

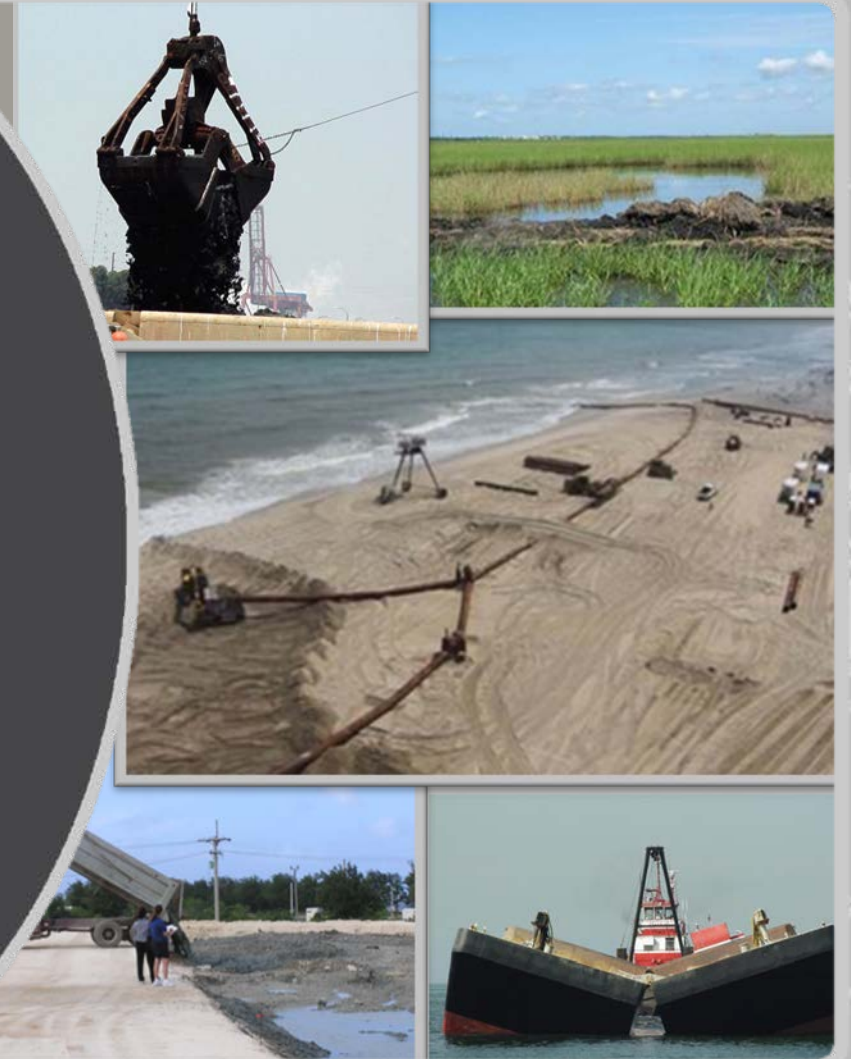


U.S. ARMY

# SUSTAINABLE SEDIMENT MANAGEMENT AND DREDGING SEMINAR

6-8 MARCH 2019  
SAUSILITO, CA

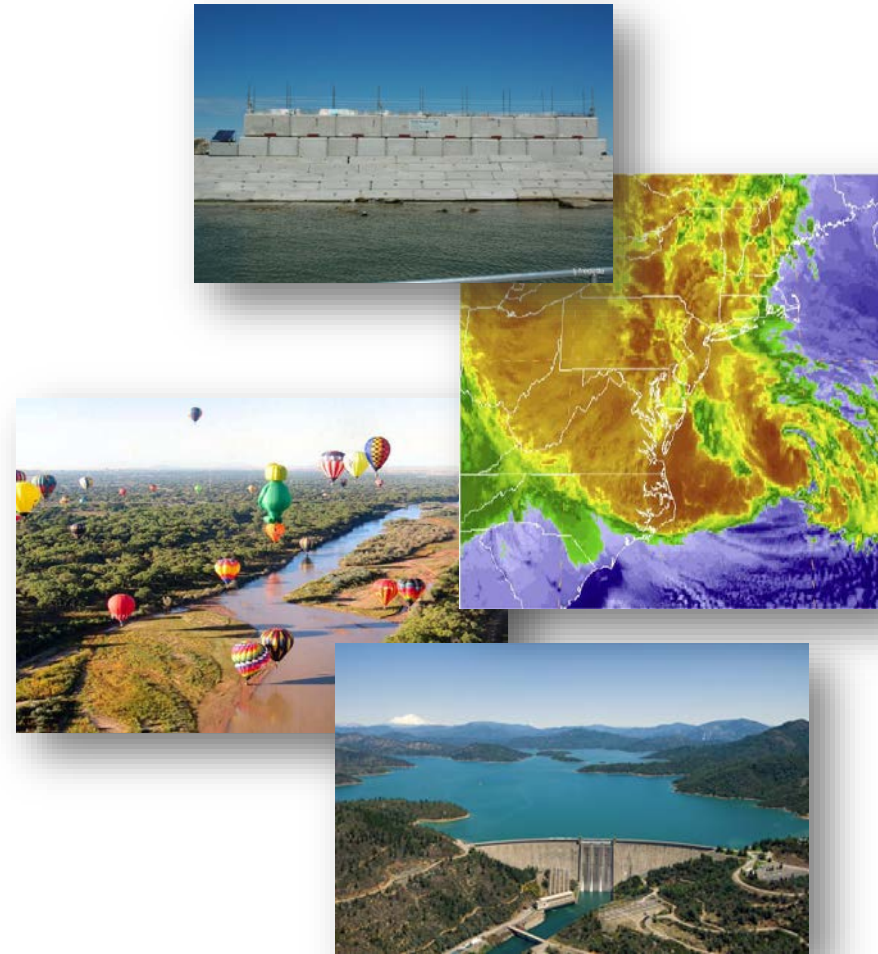
Beneficial Use of Dredged Material: Successes and Challenges  
Burton Suedel



US Army Corps  
of Engineers®

# Beneficial Use Across USACE Mission Space

- **Navigation**
  - Strategic placement of dredged material supporting habitat development
  - Habitat integrated into structures
  - Enhanced Natural Recovery
- **Flood Risk Management**
  - Natural and Nature-Based Features to support coastal resilience
  - Levee setbacks
- **Ecosystem Restoration**
  - Ecosystem services supporting engineering function
  - “Natural” development of designed features
- **Water Operations**
  - Shoreline stabilization using native plants
  - Environmental flows and connectivity





# Challenges

- Perceptions without scientific basis
- Lack of clear regulatory guidance
- Uncertainty dealing with contaminants
