SEDIMENT FOR THE FUTURE

Shifting Army Corps Policies and Planning to Facilitate Beneficial Use

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SAN FRANCISCO DISTRICT NAVIGATION PROGRAM

Navigation Mission

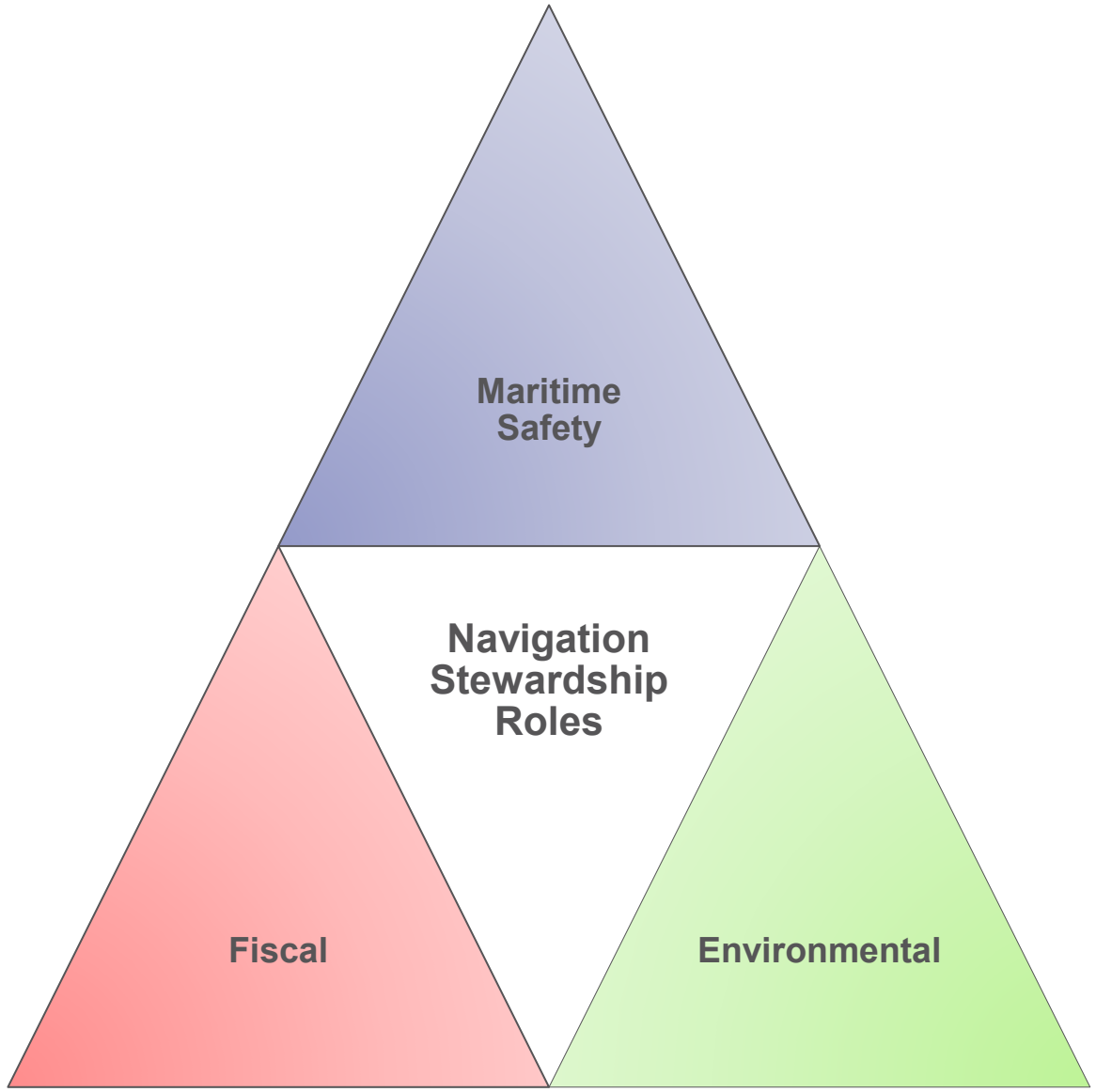
- Maintain safe, reliable, efficient, and environmentally-sustainable waterborne transportation systems in the San Francisco Bay-Delta and along the outer northern California coast

Maintenance Dredging

- Excavation of accumulated sediment from navigation channels and transportation and placement at permitted locations

