



# USACE – Galveston District: *“Texas Coastal Custodians”*

## *EWN Opportunities for Delivering Value to the Nation*

30 SEP – 1 OCT 2014



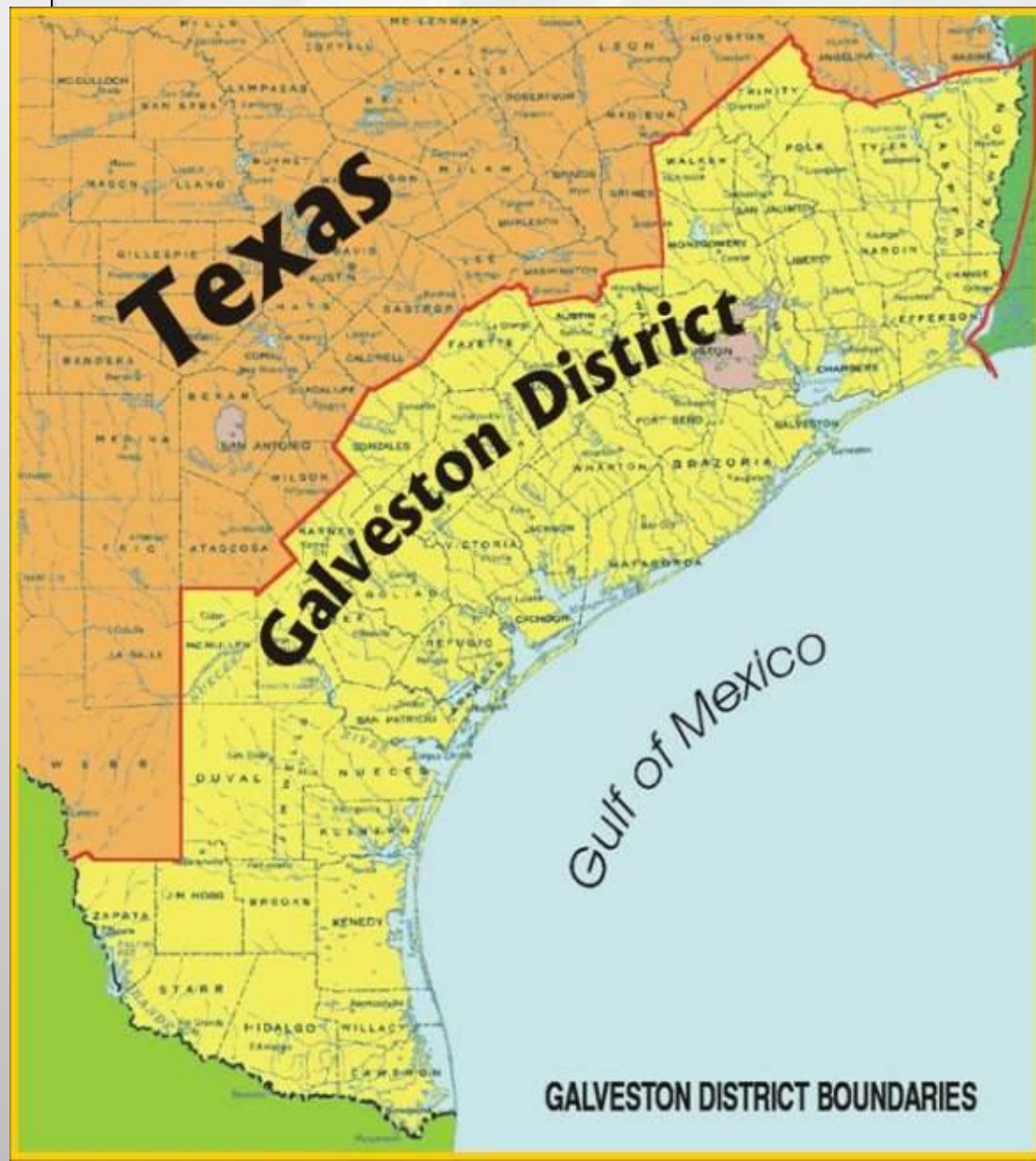
US Army Corps of Engineers  
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# Galveston District Responsibilities

- ✓ 50,000 square mile district boundary (encompassing the Texas coast from Louisiana to Mexico)
- ✓ 1,000+ miles of channels (750 miles shallow draft, 270 miles of deep draft)
- ✓ 700 miles of coastline
- ✓ 311 full time employees
- ✓ 28 ports (15 deep draft, 13 shallow draft)
- ✓ 16 Congressional districts
- ✓ 48 Texas counties
- ✓ 18 Coastal counties (coastal bay estuaries)
- ✓ 9 watersheds
- ✓ 2 Louisiana parishes







# Galveston District Missions and Business Lines

## Civil Works

- Navigation
- Flood Risk Management
- Environmental Restoration

## Interagency Support

- Customs & Border Protection
- Immigration & Customs Enforcement
- Int'l Boundary & Water Commission

## Regulatory

- Section 10 and Section 404 Permits

## Disaster Response and Recovery

- FEMA Missions



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**Coastal Navigation:  
Value to the Nation**

