Coastal Science and Engineering Collaborative (CSEC) Overview

NNBF Workshop

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23 FEB 17

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ERDC

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CSEC Objectives

- Transfer new science into practice faster
  - Deliver science and engineering to improve coastal project life cycle systems performance and cost
- Develop business collaboratively
  - Bring together capabilities, resources, and funding from multiple partners for an overall greater value than could be achieved separately
- Link academics to practice
  - Student learning experiences
  - Cultivate recruiting opportunities

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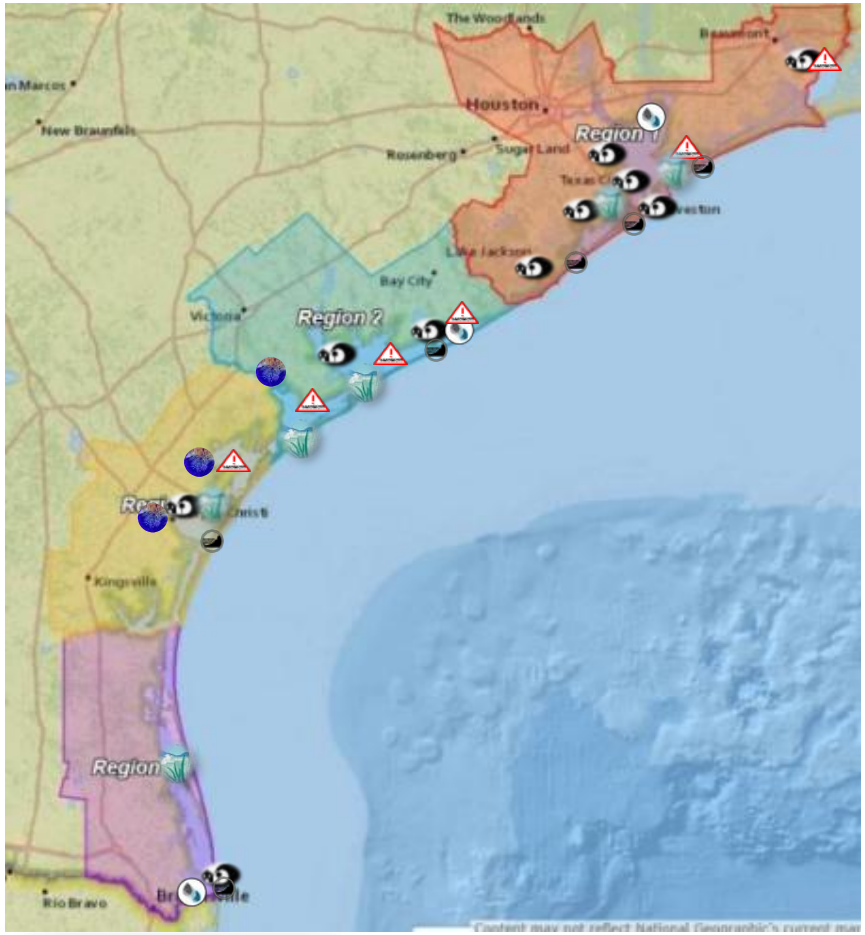
Addressing Problems and Opportunities in the Coastal Protection and Restoration Program



- Economic damage from coastal storm surge
- Inland shoreline erosion
- Gulf shoreline erosion
- Loss of T&E Critical Habitats (migratory bird habitat, critical T&E habitat, shellfish habitat)
- Loss of Natural Delta Processes
- Disrupted Hydrology






CSEC Workshop Series

Held workshops in AUG and NOV 2016 with next planned in APR 2017.

Purpose: Explore and establish common interests for partnering on coastal science and engineering academics, research and development, and practice, for timely infusion of innovative technical products to support lifecycle coastal infrastructure systems management decisions in practice.

