives of the Gulf Regional Sediment Management Master Plan developed by the Gulf of Mexico Alliance Habitat Conservation and Restoration Team. In this first phase, Alabama seeks funding for planning, engineering, design, and permitting, with implementation to come in subsequent phases.

Specific projects may include:

Denton Oyster Reef Restoration Through Beneficial Use of Upriver Sediment: This project would restore oyster reefs through the strategic placement of up-river sediments currently located in upland disposal areas along the Black Warrior-Tombigbee River System or other similar sources. The project concept is to place sediments on the historic Denton oyster reef which has had limited production due to low dissolved oxygen (DO) level. Research indicates that if the reef can be elevated at least 2 feet above surrounding water bottoms, low DO conditions can be avoided. The reef is currently comprised of 75 acres of oyster cultch inside a perimeter ring of concrete piles laid end-to-end. The "top" of the piles are approximately 2 feet above the existing water bottoms. The proposed project concept would fill the inside perimeter of the reef with approximately 150,000 cubic yards of sand from Black Warrior-Tombigbee River sites elevating the reef above the hypoxic layer on the water bottoms. Oyster cultch material could then place on top of the sand fill. RESTORE funding would be utilized to conduct further site assessments, design, engineering, water quality, hydrological and sediment transport modeling, and regulatory compliance in order to fully develop the project concept prior to pursuing implementation funds.

Grand Bay Mississippi Sound Back-Barrier Island Restoration Project Feasibility Study: Since the early 1800's, the interior headland islands of Grand Bay in the Mississippi Sound have

experienced significant erosion. This includes the Grand Batture Island, Marsh Island and the Isle Aux Dames. Most of these islands, with the exception of Marsh Island, are no longer visible above water and consist mainly of large sea grass shoals. This project will explore the feasibility of utilizing BWT sediments to restore/recreate these islands south of the existing shoals. Project activities will include field investigations, surveys and mapping, hydrological modeling, initial designs and order-of-magnitude construction estimates.

Lower Perdido Bay/Perdido Pass Navigation Project Hydrological Modeling and Sediment Budget Study: Aerial imagery and anecdotal observations indicate that the northern shoreline of Robinson Island in lower Perdido Bay has experienced increased erosion during the last decade. Additionally, shoaling patterns in lower Perdido Bay appear to have also changed. Further, as best as can be determined, a hydrological modeling and sediment budget study linking lower Perdido Bay and the tidal inlet (and its associated ebb-tidal shoal) maintained as part of the Perdido Pass Navigation Project has never been conducted. This project proposes to conduct such a study. The results of such a study would guide the dredging and sediment placement practices such that shoaling and erosion hot-spots could be addressed through beneficial use placement and directed dredging.

Texas

Texas natural resource agencies recognize the utilization of BU to transform open water areas into shallow coastal wetlands has proven to be a highly effective method of restoring and creating habitat for fish and wildlife, improving water quality and increasing needed storm buffers. These agencies, working with coastal professionals, engineering firms and other project partners have identified three priority project sites that would restore coastal habitats in Texas through the beneficial use of dredged materials. The following three projects have been identified that could utilize the beneficial use of dredge material to restore coastal habitats: (1) Marsh Restoration in the Nelda Stark Unit of the Lower Neches Wildlife Management Area in the Sabine Lake Estuary; (2) Marsh Restoration in Pierce Marsh on West Galveston Bay in the Galveston Bay Estuary; and (3) Marsh Restoration on the J. D. Murphree Wildlife Management Area within the Salt Bayou Watershed.

Nelda Stark Unit of the Texas Parks and Wildlife Department's Lower Neches Wildlife Management Area: The 7,998 acre Lower Neches Wildlife Management Area is located between Sabine Lake and the Neches River, southwest of Bridge City in Orange County. It is part of the Texas Chenier Plain and the westernmost geologic delta of the Mississippi River. The Bessie Heights Marsh, located in the Nelda Stark Unit of the Lower Neches Wildlife Management Area, was once a richly vegetated freshwater marsh. Before industrialization, the marsh consisted of approximately 17,000 acres of emergent wetland plants with small ponds scattered throughout. During Hurricane Carla in 1962, levees that had protected the area from saltwater intrusion failed and the emergent marshes rapidly converted to open water. Currently, the conversion of marshes to open water is almost complete. The Texas Parks and Wildlife Department has committed to restoring marsh within the Nelda Stark Unit using the beneficial use of dredge material. The proposed project would provide for completing bathymetric and magnetometer surveys, designing and engineering, and permitting for construction of a containment system for consolidation of dredged material for approximately 1,000 acres of the Nelda Stark Unit of Lower Neches Wildlife Management Area.

