SAN FRANCISCO BAY: SEDIMENT SUPPLY AND WETLAND RESTORATION

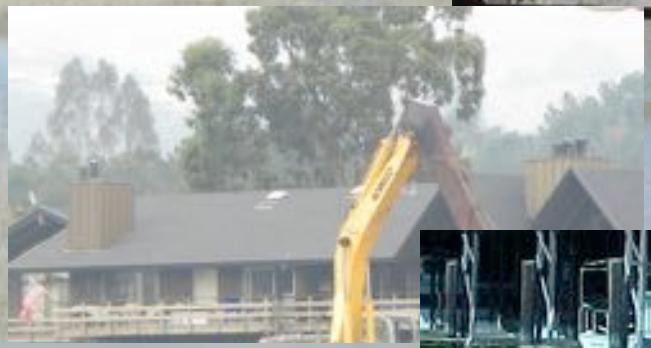
A Story of Supply and Demand

Cullinan Ranch Field Workshop
Brenda Goeden, San Francisco Bay Conservation and Development Commission

Dredging in San Francisco Bay

* Hydraulic
* Mechanical

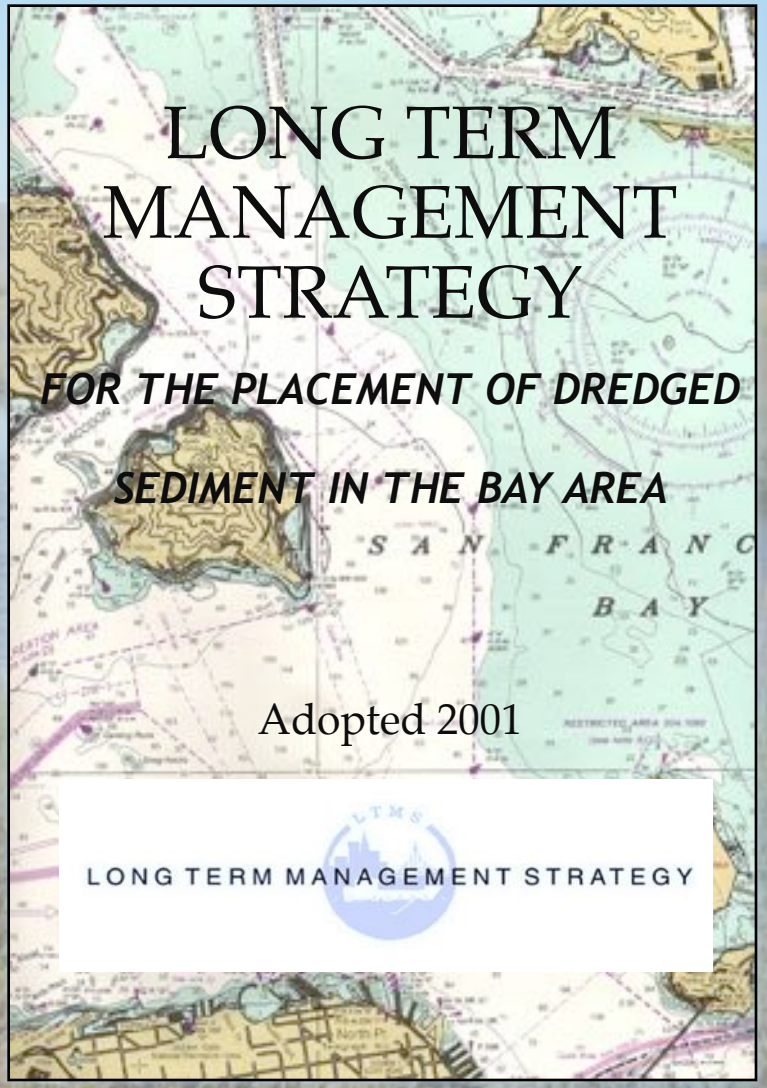
2-3 million cubic yards annually



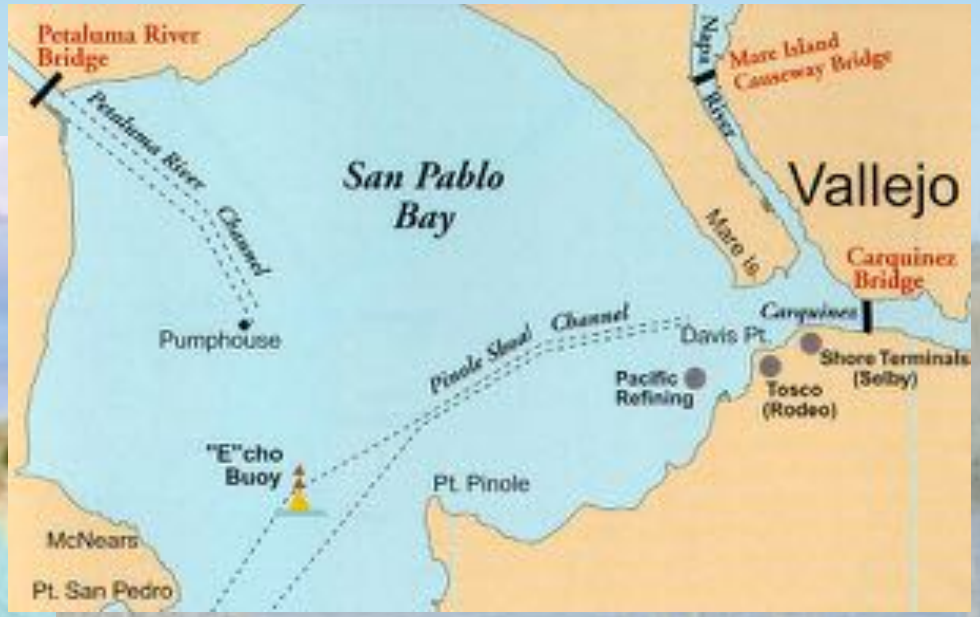
LTMS Agencies: USEPA, USACE, Water Board & BCDC