**Texas ranks #2 for total tonnage and accounts for over 21% of the Nation's tonnage (2012)**

**LEADING U.S. PORTS  
(2012 Tonnage)**

**Houston (#2 – 238.2 million tons)**  
#1 Importing Port & #2 Total Tonnage

**Beaumont (#5 – 78.5 million tons)**  
#1 Military Outload Port in the World

**Gulf Intracoastal Waterway (73 million tons – Texas portion)**  
#3 Inland Waterway

**Corpus Christi (#7 – 69 million tons)**  
America's Energy Port

**Texas City (#11 – 56.7 million tons)**  
Services Largest Petrochemical Complex

**Port Arthur (#23 – 30.6 million tons)**  
Vital Strategic Port

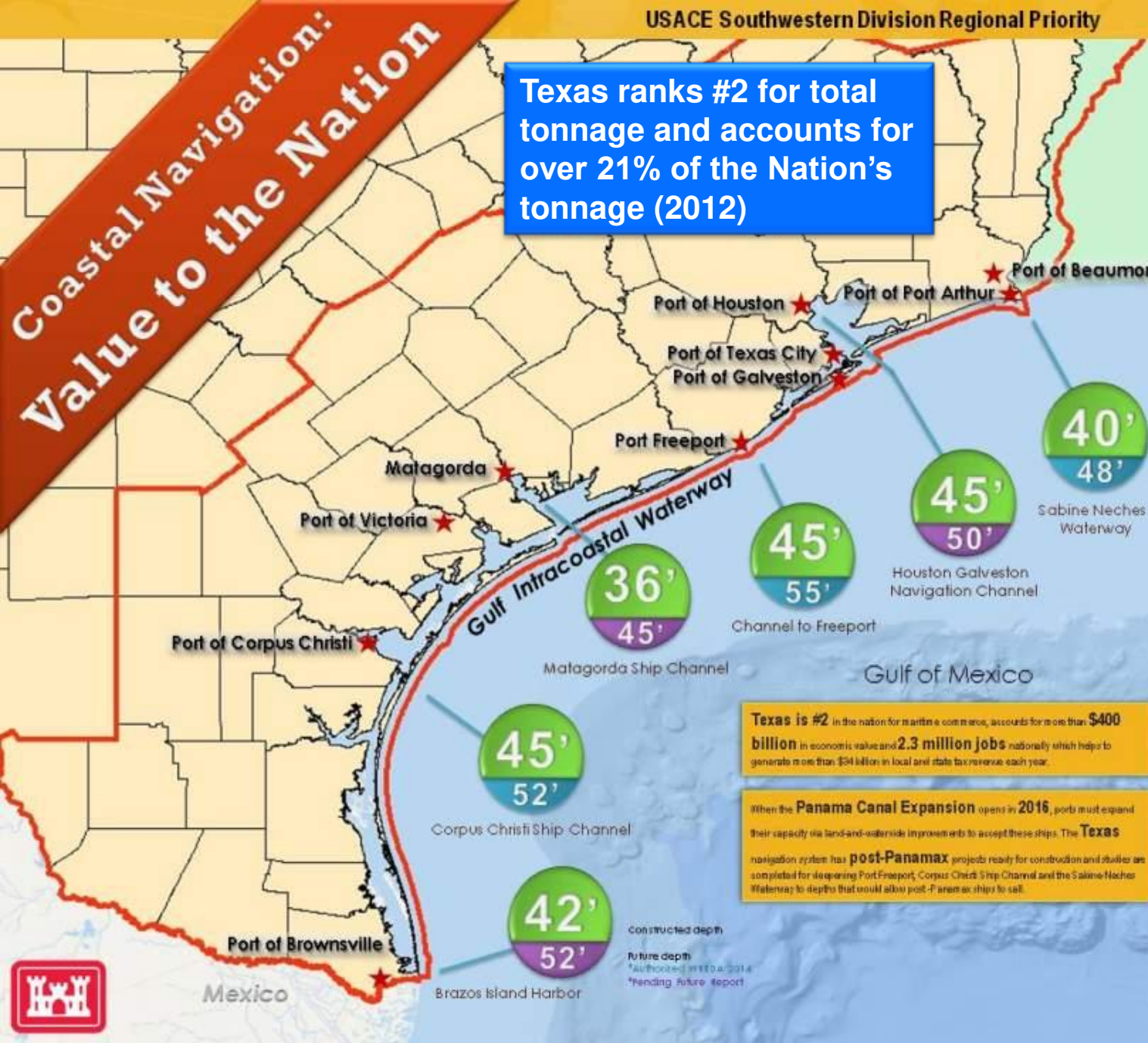
**Freeport (#31 – 22.1 million tons)**  
World Class LNG Facility

**Galveston (#47 – 11.6 million tons)**  
#5 Cruise Ship Port

**Matagorda to include Port of Port Lavaca and Port of Point Comfort (#48 – 11.6 million tons)**  
Generates Annual Business Revenues of Nearly \$2 Billion

**Brownsville (#69 – 5.6 million tons)**  
#1 Ship Recycling Port

**Victoria (#78 – 4.5 million tons)**  
#2 Shallow-Draft Port for Domestic Crude Petroleum



**Texas is #2** in the nation for maritime commerce, accounts for more than \$400 billion in economic value and 2.3 million jobs nationally which helps to generate more than \$34 billion in local and state tax revenue each year.

When the **Panama Canal Expansion** opens in 2016, ports must expand their capacity via land-and-water-side improvements to accept these ships. The **Texas** navigation system has **post-Panamax** projects ready for construction and studies are completed for deepening Port Freeport, Corpus Christi Ship Channel and the Sabine Naches Waterway to depths that would allow post-Panamax ships to sail.

Constructed depth  
Future depth  
\*Authorized FY10-2014  
\*Pending Future Report

Mexico







# Building BLOCS & Priorities

Building a Legacy Of Consistent Success

## Headquarters Priorities



1 SUPPORT NATIONAL SECURITY

2 TRANSFORM CIVIL WORKS

3 REDUCE DISASTER RISKS

4 PREPARE FOR TOMORROW

***USACE Campaign Plan***

## Southwestern Division FY15 Priorities



- Implement sustainable infrastructure systems and strategies for the Texas Gulf Coast through innovative solutions.
- Collaborate with partners to develop and implement infrastructure strategies to sustain existing USACE multipurpose reservoirs, and aid in the development and implementation of State Water planning initiatives.
- Partner with industry and users of the MKARNS to develop a model system to ensure its long-term reliability and sustainability.
- Assist military and IIS partners in making informed investment decisions to meet their project needs.
- Grow, cultivate and maintain the targeted competencies necessary to meet the future requirements of the nation, while focusing on human capital management principles and strategies to maintain a relevant and ready workforce aligned for future missions.
- Integrate knowledge management, new technologies and enterprise tools to modernize practices and deliver high-value solutions.

***Implementation Plan***

## Galveston District – FY15 Priorities – DRAFT (Under Board of Directors Discussion)

### Commander's Priorities

- 2 3 4 • TX Gulf Coast Strategy (Coastal System/Value to Nation)
- 2 3 4 • Strategic Partnerships with Key Stakeholders
- 2 4 • Accountability and transparency of our delivery process and transformation
- 2 4 • Routine tasks accomplished routinely well
- 1 2 4 • Position the district for the future (People and Resources)
- 1 2 3 4 • Prepared for contingencies
- 1 2 4 • Knowledge Management

***Operation Plan***

### Priority Projects

- Addicks & Barker Dams
- Sabine Pass to Galveston Bay Feasibility Study
- Houston Ship Channel (HSC) Improvements
- Gulf Intracoastal Waterway (GIWW)
- Texas Coastal Study
- Corpus Christi Widening Project
- Freeport PED
- TXDOT Initiative at Brazos River Floodgates
- Matagorda 408/204



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# Lines-of-Sight to SWD Implementation Plan and USACE Campaign Plan

- SWG OPlan Goal 4: Prepare for Tomorrow – Build great people, team, systems, and processes to sustain a diverse culture of collaboration, innovation, and participation to shape and deliver strategic solutions.
- Objective 4.b: Enhance trust and understanding with customers, stakeholders, teammates, and the public, through strategic engagement and communication.



