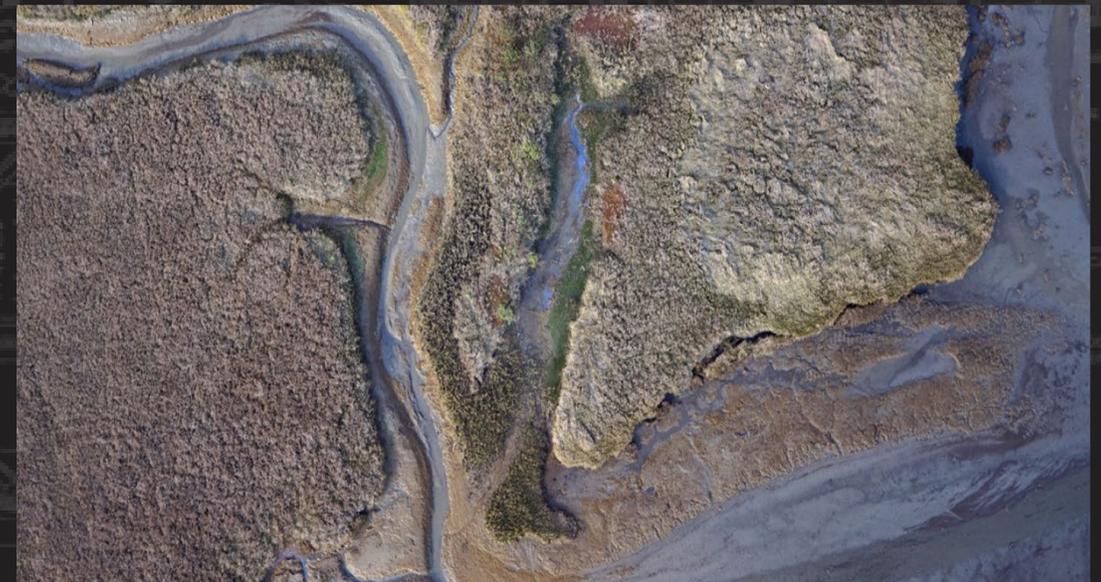


STRATEGIC SHALLOW- WATER PLACEMENT PILOT PROJECT USING DREDGED SEDIMENT IN SAN FRANCISCO BAY

October 27th, 2023
WEDA Pacific Chapter Annual Meeting 2023
Arye Janoff, Ph.D.
Lead Planner
USACE San Francisco District