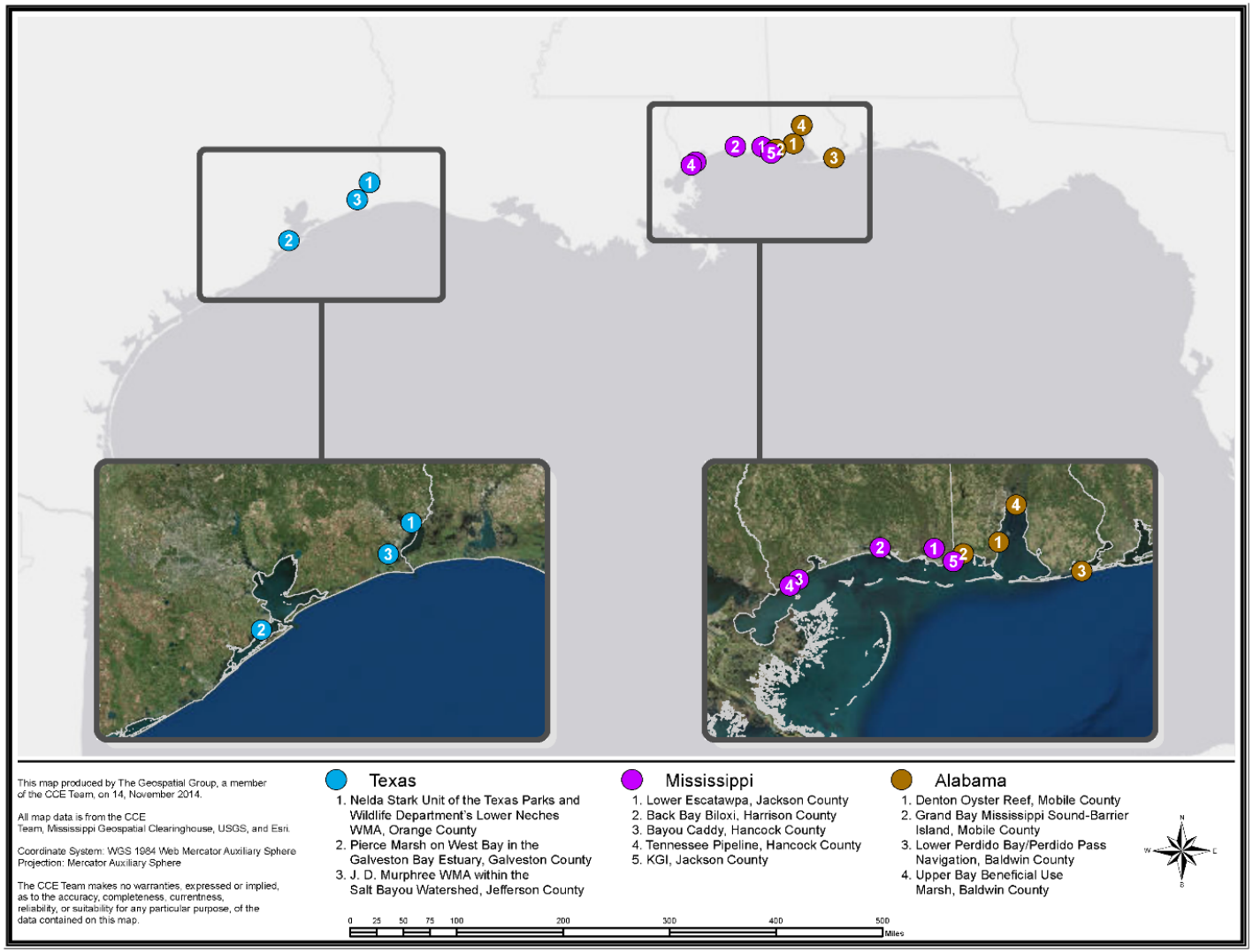
Pierce Marsh on West Bay in the Galveston Bay Estuary: Pierce Marsh is a 2,346 acre conservation area located in Galveston County, Texas, on the north shore of West Bay, adjacent to Galveston Bay on the Upper Texas Coast. Pierce Marsh was once part of Basford Lake, a salt marsh crisscrossed with channels and rich with fish and wildlife. High levels of historical subsidence in the Galveston Bay area caused the coastal marsh habitats existing within Pierce Marsh to drown and transition to open water. Working with a coastal engineering firm, project partners will design a project that beneficially utilizes dredged materials to restore elevations within up to 150 acres of Pierce Marsh to those suitable to support emergent marsh vegetation. This first phase will involve planning, engineering, design, permitting, and budget development in an effort to move the project to a shovel-ready state. All potential sources of suitable dredged material will also be identified during this phase.