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# Texas Coast Strategy

## Maximizing Capital



Communication

Transparency

Stakeholder Community

## Lines of Effort

**Improve Navigation**  
(Deepen / Widen / Safety / Capacity)

**Sustain Federal Projects**  
(Dredging / Placement Area Management)

**Support non-Federal Investment**  
(Regulatory Permits, Real Estate Outgrants, Partnerships)

**Protect the Coastal Zone**  
(Storm Damage, Ecosystem Restoration, Levee Certification)

## Future

The Texas Coast is protected & resilient, positioned for sustainable economic growth with strategic partnerships that support non-federal investment.



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# Collaboration with Partners/Clients/Stakeholders

## Maximizing Capital



Communication

Transparency

Stakeholder Community







# Future of the Texas Coast

## Shared Visioning for the Texas coast:

- The navigation system (Deep Draft Ports / Shallow Draft Ports / GIWW) is positioned for sustainable **economic growth** and Texas ports continue to drive the regional and national economic engine.
- The Texas Coast environment is protected from coastal erosion & storm surge; **ecologic health** and **community resiliency** are improved;
- USACE has strong **strategic partnerships** within the Texas Coastal Stakeholder community that support Federal and non-Federal investment in the system's infrastructure



## Future

The Texas Coast is protected & resilient, positioned for sustainable economic growth with strategic partnerships that support non-federal investment.





# Outreach and Execution Strategy Expectations

- Goals:
  - ▶ Sustain/build relevancy with partners and clients across mission business lines for delivering best-in-class products/services now
  - ▶ Shape future conditions for cultivating a program portfolio that could not be realized otherwise for supporting Federal and non-Federal investments
  
- Objectives
  - ▶ Leverage FY 15 SWD Azimuth, FY 15 SWG Priorities/Strategy, and SWG OPlan to support outreach
  - ▶ Establish value proposition to guide outreach and execution with continual shaping during implementation for greatest resonance
  - ▶ Track and steer programs pursuant to the value proposition
  - ▶ Evolve the value proposition cyclically based on successes, challenges, and internal/external feedback







# **“Deliver and Shape” Value Proposition**

- Principle: Enable agency partners to identify/realize CW infrastructure improvements together on unprecedented scope and scale that exploits vibrancy of TX economy
  
- Strategies
  - ▶ Identify studies/projects of early mutual interest for scoping/programming execution in FYs 15/16/17
  - ▶ Increase dynamic and interactive nature of deliberations between partners to cultivate enhanced program/project partnering
  - ▶ Inform cross-agency out-year program budgets in a coordinated fashion that translates into interdependent value creation
  - ▶ Embrace/cultivate business community financing to cover NFS and Federal study/project expenses to accelerate execution





# Coastal TX Protection and Restoration

- FY 15: Complete Recon Report with matrix of phased studies:
  - ▶ Comprehensive coast wide study to further cultivate opportunities
    - CSDRM / ER
    - GIWW Modernization
  - ▶ Galveston Bay FS
  - ▶ Lower Colorado River (LCR)-Matagorda Bay & Matagorda County FSs
  - ▶ Corpus Christi Bay CSDRM / ER FS
  - ▶ South Padre Island ER FS
- FY 15 ERDC R&D Coordination: Advance foundational technical studies for Galveston Bay FS via Cooperative R&D Agreement (CRADA) funded directly to ERDC by non-Federal sector
- FY 15 Budget: Initiate 3x3x3 GI Comprehensive Study in parallel with 3x3x3 priority feasibility study(ies)
- FY16 Work Plan: Compete Low Risk Galveston Bay GI FS as near 3x3x3 compliant, founded on ERDC CRADA technical work
- FY 17 Budget: Advance Low Risk Galveston Bay GI FS







# Houston Galveston Navigation Channel Improvement

- FY 15: Complete Recon Report with matrix of phased studies
  - ▶ Boggy Bayou to Turning Basin
  - ▶ Sims Bayou to Houston Ship Channel (HSC) Bridge
  - ▶ HSC Bend Easing (option to DR currently being pursued)
  - ▶ HSC Bayport/Barbours Terminals
  - ▶ HSC Galveston Bay and Galveston Entrance Channel
  - ▶ Galveston Extension
- FY 15 ERDC R&D Coordination: Advance foundational technical studies for study suite via CRADA funded directly to ERDC by non-Federal sector
- FY 15/16/17 Budget: Initiate 3x3x3 priority feasibility studies





# Gulf Intracoastal Waterway

- FY 15 Work Plan:
  - ▶ Execute Sec 216 Project Partnership Agreement (PPA) and studies for Brazos River Flood Gates Modernization
  - ▶ Sign MOU and advance Planning Assistance to States (PAS) transportation economics analysis for 12 ft channel O&M restoration
- FY 16-17 Budget: Amend Sec 216 PPA:
  - ▶ Study for integrated coast wide innovative foreshore protection and channel O&M BU placement