San Francisco Bay-Delta Program Size

- Averages 8 projects and $65 million per year

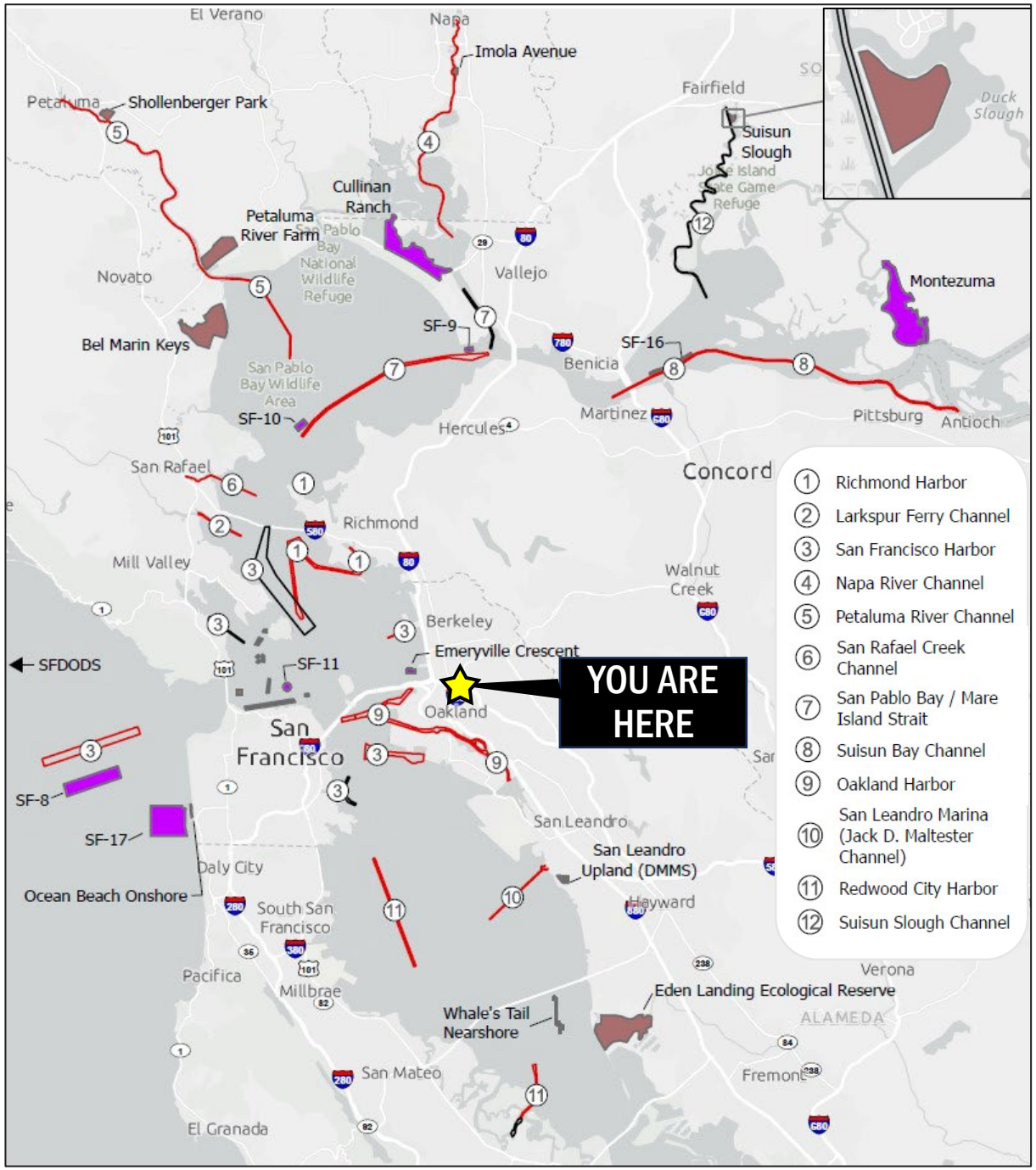


SF BAY CHANNELS & PLACEMENT SITES

Federal Channels (Red)
- 5,700 acres
- 2.2% of the Bay surface area

1.5 – 2 Million cubic yards of dredge material per year

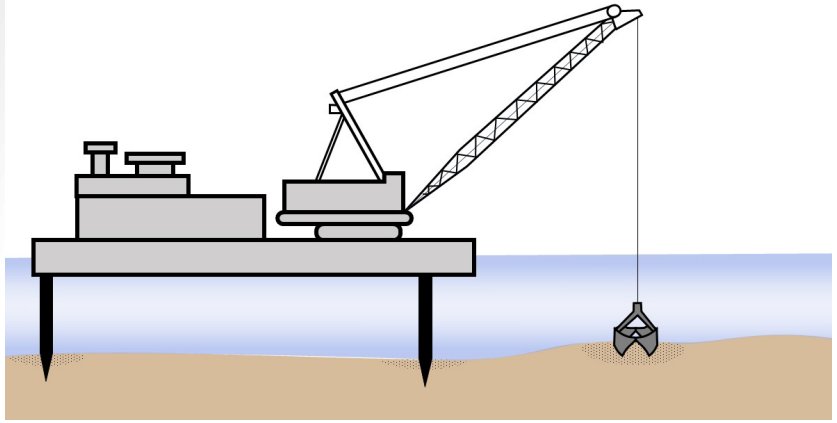
Placement Sites (Purple & Brown)
- In-Bay
- Ocean
- Wetland Restoration



* Not shown: San Francisco Deep Ocean Disposal Site (SF-DODS)

DREDGING METHODS

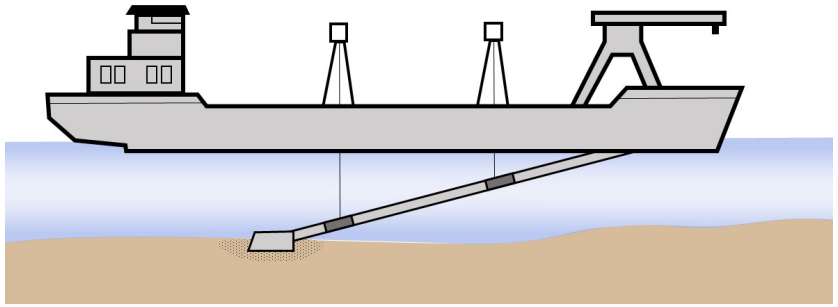
MECHANICAL



Clamshell or Bucket Dredge

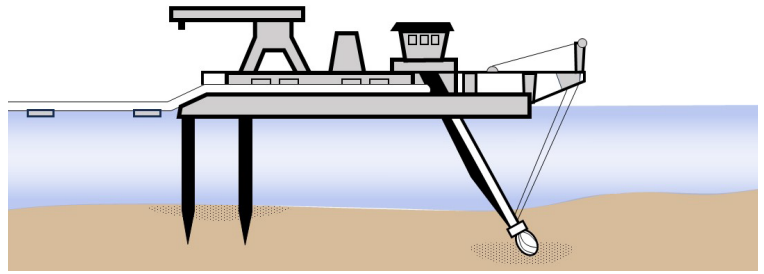
- Material is scooped from bottom
- Barges used to transport material for placement

HYDRAULIC



Hopper Dredge

- Intake pipes (drag arms) drag along bottom sucking up material into the hopper
- Ship travels to a placement site and discharges from the hopper



Cutterhead Dredge

- Pumps suck material through an intake pipe
- Sediment is discharged through a pipeline

THE FEDERAL STANDARD & INCREMENTAL COST

Federal Standard Base Plan (33 C.F.R. 335.7)

- Least costly dredging and placement alternative
- Consistent with sound engineering practices
- That meets all federal environmental requirements

Relative cost of San Francisco Bay placement sites

In-Bay ***Ocean*** ***Wetland***

Lower Cost *Higher Cost*

Incremental (additional) Cost

- Cost above the Base Plan to divert material
  - Often needed to take material to beneficial uses (BU)
- Funded by non-federal partner (historically at 100%)