Objectives:

- Become familiar with each others' organizations and their future directions
- Identify crossover working relationships in coastal science and engineering
- Develop a partnering value proposition for achieving mutually held objectives
- Identify action items for joint organization follow up with future event planning

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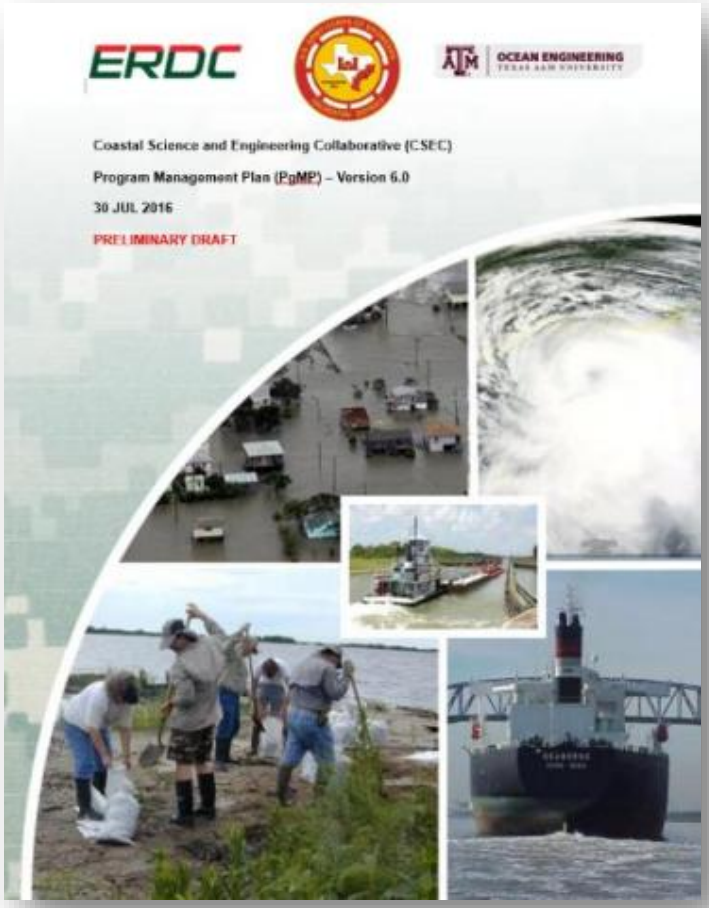
CSEC Program Management Plan Under Development

- Vision
- Intent
- Strategy
- Approach
- Goals
- Objectives
- Intended Capabilities and Products
- Path forward



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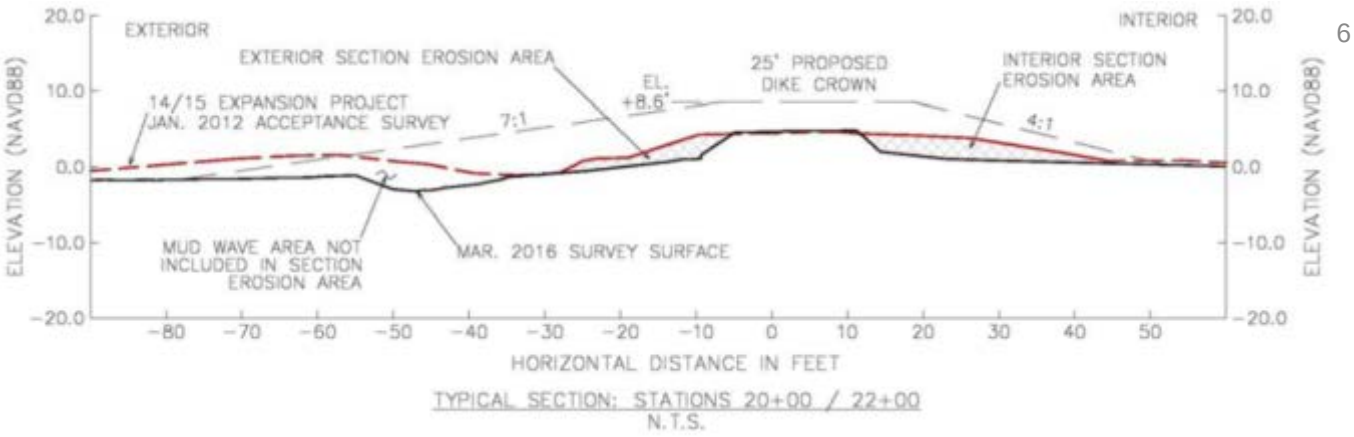
MUD DIKES

