

# Beneficial Reuse of Dredged Sediment in San Francisco Bay: Program and Practice

Amy Hutzel

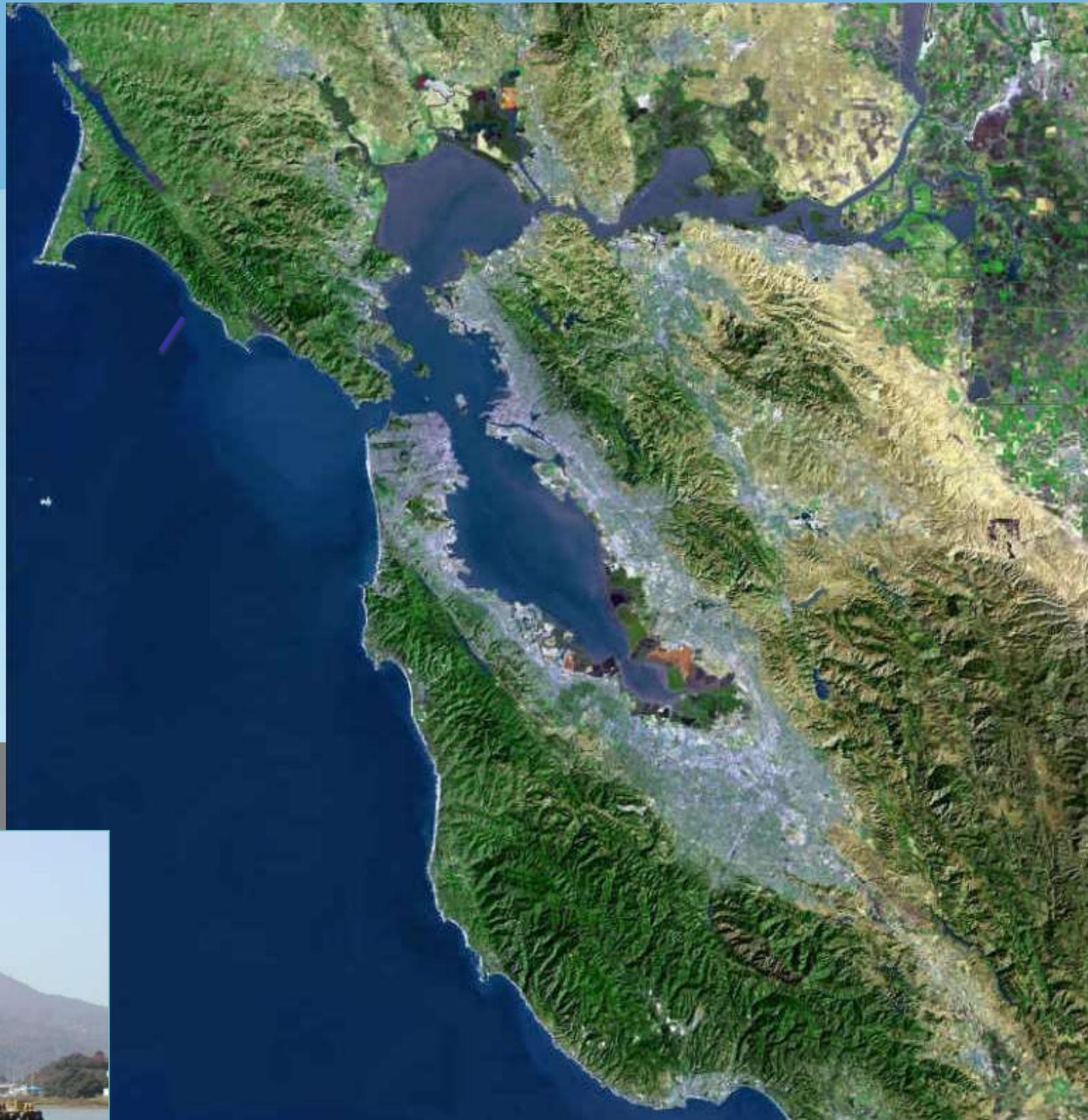
*San Francisco Bay Restoration Authority  
and California State Coastal Conservancy*