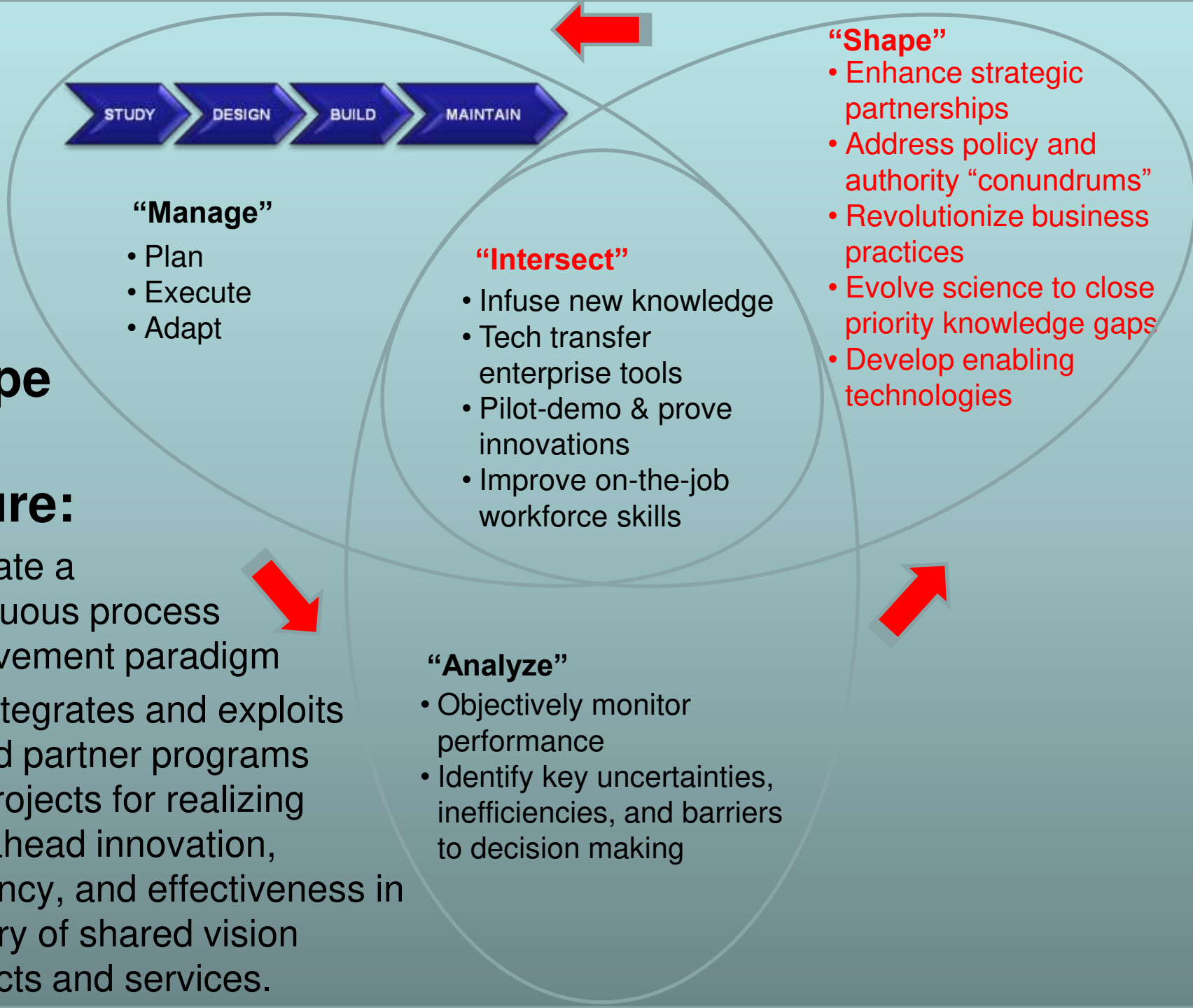


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# Shape the Future:

Cultivate a continuous process improvement paradigm that integrates and exploits related partner programs and projects for realizing leap-ahead innovation, efficiency, and effectiveness in delivery of shared vision products and services.





# Shape the Future: Enhancing Strategic Partnerships

- Texas coast shared visioning for alignment of agency values toward mutually desired outcomes
  - ▶ Healthy, diverse, and functional ecosystems
  - ▶ Resilient and sustainable communities
  - ▶ Vibrant regional and national economy
- Driving progress through regularly-engaged organizational leadership framework
  - ▶ Multi-agency participation (Local, State, Federal)
  - ▶ Shared vision steering
  - ▶ Identifying / resolving barriers to progress
- Team building, collaboration, and unified communications
  - ▶ Articulating challenges and successes
  - ▶ Building stakeholder awareness and support for action
  - ▶ Supporting elected officials with information they need



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# Shape the Future

- Identify and address policy/authority “conundrums”
  - ▶ Streamline the planning model certification process for congruency with SMART Planning constraints
  - ▶ Streamline review times and read-ahead provisions
  - ▶ Increase understanding and focus of DQC vs. ATR according to respectively intended purposes
- Revolutionize business processes
  - ▶ Times have changed: Ask interested and affected communities/businesses to contribute more than before so we can effectively support them via USACE missions under SMART Planning constraints
  - ▶ Partner with ERDC under their unique authorities for conducting technical studies in cooperation with non-Federal interests to explicitly inform the 3x3x3 study process beyond its limitations