U.S. ARMY

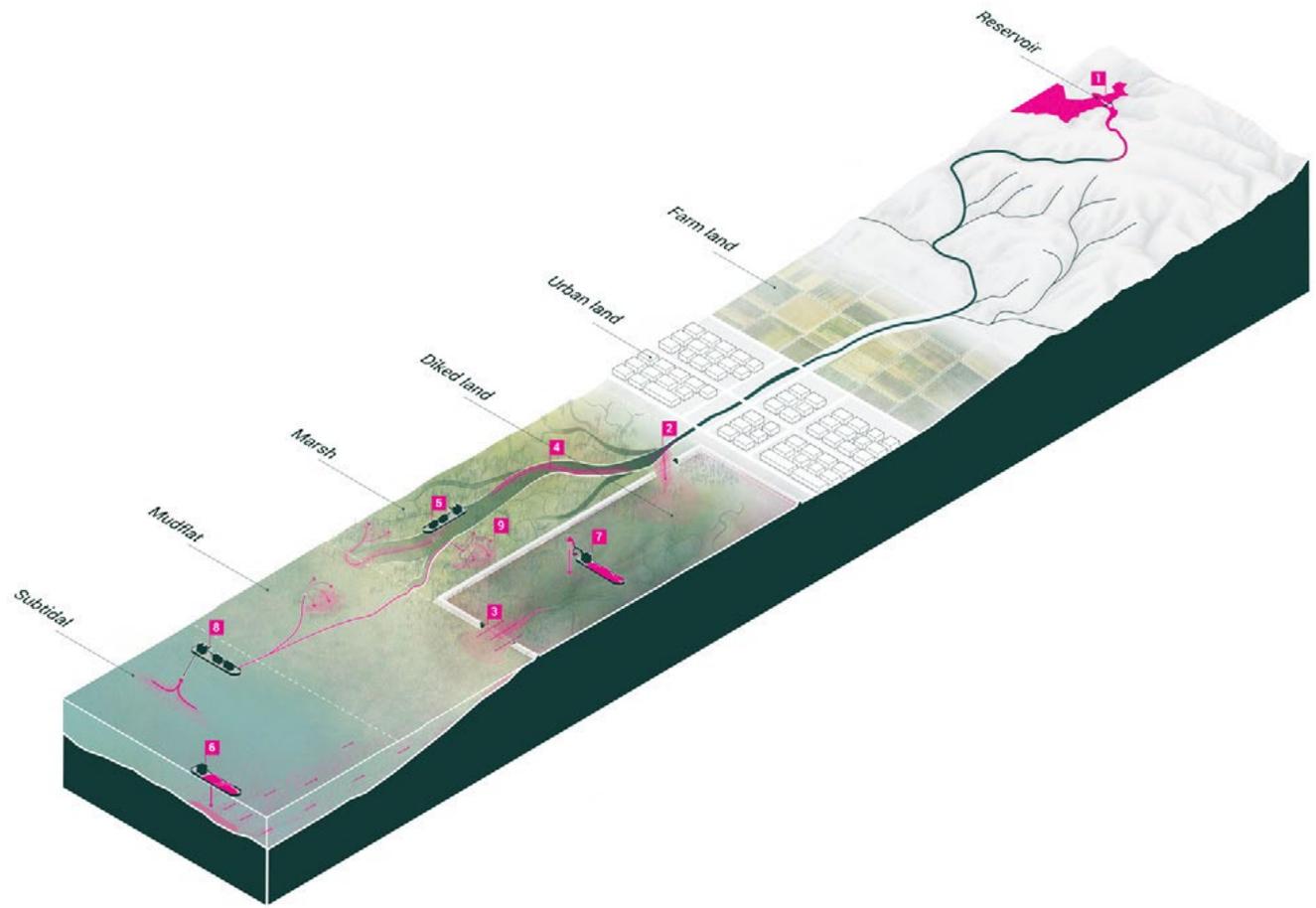


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OBJECTIVES

- Problem
- Opportunities/Solutions
- Strategic Placement planning process and design
- Defining success
- Schedule update and challenges



- | | | |
|----------------------------------------|------------------------------------------|-------------------------------|
| 1 Reservoir Management | 4 Geomorphic Dredging | 7 Mechanical Placement |
| 2 Creek-to-Bayland Reconnection | 5 Strategic Sediment Mobilization | 8 Hydraulic Placement |
| 3 Breached Dikes | 6 Strategic Placement | 9 Thin Layer Placement |
-
- | | | |
|-------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| REMOVE OBSTRUCTIONS
<small>TO NATURAL PROCESSES</small> | ASSIST
