SUSTAINABLE SEDIMENT MANAGEMENT AND DREDGING SEMINAR

28-30 NOVEMBER 2018

GALVESTON, TX

Overview: Sediment Beneficial Use

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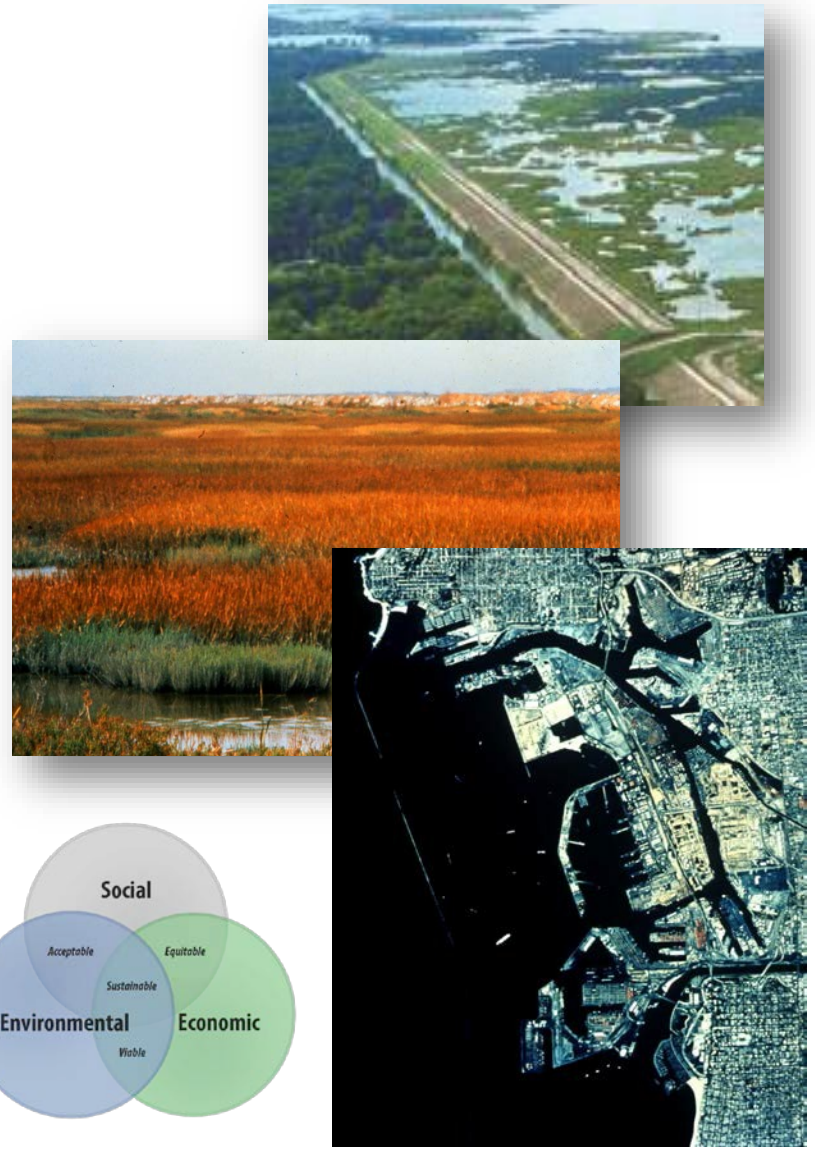
US Army Corps of Engineers

ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

A Systems View

- We build and manage systems to achieve specific objectives
  - Navigation system:
    - Locks, dams, channels
  - Flood risk reduction system:
    - Structural, nonstructural, ecosystem features
  - Ecosystems supporting values and services
- Balancing objectives and optimizing
  - Law, regulation, dialogue and deliberation



U.S. Environmental Laws and Regulations

- National Environmental Policy Act of 1969
- Federal Water Pollution Control Act of 1972 (amended and renamed the Clean Water Act in 1977)
- Marine Protection, Research, and Sanctuaries Act of 1972 (commonly called the Ocean Dumping Act)
- Coastal Zone Management Act of 1972
- Marine Mammal Protection Act of 1972, amended 1994
- Endangered Species Act of 1973
- Resource Conservation and Recovery Act of 1976
- Magnuson-Stevens Act as reauthorized by the Sustainable Fisheries Act of 1996
- Etc.

The USACE Navigation Mission:

To provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation

Observations

- **The Corps' navigation mission involves multiple objectives**
- **Managing the risks relevant to these objectives requires making tradeoffs**

What Risks are We Concerned About?