J. D. Murphree Wildlife Management Area within the Salt Bayou Watershed: The Salt Bayou ecosystem contains the largest contiguous estuarine marsh complex in Texas, covering approximately 139,000 acres in the Texas Chenier Plain. The J. D. Murphree Wildlife Management Area (WMA) is a 24,250 acre tract of fresh, intermediate and brackish water marsh located in the northeast region of the Salt Bayou area, west of Sabine Lake in Jefferson County on the Texas upper coast. In 2008, Hurricane Ike made landfall and created over 800 acres of open water from emergent marsh by scouring vegetation from the marsh within the J. D. Murphree WMA. This project would provide funding for project design to facilitate dredge material marsh restoration within the Salt Bayou Unit. Initial survey work is needed to determine soil placement capacities for the Salt Bayou Unit Compartments 13 (1,072 acres), 16 (3,814 acres), 17, (2,133 acres) and 18 (1,832 acres) an approximate total area of 8442 acres. Sources of desirable fluid dredge spoil materials at this time include the Golden Pass LNG Marine Terminal Basin located east of the WMA on the Sabine Neches Waterway. Each dredge cycle should provide enough soil to enhance 400 to 600 acres of existing and former emergent marsh habitat.

Foundational Steps

Though not explicitly a part of this proposal, once habitat is created through these specific tasks there would be a *commitment to measuring successes of habitat created, and delivering the results of sustainable habitat restoration. These lessons learned will be fundamental to further habitat creation across the Gulf.* These initial steps forward in planning, prioritization, engineering and design as well as the environmental compliance and permitting of these sites will create BU sites across the Gulf that are "ready" to be built with available funds.

Location of BU Sites



High Level Budget

Objective #1: To enhance state's abilities to beneficially use dredge sediments
Budgets in objective 1 are based on State's individual needs for opportunities to utilize dredge sediments:

Alabama
State Budget: $3,000,000
Assumptions:

- $175,000 for planning and prioritization
    - Program management and support for engaging respective stakeholders in Alabama
- $550,000 budget will be spent in environmental compliance and permitting of the following sites:
    - Denton Oyster
    - Grand Bay Mississippi Sound Back – Barrier Island
    - Lower Perdido
- $2,275,000 budget for engineering and design of containment, marsh habitat to be created, as well as living shoreline/breakwaters as applicable within each new BU receipt site described above.
    - Engineering and design includes the completion if deemed necessary of 3D hydrodynamic modeling, as well sediment transport modeling by site.

Mississippi
State Budget: $2,000,000
Assumptions:

- $100,000 for planning and prioritization
    - Program management and support for engaging the MS BU forum and additional entities
- $350,000 budget will be spent in environmental compliance and permitting of the following sites:
    - Lower Escatawpa
    - Back Bay Biloxi Island
    - Hancock County Borrow Pit
    - Bayou Caddy
    - Tennessee Pipeline
    - New Round Island
- $1,550,000 budget for engineering and design of containment, marsh habitat to be created, as well as living shoreline/breakwaters as applicable within each new BU receipt site described above
    - Engineering and design includes the completion if deemed necessary of 3D hydrodynamic modeling, as well sediment transport modeling by site.

Texas
State Budget: $1,000,000
Assumptions:

- $75,000 for planning and prioritization
    - Program management and engagement of relevant stakeholders
- $250,000 budget for environmental compliance and permitting of the following sites:
    - Nelda Stark Unit of the Lower Neches Wildlife Management Area in the Sabine Lake Estuary
    - Pierce Marsh on West Galveston Bay in the Galveston Bay Estuary
    - J. D. Murphree Wildlife Management Area within the Salt Bayou Watershed, Jefferson County
- $675,000 budget for engineering and design of containment, marsh habitat to be created, as well as living shoreline/breakwaters as applicable within each new BU receipt site described above.
    - Engineering and design includes the completion if deemed necessary of 3D hydrodynamic modeling, as well sediment transport modeling by site

Overall Program Management and Coordination
Budget: $180,000
Assumptions:

- 3% of total amount of program

TOTAL BUDGET: $6,180,000

Leveraged Funds

National Fish and Wildlife Foundation – Gulf Environment Benefit Fund
Round 2 Mississippi - Marsh Restoration Proposal **$21,980,000**