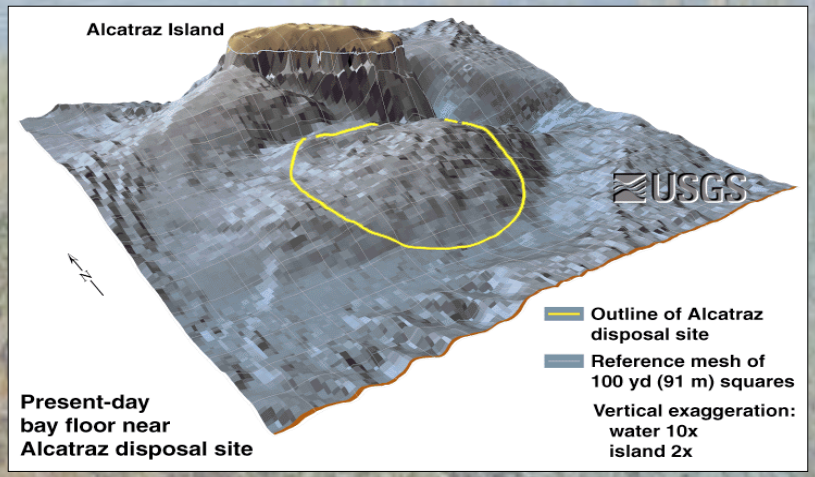
GOALS:

- 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



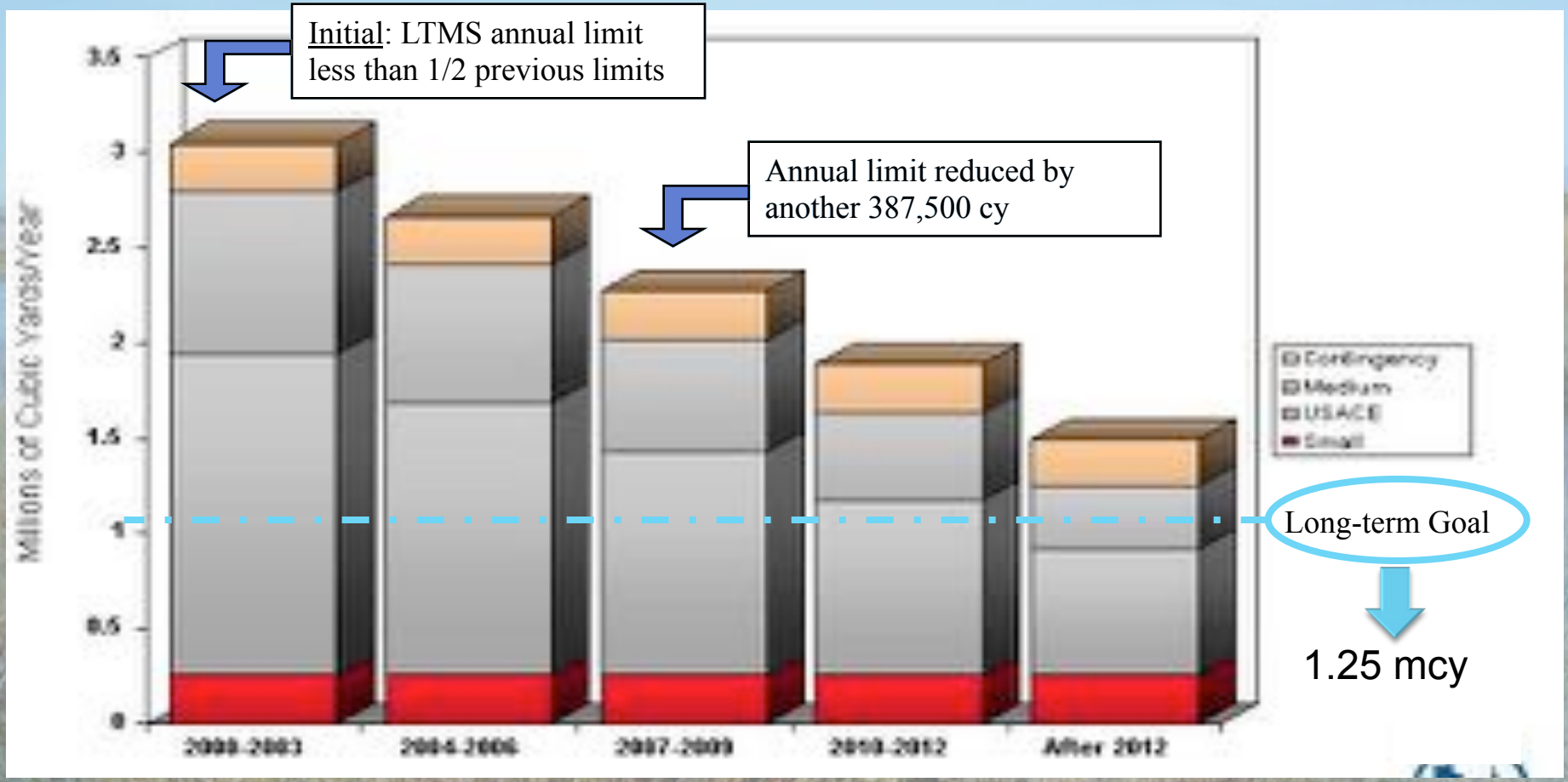
Response to Dredging and Environmental Crisis