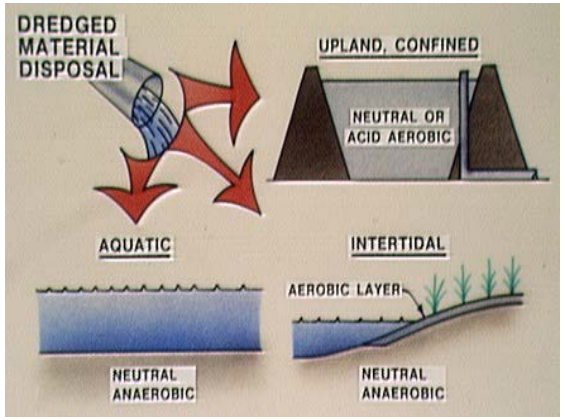
- Economic losses associated with reduced performance of a channel
- Environmental impacts associated with dredging
- Environmental impacts associated with DM placement, disposal, or beneficial use
- Navigation accidents
- Unnecessary costs for the dredging program
- Environmental impacts associated with contaminated sediments when dredging must be deferred

US Authorities

- Rivers and Harbors Act of 1899, and all subsequent WRDA's
- Clean Water Act
  - Section 404
- Marine Protection, Research, and Sanctuaries Act
  - Section 103

International Authorities

- London Convention and Protocol
  - Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- OSPAR Convention
  - Convention for the Protection of the Marine Environment of the North-East Atlantic
- HELCOM
  - Baltic Marine Environment Protection Commission
- Barcelona Convention
  - Convention for the Protection of the Mediterranean Sea Against Pollution



Risk Analysis

Risk-Informed Decision Making

- ***Risk Assessment***: an approach to developing an understanding of the processes shaping the scope and nature of risks and uncertainties that is sufficient to support decision making
  - What is the risk?
  - Why and how are the risks occurring?
  - What is the uncertainty associated with the risk estimate?