Environmental Compliance Checklist

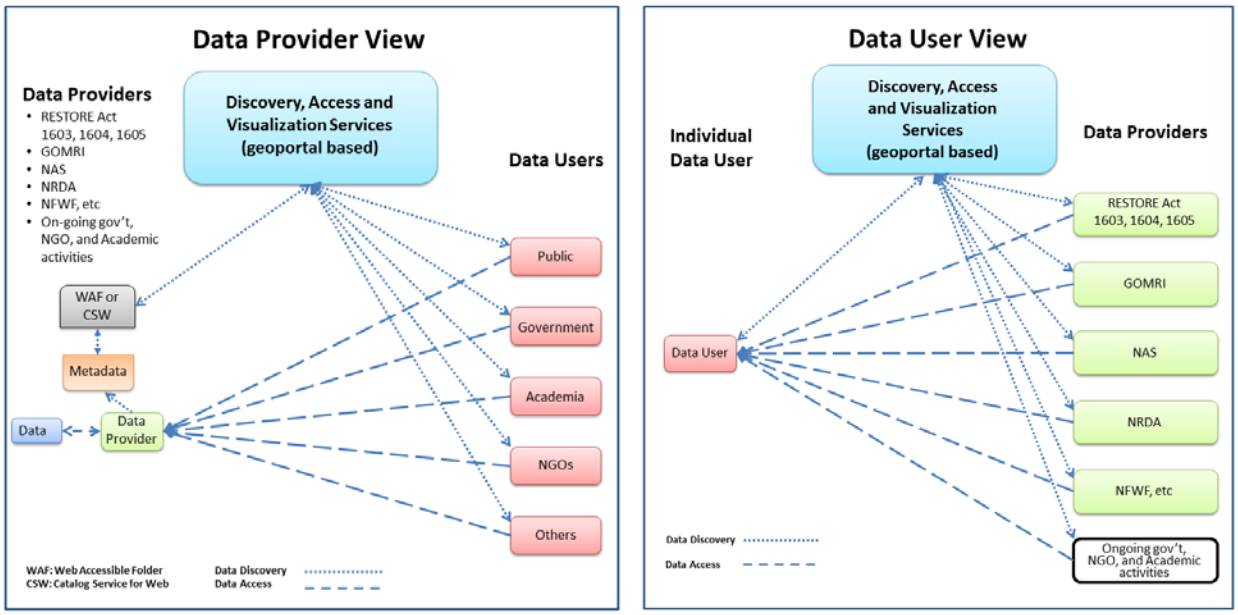
Environmental Compliance Type	**Yes**	**No**	**Applied For**	**N/A**
Federal* **				
National Marine Sanctuaries Act (NMSA)				x
Coastal Zone Management Act (CZMA)				x
Fish and Wildlife Coordination Act				x
Farmland Protection Policy Act (FPPA)				x
NEPA – Categorical Exclusion				x
NEPA – Environmental Assessment				x
NEPA – Environmental Impact Statement				x
Clean Water Act – 404 – Individual Permit (USACOE)				x
Clean Water Act – 404 – General Permit(USACOE)				x
Clean Water Act – 404 – Letters of Permission(USACOE)				x
Clean Water Act – 401 – WQ certification				x
Clean Water Act – 402 – NPDES				x
Rivers and Harbors Act – Section 10 (USACOE)				x
Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)				x
Endangered Species Act – Section 7 - Biological Assessment (BOEM,USACOE)				x
Endangered Species Act – Section 7 – Biological Opinion (NMFS, USFWS)				x
Endangered Species Act – Section 7 – Permit for Take (NMFS, USFWS)				x
Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS)				x
Marine Mammal Protection Act – Incidental Take Permit (106) (NMFS, USFWS)				x
Migratory Bird Treaty Act (USFWS)				
Bald and Golden Eagle Protection Act – Consultation and Planning (USFWS)				x
Marine Protection, Research and Sanctuaries Act – Section 103 permit (NMFS)				x
BOEM Outer Continental Shelf Lands Act – Section 8 OCS Lands Sand permit				x
NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)				x
NHPA Section 106 – Memorandum of Agreement/Programmatic Agreement				x
Tribal Consultation (Government to Government)				x
Coastal Barriers Resource Act – CBRS (Consultation)				x
State				
As Applicable per State				

******* All requisite environmental compliance and permitting for sites will be applied for and received during this proposal.