Incremental cost **= [$ to take material to BU] – [$ for Base Plan]**

Partner Funding ***Federal O&M Funding***

THE BENEFICIAL USE PARADIGM IS SHIFTING

HISTORIC PARADIGM

Limited Beneficial Use

- Few sites
- High-Cost
- Limited Cost Sharing

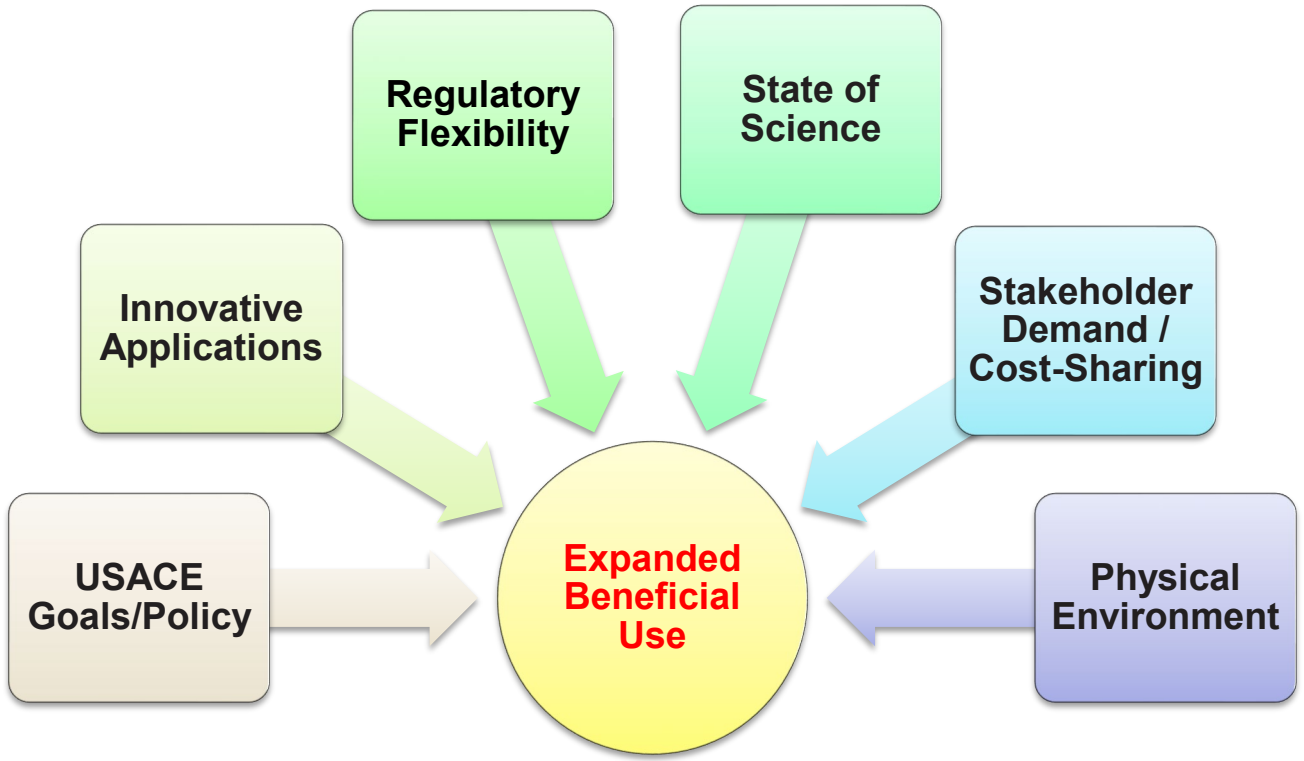
EMERGING PARADIGM

Expanded Beneficial Use

- More sites (nearshore / resiliency)
- Lower-cost
- Cost-shared resource

HOW DO WE GET THERE?