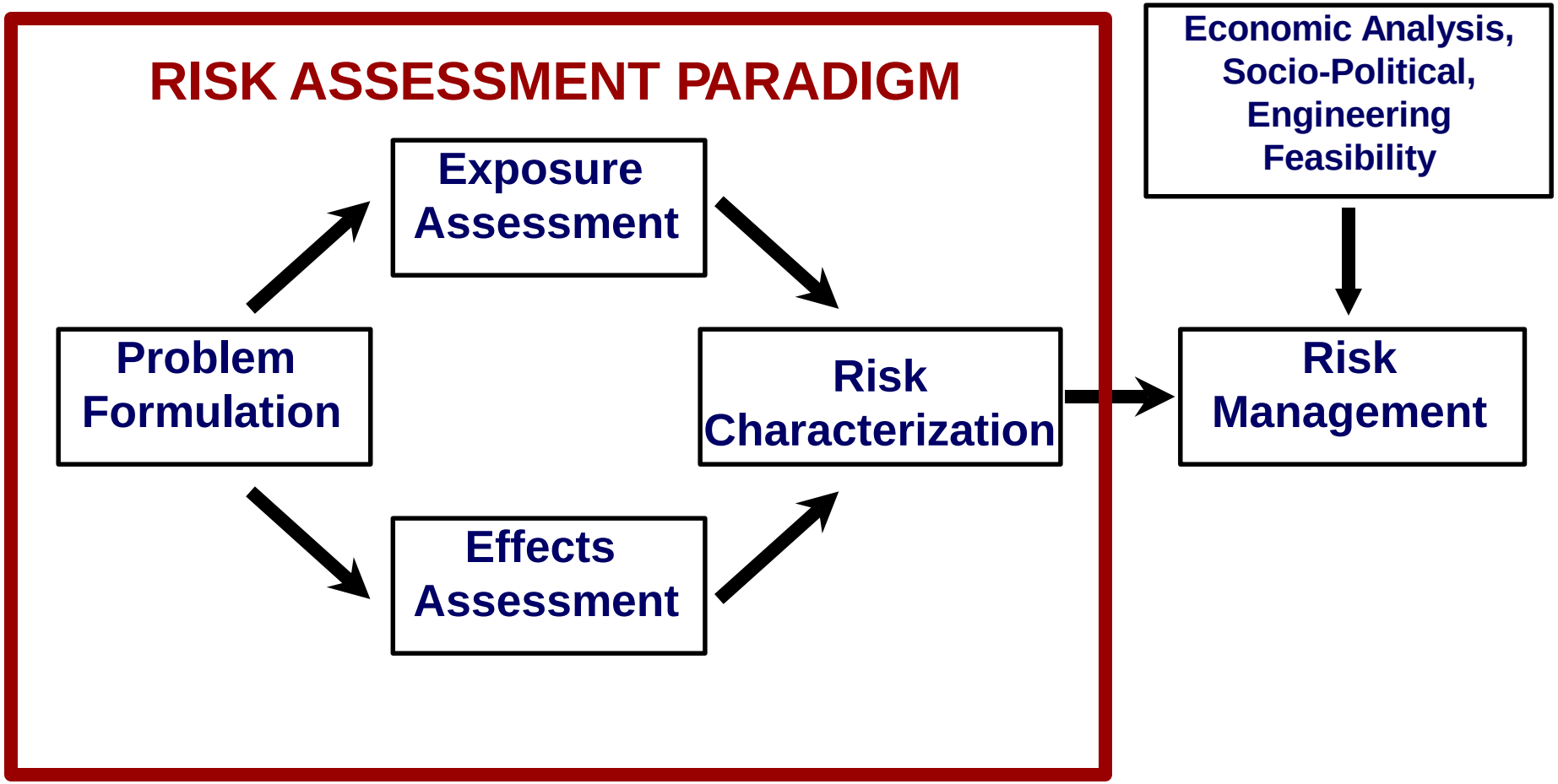
Risk-Informed Decision Making

- ***Risk Management***: a process to evaluate, select, implement, monitor and modify actions to alter levels of risk
  - What are my decision alternatives?
  - How will I evaluate the performance of those decision alternatives?
  - How do the decision alternatives differ in terms of risks?
  - What are the tradeoffs in terms of costs, benefits, and risks among the alternatives?

Risk-Informed Decision Making

- ***Risk Communication***: **exchange of information about risks that supports deliberation and decision-making**
  - **Why are we communicating?**
  - **With whom are we communicating?**
  - **How will we communicate?**
  - **What are we communicating?**