<small>NATURAL PROCESSES</small> | REPLACE
<small>NATURAL PROCESSES</small> |
|-------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------|

Problems

Limited **sediment supply** regionally + **sea-level rise**

- Marsh drowning and erosion
- **Habitat loss** for endangered and threatened species
- Increased **flood risk** for low-lying communities

Opportunities/Solutions

Leverage dredged material from navigation channels

- Beneficial Use: Direct Placement
- **Novel EWN Methods (e.g., Strategic Placement)**

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BENEFICIAL USE OF DREDGED MATERIAL IN SF BAY

Hamilton Wetlands



Hamilton Wetlands



Hamilton Wetlands



Dry Creek



Shoreline Phase I

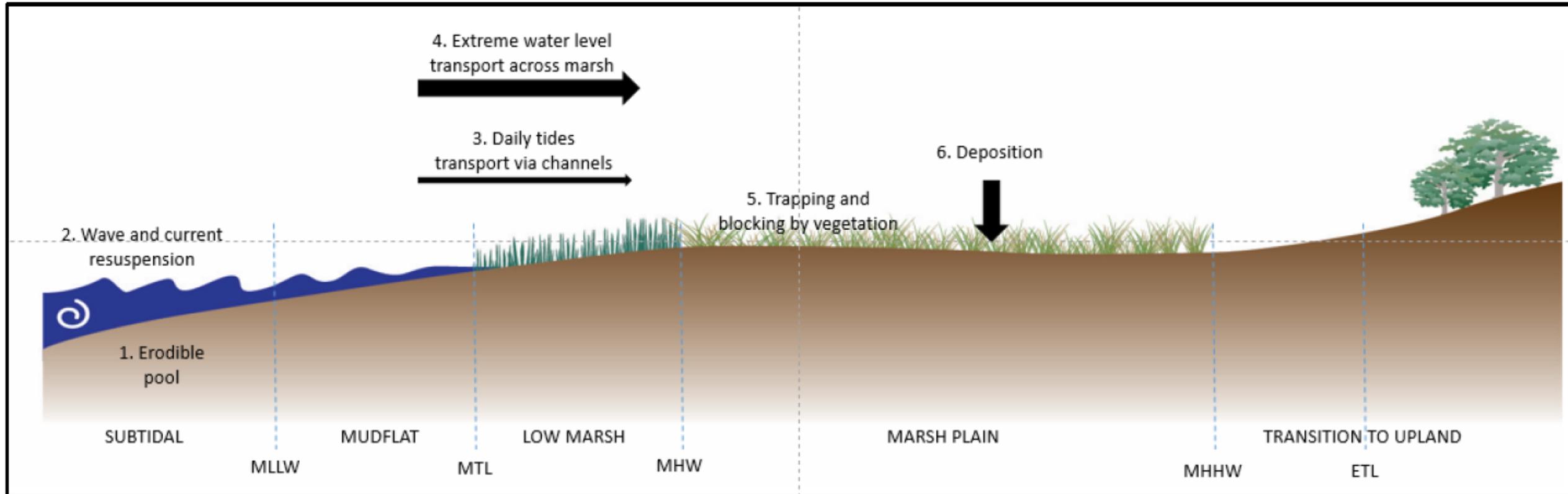
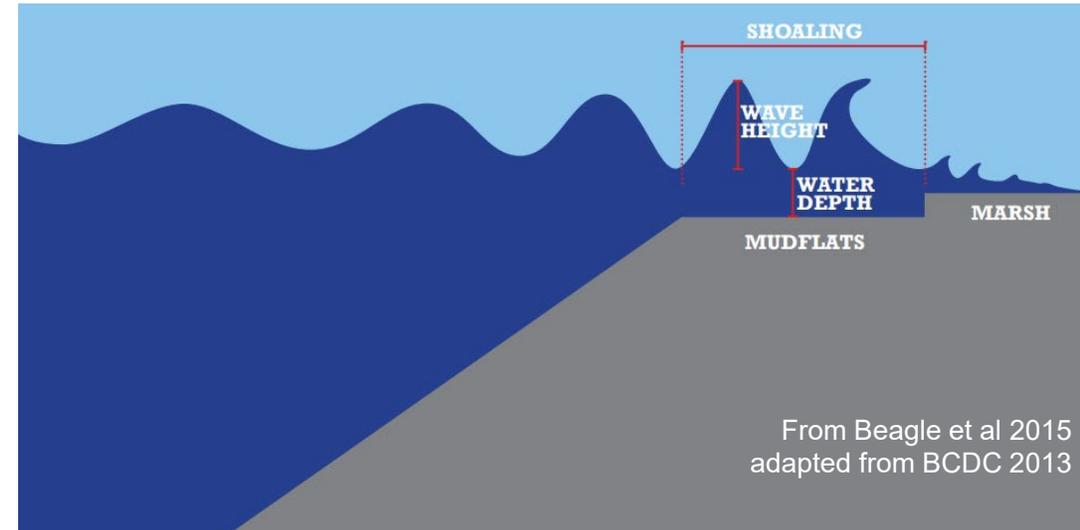