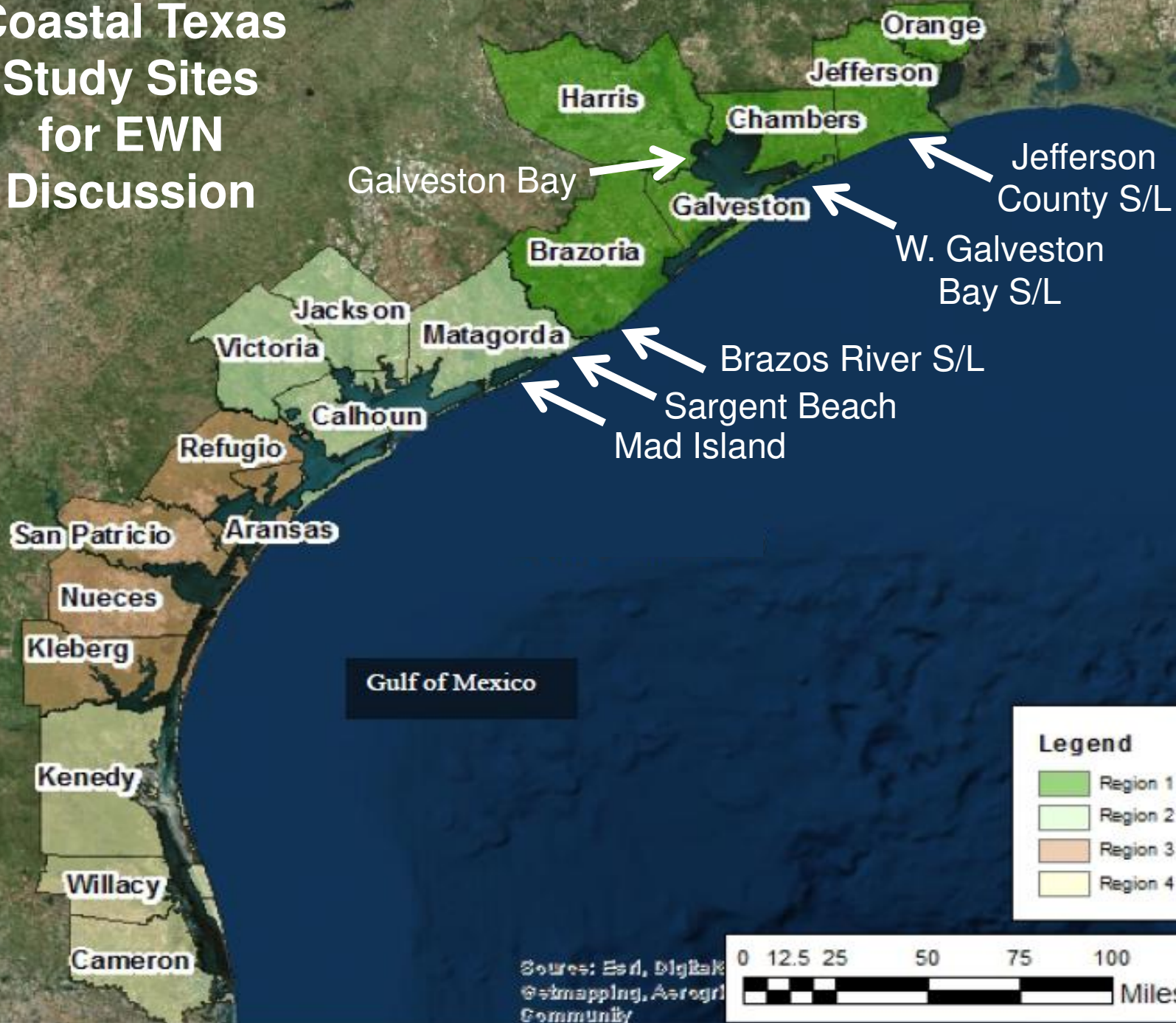
# Shape the Future

- Evolve science to close priority knowledge gaps
  - ▶ Engineering with Nature
  - ▶ Regional Sediment Management
  - ▶ Conservation Planning
- Develop enabling technologies
  - ▶ Integrate/apply enterprise tools for leap-ahead decision support capabilities
  - ▶ Pilot demo field testing/refining of innovative solutions to redefine traditional technical practices for increased efficiency and effectiveness



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# Coastal Texas Study Sites for EWN Discussion





# GIWW Erosion

## Problems

- Erosion causes increased shoaling in the channel
- Erosion affects fresh water marshes in some areas
- Location of erosion control can be an issue
- Rock breakwaters are not compatible with barge navigation
- No opportunity for ingress/egress of aquatic organisms

## Potential Solutions

- Needs to be low cost
- Effective
- Stays in place
- Can be seen
- Maximizes ecosystem benefits

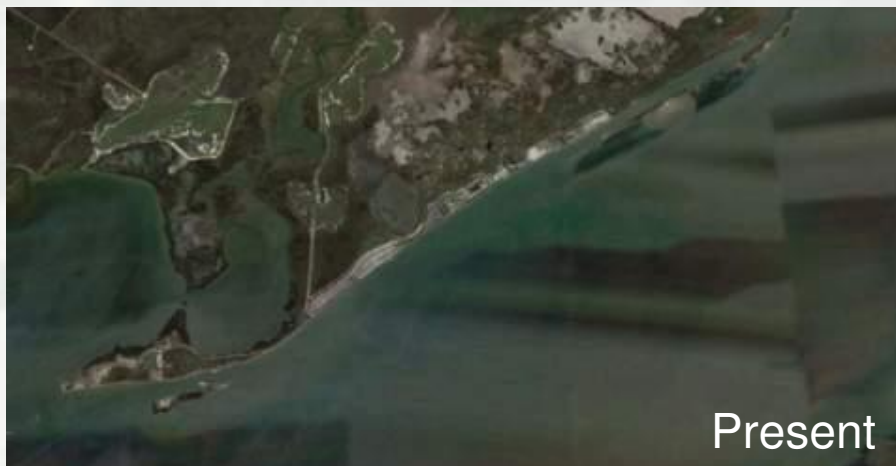
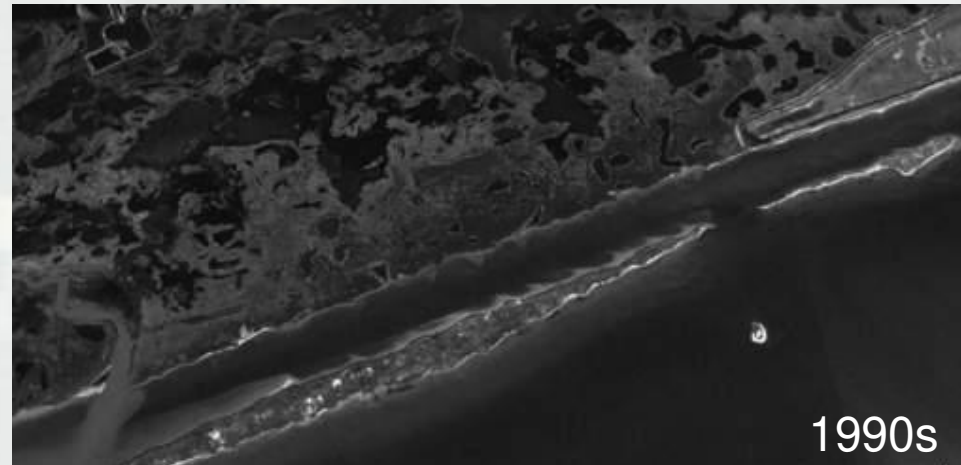
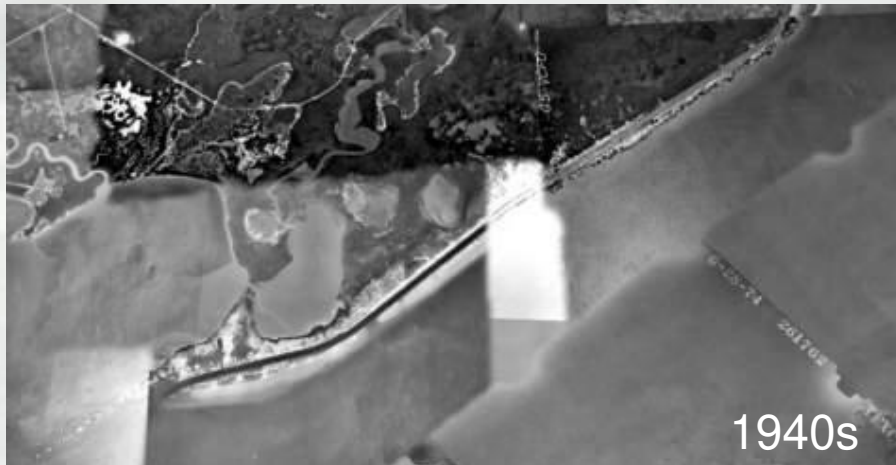