- Fear of product liability
- Emerging contaminants, e.g., microplastics, HABs, PFAS
- CDF capacity issues nationwide
- Re-use of dredged material in existing CDFs

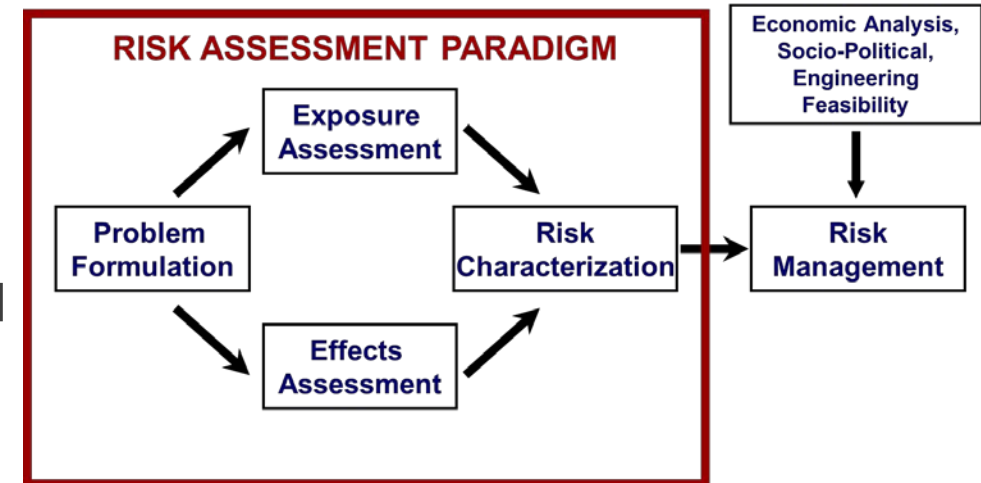


# What Risks are We Concerned About?

- **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**

# Principles for Beneficial Use Dredged Material Evaluations

- Consistent with USEPA risk assessment framework
- Recommends developing project goals for BU of dredged material
  - USEPA framing the risk assessment with management goals
- Uses conceptual site models to establish potentially complete exposure pathways
  - Generalized CSMs developed for aquatic, upland, and wetland placement scenarios
- Recommends the initial evaluation be documented and reported
- Suggests chemical, physical, and biological testing
  - Specific sampling and analysis requirements are not stipulated
- Recommends use of reference and control materials in the testing procedures