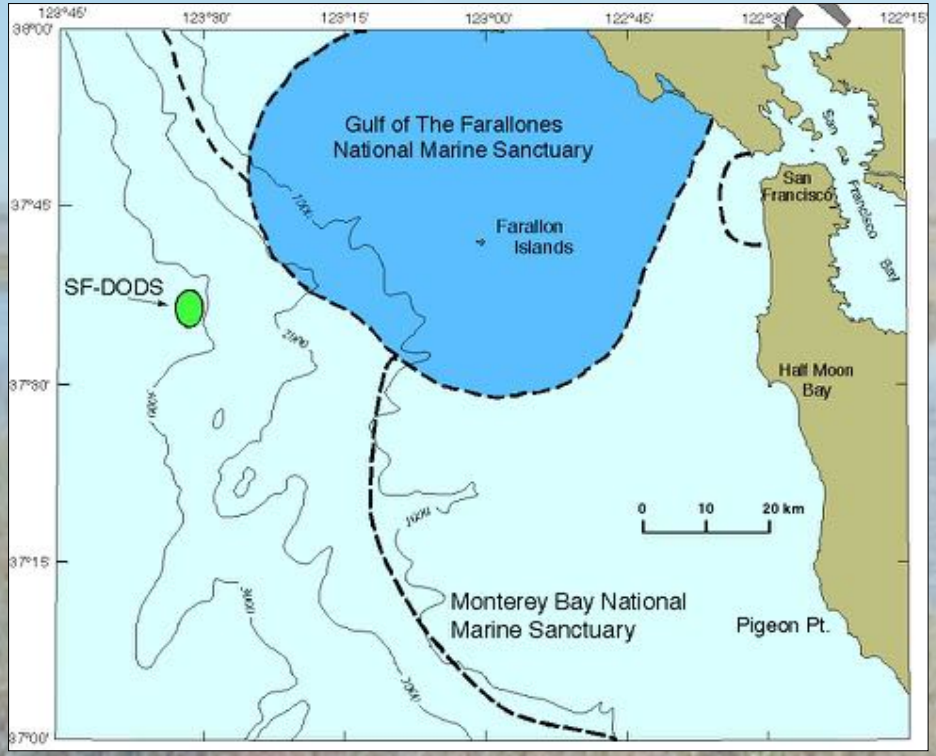


Biggest Recycling Project in the Bay Area

The LTMS Transition is Done….