Brenda Goeden

*San Francisco Bay Conservation and  
Development Commission*

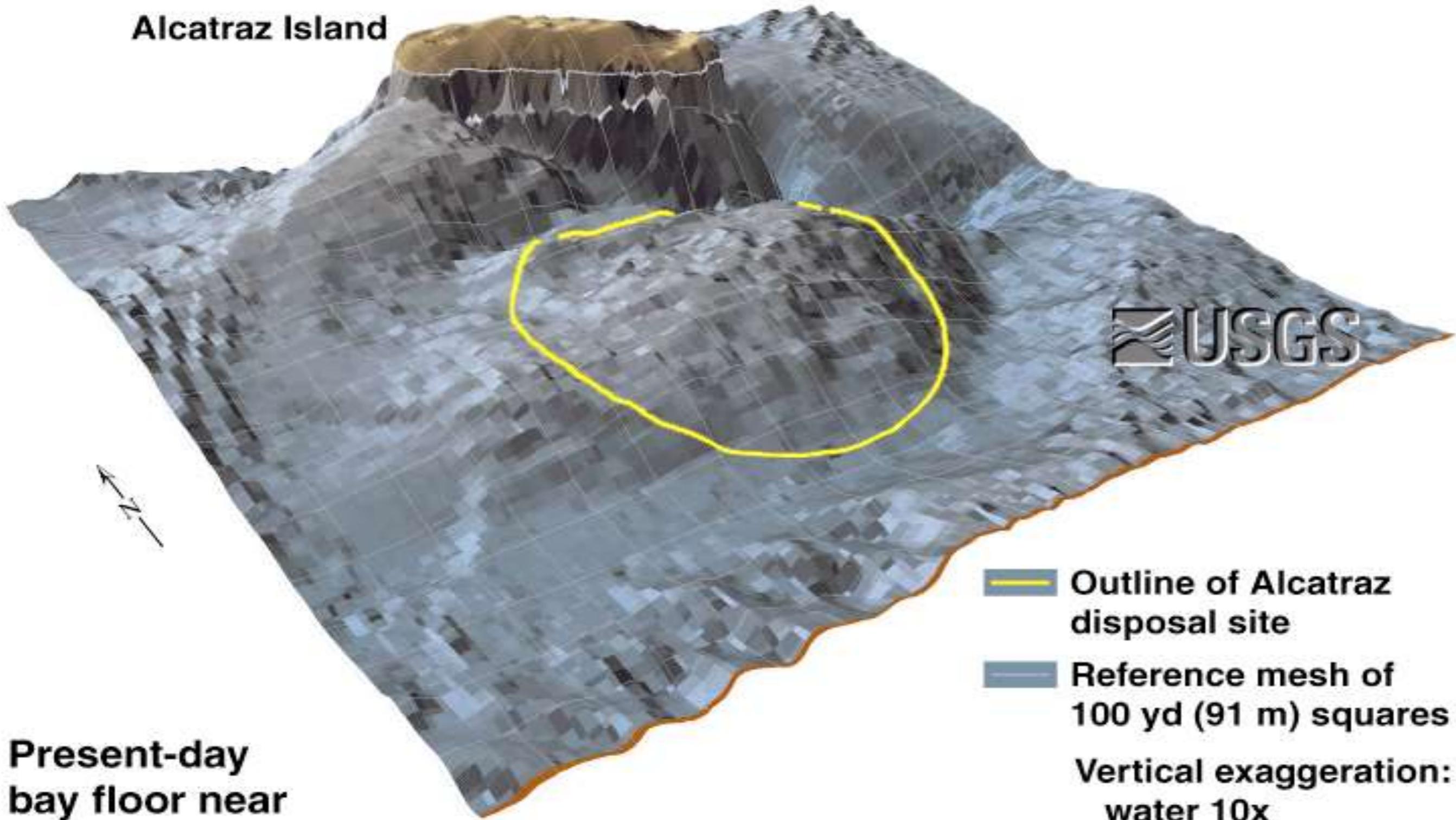
# San Francisco Bay: a highly urbanized estuary

- **90% Loss of Wetlands** resulting in deeply subsided baylands rimming the Bay
- **19<sup>th</sup> Largest Economy** in the world
- **17** federal channels, **5** ports, **7** oil terminals, and **~100** marinas for recreation