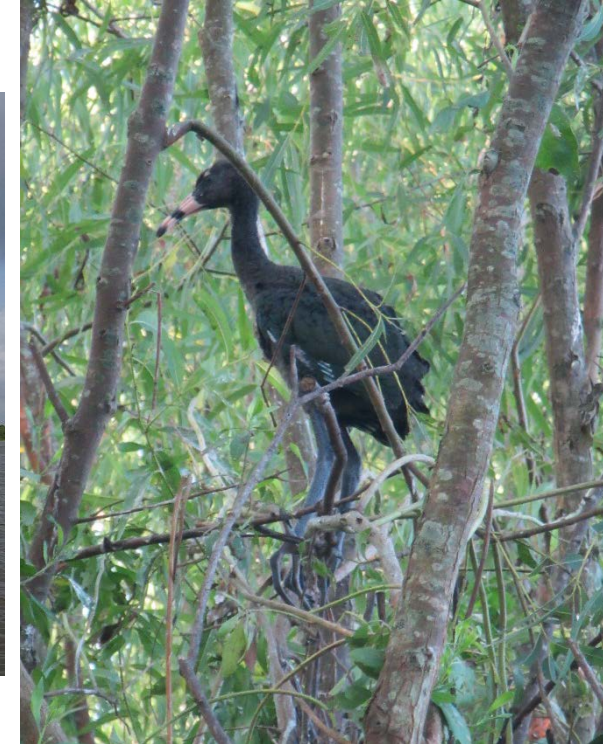


# Beneficial Uses: Two Opportunities

- **Beneficial use as part of the dredging and placement process**
  - Regional Sediment Management
  - Engineering With Nature® and natural and nature based features
- **Beneficial use as part of CDF operations and management process**
  - Mining CDFs to maintain capacity



# Beneficial Uses of Dredged Material and Engineering With Nature



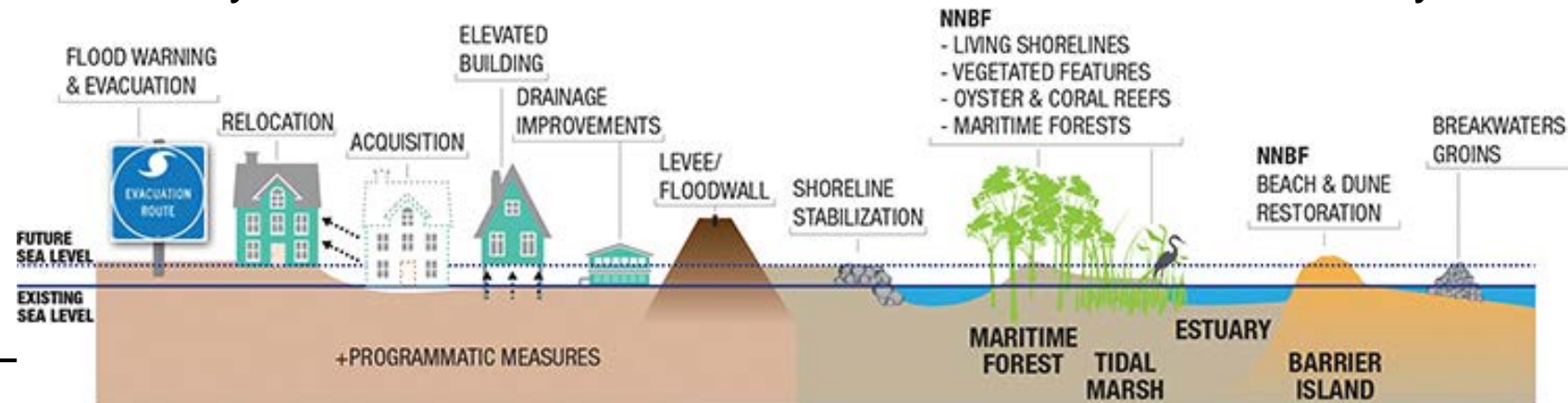


# BU Opportunities to Engineer With Nature



## Opportunities

- Integrate Natural and Nature-Based Features (NNBF) with structural and non-structural measures to provide multiple lines of defense against storms and sea level rise
- Generate full array of relevant economic, environmental and social ecosystem services