Construction:

Build a dike to protect a disposal area & make a new marsh



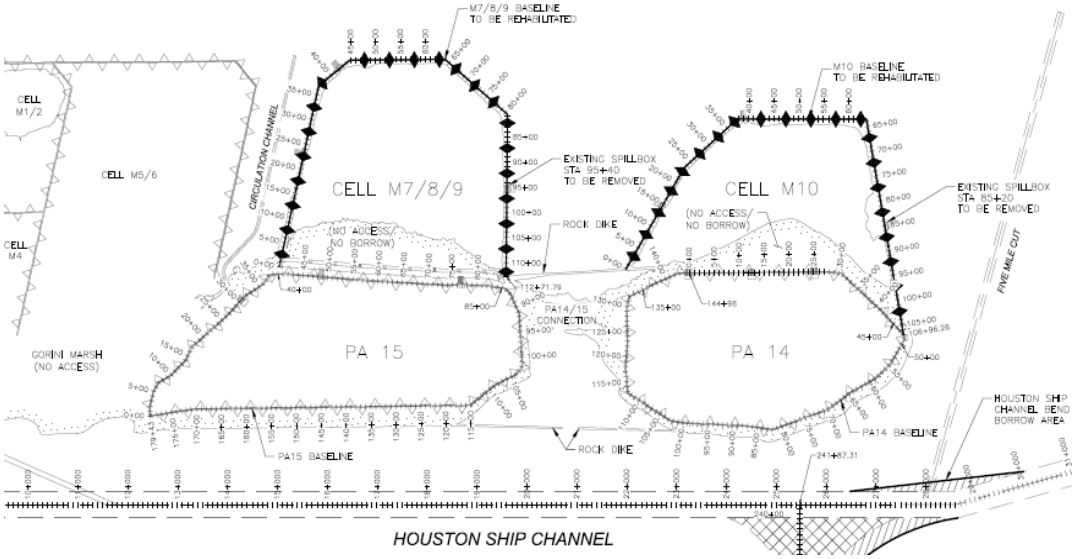
Research Questions:

1. Under what conditions does the dike erode?

2. How does a sandy beach form (erosion? winnowing?)

3. Are there critical thresholds (tipping points) of the forcing functions? (storm duration, wave height)

4. What is the impact of storm surge? (duration & height)



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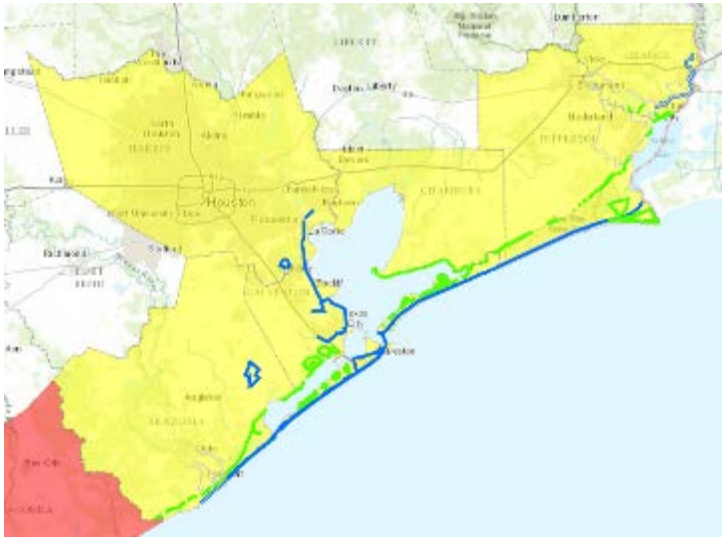
Coastal Texas Feasibility Study