# Severe Mounding at the Alcatraz Disposal Site – Early 1980s

Alcatraz Island



USGS

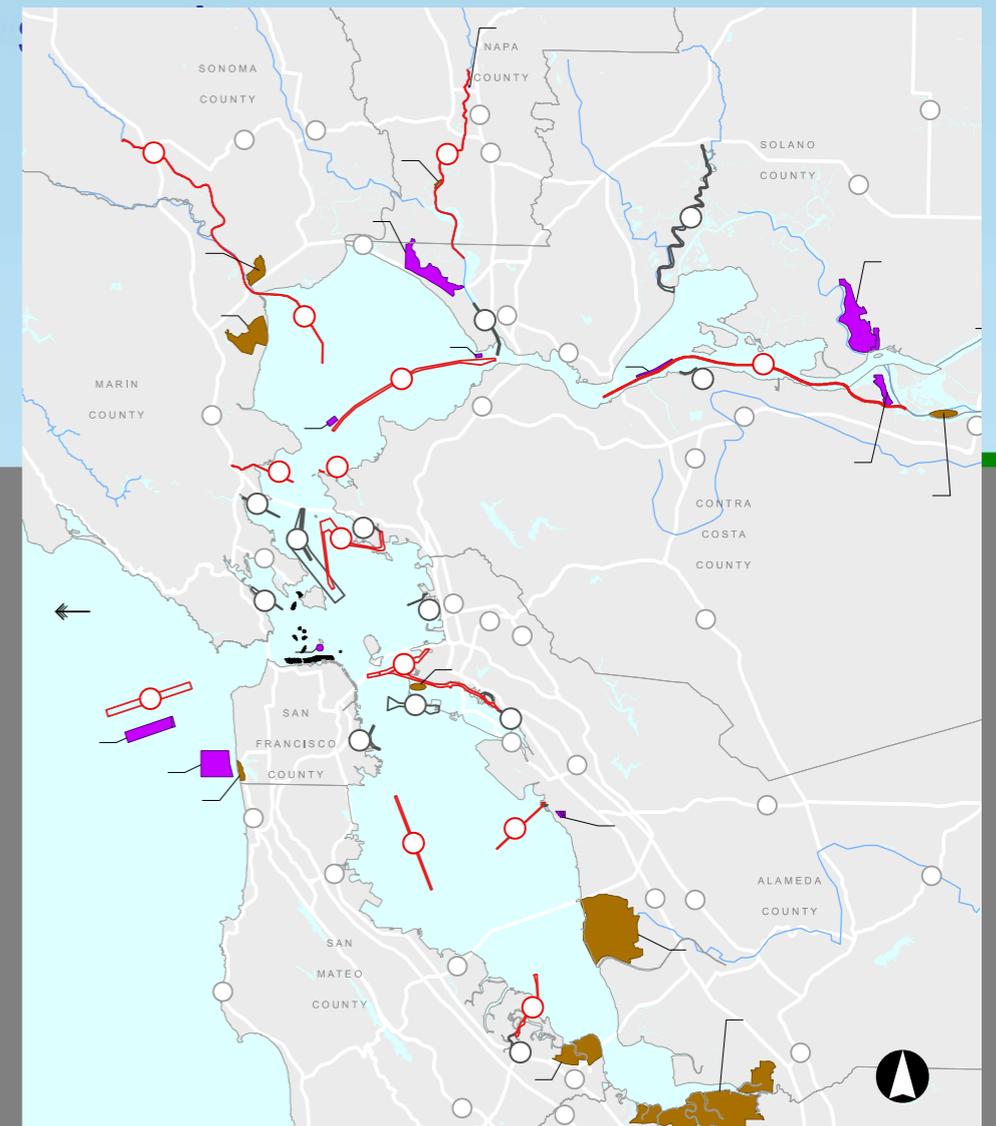
- Outline of Alcatraz disposal site
- Reference mesh of 100 yd (91 m) squares
- Vertical exaggeration:  
water 10x  
island 2x

Present-day  
bay floor near  
Alcatraz disposal site

# LTMS Program Goals

- Maintain in an environmentally & economically sound manner channels necessary for safe navigation & eliminate unnecessary dredging
- Conduct disposal in the most environmentally sound manner
- Maximize reuse of dredged material
- Establish cooperative permitting framework