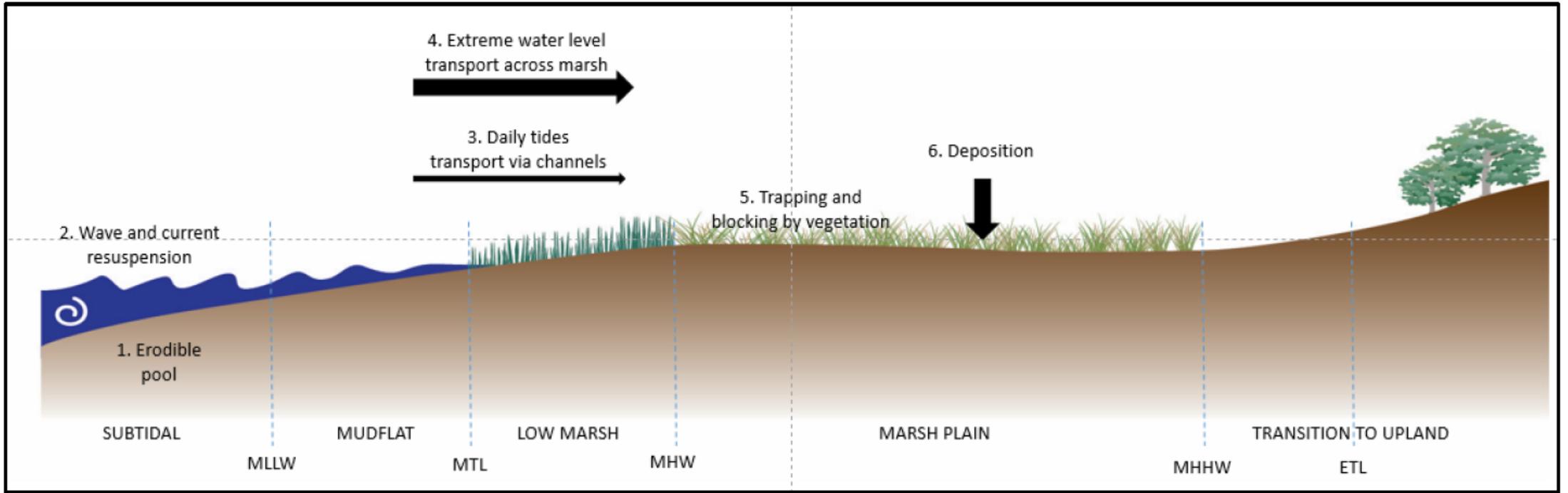
Ocean Beach, SF



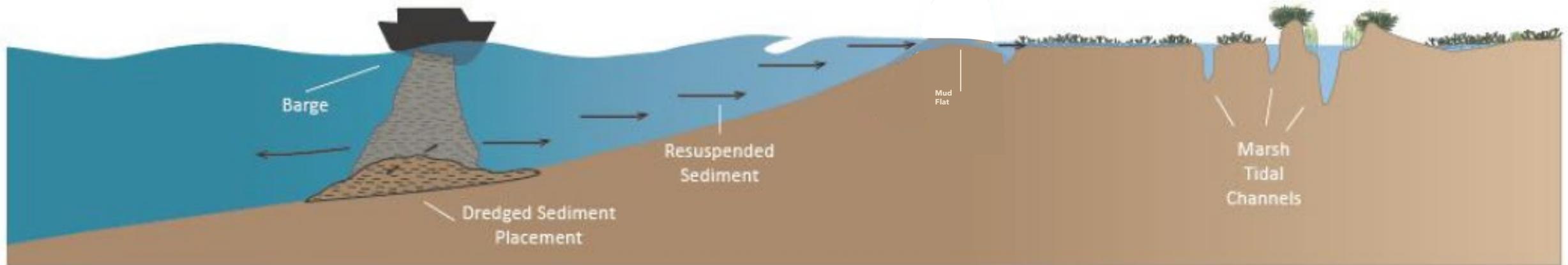


LEVERAGING NATURAL PROCESSES





Shallow-Water Placement





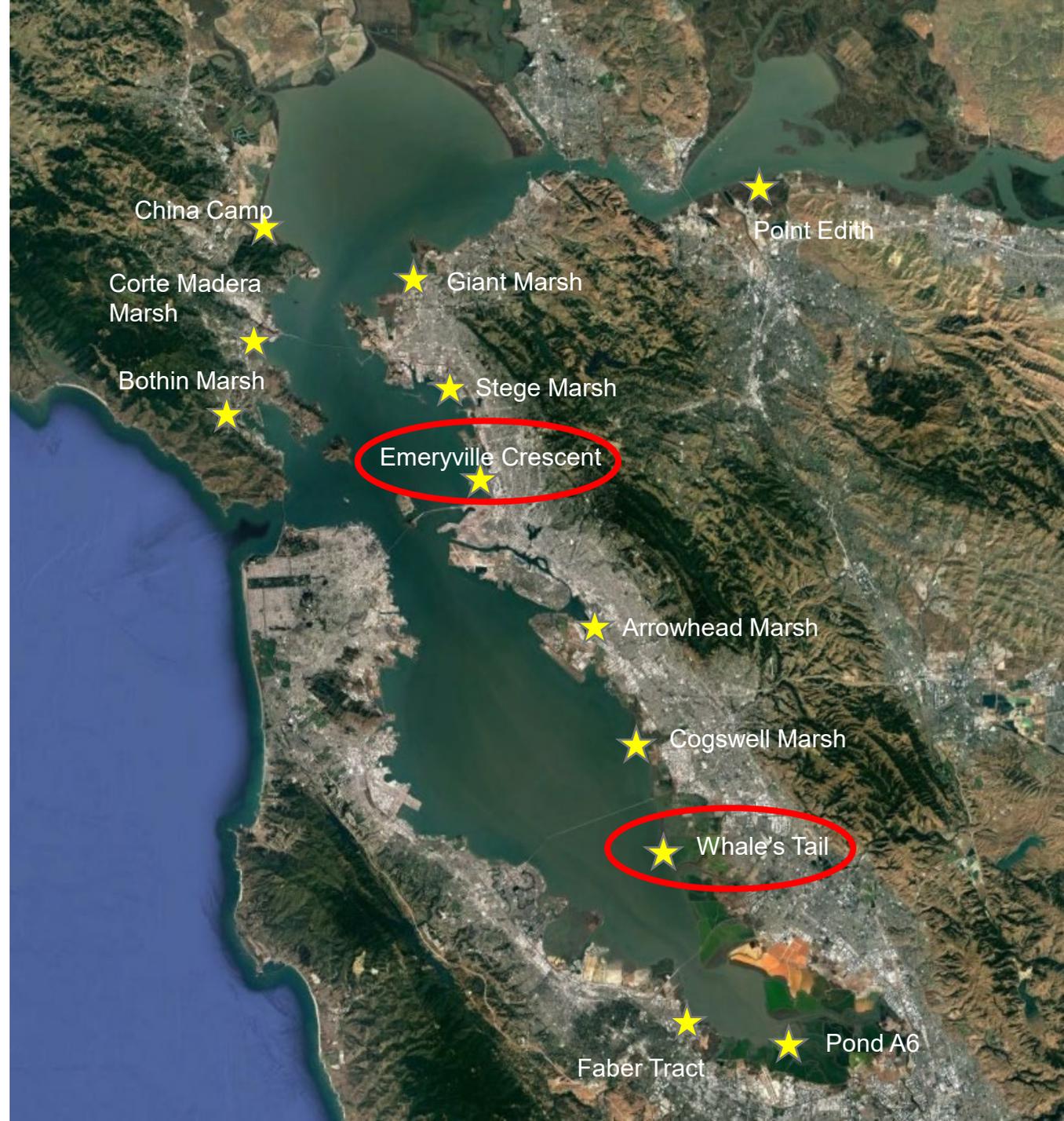
WRDA 2016 SECTION 1122: BENEFICIAL USE OF DREDGED SEDIMENT PILOT PROJECT

- Section 1122 of WRDA 2016 requires USACE to establish a pilot program to beneficially use dredged sediment
- \$50 mil proposal by State Coastal Conservancy with Bay Conservation and Development Commission requested funds for **both direct and strategic placement**
- SF District was funded to do shallow water placement pilot project to test new innovative method through the Resilient SF Bay Project and for direct placement of dredged material