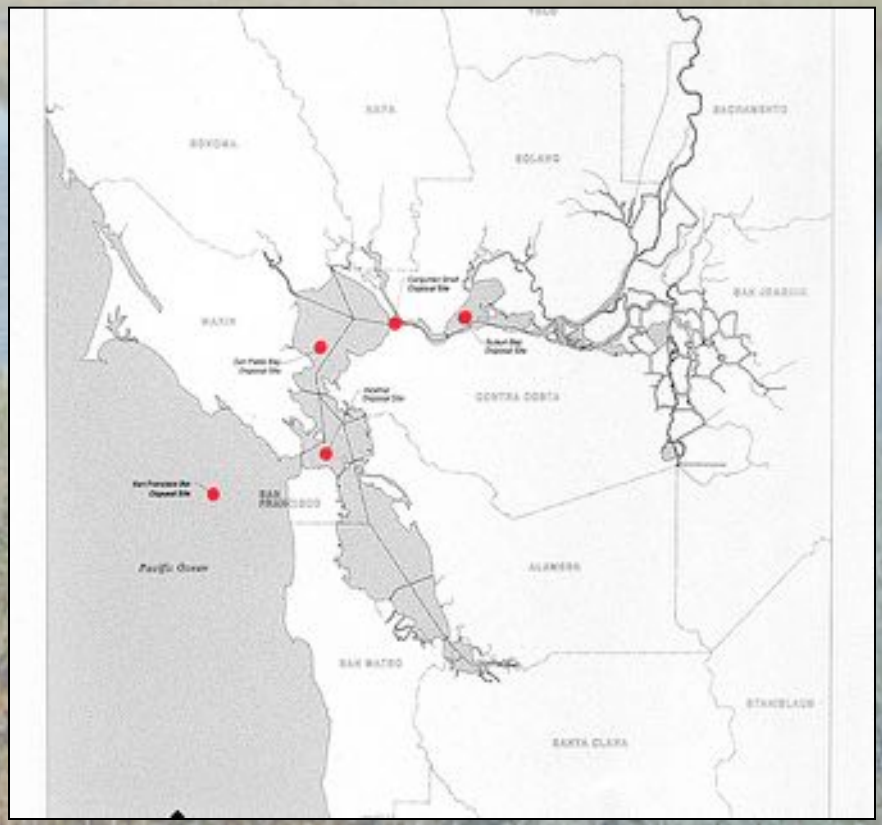


DEEP OCEAN DISPOSAL SITE

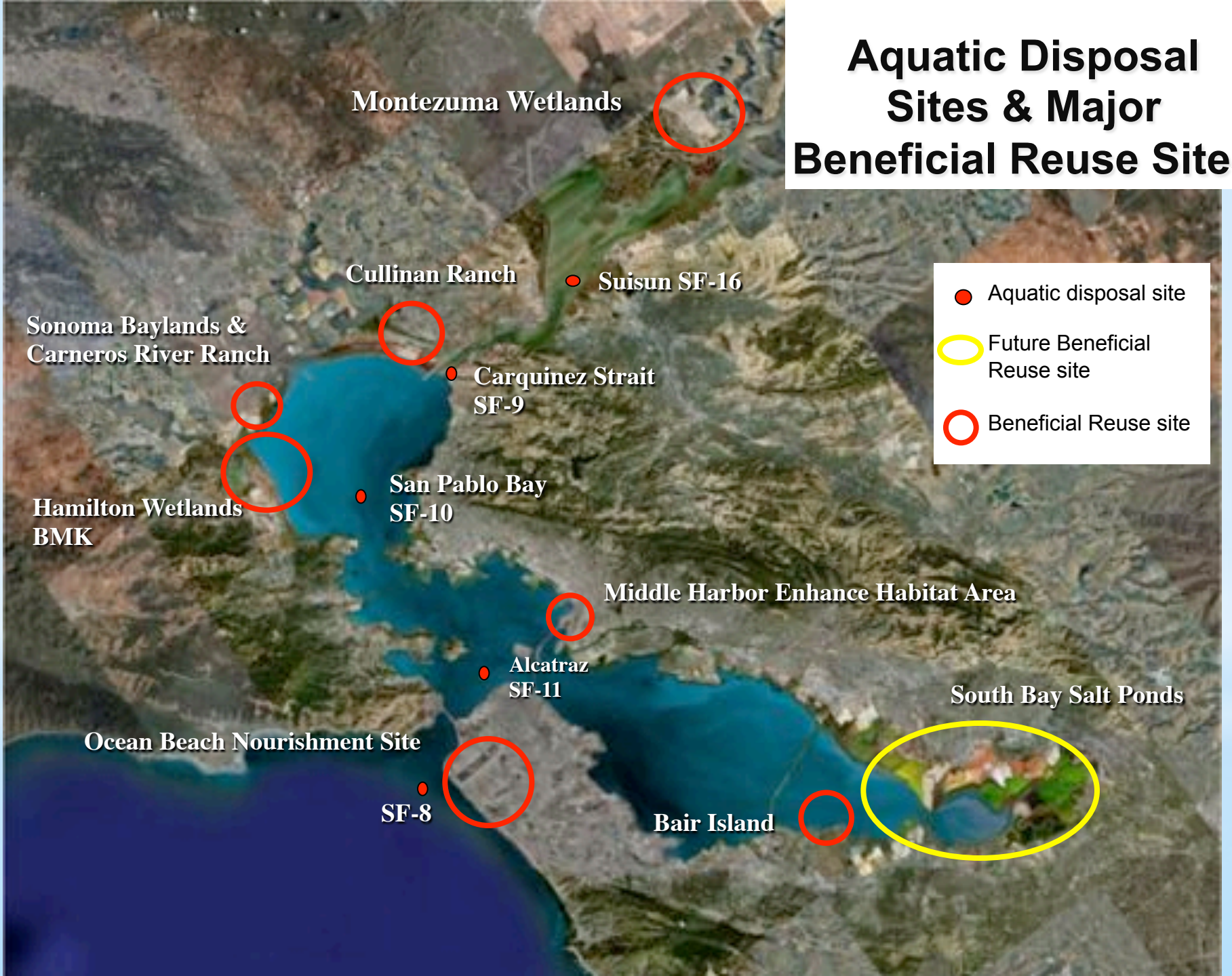


IN-BAY DISPOSAL SITES

- Alcatraz
- San Pablo Bay
- Carquinez Strait
- Suisun Channel

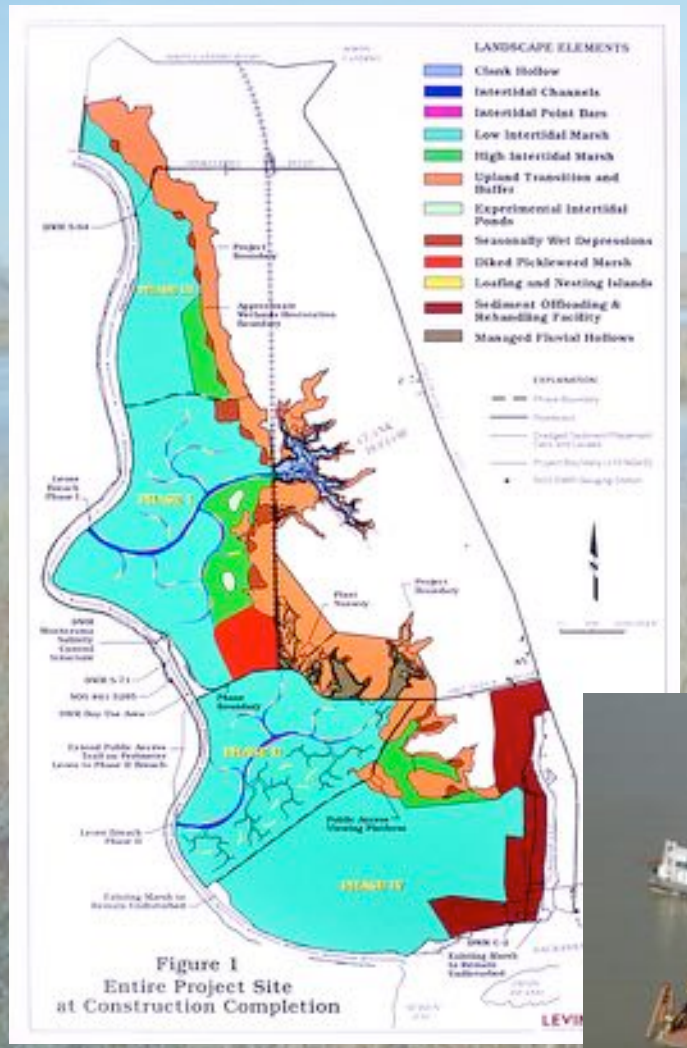