- Background
  - Develop comprehensive plan for coastal storm risk mitigation and ecosystem restoration
  - 5.5 yr feasibility study
- Funded Activities
  - Regional storm climate & statistics
  - Regional storm surge & wave modeling
  - Galveston Bay 3D circulation & salinity model



- Research Needs
  - Depth-damage functions
  - Framework for climate change and sea level rise
  - Storm surge barriers: selection, operations, etc.

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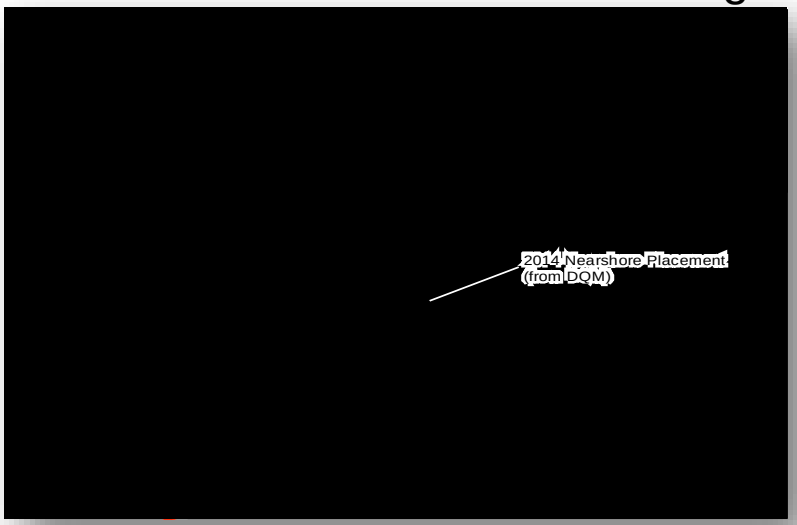
South Padre Island BU

SWG POCs: Thomas/Maglio

- Background
  - BIH Navigation Channel
  - Critical shoaling in the entrance channel
  - Critical erosion on South Padre Island
    - The most nourished beach in Texas!



- Funded Activities
  - Channel dredging
  - Incremental cost for beach placement
  - Monitoring completed navigation projects
  - SPI/GLO funded activities

- Research Needs
  - Improved methods to evaluate nearshore placement
  - Lower cost beach placement methods
  - More frequent, lower cost monitoring

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BENEFICIAL USE OF DREDGED MATERIAL – 2015
61ST GALVESTON

BENEFICIAL USE OF DREDGED MATERIAL – 2015
61ST GALVESTON

94 samples collected on the dredge Terrapin Island – over two loads

- 35 Inflow
- 59 overflow

330 samples collected at the beach over 3 months by GLDD

- Discharge slurry
- Carrier water
- Beach berm

Munsell Color

Cone Penetrometer

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BENEFICIAL USE OF DREDGED MATERIAL – 2015
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Before

After 15 December 2015

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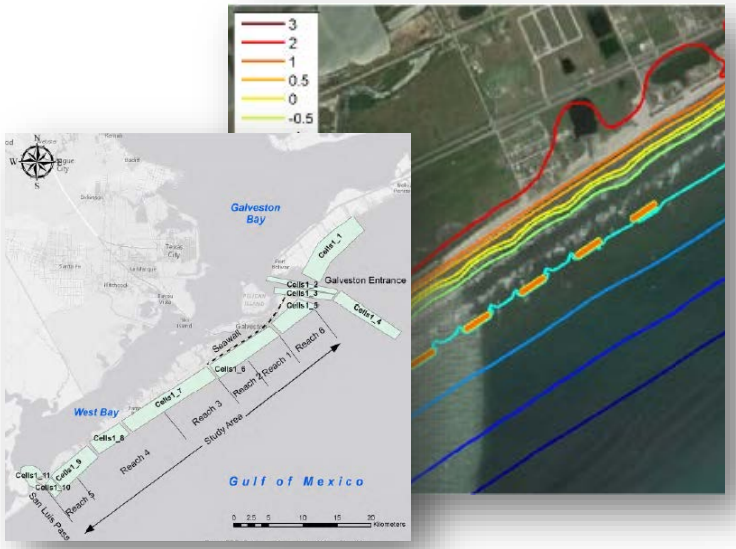
Galveston Park Board PAS