# Beneficial Uses Path Forward

- Many opportunities
- Focus energy to motivate and facilitate innovation in both technical and business processes
- Accelerate progress through co-development of solutions
- Important to elevate communication about advancing practice to enhance project value




# Beneficial Use Case Studies

# Beneficial Use Case Study #1 (NWW)

- Walla Walla Programmatic Sediment Evaluation results require a beneficial use of dredged material



# **“SURGICAL” DREDGING**

An underwater photograph showing a diver in a black wetsuit and yellow fins operating a large, black hydraulic dredger. The dredger is positioned on a sandy seabed, and its long, articulated arm extends towards the left. The water is a deep blue-green color, and the seabed is covered in fine sand and some small rocks.

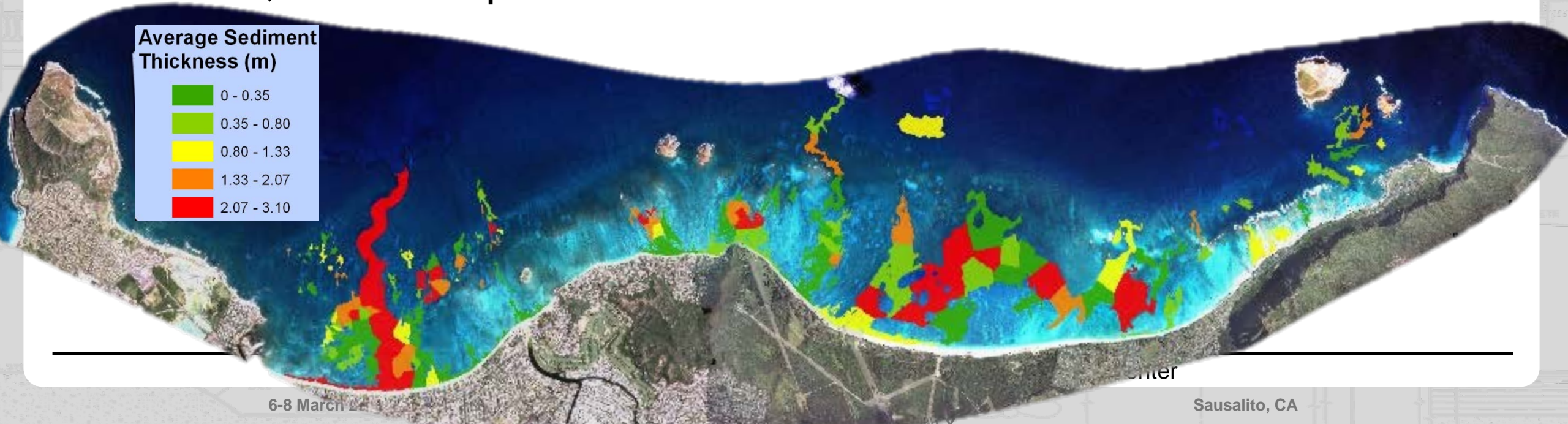
**Honolulu District  
Thomas D. Smith, P.E.**