**Shoreline Protection –  
GIWW in Jefferson Co (courtesy TNC)**





# GIWW Erosion



**GIWW Islands – West  
Galveston Bay**



**GIWW – Matagorda  
Bay at Mad Island**



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# Sargent Beach

## Problems

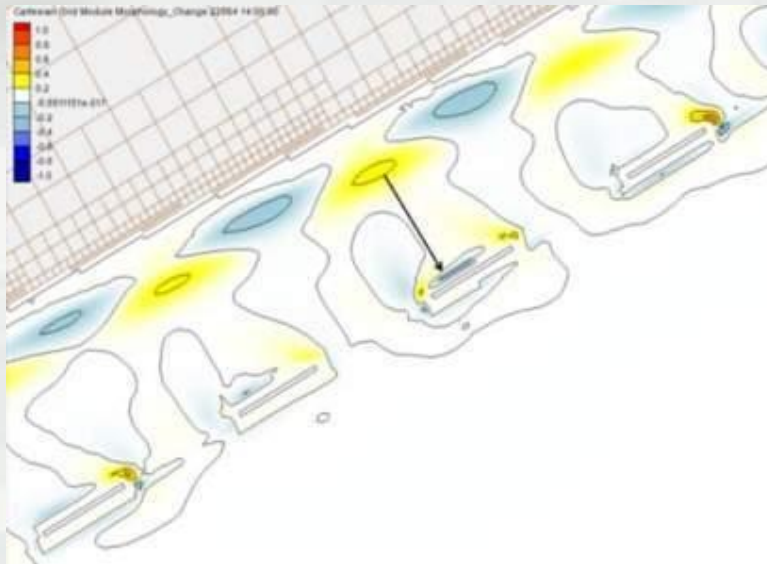
- Existing 8-mile long revetment was built along shoreline to protect the GIWW from land breaching
- Revetment is in imminent danger of being exposed to continuous wave action
- Beach sediments include silts and clays



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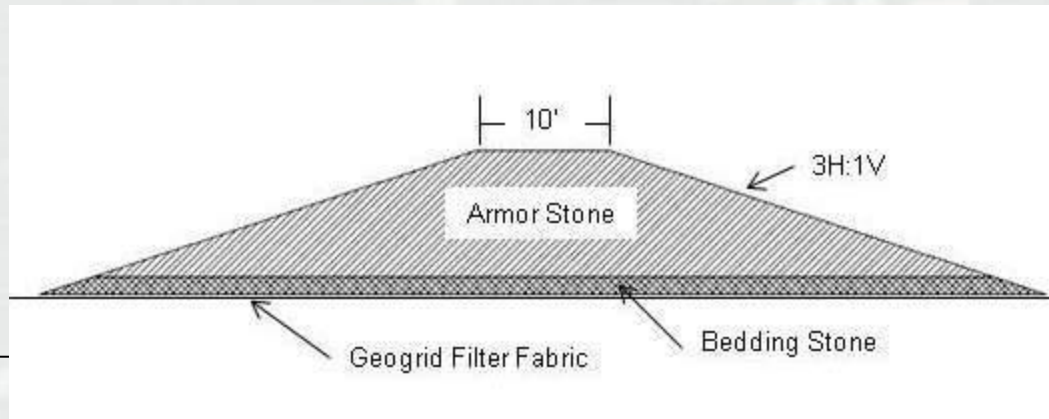
# Sargent Beach



## Potential Solutions

- Studied under PAS Authority
- Recommendation:
  - ▶ Construction of segmented shore parallel breakwaters
  - ▶ Build smaller demonstration projects, then monitoring performance and revising structure design
  - ▶ Limited beach fill

Is there more environmentally friendly way to design this structure?



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# Brazos River Gulf Shoreline Erosion



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# Brazos River Gulf Shoreline Erosion

## Problems

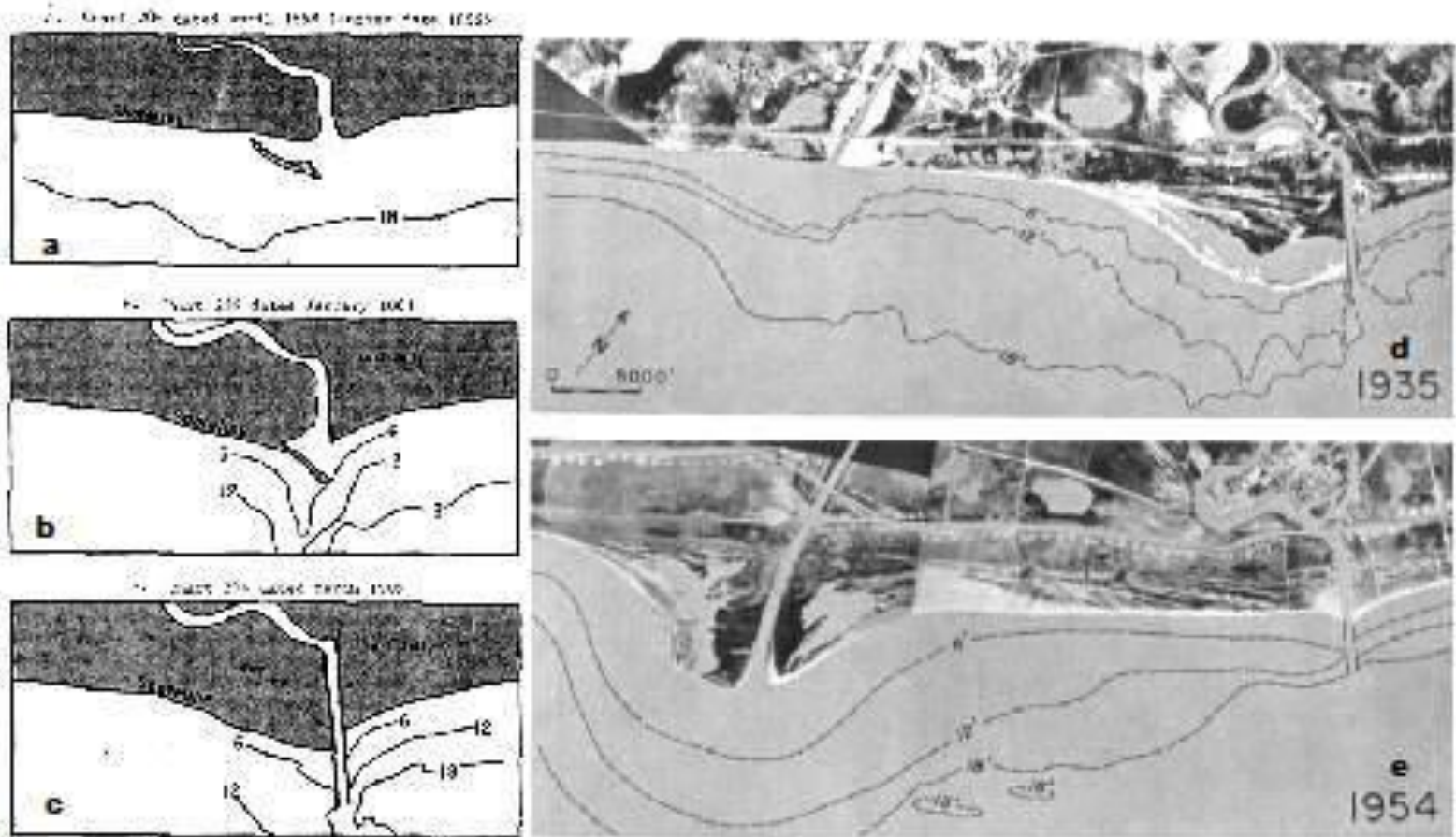
- Gulf shoreline erosion at Surfside 4 ft/yr (historical) and 11 ft/yr (recent)
- Diversion of Brazos River redirected sediment 6 miles down the coast
- Collapse of relict Brazos River delta allows higher wave energy to attack the shoreline
- Longshore sediments (averaging 20% sand) are captured by Freeport Harbor entrance channel, and removed from longshore system by disposal in Ocean Dredged Material Disposal Site
- Real estate values of Surfside Village residences not high enough to support traditional beach nourishment project and