Data / Information Sharing Plan

All data collected within this proposal will be collected by a variety of state and federal agencies and the data will be stored in multiple locations depending on the agency collecting the data. This follows the White House "Open Data Policy" (OMB M-13-13) of May 9, 2013 which supports the related Executive Order of May 9, 2013 (Making Open and Machine Readable the New Default for Government Information). This policy requires federal agencies to collect or create information in a way that supports downstream information processing and dissemination activities. This includes using machine readable and open formats, data standards, and common core and extensible metadata for all new information creation and collection efforts. Following this guidance the BU proposal will engage with NOAA NCDDC to create a comprehensive mechanism to preserve, discover and access this data and information to maximize the investment made by the RESTORE Council and various agencies by allowing multiple uses of the data while minimizing duplication of effort.

Simply, the proposed infrastructure will provide a publicly available data/information discovery mechanism based upon the geoportal concept, typified by the open-source Esri Geoportal Server, which can efficiently search a variety of metadata standards contained in web catalogs of the various data collectors/providers. This system will provide end users with the ability to go directly to the data providers, often using automated on-line services, to obtain data/information discovered. A nominal infrastructure diagram from the data provider point of view demonstrates how this architecture provides discovery and access to a variety of end users:



The key components of this proposed infrastructure include:

- Data Producer, data, and information
  - The diversity of data producers within this BU proposal, will result in multiple state, federal, and resource organization pieces of data and information.
- Data discovery, access, and visualization services (geoportal)
  - Metadata discovery is enabled by using data access and discovery services. NOAA is widely using a free, open-source product developed by Esri called Geoportal Server. The Esri Geoportal Server enables discovery and use of geospatial resources including datasets, rasters, and Web services as well as non-geospatial resources such as publications and lab data through the use of metadata. The product allows many various formats of metadata and import options (harvest or CSW to name a few) so that interoperability and a common search can be achieved across several platforms without all inputs adopting the same standards and formats. Esri Geoportal Server is not the only viable geoportal software, but it is widely used both inside and outside of NOAA.
- Supportive metadata for the data/information
  - A geoportal-based infrastructure is ideal since it supports a variety of metadata profiles and catalogue services. Most Gulf of Mexico activities already develop and provide some level of metadata.
- Organizational Web Accessible Folders (WAF) or Catalog Service for Web (CSW)
  - Each activity providing data/information will need to provide either a web accessible folder (WAF) or Catalog Service for Web (CSW) service. Many activities already have one of these services in place. A WAF is a simple directory of files on a web server that can be accessed by users with a web browser, indexed by Google or other search engine, and harvested by a metadata discovery portal or other freely available utility such as Geoportal Server. A WAF provides a straightforward approach to build and maintain a centralized repository of metadata XML files in any format. Each entity receiving funding under this land protection strategy will create a WAF for data accessibility.
- End users
  - This initiative provides a data discovery and access mechanism for the government, academia, NGOs, project managers, coastal zone managers, Councils, Consortia, Alliances, Centers, and the general public.

This approach is attractive for several reasons:

- Very low cost to establish a public Gulf of Mexico Geoportal server
- Most providers either already possess or can easily establish a WAF or CSW
- Most providers already develop and provide acceptable levels of metadata to facilitate discovery

Data/information will continue to be accessed from the Authoritative Source via existing infrastructure and data bases.

References Cited

Allen, H.H., Shirley, S.O. 1988. Wetlands created for dredged material stabilization and wildlife habitat in moderate to high wave-energy environments. Environmental Effects of Dredging, Technical Notes. USACE. pp. 11.

Barbier E.B., Hacker, S.D., Kennedy, C., Koch, E.W., Stier, A.C., Silliman, B.R. 2011. The value of estuarine and coastal ecosystem services. *Ecological Monographs* 81(2): 169-193.

Barko, J.W., Smart, R.M., Lee, C.R., Landin, M.C., Sturgis, T.C. and Gordon, R.N. 1977. Establishment and Growth of Selected Freshwater and Coastal Marsh Plants in Relation to Characteristics of Dredged Sediments. Technical Report D-77-2, Waterways Experiment Station, Vicksburg, MS USA.

Broome, S.W., Seneca, E.D., Woodhouse, W.W. 1989. Tidal salt marsh restoration. *Aquatic Botany.* 32:1-22.

Byrnes, M.R., Berlinghoff, J.L. 2011. Gulf Regional Sediment Management Master Plan: Case Study Compilation. GOMA (HCRT) Available online: http://www.gulfmex.org/wp-content/uploads/2011/09/HCRT_GRSMMP_case_studies_chapter.pdf ; *Journal of Coastal Research Special* Issue 60: 72-124.