**> 25 million cubic yards used!**



# Restored Hamilton Airfield Sonoma Baylands

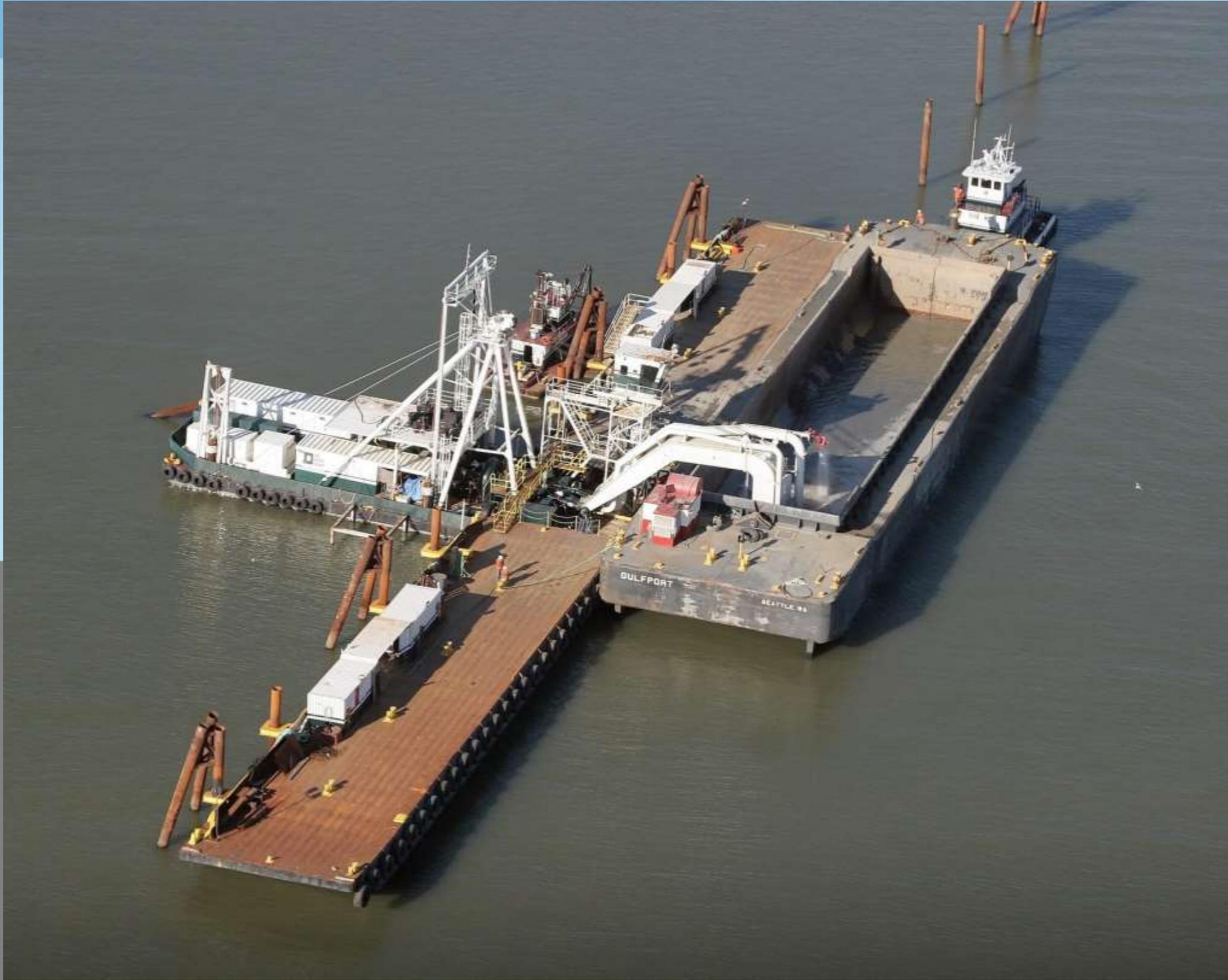
# Sonoma Baylands



# Montezuma Wetlands



# Dredged Sediment Offloader



# Bel Marin Keys Expansion

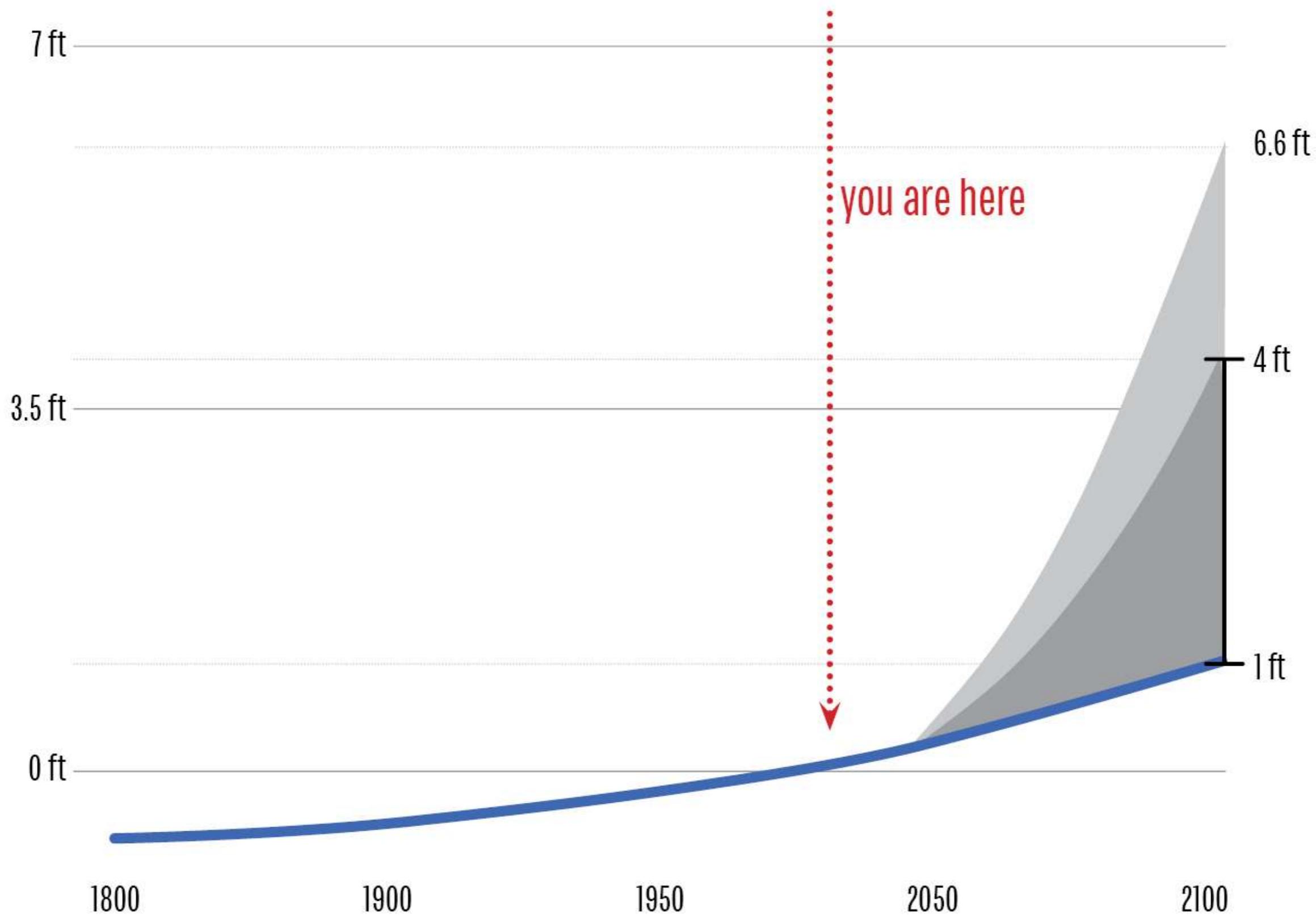


# GLOBAL SEA LEVEL

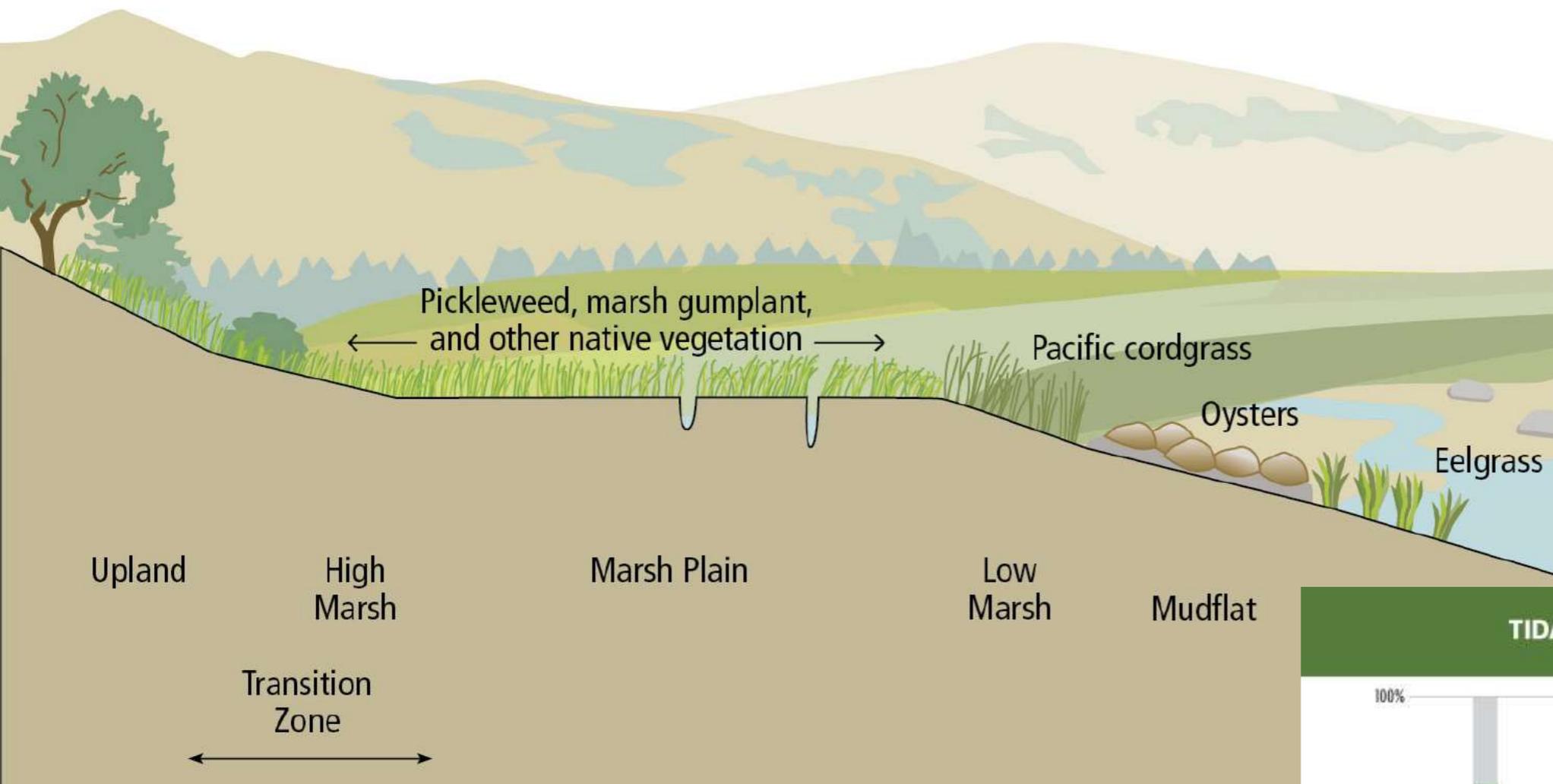
# *change*

## SINCE 1800

Courtesy 3rd National  
Climate Assessment,  
2014



# Restore COMPLETE SYSTEMS



SEDIMENT  
ISA

*precious resource*



# Conservancy Beneficial Use Pilot Program Proposal

- Four deep water navigation channels that can provide 1.5 to 2.5 million cubic yards annually of valuable sediment necessary for the foundation for wetland protection, restoration and creation of four available restoration sites.
- Two restoration sites that are fully permitted and operational and receiving dredged sediment now.
- Two more restoration sites that will come on-line in the next two to three years.
- Strategic Aquatic Placement of Dredged Sediment Pilot.