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# Brazos River Gulf Shoreline Erosion



**Figure 2. Historical morphology of the Freeport Entrance and Brazos River from Seeling and Sorensen (1973) and Watson (2003). (a) through (c) show the formation of the rapid pro-gradation of Brazos Delta from 1852 to 1909, and (d) and (e) shows the rapid degradation of the original delta and simultaneous pro-gradation of the delta at the relocated Brazos River mouth.**



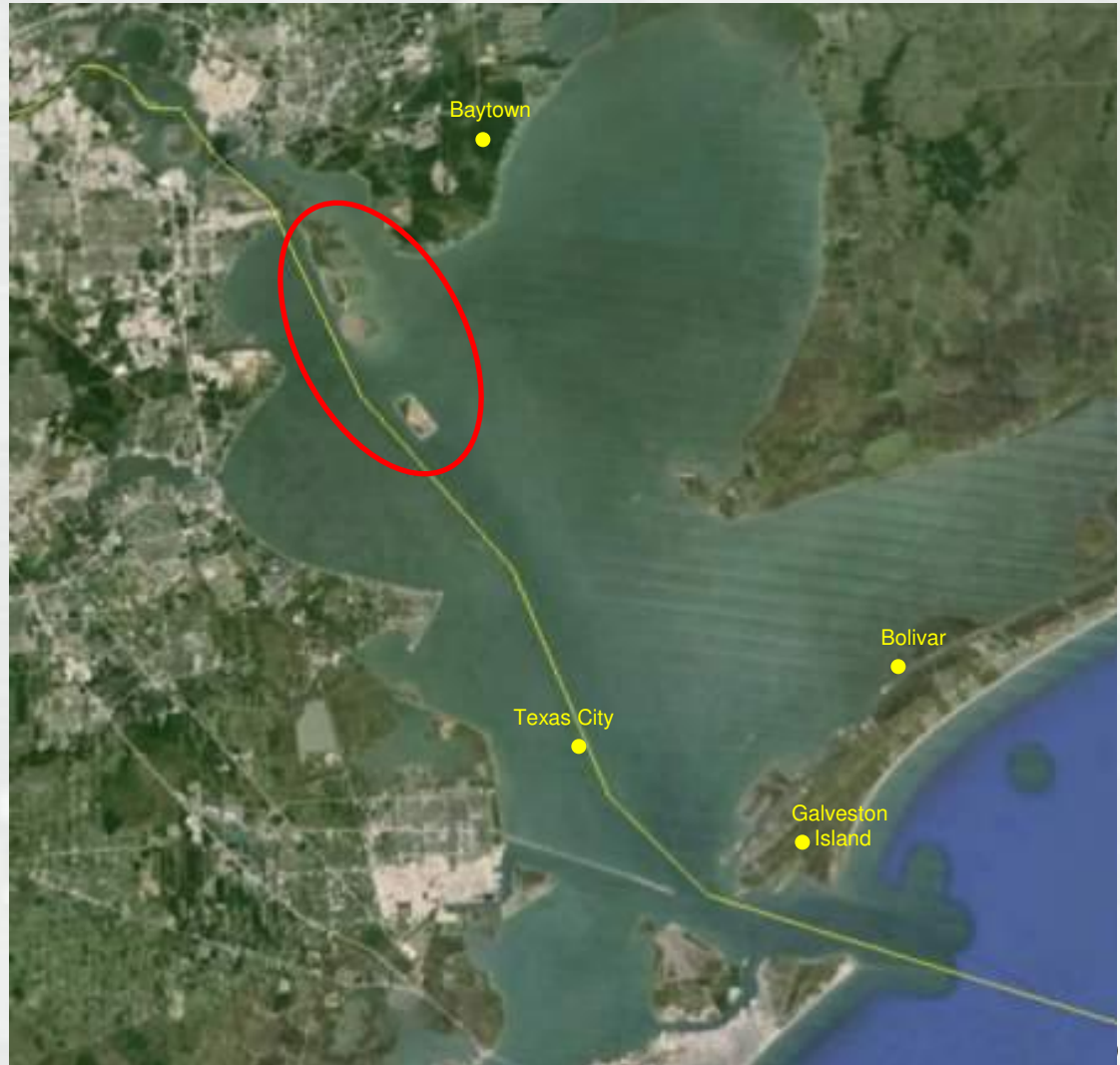




# Houston Ship Channel

## Problems

- Limited placement area capacity for existing projects
- Future expansion would require additional placement capacity solutions
- Limited opportunity for expansion of disposal facilities in the Bay