SCREENING OF SITES

- **Logistics**
 - Proximity to a Federal Channel
 - Water deep enough to get scow close to shore
- **Geomorphology/Hydrodynamics**
 - Eroding or drowning marsh, lack of natural sediment supply
 - Sufficient wind-wave action to resuspend sediment placed
 - Wind-wave shore-normal approach
 - Open to tidal exchange
- **Environmental**
 - Lower populations of critical species
 - Avoiding large eelgrass beds/nearshore reef projects
- **Social**
 - Flood protection for EJ/disadvantaged communities





MODELING

- Modeling using UnTRIM Bay-Delta model and sediment transport model to simulate existing conditions and placement alternatives
- **First Round – Site Selection**
 - Determine whether Emeryville or Eden Landing is most suitable for this pilot study
 - Evaluate different placement strategies
 - Testing 100,000 yd³ total
 - Placement locations
- **Second Round –sensitivity analysis**
 - Different volumes
 - Seasonal differences
 - Size of placement footprint
 - Sediment sources



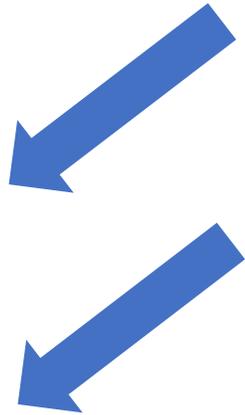
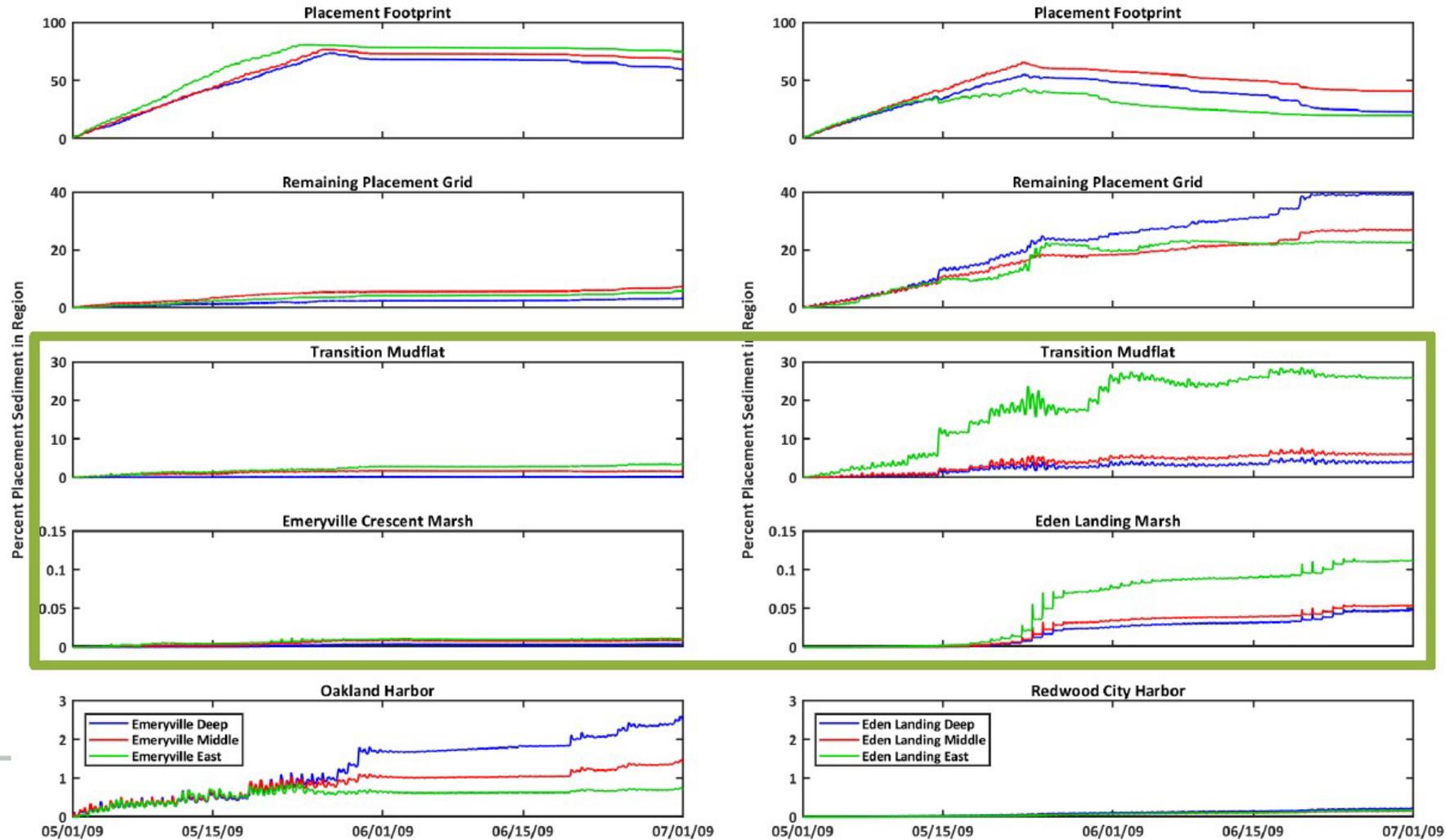
Emeryville Crescent