CH2M Hill. 2011a. Final master plan for the beneficial use of dredged material for coastal Mississippi. Prepared for the Gulf of Mexico Alliance/Habitat Conservation and Restoration Team in cooperation with Mississippi Department of Marine Resources. Funding provided by the Gulf of Mexico Foundation, through cooperative agreement with the National Oceanic and Atmospheric Administration Coastal Services Center. http://msrestoreteam.com/docs/final%20MS%20Master%20Plan%20with%20appendices_102011-print%20version_with%20appendices.pdf

CH2M Hill. 2011b. Final project management plan for selected beneficial use projects along coastal Mississippi. Prepared for the Gulf of Mexico Alliance/Habitat Conservation and Restoration Team in cooperation with Mississippi Department of Marine Resources. Funding provided by the Gulf of Mexico Foundation, through cooperative agreement with the National Oceanic and Atmospheric Administration Coastal Services Center. http://msrestoreteam.com/docs/Final%20MS%20PMP%20for%20BU%20102011.pdf

Costanza, R., O. Perez-Maqueo, M.L. Martinez, P. Sutton, S.J. Anderson, and K. Mulder. 2008. The value of coastal wetlands for hurricane protection. *Ambio* 37(4):241-248.

Dahl, T. E. 2011. Status and trends of wetlands in the conterminous United States 2004 to 2009. US Department of the Interior, US Fish and Wildlife Service, Fisheries and Habitat Conservation.

Edwards, K.R., Proffitt, C.E. 2003. Comparison of wetland structural characteristics between created and natural salt marshes in southwest Louisiana, USA. *Wetlands* 23(2): 344-356.

ERG. 2014. Economic, environmental, and social benefits of regional ocean partnerships. Final report, NOAA Coastal Services Center, Charleston, SC. Prepared by Eastern Research Group, Inc., Lexington, MA. pp. 49

Ford, M.A., Cahoon, D.R., Lynch, J. C. (1999). Restoring marsh elevation in a rapidly subsiding salt marsh by thin-layer deposition of dredged material. *Ecological Engineering* 12(3), 189-205. Last Accessed November 14th, 2014

GCERTF. 2011. Gulf of Mexico regional ecosystem restoration strategy. Gulf Coast Ecosystem Restoration Task Force, pp.128 Available online: http://www.epa.gov/gulfcoasttaskforce/pdfs/GulfCoastReport_Full_12-04_508-1.pdf Last Accessed November 14th, 2014

GOMA HCRT 2009. Technical framework for the Gulf regional sediment management master plan. Pp. 139. Available online: http://gulfofmexicoalliance.org/pdfs/GRSMMP_Technical_Framework_Dec_09.pdf Last Accessed November 14th, 2014

GOMA HCRT 2010. Beneficial Use of Dredged Sediment & the Federal Standard: Issues of Concern and Recommendations for Action by the Alliance Management Team. Pp. 28 Available at: http://www.gulfmex.org/wp-content/uploads/2011/08/2010_goma_hcrt_federal_standard_issues_recommendations.pdf Last Accessed November 14th, 2014

Harrington, B.R. 2008. Coastal inlets as strategic habitat for shorebirds in the southeastern United States. ERDC TN-DOER-E25. U.S. Army Engineering Research and Development Center, Vicksburg, MS. pp. 8 http://el.erdc.usace.army.mil/dots/doer/ Last Accessed November 14th, 2014.

Khalil, S.M., Parson, L.E., and Waters, J.P. (eds.). 2012. Technical Framework for the Gulf Regional Sediment Management Master Plan (GRSMMP), Journal of Coastal Research, Special Issue No. 60:1-5.

Knutson, P.L., Allen, H.H., Webb, J.W. 1990. Guidelines for vegetative erosion control on wave-impacted coastal dredged material sites. Dredging Operations Technical Support Program, Technical Report D-90-13. USACE. pp. 89.

Landin, M.C. (ed) 1997. Proceedings: International workshop on dredged material beneficial uses. USACE. pp. 187.

Landin, M.C. 1980. Building and management of dredged material islands for use by wildlife in North America. Proceedings of the Twelfth Dredging Seminar. Center for Dredging Studies, Texas A&M University, College Station, TX. pp. 188-215.

LePeyre, M.K., B. Gossman, and B.P. Piazza. 2009. Short- and long-term response of deteriorating brackish marshes and open-water ponds to sediment enhancement by thin-layer dredge disposal. *Estuaries and Coasts* 32:390-402.