- Policy Changes
- Planning
- Engineering with Nature

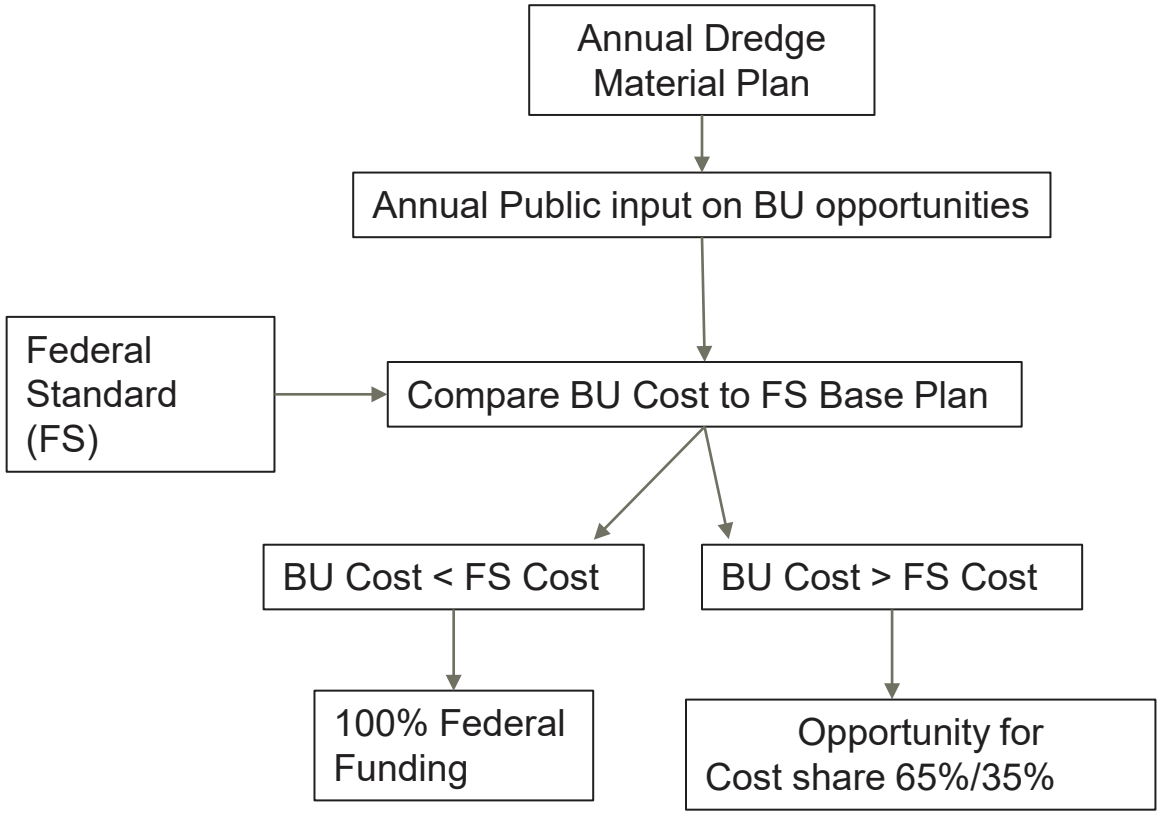


USACE BENEFICIAL USE POLICY SHIFT

Sec. 125 of Water Resources Development Act of 2020

- Directs USACE to annually prepare dredged material management plans with input from stakeholders and the public on potential beneficial uses (BU)

- Authorizes USACE to pay 65% of the incremental (additional) cost of BU
  - Still requires cost-share partner (to pay 35%)



KEY TAKEAWAYS

USACE Priorities and Policies support increased Beneficial Use

Beneficial use (when not the base plan) still requires cost share

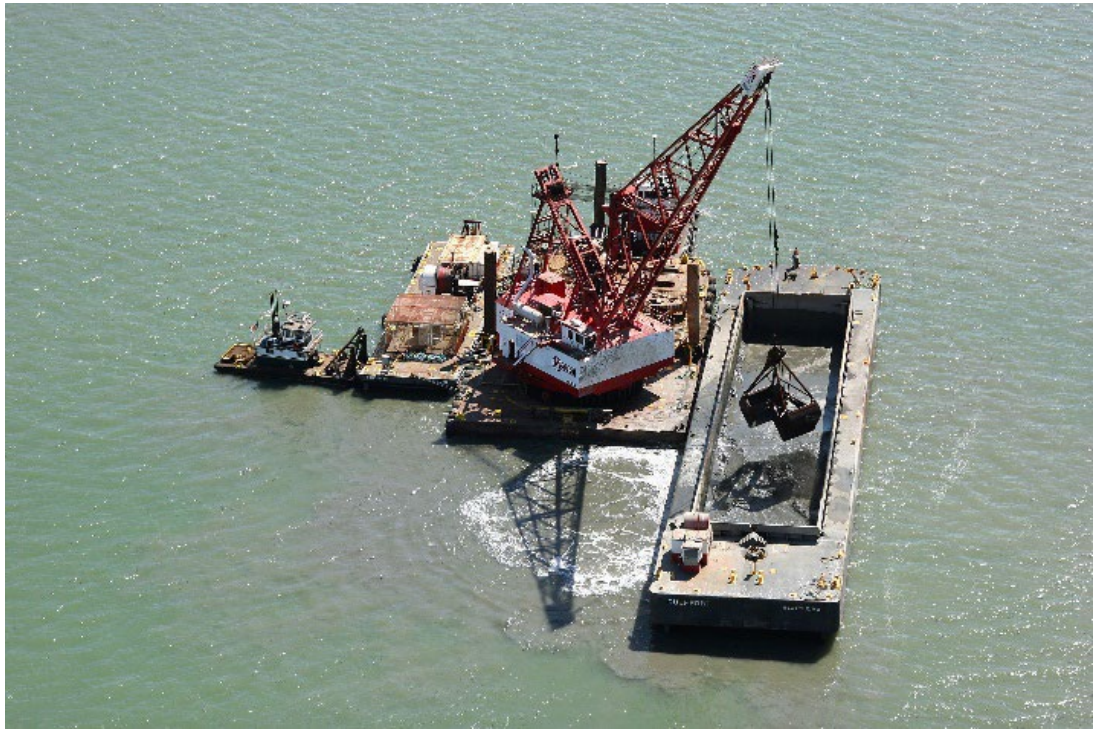
- But recent policy changes allow USACE to fund 65%