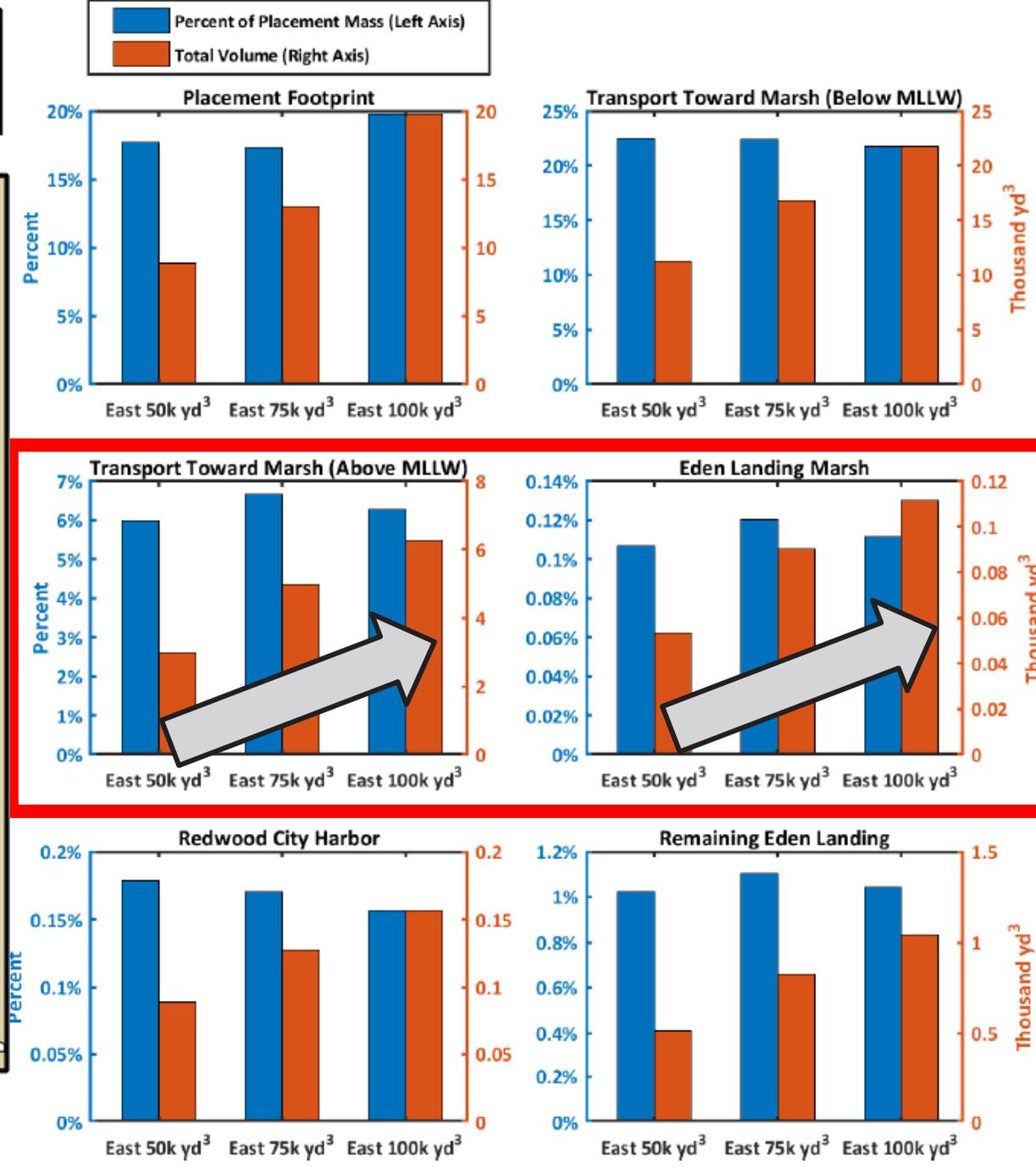
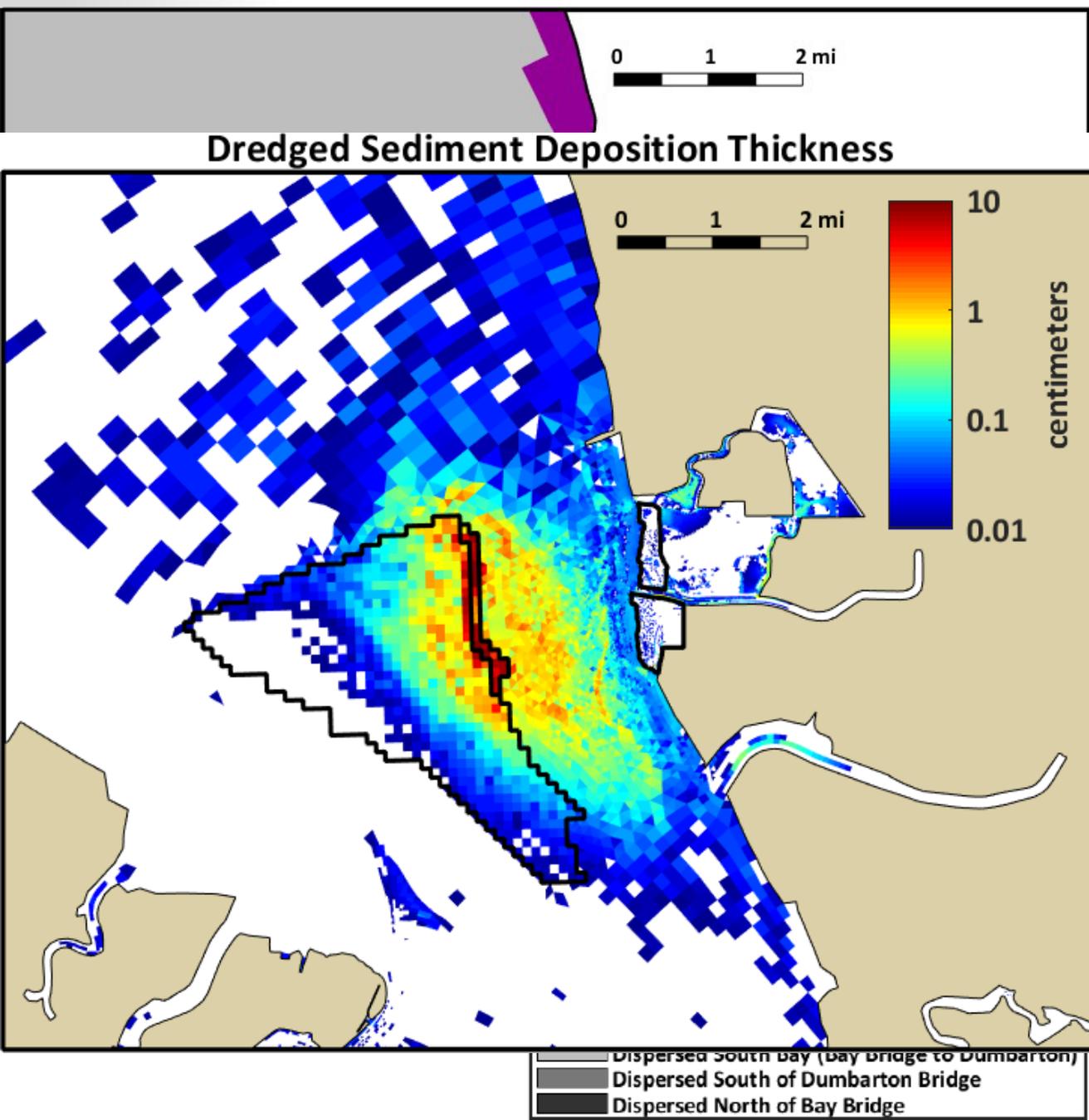
Whale's Tail
Eden Landing