- Background
  - Needed nourishment has not been sustained
  - Critical erosion west end of the seawall
- Funded Activities
  - Sand Management Plan
  - Channel dredging
  - Incremental cost for beach placement
  - Monitoring completed navigation projects
  - County/USFWS/ATKINS assessment of shore protection



- Research Needs
  - East beach sediment source
  - Lower cost beach placement methods
  - By/Back passing systems
  - More frequent, lower cost monitoring

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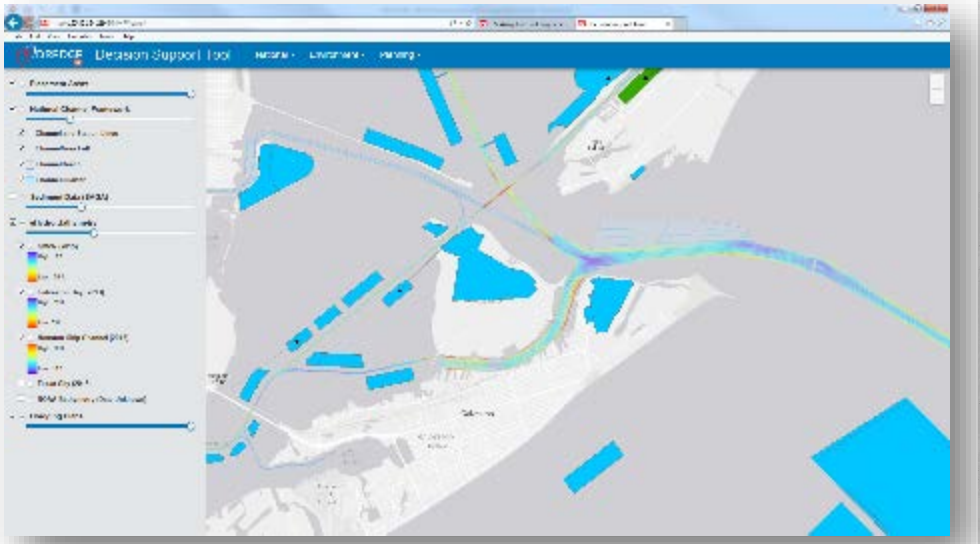
DMMP Modernization

- Background
  - Need to manage dredging and placement capacity
  - Opportunity to integrate data and systems with knowledge
- Funded Activities
  - Channel dredging and PA maintenance program
  - CE Dredge Decision Support Tool
  - Leveraging RSM and other ERDC programs



- Research Needs
  - Better monitoring
  - Visualization, Knowledge transfer
  - Systems optimization
  - Sediment management

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Submitted Statements of Need

1. Biophysical System Performance of Natural and Nature Based Features (NNBFs) for Coastal Storm Risk Management (CSRM)
2. Vegetated Stabilization of Erodible Clay Dike for Protection of Dredged-Material Placement Areas
3. Environmentally Acceptable Methods for Dredged-Material Disposal in Deep Holes
4. Decision tools for integration of dredged material management information and analyses
5. Modern dissemination, access, and approval methods for USACE Engineering Regulations and Manuals

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Engagement Opportunities

- Identifying critical knowledge gaps
- Sharing knowledge
- Participate in reviews
- Funding research
- Leading science to build the Texas Coast

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