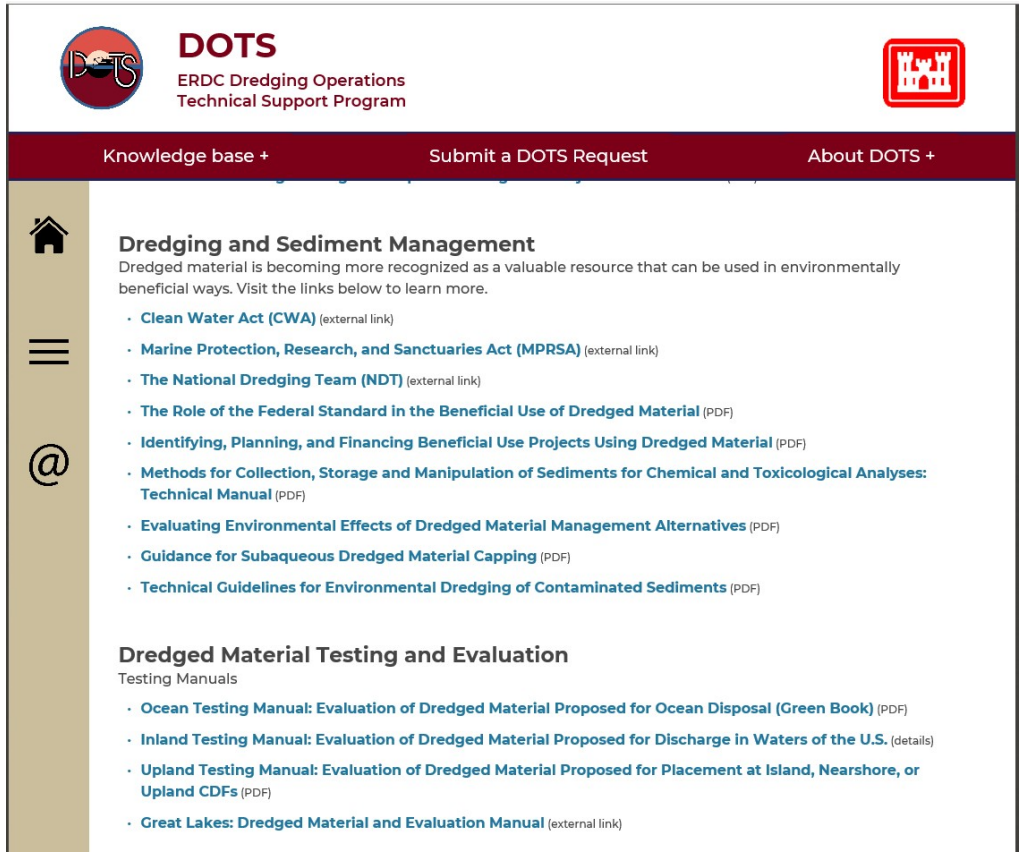
Risk Analysis Overview



Guidance Documents for Assessment and Management of Dredged Material

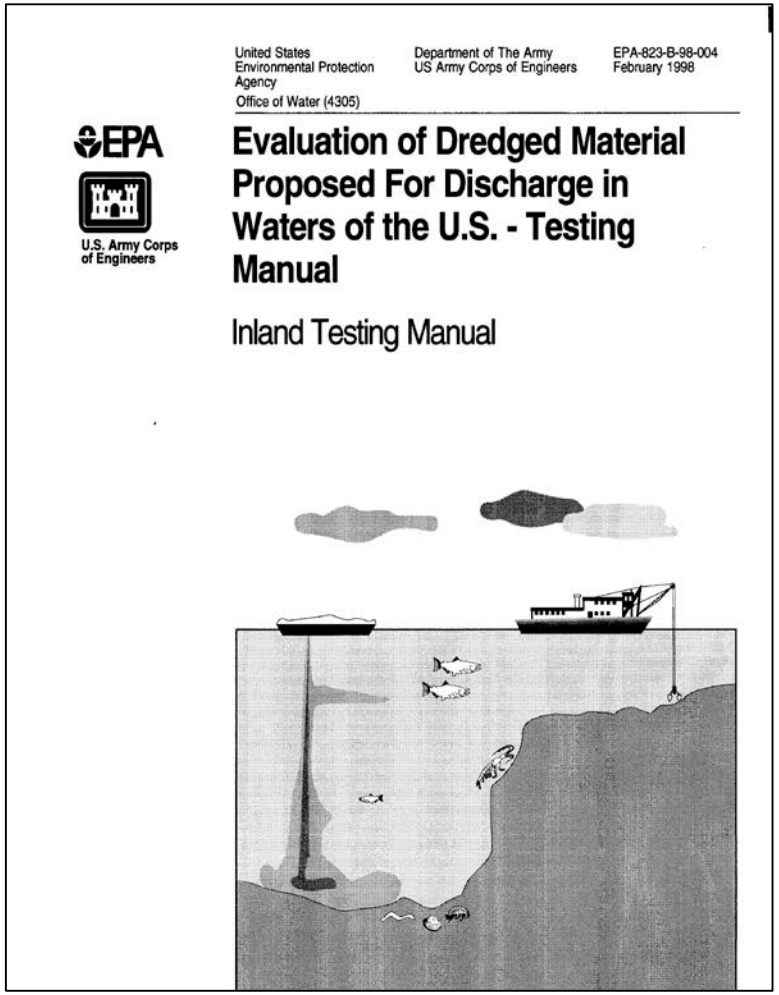
National Technical Guidance

- Technical Framework
- Inland Testing Manual
- Ocean Testing Manual
- Upland Testing Manual
- Beneficial Use Manual