Note y-axis scales are different

Scenario Results: Emeryville and Eden Landing





ALTERNATIVES ANALYSIS

- Proposed Action:
 - Eden Landing (shallow, 100,000 yd³)
- Alternative B:
 - Emeryville Crescent (shallow, 100,000 yd³)
- No Action Alternative
 - Redwood City → SF-11
 - Oakland Harbor → SF-DODS

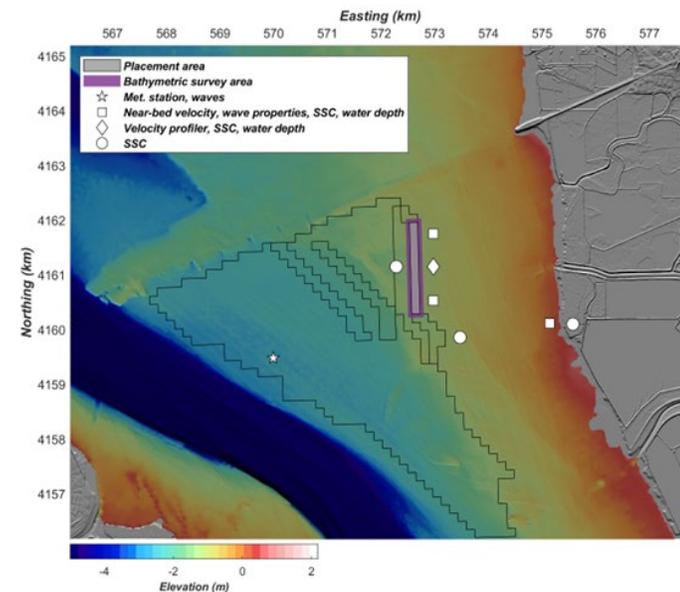
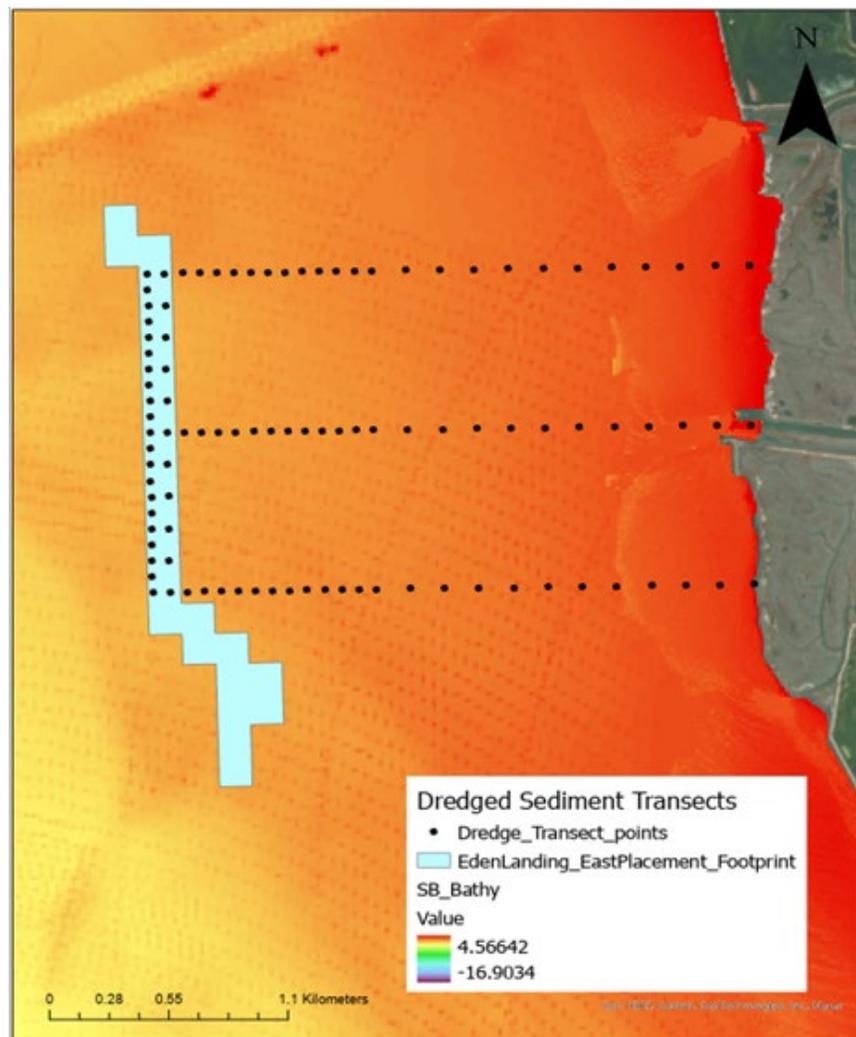




MONITORING PLAN

- **Pre-project (UNDERWAY)**
 - Water depth and elevation
 - Suspended sediment, wave conditions
 - Eelgrass surveys
 - Sediment transport rates
 - Background marsh/mudflat gain or loss

- **Post-project**
 - Water depth and elevation
 - Benthos, eelgrass
 - Sediment transport rates
 - Marsh/mudflat gain or loss
 - Magnetic Particle Tracking Study



 **DEFINING SUCCESS**

- Implementation of novel placement method
- Avoid significant impact to ecological function of shallow water environment
- **Keep dredged material in Bay system**
 - Increase BU and avoid disposal
- **Delivery to mudflats**, eventually marshes, and restoration ponds
- Community engagement
- **Successful contract**
 - Inform costs of EWN
- **Testing EWN tool**
 - Inform **Regional Dredged Material Management Plan** and future projects

SCHEDULE UPDATE AND CHALLENGES

- **Environmental Compliance**
 - NEPA, CEQA, CWA, FWCA, MSA, ESA, NHPA, CAA, CZMA
 - Permit extensions until 31 December 2023
- **Contracting**
 - Solicitation/bids Sept – Oct 2023
 - Award 23 Oct and NTP 30 Oct 2023
 - **Implementation November – December 2023**
 - Monitoring began October 2023, ending December 2024
 - Technical report produced post-placement and data analysis
- **Challenges**
 - Matching with O&M dredging contract
 - » Cost estimating, communication, balancing priorities
 - Re-solicitation was needed
 - Permitting coordination with resource agencies





PROJECT TEAM

USACE

- Peter Mull - Project Manager
 - Arye Janoff – Lead Planner
 - John Dingler- Planning Mentor
 - Julie Beagle- Environmental Planner
 - Eric Joliffe- Environmental Planner
 - Ellie Covington- Environmental Planner
 - Tiffany Cheng- Coastal Engineer
 - Fanny Chan- Civil Engineer
 - Kelly Boyd – Real Estate
- Non-Federal Sponsor (CA Coastal Conservancy)
- Evyan Sloane (SCC)-Sponsor Program Manager
 - Brenda Goeden (BCDC)-Sponsor Technical Support

- Contractor (Modeling)
 - Anchor QEA (Michael MacWilliams, Aaron Bever)
- SF Bay Regional Water Quality Control Board (CEQA Lead)
 - Xavier Fernandez
 - Kevin Lunde
 - Jazzy Graham-Davis

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