Llewellyn, C.B. 2008. Evaluating ecological equivalence in created marsh. Thesis for Master of Science at the School of Renewable Natural Resources, Louisiana State University. pp. 63.

Melvin, S.L., Webb, J.W. (1998). Differences in the avian communities of natural and created *Spartina alterniflora* salt marshes. *Wetlands* 18(1):59-69.

Mendelssohn, I.A., Kuhn, N. 2003. Sediment subsidy: effects on soil–plant responses in a rapidly submerging coastal salt marsh. *Ecological Engineering* 21:115–128.

Mendelssohn, I.A., Andersen, G.L., Baltz, D.M., Caffey, R.H., Carman, K.R., Fleeger, J.W., Joye, S.B., Lin, Q., Maltby, E., Overton, E.B., Rozas, L.P. 2012. Oil impacts on coastal wetlands: implications for the Mississippi River delta ecosystem after the *Deepwater Horizon* oil spill. *Bioscience* 62 (6): 562-574.

Minello, T.J., Rozas, L.P. (2002). Nekton in Gulf Coast wetlands: fine-scale distributions, landscape patterns, and restoration implications. *Ecological Applications* 12(2):441-455.

Minello, T.J., Webb Jr, J.W. (1997). Use of natural and created Spartina alterniflora salt marshes by fishery species and other aquatic fauna in Galveston Bay, Texas, USA. *Marine Ecology Progress Series* 151(1):165-179.

Mitsch, W.J., Gosselink, J.G. 2007. Wetlands, 4th ed. John Wiley & Sons, Hoboken, N.J. pp. 582.

National Audubon Society. 2012. Restoring the Gulf for Coastal Waterbirds: A Long-term Vision. pp. 18 Available online: http://conservation.audubon.org/sites/default/files/documents/restoring_the_gulf_for_coastal_waterbirds_nov12lr.pdf Last Accessed November 14th, 2014.

O'Connell, J.L., Nyman, J.A. (2010). Marsh terraces in coastal Louisiana increase marsh edge and densities of waterbirds. *Wetlands* 30(1):125-135.

Ocean Conservancy. 2011. Restoring the Gulf of Mexico: A Framework for Ecosystem Restoration in the Gulf of Mexico. Available online: http://www.oceanconservancy.org/places/gulf-of-mexico/restoring-the-gulf-of-mexico.pdf Last Accessed November 14th, 2014.

Parson, L.E., Swafford, R. 2012. Beneficial use of sediments from dredging activities in the Gulf of Mexico. In: Khalil, S.M., Parson, L.E., Waters, J.P. (eds.), Technical Framework for the Gulf Regional Sediment Management Master Plan (GRSMMP), Journal of Coastal Research, Special Issue No. 60, 45–50

Ray, G.L. 2007. Thin Layer placement of dredge material on coastal wetlands: a review of the technical and scientific literature. USACE. pp. 9.

Rozas, L.P., Minello, T.J. (2001). Marsh terracing as a wetland restoration tool for creating fishery habitat. *Wetlands* 21(3): 327-341.

Rozas, L.P., Caldwell, P., Minello, T.J. (2005). The fishery value of salt marsh restoration projects. Journal of coastal research, 37-50.

Seneca, E.D., Broome, S.W., Woodhouse, W.W., Cammen, L.M., Lyon, J.T. 1976. Establishing *Spartina alterniflora* marsh in North Carolina. *Environmental Conservation* 3(03):185-188.

Shafer, D.J., Roland, R., Douglass, S.L. 2003. Preliminary evaluation of critical wave energy thresholds at natural and created coastal wetlands. WRP Technical Notes Collection (ERDC TN-WRP-HS-CP-2.2), U.S. Army Engineer Research and Development Center, Vicksburg, MS. Available online: www.wes.army.mil/el/wrtc/wrp/tnotes/tnotes.html Last Accessed November 14th, 2014.

Shafer, D.J., Streever, W.J. 2000. A comparison of 28 natural and dredge material salt marshes in Texas with emphasis on geomorphological variables. *Wetlands Ecology and Management* 8:353-366.

Smith, R. 2014. Restoring the Mississippi Gulf Coast: A strategic plan for people, wildlife and the economy. Wildlife Mississippi. pp.24. Available online: http://www.wildlifemiss.org/PDF/Wildlife%20MS%20Coast%20Plan%20Final_7.8.14.pdf Last Accessed November 14th, 2014.