Found at:
https://dots.el.erdc.dren.mil/guidance.html

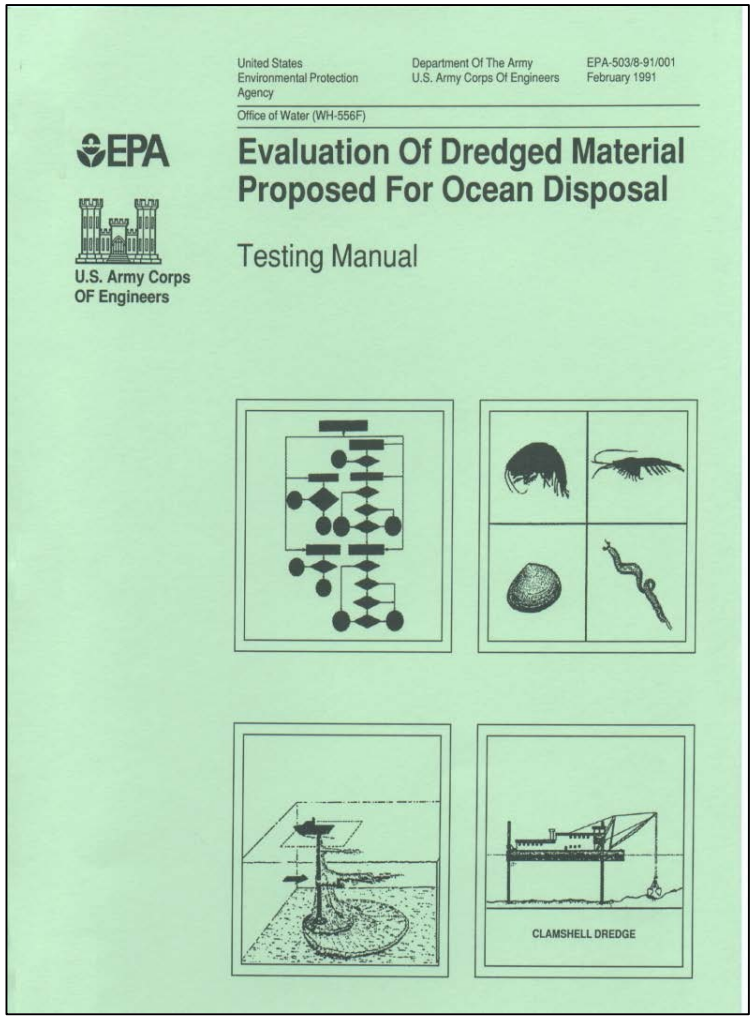
Inland Testing Manual



- Addresses Clean Water Act
- Interim guidance in 1976, updated in 1998
- Included:
  - Effects-based testing
  - Sequenced > Tiered

DM placement *"will not cause "an unacceptable adverse impact"*

Ocean Testing Manual



- Addresses MPRSA
- Originally developed in 1977, updated in 1991
- Included:
  - Effects-based testing
  - Bioaccumulation
  - Sequenced >Tiered

DM placement in ocean will not *"unreasonably degrade or endanger: human health, welfare, or amenities, marine environment, ecological systems, or economic potentialities"*

Upland Testing Manual

- **Addresses evaluation of DM for upland placement**
- **Published in 2003**
- **Included:**
  - **Tiered approach to assess contaminant releases**
  - **Focused on contaminant pathways and use of a conceptual model**
  - **Goal is to determine need/extent of contaminant controls**

USACE GALVESTON DISTRICT BENEFICIAL USE AND IMPLEMENTATION OF REGIONAL SEDIMENT MANAGEMENT

131	239	110	112	62	102	130
132	65	135	92	102	56	120
122	53	120	56	130	48	111

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US Army Corps of Engineers

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Texas Ports Coastal Navigation Value to the Nation

LEADING U.S. PORTS
(2016 Tonnage)

Houston #2 – 248.0 million tons
#1 Foreign Tonnage & #2 Total Tonnage

Beaumont #5 – 84.5 m.tons
#1 Military Port in World

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

Corpus Christi #6 – 82.0 m.tons
America's Energy Gateway

Texas City #15 – 41.3 m.tons
Services Largest Petrochemical Complex

Port Arthur #20 – 35.2 m.tons
Vital Break-Bulk Port

Freeport #33 – 19.6 m.tons
Connecting Global Services
Via Caribbean Relay Port

Galveston #52 – 9.9 m.tons
#4 Cruise Ship Port

Brownsville #66 – 7.3 m.tons
#1 Ship Recycling Port

Victoria #74 – 5.1 m.tons
#2 Shallow-Draft Port for Domestic
Crude Petroleum

Calhoun County Port #76 - 4.9 m.tons
(Matagorda Ship Channel)

Texas is the number two state in the nation for waterborne commerce. Texas ports generate over $5 billion in local and state tax revenue, and over $9 billion in federal import tax revenue each year

Sabine-Neches Waterway
40' / 48'

46' / 46'
Houston-Galveston Texas City Navigation Complex

46' / 56'
Freeport Harbor

38' / 45'
Matagorda Ship Channel

47' / 54'
Corpus Christi Ship Channel

42' / 52'
Brazos Island Harbor

KEY

Constructed Depth	Constructed Depth	Constructed Depth
Pending Authorization	Authorized Construction; Not Funded	Construction Ongoing