	<b>Authorized or Regulatory Depth (feet below MLLW)<sup>1</sup></b>	<b>Historic Dredge Type</b>	<b>Typical Dredging Cycle (years)</b>	<b>Planning Volume per Episode (cy)</b>	<b>Federal Standard Site<sup>2</sup></b>
Oakland Inner and Outer Harbor	50	Clamshell Bucket	Annual	350,000 – 700,000	Ocean
Richmond Inner Harbor	41 authorized 38 maintained	Clamshell Bucket	Annual	350,000 – 400,000	Ocean
Outer Harbor	45	Hydraulic Hopper/ Clamshell Bucket	Annual	150,000 – 250,000	In-Bay Alcatraz
Redwood City Harbor	30	Clamshell Bucket (Harbor Channels)	1-2	300,000 – 600,000	In-Bay Alcatraz
Pinole Shoal	35	Hydraulic Hopper/ Clamshell Bucket	Annual	200,000 – 350,000	In-Bay San Pablo

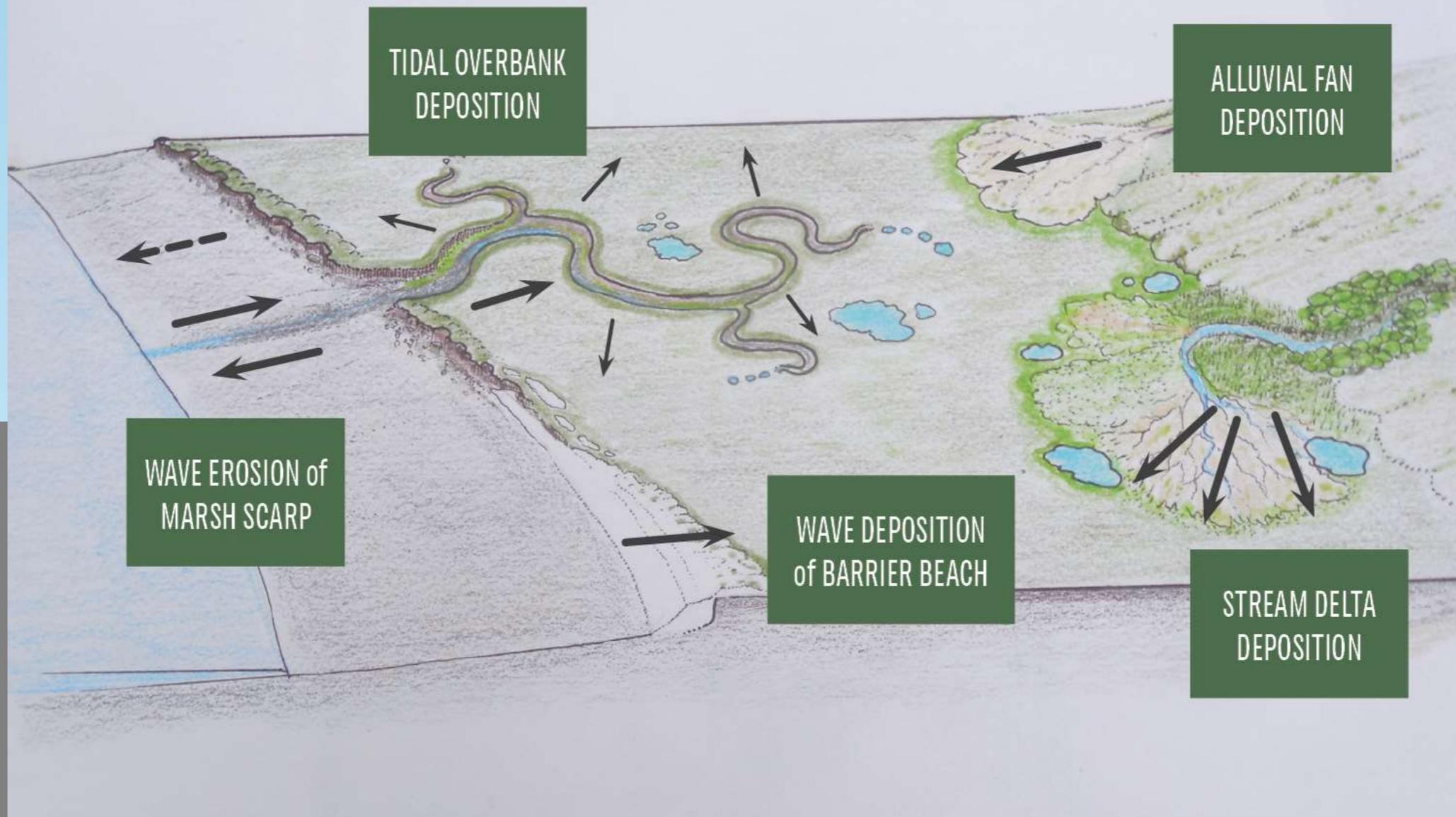
Project	Volume Needed	Acres Restored
Cullinan Ranch	2.0 mcy	1,575
Montezuma (Phase 2)	4.5 mcy	1,880 (502 in Phase 2)
Bel Marin Keys	9.1 mcy	1,576
Eden Landing	7.2 mcy	2,300
<b>Total</b>	<b>22.8 mcy</b>	<b>7,331 acres</b>

MEANS  
RESTORING

# PROCESSES

NOT JUST  
PLACES

COURTESY PETER BAYE



# Next Steps

- Pilot Project scope decisions by Corps HQ.
- Cost-share agreement.
- Federal and Non-Federal funding for pilot projects.
- Pilot to the pilot at Redwood City Harbor.