Aquatic Disposal Sites & Major Beneficial Reuse Sites



Sonoma Baylands

MONTEZUMA WETLANDS



HAMILTON WETLANDS WITH BEL MARIN KEYS PARCEL V ADDITION

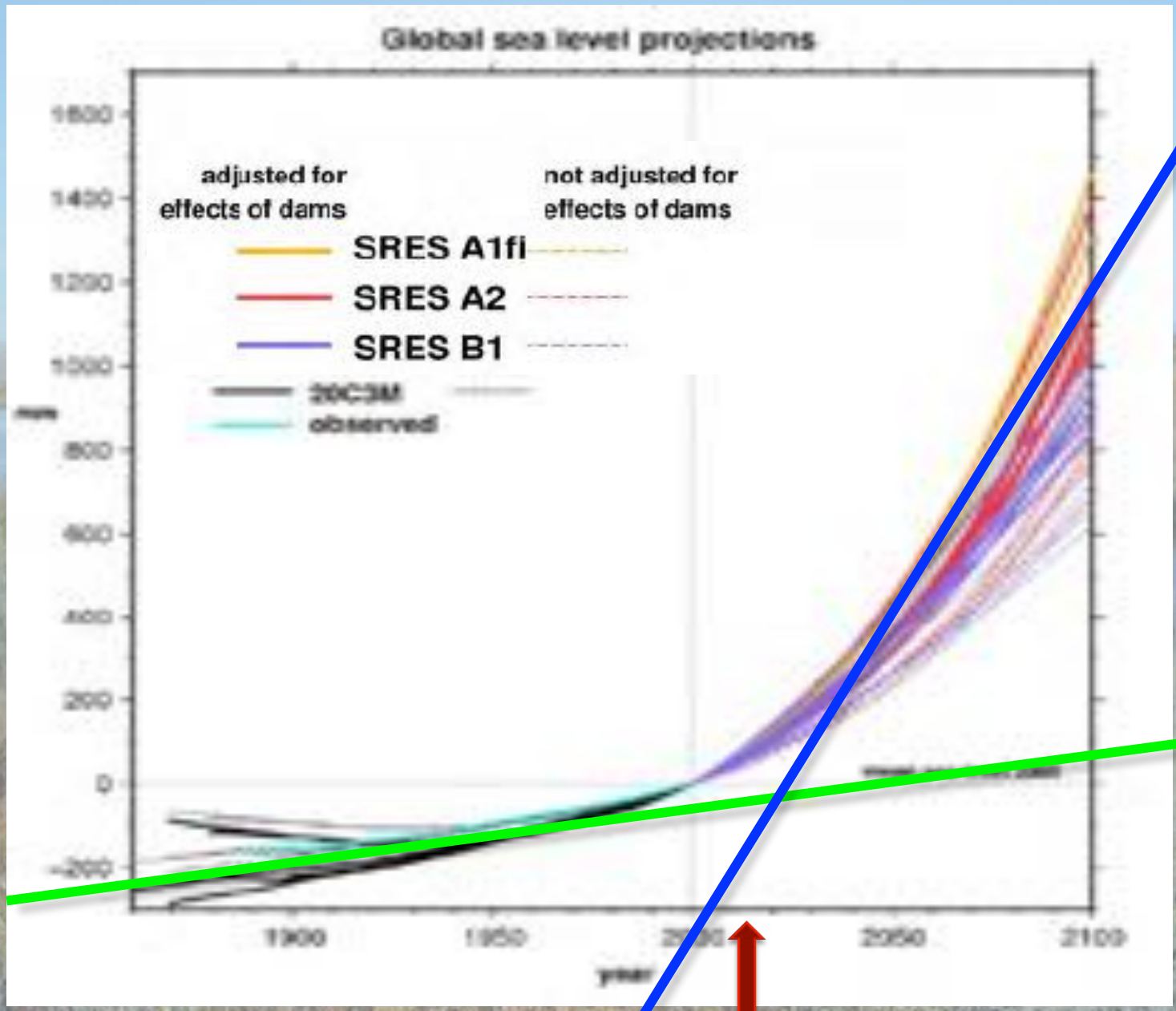
Inner Bair Island

And Now, Cullinan Ranch

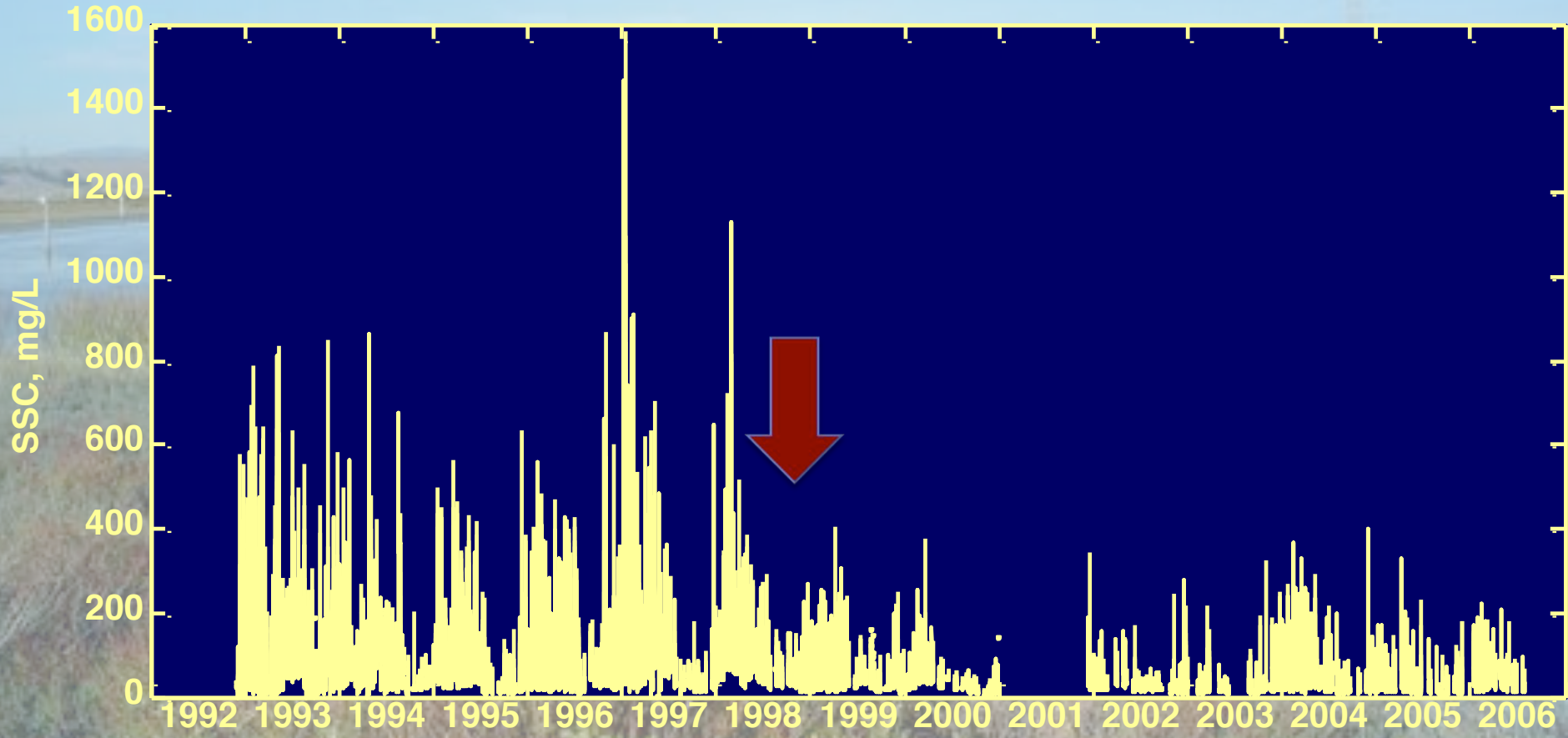
Sea Level Rise

1849

2100


Global sea level projections
adjusted for
effects of dams
not adjusted for
effects of dams
SRES A1fi
SRES A2
SRES B1
20C3M
observed
1600
1400
1200
1000
800
600
400
200
0
-200
1900
1950
2050
2100
year

