

ALABAMA STATE EXPENDITURE PLAN (SEP)

Project #5: Characterization and Delineation of Significant Sand Resource Areas Essential for Beach Restoration

Project Description/Summary

- a) This planning assistance project will support coastal restoration efforts by promoting sand resource identification and assessing the feasibility of dredging State and outer continental shelf (OCS) sand deposits. The data needed to fully identify “beach quality” sands does not exist, and there is not an updated platform to examine and disseminate this knowledge. In order to maintain and improve coastal infrastructure, economic, and coastal habitat resiliency, viable nearshore sand sources suitable for beach placement are essential. Moreover, the need to identify sand sources through further data assimilation and collection has never been greater.

Beach restoration does not ensure a long-term solution to erosive influences such as storms and rising sea level. Infrastructure, tourism, storm protection, and ecosystem services are dependent upon a stable beach environment driving the need for long-term beach maintenance. Offshore sand resources are essential to the maintenance of amenity beaches and the intertidal and beach habitat they provide. The Cities of Gulf Shores and Orange Beach, as well as the Alabama Department of Conservation and Natural Resources, have acknowledged the essential importance of Alabama’s gulf-fronting beaches through previous investments in offshore “beach compatible” sand searches and nearshore dredging and placement in needed areas. This is a significant financial investment that should be appreciated both in the state and by those with an interest in Gulf of Mexico resources.

Gulf-fronting beaches along Baldwin and Mobile Counties, Alabama, are continuously monitored by Olsen Associates, Inc. (City of Gulf Shores, City of Orange Beach, Gulf State Park) and the Geological Survey of Alabama (GSA/Fort Morgan Peninsula, Dauphin Island). Both entities are familiar with the stress that natural (e.g., hurricanes) and human-induced (e.g., oil spill response and recovery) disasters can bring to the beach ecosystem and acknowledge the benefits of maintained beaches to the region. The economic importance of Alabama’s coastal area is intrinsically linked to the condition of Alabama’s Gulf-fronting beaches. The Alabama Gulf Coast region, as classified by the Alabama Tourism Department in its 2016 Travel Economic Impact document (available on its [website](#)), significantly leads other Alabama regions in total expenditures, travel-related earnings, and travel-related employment. The 2010 Alabama Tourism Department’s Economic Impact document (available on its [website](#)) shows that 2009 and 2010, total expenditures and travel-related earnings declined 9% and 5% respectively, reflecting the profound adverse economic impact of the Deepwater Horizon oil spill on Alabama beaches and other ecosystems.

Sand reserves offshore of Alabama have not been delineated to allow designation as significant Federal Outer Continental Shelf (OCS) sediment resource areas, nor have suitable borrow sources been characterized to maintain engineered beaches long term. The main reasons for this include numerous geophysical and vibracore

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data gaps which inhibit detailed characterization of offshore sand sources. The search for existing offshore high-quality sand remains a high priority; however, the cost to obtain seismic and vibracore data is prohibitive. Previously, the cost for sand search investigations was covered by the City of Orange Beach, City of Gulf Shores, and the State of Alabama. The Deepwater Horizon incident resulted in opportunities for states to address their economic and ecological concerns.

Activities also include the comprehensive administration of this grant, including, but not limited to, project development and oversight, contracting, and sub-recipient monitoring.

- a. **Need:** In order to maintain and improve coastal infrastructure, economic, and coastal habitat resiliency, viable nearshore sand sources suitable for beach placement are essential. There is a pressing need to identify sand sources through further data assimilation and collection.

Purpose: Alabama offshore sand reserves are essential to the maintenance of amenity beaches and to the intertidal and beach ecosystem functions and services they provide. The purpose of this project is to identify offshore sand resources suitable for beach restoration purposes by initiating a Bathymetric and sand sediment sampling and analysis program.

Objective: The GSA will address the need and purpose of this proposed work through three tasks:

- Update the Offshore Alabama Sand Information System (OASIS) platform through collaboration with interested governing and private parties;
 - Acquire geophysical and vibracore data and characterization of offshore sand resource areas of further interest through the use of the OASIS update and collaborative efforts; and
 - Disseminate collected information through the OASIS platform, publication(s), and presentations.
- b. This project is located in the Gulf Coast Region and will be conducted offshore of Baldwin and Mobile Counties, Alabama out to 5 miles.
 - c. This project is expected to begin 7/1/2019 and end 6/30/2023 (4 years).
 - d. The proposed project will be implemented by the Geological Survey of Alabama.
- b) This project will identify significant sand sources that will ultimately be used for habitat restoration and conservation, ensuring long-term protection of coastal Alabama's environment and economy. Restored beaches enhance ecosystem health and recreational opportunities resulting in the restoration of the Gulf economy.

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Eligibility and Statutory Requirements

Located in the Gulf Coast Region, this activity is eligible for Spill Impact Component funding under Category #8 - Planning Assistance (primary). Secondary activities include Category #10 - Promotion of tourism in the Gulf Coast Region, including recreational fishing.

Comprehensive Plan Goals and Objectives

This project is consistent with the following Comprehensive Plan goals:

- Goal 1: Restore and Conserve Habitat – Restore and conserve the health, diversity, and resilience of key coastal, estuarine, and marine habitats;
- Goal 3: Replenish and Protect Living Coastal and Marine Resources – Restore and protect healthy, diverse, and sustainable living coastal and marine resources;
- Goal 4: Enhance Community Resilience – Build upon and sustain communities with capacity to adapt to short- and long-term changes; and
- Goal 5: Restore and Revitalize the Gulf Economy – Enhance the sustainability and resiliency of the Gulf economy.

This project supports the following Comprehensive Plan objectives:

- Objective 1: Restore, Enhance, and Protect Habitats – Restore, enhance, and protect the extent, functionality, resiliency, and sustainability of coastal, freshwater, estuarine, wildlife, and marine habitats. These include barrier islands, beaches, dunes, coastal wetlands, coastal forests, pine savannahs, coastal prairies, submerged aquatic vegetation, oyster reefs, and shallow and deepwater corals;
- Objective 4: Restore and Enhance Natural Processes and Shorelines – Restore and enhance ecosystem resilience, sustainability, and natural defenses through the restoration of natural coastal, estuarine, and riverine processes, and/or the restoration of natural shorelines;
- Objective 5: Promote Community Resilience – Build and sustain Gulf Coast communities' capacity to adapt to short- and long-term natural and man-made hazards, particularly increased flood risks associated with sea-level rise and environmental stressors. Promote ecosystem restoration that enhances community resilience through the re- establishment of non-structural, natural buffers against storms and flooding; and
- Objective 7: Improve Science-Based Decision-Making Processes – Improve science-based decision-making processes used by the Council.

Major Milestones

- a) Milestone 1: Procure professional services
- b) Milestone 2: Compile existing data
- c) Milestone 3: Update OASIS
- d) Milestone 4: Develop seismic and vibrocore specs and bidding

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- e) Milestone 5: Permitting
- f) Milestone 6: Complete seismic and vibrocore acquisition and analyses
- g) Milestone 7: Analyze data and complete report
- h) Milestone 8: Final reporting and outreach

Success Criteria/Metrics/Outcomes

The anticipated outcome of the Characterization and Delineation of Significant Sand Resource Areas Essential for Beach Restoration will be:

- Identification of significant sand resource areas to be used for beach restoration

Table 6. Proposed Projects Success Criteria/Metrics/Outcomes

Activity	Anticipated Project Success Criteria/Metrics	Short-term outcome	Long-term outcome
Collect, analyze and publish geophysical data	5 studies/data published 1 tool developed	Sand sources identified	Ensure coastal resiliency Enhanced tourism opportunities

Monitoring and Evaluation

- a) Submission of 5 completed studies and one tool to ADCNR for review
- b) Provide evidence to ADCNR that all required permits were obtained (including SHPO)
- c) Submission of quarterly and final reports

Best Available Science

Resource information essential to the development, protection, and restoration of a natural resource is included below. GSA offers the following references to indicate a statement of due diligence in the subject area. Many of these references are peer-reviewed publications by the GSA.

Hummell, Richard L., 1996, Holocene geologic history of the west Alabama inner continental shelf, Alabama: Alabama Geological Survey, Circular 189, 68 p. + 125 p. appendix.

Hummell, Richard. L., 1997, Hydrographic numerical model investigation and analysis of an offshore sand resource site for use in beach nourishment projects on Dauphin Island,

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Alabama: Minerals Management Service Cooperative Agreement No. 14-35-0001-30781, 151 p.

___1999, Geological and economic characterization and near-term potential of sand resources of the east Alabama inner continental shelf offshore of Morgan Peninsula, Alabama: Minerals Management Service Cooperative Agreement No. 1435-01-98-CA-30935, 123 p. + 107 p. appendix.

Hummell, R. L. and Smith, W. E., 1995, Geologic and environmental characterization and near-term lease potential of an offshore sand resource site for use in beach nourishment projects on Dauphin Island, Alabama: Minerals Management Service Cooperative Agreement No. 14-35-0001-30725, 164 p. + 29 p. appendix.

___1996, Geologic resource delineation and hydrographic characterization of an offshore sand resource site for use in beach nourishment projects on Dauphin Island, Alabama: Minerals Management Service Cooperative Agreement No. 14-35-0001-30781, 168 p. + 38 p. appendix.

Jones, S. C., Darby, S. B., and Tidwell, D. K., 2009, The development of an offshore Alabama sand information system: Minerals Management Service Cooperative Agreement No. M07AC12488, 88 p.

Natharius, J. A., 2002, Sand resources and shoreline profile geospatial data and interactive maps, fiscal year 2001/2002: Project deliverable for Minerals Management Service Cooperative Agreement 1435-01-98-CA-30935, Alabama Geological Survey Open-File Report (on CD-ROM).

Olsen Associates, Inc., 2001, Gulf Shores, Alabama beach restoration project, sand search investigation: Jacksonville, Florida, Olsen Associates, Inc., submitted to the City of Gulf Shores, Alabama, 22 p.

___2003b, Sand search investigation and analysis of borrow site sediment characteristics: Jacksonville, Florida, Olsen Associates, Inc., submitted to the City of Orange Beach, the Alabama Department of Conservation and Natural Resources, and the City of Gulf Shores, Alabama, 59 p.

___2006a, Orange Beach/Gulf State Park/Gulf Shores 2005-2006 beach restoration project, Baldwin County, Alabama, post-construction report: Jacksonville, Florida, Olsen Associates, Inc., submitted to the City of Orange Beach, the Alabama Department of Conservation and Natural Resources, and the City of Gulf Shores, Alabama, 100 p.

___2006b, Orange Beach, Gulf State Park, and Gulf Shores 2006 Phase I deep-water sand search: Jacksonville, Florida, Olsen Associates, Inc., submitted to the City of Orange Beach, the Alabama Department of Conservation and Natural Resources, and the City of Gulf Shores, Alabama, 59 p.

___2012, Orange Beach, Gulf State Park, and Gulf Shores Beach Restoration Project, 2011 Phase II Sand Search: Jacksonville, Florida, Olsen Associates, Inc., submitted to

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the City of Orange Beach, the Alabama Department of Conservation and Natural Resources, and the City of Gulf Shores, Alabama, 70 p.

Parker, Steven J., 1988, Data application to hard mineral exploration on the Outer Continental Shelf, in Proceedings of the Ninth Annual Gulf of Mexico Information Transfer Meeting, October 1988: New Orleans, Louisiana, U.S. Minerals Management Service, p. 104-107.

___1989, Occurrence, economic potential and mining feasibility of sand, gravel, heavy mineral, and carbonate rock rubble resources in the exclusive economic zone in offshore Alabama, in John, C.J., project coordinator, Preliminary assessment of non- fuel mineral resources in the outer continental shelf exclusive economic zone of the Gulf of Mexico: Louisiana Geological Survey, U.S. Minerals Management Service Cooperative Agreement #14-12-0001-30404, Report, p. A1-A52.

Budget/Funding

- a) Estimated cost of the project and amount to be requested from Spill Impact Component Funds: \$950,175 (100% - Planning).
- b) No other funding sources are anticipated at this time.

Partnerships/Collaboration (if applicable)

The Geological Survey of Alabama (GSA) has worked with the Department of Interior (DOI) and its various bureaus, including US Geological Survey (USGS) and Bureau of Ocean Energy Management (BOEM), for many years. We welcome continuing cooperative and collaborative interactions and communications with these agencies to ensure effective and efficient use of resources related to offshore sand inventory and assessment during the course of this project and with other similar activities.

Leveraged Resources (if applicable)

Not applicable at this time.

Funds Used As Non-Federal Match (if applicable)

Not applicable at this time.

Other

Not applicable at this time.

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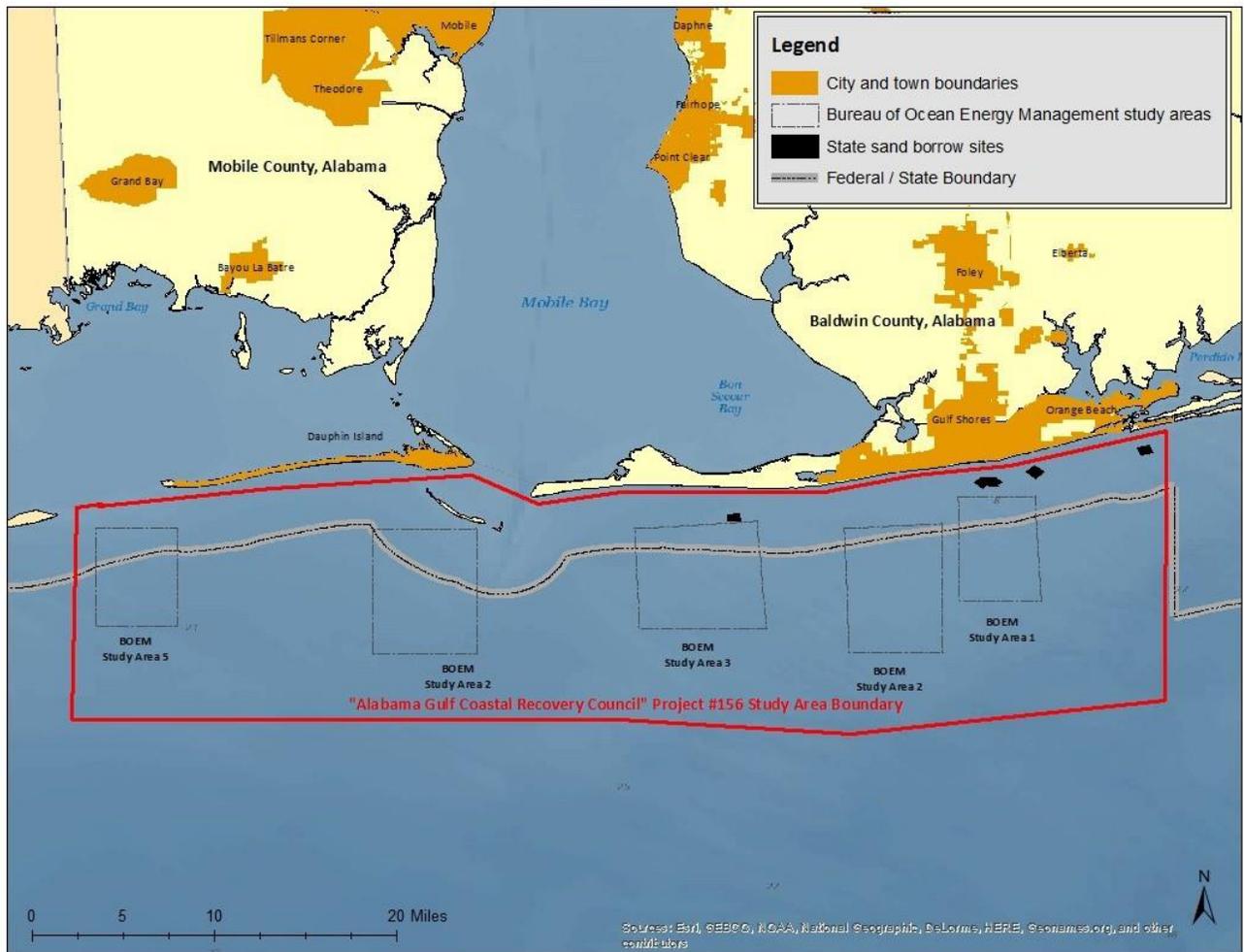


Figure 5. The Characterization and Delineation of Significant Sand Resource Areas Essential for Beach Restoration will be conducted in the Gulf of Mexico off the coasts of Baldwin and Mobile Counties.