# Assembly Member Mullin

- Provides State funding for the incremental cost of beneficial reuse of sediment from a federal navigation channel
- 3 years to commit funds, 5 years to implement
- Identifies Redwood City
  - Challenging location and sediment
- Conservancy and USACE agree with Model MOU
- Study offloader feasibility

# Measure AA: San Francisco Bay Clean Water, Pollution Prevention and Habitat Restoration Program

- \$12/year parcel tax will generate \$500 million over 20 years for restoration around SF Bay.
- Passed with over 70% support in the 9-county Bay Area.
- Complete restoration is estimated to cost \$2 billion. Measure AA funds will leverage state and federal funds.



# SF Bay Restoration Authority Act Eligibility

## The Restoration Authority can fund:

- **Habitat projects** that will restore, protect, or enhance tidal wetlands, management ponds, or natural habitats on the shoreline.
- **Flood management features** that are part of a habitat project.
- **Public access or recreational amenities** that are part of a habitat project.



Photo: National Geographic



# Geographic Distribution of \$

North Bay	Sonoma, Marin, Napa & Solano	9%
East Bay	Contra Costa & Alameda	18%
West Bay	San Francisco & San Mateo	11%
South Bay	Santa Clara	12%
Baywide	All 9 Counties	50%

*based on 2010 population*

# Projects Authority Has Funded or Staff Has Recommended

## Map of Round One Grant Recommendations



1. Project: Deer Island Basin Tidal Wetlands Restoration project  
Grantee: Marin County Flood Control District  
Amount: \$630,000

2. Project: Restoring Wetland-Upland Transition Zone Habitat in the North Bay with STRAW  
Grantee: Point Blue Conservation Science  
Amount: \$2,661,264

3. Project: Sonoma Creek Baylands Strategy  
Grantee: Sonoma Land Trust  
Amount: \$150,000

4. Project: Montezuma Wetlands Restoration Project, Phase 1  
Grantee: Montezuma Wetlands LLC (MWLLC)  
Amount: \$1,610,000

5. Project: Encinal Dune Restoration and Public Access  
Grantee: East Bay Regional Park District  
Amount: \$450,000

6. Project: 900 Innes Remediation  
Grantee: City/County of San Francisco, Recreation and Park Department  
Amount: \$4,998,600

NOTE: This will be presented later in the year

7. Project: San Leandro Treatment Wetland for Pollution Reduction, Habitat Enhancement, and Shoreline Resiliency  
Grantee: City of San Leandro  
Amount: \$539,000