Stedman, S., Dahl, T.E. 2008. Status and trends of wetlands in the coastal watersheds of the Eastern United States 1998 to 2004. National Oceanic and Atmospheric Administration, National Marine Fisheries Service and U.S. Department of the Interior, Fish and Wildlife Service. Available online: http://www.habitat.noaa.gov/pdf/pub_wetlands_status_trends.pdf Last Accessed November 14th, 2014.

Stedman, S.M., Hanson, J. 2000. Habitat Connections: Wetlands, fisheries and economics in the South Atlantic Coastal States. National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Available online: http://www.nmfs.noaa.gov/habitat/habitatconservation/publications/habitatconections/num2.htm Last Accessed November 14th, 2014.

Streever 2000. *Spartina alterniflora* marshes on dredge material: a critical review of the ongoing debate over success. *Wetlands Ecology and Management* 8:295-316.

Turner, R.E. 1990. Landscape development and coastal wetland losses in the northern Gulf of Mexico. *American Zoologist* 30(1):89-105.

Turner, R.E., Gosselink, J.G. 1975. A note on standing crops of *Spartina alterniflora* in Texas and Florida. 19:113-118

Turner, R.E., Streever, B., 2002. Approaches to Coastal Wetland Restoration: Northern Gulf of Mexico. SPB Academic Publishing, Hague, The Netherlands, pp. 147

USEPA. 2000. Principles for the Ecological Restoration of Aquatic Resources. EPA841-F-00-003. Office of Water (4501F), United States Environmental Protection Agency, Washington, DC. pp. 4.

USEPA. 2008. National Coastal Condition Report III. Office of Research and Development/Office of Water EPA/842-R-08-002. Washington, D.C. pp. 295.

USEPA, USACE. 2007. Identifying, planning, and financing beneficial use project using dredge material. Beneficial Use Planning Manual. US Environmental Protection Agency and US Army Corp of Engineers. pp. 114.

USFWS. 2013. Vision for a healthy Gulf of Mexico Watershed. United States Fish and Wildlife Service., Department of the Interior, pp.24 Available online: http://www.fws.gov/gulfrestoration/pdf/VisionDocument.pdf Last Accessed November 14th, 2014.

Valiela, I., Cole, M.L., Mcclelland, J., Hauxwell, J., Cebrian, J., Joye, S.B. 2000. Role of salt marshes as part of coastal landscapes. *In:* Weinstein, M.P., Kreeger, D.A. (eds), Concepts and Controversies in tidal marsh ecology. Springer, Netherlands, pp. 23-36.

Withers, K. 2002. Shorebird use of coastal wetland and barrier island habitat in the Gulf of Mexico. *The Scientific World Journal* 2:514-536.

ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Enhancing Opportunities for Beneficial Use of Dredge Sediments

PROPOSAL NUMBER

MS-2

LOCATION

Gulf Coast Region

SPONSOR(S)

Mississippi

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Planning/Technical Assistance

REVIEWED BY:

Bethany Carl Kraft/ Ben Scaggs

DATE:

11-18-14

1. Does the project aim to restore and/or protect natural resources, ecosystems, fisheries, marine and wildlife habitat, beaches, coastal wetlands and economy of the Gulf Coast Region?

(●) YES ( ) NO

Notes:

Proposal aims to provide funding across the Gulf towards beneficial use of dredge sediments.

2. Is the proposal a project?

( ) YES (●) NO

If yes, is the proposed activity a discrete project or group of projects where the full scope of the restoration or protection activity has been defined?

( ) YES ( ) NO

Notes:

3. Is the proposal a program?

(●) YES ( ) NO

If yes, does the proposed activity establish a program where the program manager will solicit, evaluate, select, and carry out discrete projects that best meet the program's restoration objectives and evaluation criteria?

(●) YES ( ) NO

Notes:

4. Is the project within the Gulf Coast Region of the respective Gulf States?

(●) YES ( ) NO

If no, do project benefits accrue in the Gulf Coast Region?

( ) YES ( ) NO

Notes:

Eligibility Determination

ELIGIBLE

Additional Information

Proposal Submission Requirements

1. Is the project submission overall layout complete? ***Check if included and formatted correctly.***

A. Summary sheet	☑	F. Environmental compliance checklist	☑
B. Executive summary	☑	G. Data/Information sharing plan	☑
C. Proposal narrative	☑	H. Reference list	☑
D. Location information	☑	I. Other	☐
E. High level budget narrative	☑		

If any items are NOT included - please list and provide details

2. Are all proposal components presented within the specified page limits (if applicable)?

◉ YES ○ NO

Notes: