



# City of Galveston

## COASTAL RESOURCE DIVISION

Brandon N. Hill, MMRM, CCP, Coastal Resources Manager  
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**Date** April 25, 2022

**To:** Honorable Mayor and Industrial Development Corporation Members

**From:** Brandon N. Hill, MMRM, CCP, Coastal Resources Manager

**Project Location:** Galveston Island

**Project:** Regional Sediment Management Update

**Request:** Consider for approval engaging in the Planning Assistance to States Program through the United States Army Corps of Engineers Galveston District for the update and enhancement of the City of Galveston's Sediment Management Strategies Plan and the establishment of the next phase in the regional sediment management for Galveston Island. A 50% match projected to be \$150,000 from the IDC will allow the City Staff to engage the Galveston District.

### **Prior IDC Action**

This proposal was heard by the IDC on April 5, 2022, as part of the discussion and update from staff on ongoing Beach Projects.

### **Background**

Galveston Island is a sand starved barrier island located approximately 50 miles south of the Houston metro area on the upper Texas coast. The coastal system along Galveston Island is greatly influenced by the historic Galveston seawall stretching from the south jetty on the east to 103rd street on the west. Additionally, the world's longest paired jetties extend approximately 35,000LF out into the Gulf of Mexico protecting the entrance to the Houston Galveston Ship Channel. Fronting the seawall between 14th street to 61st street is a series of seawall perpendicular granite rock groins intended to help retain sediment and maintain a sandy beach area in front of the older (untreated timber pile foundation) section of the Galveston seawall. Compounding the problem, there is not any additional sediment reaching the gulf shoreline from rivers due to upstream containments and other man-made influences.

The City seeks to engage the Galveston District (SWG) through the Planning Assistance to States program to update and build upon the Galveston Island, Texas, Sand Management Strategies document.





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The SWG and ERDC have previously been engaged in several planning efforts including;

- Galveston Island, Texas, Sand Management Strategies, 2016
- Sand Management Plan - Addendum 2018 Volume 1 of 2, EVALUATION OF GALVESTON ISLAND MULTIPURPOSE REEF AND BREAKWATER DESIGN ANALYSIS
- Sand Management Plan - Addendum 2018 Volume 2 of 2, EVALUATION OF GALVESTON ISLAND SAND TRANSFER PLANT PRELIMINARY ENGINEERING DESIGN

The scope of this PAS project seeks to synchronize the assumptions and results associated with those plans with newly available modeling and data. The previous strategy document and subsequent addendums explored a “prioritized” placement strategy that now merits further analysis and adjustment to account for the significant work which has caused parts of the island to undergo a stabilizing transformation. This updated strategy must broaden the horizons of future project scopes by accounting for the environmental, economic, and social value added by all of the beaches on Galveston Island. This update should leverage the work performed for the following regional and local efforts:

1. Coastal Texas Protection and Restoration Feasibility Study (Coastal Texas Study)
2. National Sediment Management Study for the Gulf
3. Galveston 204 CAP – Beach Nourishment
4. Galveston PAS – Dellanera Reef / Offshore Breakwater Study
5. GLO’s Coastal Erosion Planning and Response Act (CEPRA) – Sand transport modeling
6. GLO-BOEM Offshore Sediment Inventory Surveys
7. Texas Coastal Resiliency Master Plan

**Guiding Principle #1 – *The Islands' beaches must not be divided by jurisdiction or adjacent property descriptions.***

The island cannot be properly managed if anthropogenic restraints are placed on the extent or prioritization of the beaches. This plan must account for the sediment sources and sinks within the areas east and west of Galveston Island. The plan must utilize the latest and most accurate information available to account for the longshore and cross-shore relationships which are crucial to predicting the success of any attempt to maximize the benefits of strategic placement of material.





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### **Guiding Principle #2 – Regional Sediment Management**

Galveston is currently a sand starved system, largely without access to “new” material, yet the Galveston District maintains many local federal channels. Priority consideration is given to projects that can incorporate a BUDM component. This plan must expand on the success of BUDM within the area in front of the Seawall and build upon those efforts. This needs to include immediate and long-term steps which can be taken to stabilize the islands’ beaches. It should also take into account the multiple efforts which have occurred or are occurring to identify sand sources within the region and offshore.

### **Guiding Principle #3 – Acknowledge and anticipate completed and projected projects**

The Plan must acknowledge the successful beach nourishment which has taken place and the work which is projected to occur in association with the Texas Coastal Plan. While lying outside the scope of this plan the USACE Texas Coastal Plan’s impacts on sedimentation/erosion within the channels and along the shores should be encompassed to the degree possible.

On the horizon there exist many regional projects which could result in substantial sediment regime change. Projects such as the Port of Houston Project 12 (Houston Ship Channel Deepening) need to be assessed and considered for the potential paradigm shifts that they may cause. This potential must be anticipated and actionable next steps to ensure that Galveston Island is prepared to incorporate them into its regional sediment management strategies must be developed.

### **Guiding Principle #4 – This document must result in actionable plans to address the components identified therein.**

Through the use of the Progressive Elaboration or “rolling wave” planning process, this document needs to include the next steps which have had their most immediate components well defined and explored allowing them to be pursued. The steps which are further out can be described with less granularity but ought to still be identified so that they can be focused on as they come into resolution.





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### **Guiding Principle #5 – Adaptive Management**

It is financially responsible to protect previous investments for future generations. Ongoing maintenance is identified in the Plan as a critical step, and with ongoing maintenance, the burden of each maintenance cycle can have less of a financial impact. The Plan must consider large and small quantity placement to continue the healthy maintenance of the island. It must also establish a phased or cycled nourishment strategy to steer the destination of Beneficially Used Dredged Materials which is informed by the geomorphological data. Having priorities set in a fashion that can be tied back to the overall health and survival of the island is paramount to the long-term success of the region. In keeping with the tenets of adaptive management, the plan should include clear means and instructions to update the strategy outlined as the region evolves or more information becomes available.

### **Guiding Principle #6 – Seek opportunities to conduct large scale nourishment projects**

It is widely recognized and documented that larger (with greater length and with a greater volume per linear foot) beach nourishment projects perform better and have a longer life span. A minimum goal is to achieve a 50 yds<sup>3</sup> per linear foot of beach nourished; however, a greater density is preferred. Beneficial Use of Dredged Material (BUDM) is identified in the Plan as a potential mechanism to return sand from the ship channel to the gulf shoreline.

### **Guiding Principle #7 – Disaster recovery; Resilience, Sustainability, and Engineered Beach Status**

Wide beaches backed by tall, healthy dune systems have been documented to provide storm damage reduction benefits to coastal communities. These storm damage benefits have resulted in those communities being more resilient to the impacts of tropical weather and have allowed them a faster return to normalcy. A necessary step to protect the public investment is to implement a comprehensive program to conduct monitoring surveys annually (and post-event) to assess the amount of change taking place in the system. Recurring surveys provide a basis for decision-making to maintain the beach template and support the “engineered beach” determination necessary to remain eligible for FEMA Post-Disaster Public Assistance funding. Recently FEMA has determined that beach nourishment is an eligible project for FEMA Hazard Mitigation and Pre-Disaster Mitigation Grant Programs.





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### **Guiding Principle #8 – Support research on innovative ideas in Coastal Zone Management**

There is a long history of academia working with the local communities to develop concepts, demo projects, and research to address locally identified resiliency issues. This collaborative process should be furthered to facilitate and vet concepts that could greatly reduce the burden of coastal storm protection and resiliency; while simultaneously growing the future scientist and leaders that will advance these strategies.

### **Community Impact**

The existing sediment management strategy document was authored in 2016 and has two addendums that were authored in 2018. While the coastline itself may move on a geologic timescale, coastal research is moving at blazing speeds. Updating our guiding documents with the data available to us will help decision-makers identify and pursue the highest and best uses for the sediment in our region. The alignment of our plan with the numerous state and federal efforts which have come to pass in the time since it's writing facilitates synergistic opportunities. The focus on a living document that employs progressive elaboration will protect the coastal strategies from falling into stagnation. This plan will help to bring about the next chapter in our Islands coastal resource management and help us to chart a course towards a more resilient, balanced, and robust island.

### **Fiscal Impact Report**

The total cost associated with the engagement of the USACE Galveston District through the Planning Assistance to States program would be a 50% cost-share between the district and the IDC. This agreement makes it possible for the Galveston community to receive a document that incorporates data analysis, modeling, and a holistic sediment management strategy that can direct our priorities as a community moving forward. The speculative cost of this project is around \$300,000 based on other PAS projects with similar goals.

Coastal Resource Sediment Management Strategy Update and Regional Sediment Management		
	Line Item Detail	Cost
	Galveston IDC	\$150,000
	USACE Galveston District	\$150,000
	Total Project	\$300,000





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### Alternatives

1. Approve the inclusion of the requested funding for the PAS project proposed here.
2. Do not approve the inclusion of the requested funding, City staff will continue to operate off of a guidance document that does not reflect the current understanding of the regional sediment budget and is not inclusive of the beach dynamics we observe today.

### Staff Recommendation

Approve the inclusion of the requested funding for the PAS Project in the amount of \$150,000.00.

Respectfully Submitted,

**Brandon N. Hill**

**Coastal Resources Manager**