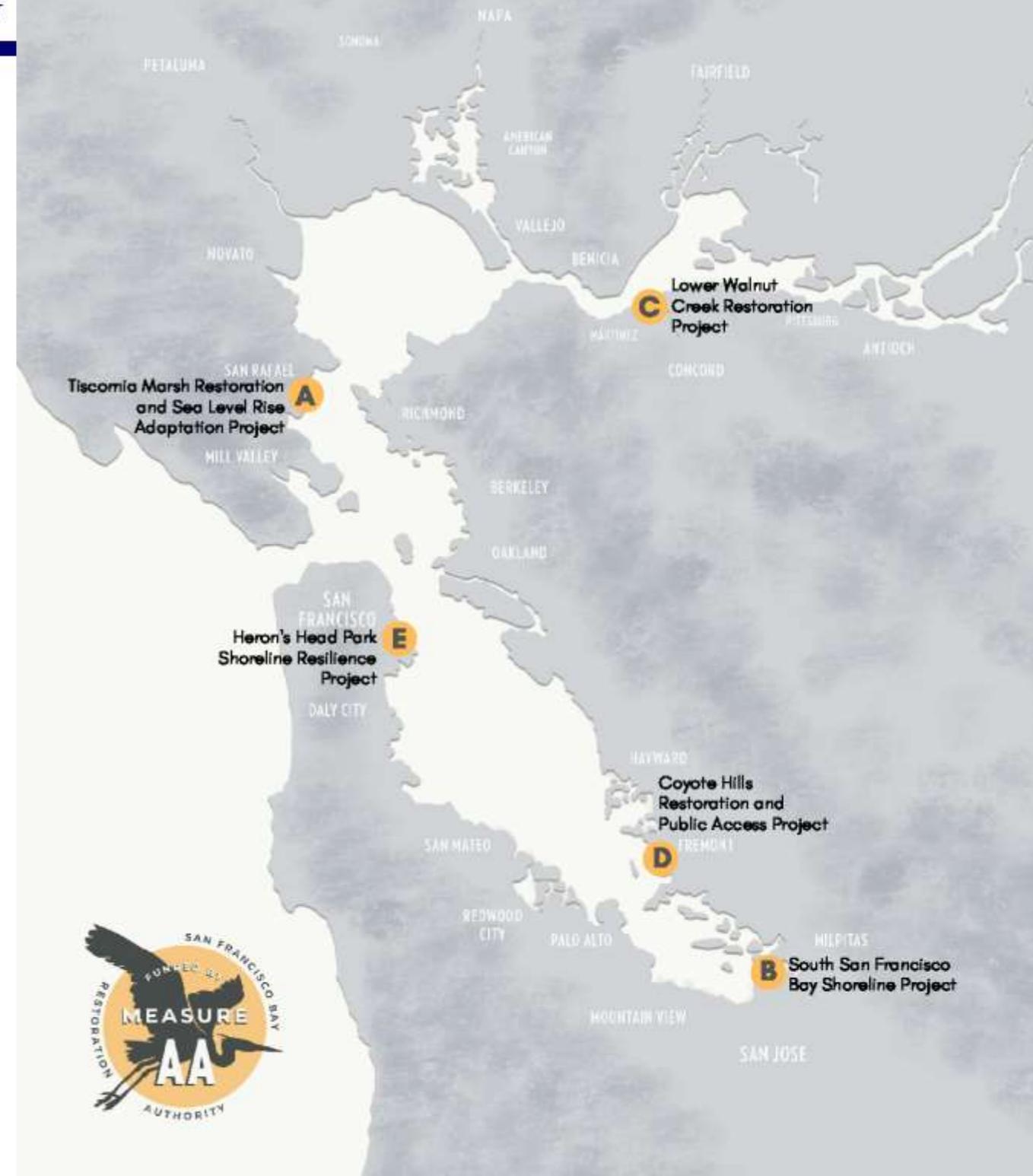


8. Project: South San Francisco Bay Shoreline Project  
Grantee: Santa Clara Valley Water District  
Amount: \$4,439,406

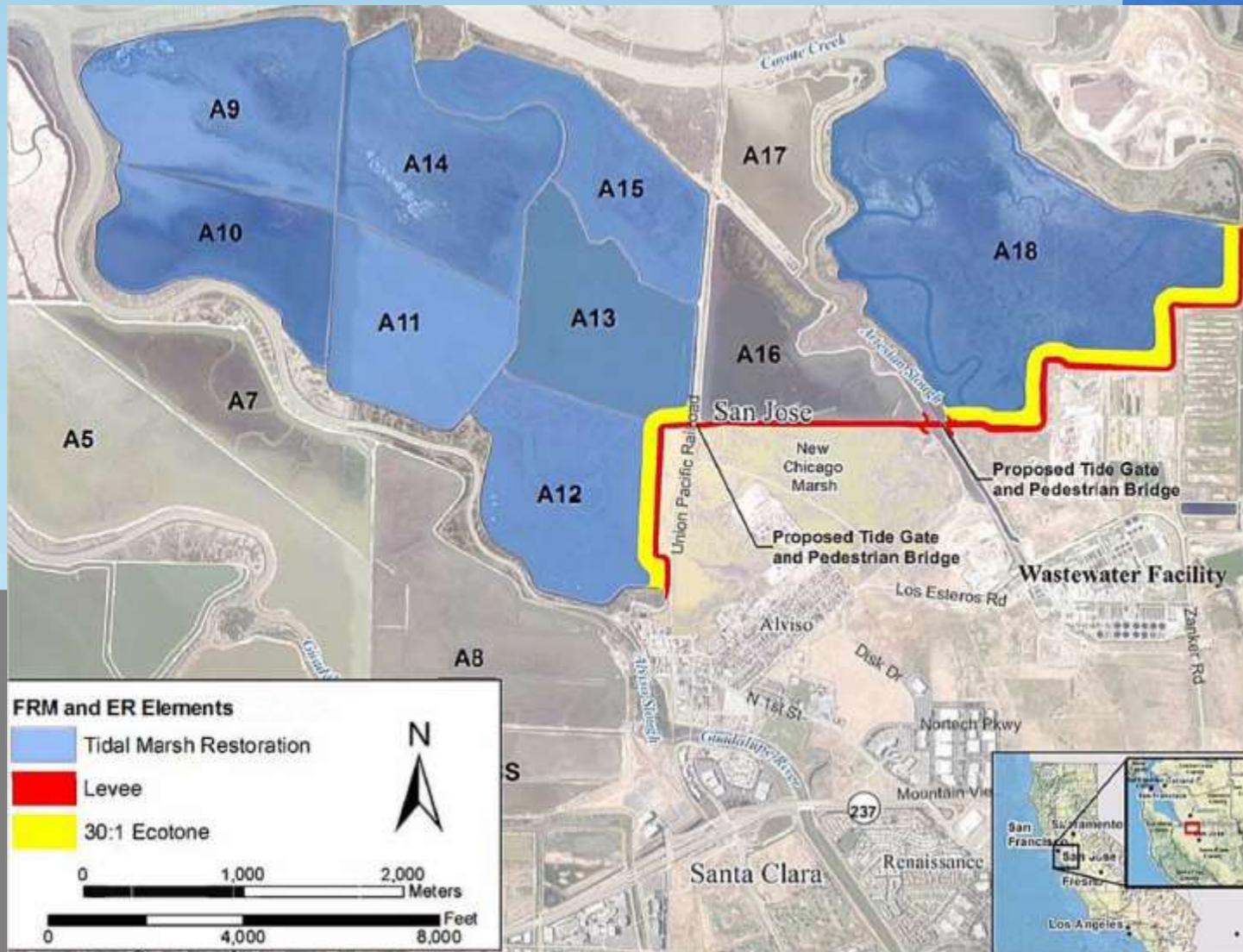
9. Project: South Bay Salt Ponds Restoration Project, Phase 2  
Grantee: Ducks Unlimited, Inc  
Amount: \$7,421,730

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## Measure AA Grant Round 2: Projects Recommended for Funding



# Example of Type of Project Authority Has Funded:



# Questions?