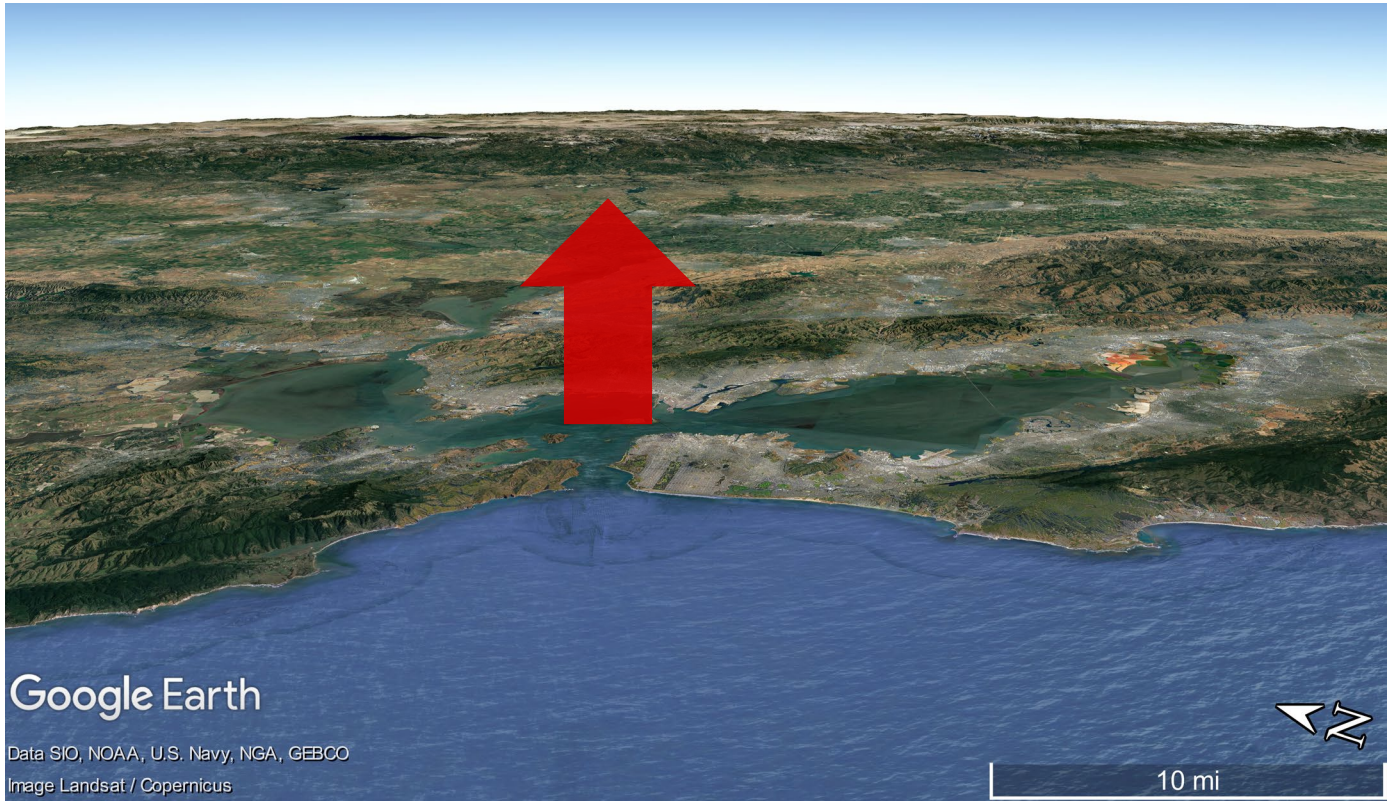
Limited beneficial use opportunities still create a challenge

- Engineering with nature; public and stakeholder input present opportunities

CURRENT STATE

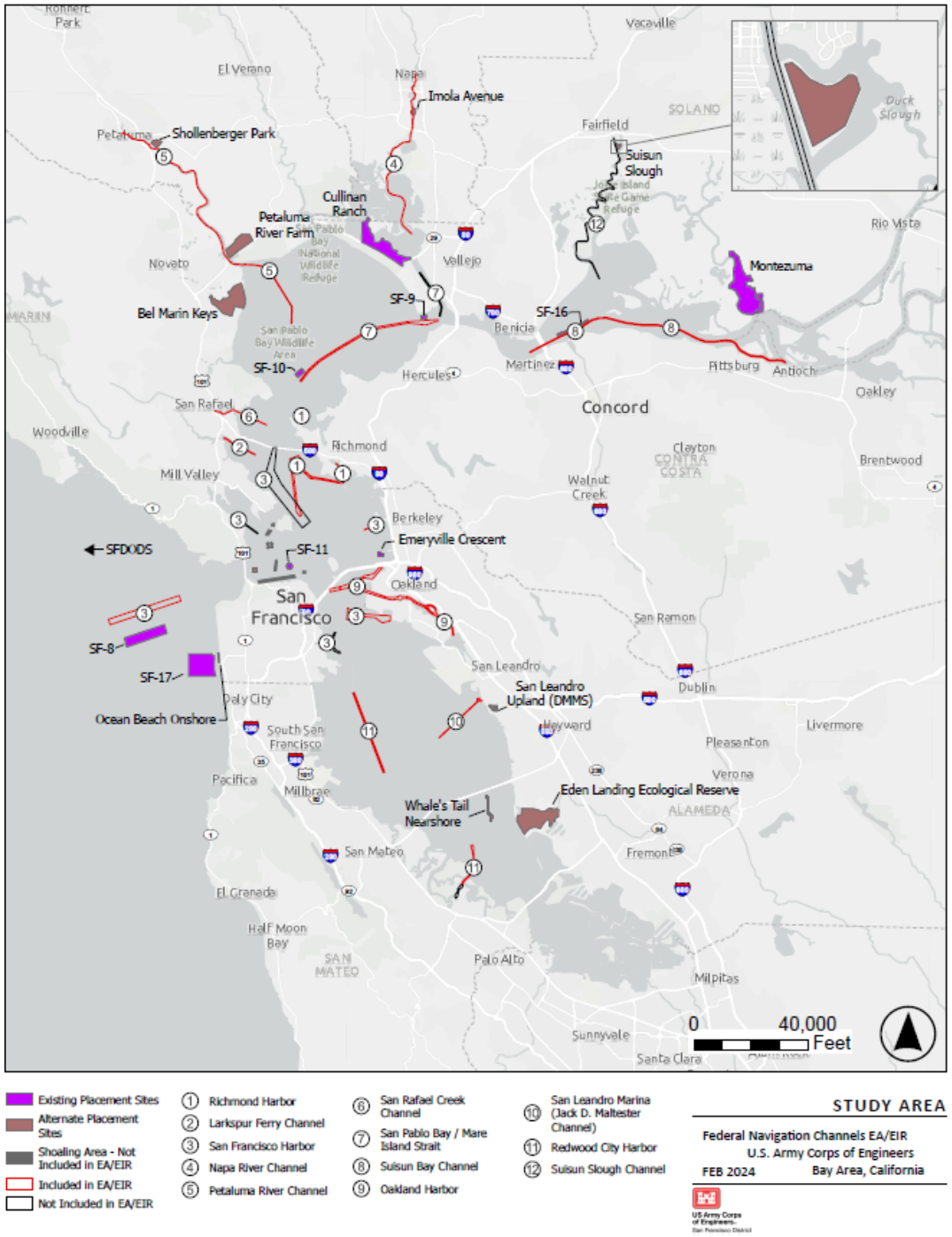
- Sea-level rise and decreasing dredging volumes
  - Current paradigm results in sediment lost to ocean disposal
    - Change paradigm by **regionalizing** approach prioritizing **wetland restoration** and **avoiding ocean disposal**





REGIONAL DREDGED MATERIAL MANAGEMENT PLAN

- **20-year plan** for dredging and sediment placement from 10 federal channels
- Identify **least cost, environmentally acceptable, technically feasible** = federal standard (base plan)
- Goal: **beneficial use within federal standard and avoid ocean disposal**
- **Broad stakeholder engagement**