07 November 2018

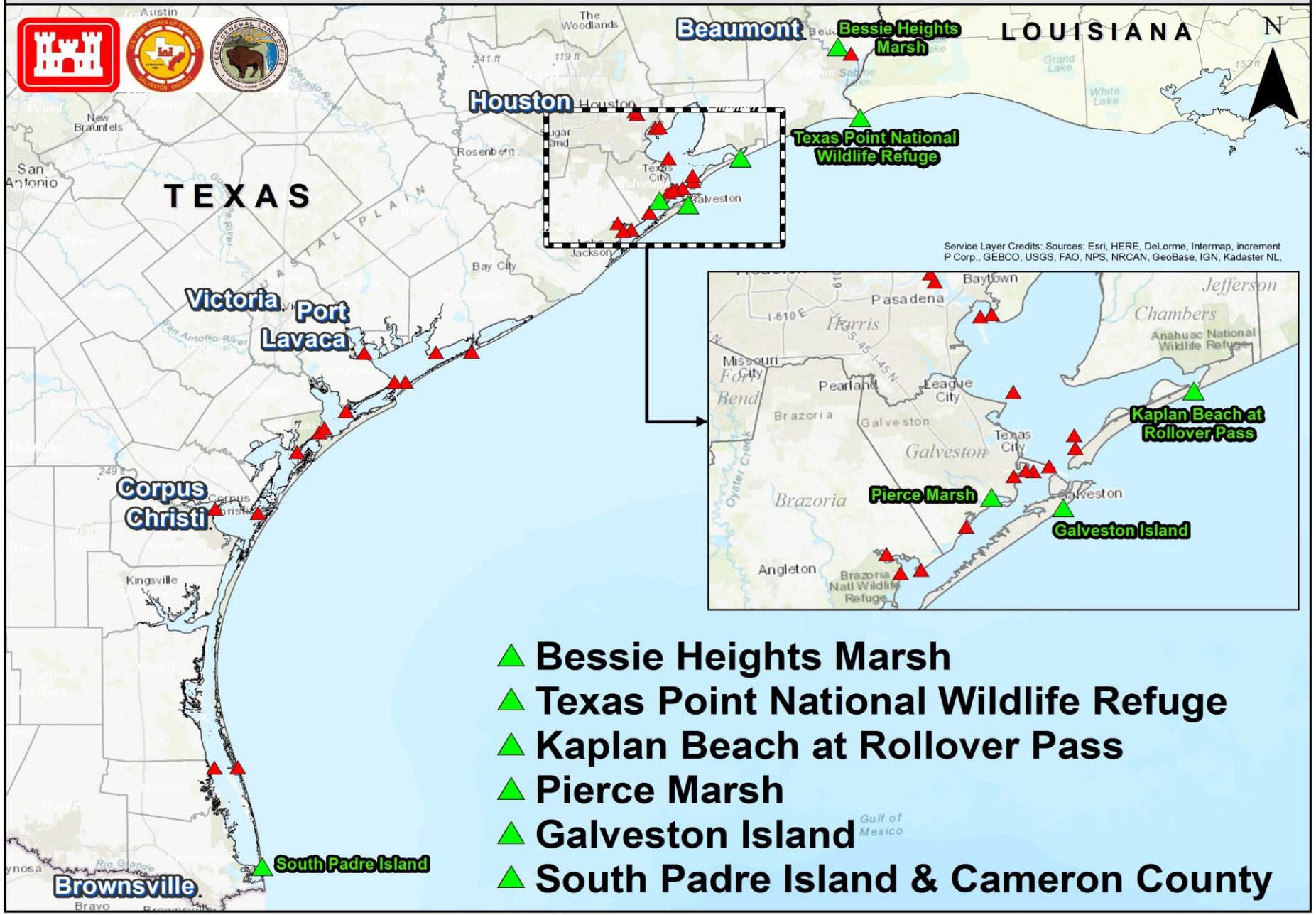
GALVESTON DISTRICT – NAVIGATION FACTS

- Monitor and maintain over 1,000 miles of navigation channels and waterways
- Dredge 20-30 million cubic yards per year
- 10 Major Texas maritime Ports
- Gulf Intracoastal Waterway connects Ports
- 3 Strategic Ports
- Texas Ports and Waterways moved >600M tons of Commercial Cargo during 2017

US Army Corps of Engineers.

U.S.ARMY

Beneficial Use of Dredged Material (BUDM), a Corps GLO Partnership Success



- Bessie Heights Marsh
- Texas Point National Wildlife Refuge
- Kaplan Beach at Rollover Pass
- Pierce Marsh
- Galveston Island
- South Padre Island & Cameron County

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