# Houston Ship Channel



## Potential Solutions

- Engineer confined disposal facilities (CDFs) in a cost-effective environmentally acceptable and/or beneficial manner
- Engineer beneficial use (BU) sites so that they maximize capacity and environmental benefits in a more cost-effective manner
  - ▶ Wetland creation
  - ▶ Open water thin layer placement



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# Houston Ship Channel

## Engineering Considerations for Future CDFs and BU sites:

- Poor bay bottom foundations (most of the middle and lower bay bottom is soft)
- Deep bay waters (10-12 feet)
- High fetch and wave energy
- Effects of ship wake
- Oyster impacts
- Minimal impacts to bay circulation and salinity
- Influences on sedimentation in the channel
- Potential benefits to CSDRM







# SWG-EWN Implementation Challenges and Opportunities

- How can we strategically employ EWN principles to:
  - ▶ Restore/sustain critical coastal land features that reduce adverse impacts of wave energy and/or sedimentation on navigation and CSDRM features?
  - ▶ Conserve sensitive coastal wetlands from breakthrough/exposure with increased coastal hydrodynamics and associated elevated salinity regimes with storms/RSLR?
  - ▶ Create/sustain multiple lines of coastal defense in the vicinity of low-lying coastal communities/infrastructure?





# SWG-EWN Implementation Challenges and Opportunities

- How can we effectively/efficiently/productively reuse new work and maintenance dredging materials from navigation channels to build:
  - ▶ General Navigation features?
  - ▶ Flood Risk / Water Management features?
  - ▶ Ecosystem Restoration features?
- What EWN synergies/innovations could provide for reduced maintenance requirements for constructed features?



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# SWG-EWN Implementation Challenges and Opportunities

- What are the required environmental river flows for ensuring ecological health of coastal bays/estuaries in context of existing/future potential upstream uses?
- With regard to aging coastal structure recapitalization (e.g., Brazos River Flood Gates), how can we use EWN principles to achieve current/projected navigation and FRM requirements at systems-scale to sustain ecosystem restoration and management needs on the coast (e.g., integrity of Brazos and San Bernard River deltas)?



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# SWG-EWN Implementation Challenges and Opportunities

- How will potential EWN actions incorporated into projects, coordinated on a regional scale from a portfolio perspective, become an enabler to:
  - ▶ Conserve natural resources?
  - ▶ Avoid/minimize environmental mitigation requirements?
  - ▶ Reduce lifecycle project costs?
  - ▶ Minimize construction timeframes?
  - ▶ Enhance overall quality/quantity/distribution of project outputs?



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# Additional SWG Program Information



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# Sabine Pass to Galveston Bay

- FY 15 Work Plan: Initiate Brazoria and Jefferson Counties ER 3x3x3 Interim General Investigation (GI) Feasibility Studies (FSs)
- FY 15-16 Budget: Complete Brazoria and Sabine Regions Coastal Storm Damage Risk Management (CSDRM) GI Chief's Report
- FY 16-17 Budget: Complete Brazoria and Jefferson Counties Ecosystem Restoration (ER) 3x3x3 GI Interim FSs



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# Sabine-Neches Waterway

- FY 15 Work Plan: Update economics, update Sec 902 analysis, amend Design Agreement (DA), advance Pre-Construction, Engineering, and Design (PED), and create MOA on NF risk of non-reimbursement
- FY 15/16/17: Cultivate and advance Public-Private Partnership (P3) Pilot Project via IWR Program funds



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# Freeport Channel Improvement

- FY 14: Complete White Paper with view towards Limited Reevaluation Report (LRR) approval
- FY 15 Work Plan: Sign approved DA, initiate LRR, and begin PED
- FY 16-17 Budget: Complete LRR, PED, and first set of P&S



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# Corpus Christi Channel Improvement

- FY 15/16/17 Budget: Amend/execute Project Partnership Agreement (PPA), evaluate for LRR (barge lane & main channel widening), and advance PED
- FY 16/17/18 Budget: LaQuinta Channel FS (52 ft depth)



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# Brazos Island Harbor

- FY 16 Work Plan: Develop/execute DA, Advance PED, first set of P&S



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# Brownsville Resacas

- Boulevard Resaca
  - ▶ FY 15 Work Plan: Continuing Authorities Program (CAP) ER Study (based on FY 14 executed Feasibility Cost Share Agreement, FCSA)
- Resacas System
  - ▶ FY 16-17 Budget: Remaining Features ER FS (Continuation)



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# Houston Bayou Network

- White Oak Bayou (Sec 211f Reimbursement)
  - ▶ FY 15/16/17 Budget: PPA cost reimbursement, audits for completed work and Lands, Easements, Relocations, Rights-of-Way, and Disposal (LERRDs) evaluation
- Hunting Bayou (Sec 211f Reimbursement)
  - ▶ FY 15/16/17 Budget: PPA cost reimbursement, audits for completed work and LERRDs evaluation
- Sims Bayou FRM & Recreation (Const General (CG) Cost Share Balance)
  - ▶ FY 15: Complete Hike & Bike Trail construction
  - ▶ FY 16-17: FRM and Recreation project fiscal closeout
- Brays Bayou (Sec 211f Reimbursement)
  - ▶ FY 15 Budget & Work Plan: Cost reimbursement, completion of discrete segment construction
  - ▶ FY 15 Work Plan: Will request additional catch up reimbursement funds for completed work
- Addicks & Barker Dam Safety Mega Project
  - ▶ FY 15/16/17 Budget: Perform outlet structure permanent rehabilitation





# Interagency and International Support (Reimbursables)

- International Boundary Water Commission
  - ▶ FY 15: Rio Grande River Levee Failure Analyses and Rehabilitation Recommendations
  - ▶ FY 16-17: Rio Grande River Systems Performance Evaluation
- Customs and Border Protection
  - ▶ FY 15: Command and Control Projects, 35% design, Falfurrias Check Point
  - ▶ FY 15/16: Freer Border Patrol Station (potential)
- Immigration and Customs Enforcement
  - ▶ Border Fence (potential)
- Maritime Administration
  - ▶ Sabine-Neches Waterway MARAD Ship Fleeting Area Improvements
- Lower Neches, Trinity, Brazos, and Colorado Rivers PAS
  - ▶ FY 15 Work Plan: Watershed performance assessments