KEY POINTS

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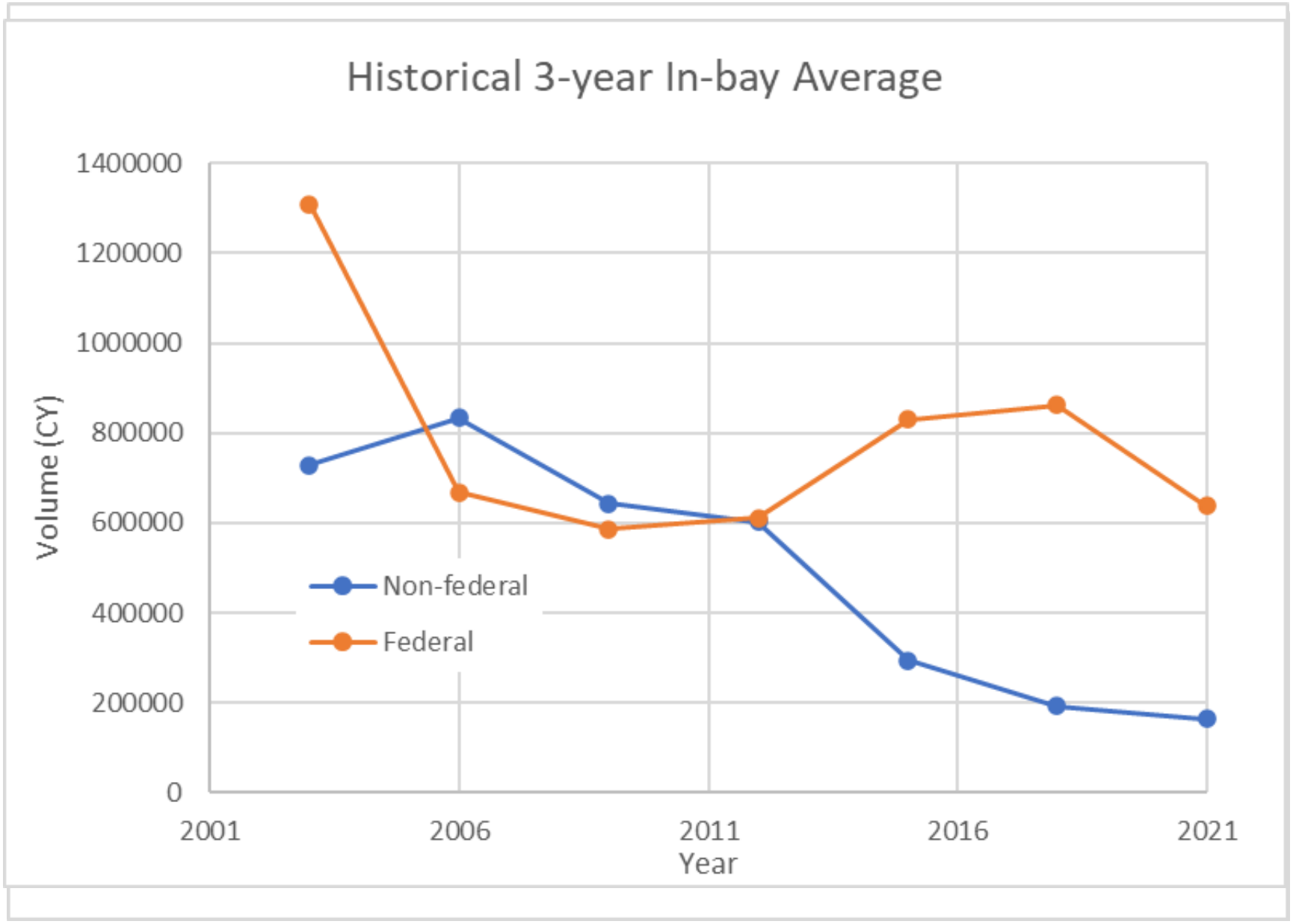
Preliminary Alternatives	
Current Paradigm	Equal Cost
Beneficial Use - Divert Ocean to BU/In-bay	Equal Cost
Regional Optimization, Most BU in Base Plan	Equal Cost
Beneficial Use - Cost-Sharing	Higher Cost
Beneficial Use - Maximized	Higher Cost



FUTURE INNOVATION

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McKnight et al. 2020