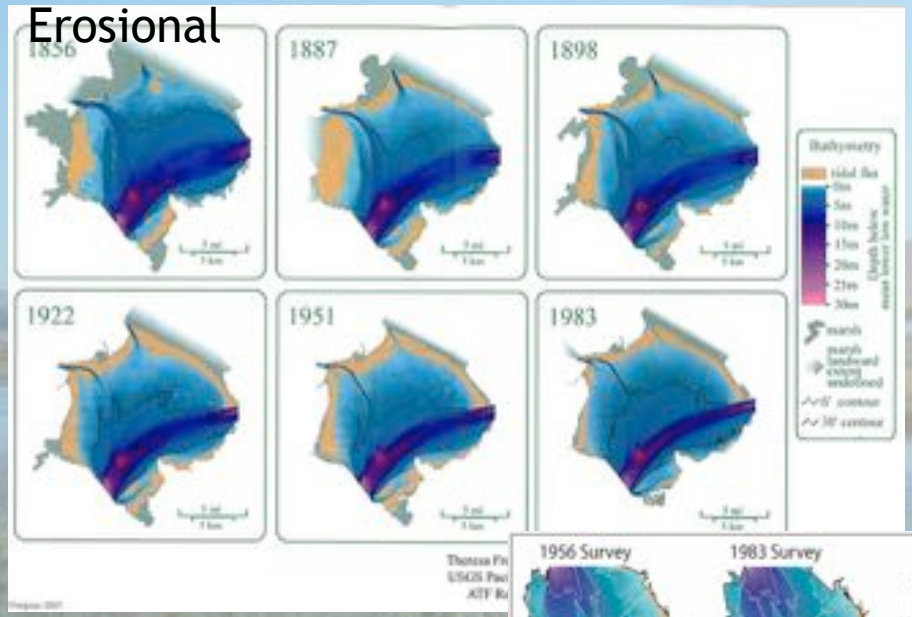
Decline in Sediment Supply



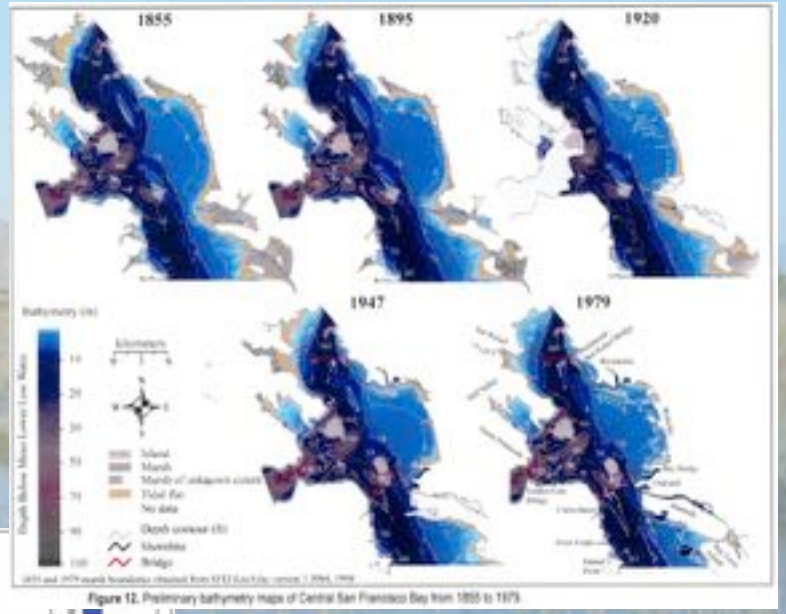
Point San Pablo, mid-depth, Dave Schoellhamer, USGS