**Jacksonville District  
Andrew J. Condon**

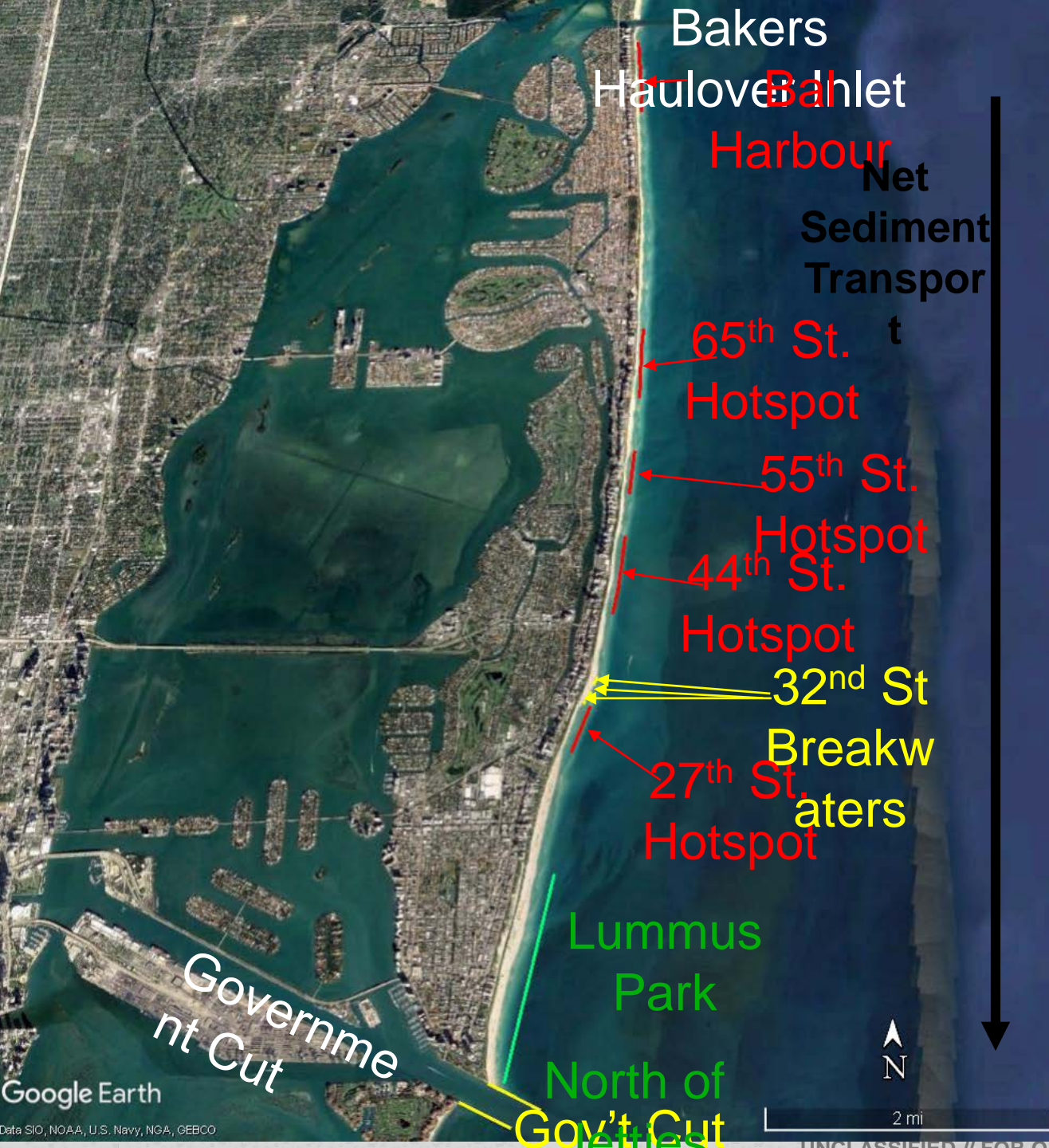
# HONOLULU DISTRICT

## RSM Offshore Sand Investigations

- Reeftop sand bodies are small and irregularly shaped.
- Not well suited for hopper dredges.
- Clam shell dredges are slow and expensive.
- Diver directed dredging was successful for small volume in West Maui, but susceptible to wave and current extremes.







# JACKSONVILLE DISTRICT

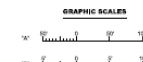
## Miami-Dade Shore Protection Project

- 9.5 mile segment featuring five erosion hotspots that require frequent renourishment
- Nearby offshore sand sources have been exhausted
- Typically contract small hotspot truck haul contracts utilizing upland mines
- Bakers Haulover Inlet complex provides required nourishment quantities for Bal Harbour

Research and Development Center

Sausalito, CA





- US Army Corps of Engineers • Engineer Research and Development Center



# Alternatives

- Truck hauls are expensive and do not appear to be economically viable in the long term
- Closest offshore sand sources are 100 miles away
- Are there more efficient backpassing methods (in terms of cost and disruption)?
- Along south jetty sand has accumulated in a thin veneer over hardbottom – Are there efficient extraction methods?
- Any permanent backpassing options given the heavily urban environment / limited and expensive real estate?



# Discussion Points

- **What are the key opportunities with respect to beneficial use of dredged material in the West Region?**
- **What are the main obstacles to realizing those opportunities?**
- **What are ways in which we can overcome those obstacles?**
- **How might the West Region achieve 100% beneficial use?**