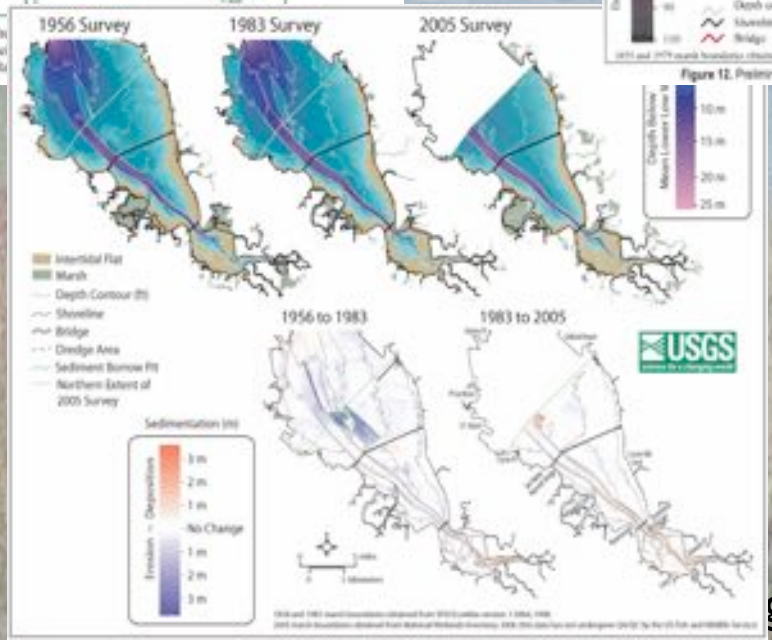
Embayments: Erosional & Depositional

San Pablo Bay - Erosional



Central Bay - Erosional

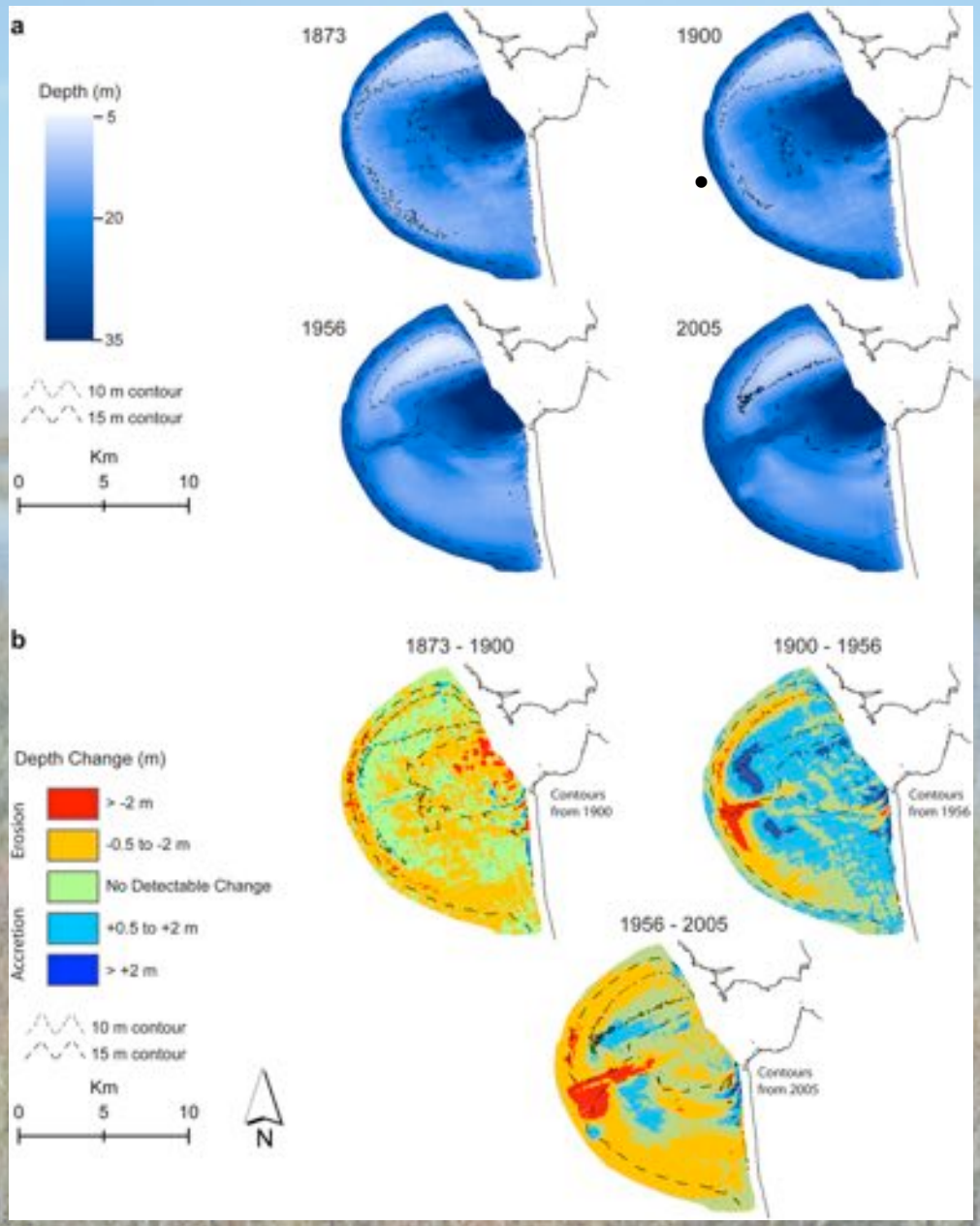




South Bay - Depositional

goso, Jaffe, Foxgrover, USGS

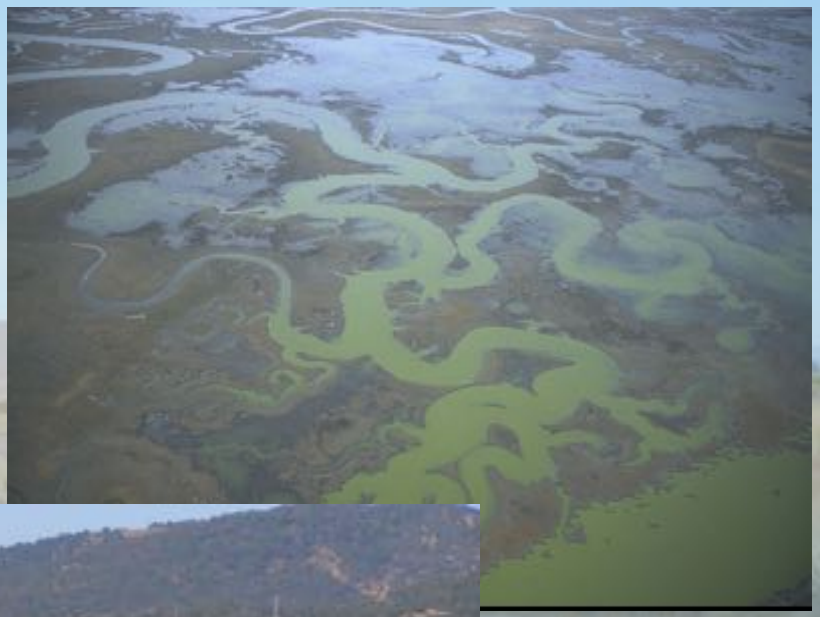
Ebb-Tide Delta Erosion



Dallas & Barnard, USGS

Today's Shoreline Tomorrow's Bay

Physical Processes Drive Biological Processes



Existing Marshes, Mudflats and Restoration Projects

- ✓ Increased Wave Action
- ✓ Increased Tidal Height
- ✓ Longer Duration of Inundation
- ✓ Increased Storm Surge
- ✓ Less Sediment

New Things to Consider/Reconsider:

- ✓ What is the target habitat?
- ✓ What is the period of anticipated marsh plain development?
- ✓ How does this compare with two periods of sea level rise?
- ✓ Is the adjacent suspended sediment adequate?
- ✓ Are their near by projects that will compete for sediment?

25 ml/l ??

100 ml/l ??

50 ml/l ??

200 ml/l ??

Consider Strange Bedfellows

The Community is Getting Larger and Needs to Be More Inclusive

- ✓ Flood Control Managers
- ✓ Restoration Community
- ✓ Dredging Community
- ✓ Industry
- ✓ Watershed Managers
- ✓ Scientists

*Creativity is Needed

- Aquatic Transfer Facility
- Bring your on Offloader (BYO)
- Outlaw Aquatic Disposal
- Charge a Fee to dispose in-Bay and level the playing field
- Give Carbon Credits for Reuse
- Others?

Creative Partnerships Are Becoming A Necessity

- ✓ Marshes as flood protection
- ✓ Sediment “suppliers”
- ✓ Projects with capacity or need
- ✓ Shoreline stabilization
- ✓ Coastal hazard planning
- ✓ Different funding sources

Regional Sediment Management

Looks at the system and the sediment-shed as a whole, balances the sediment needs between ecological and human needs on a headwaters to sea approach.

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Photo Credit: Steve Crooks, PWA

Thank you!

Questions?

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Photo Credit: PWA Steve Crooks