



# San Francisco Bay Long Term Management Strategy

**12-Year Review Process Meeting**

March 29, 2012

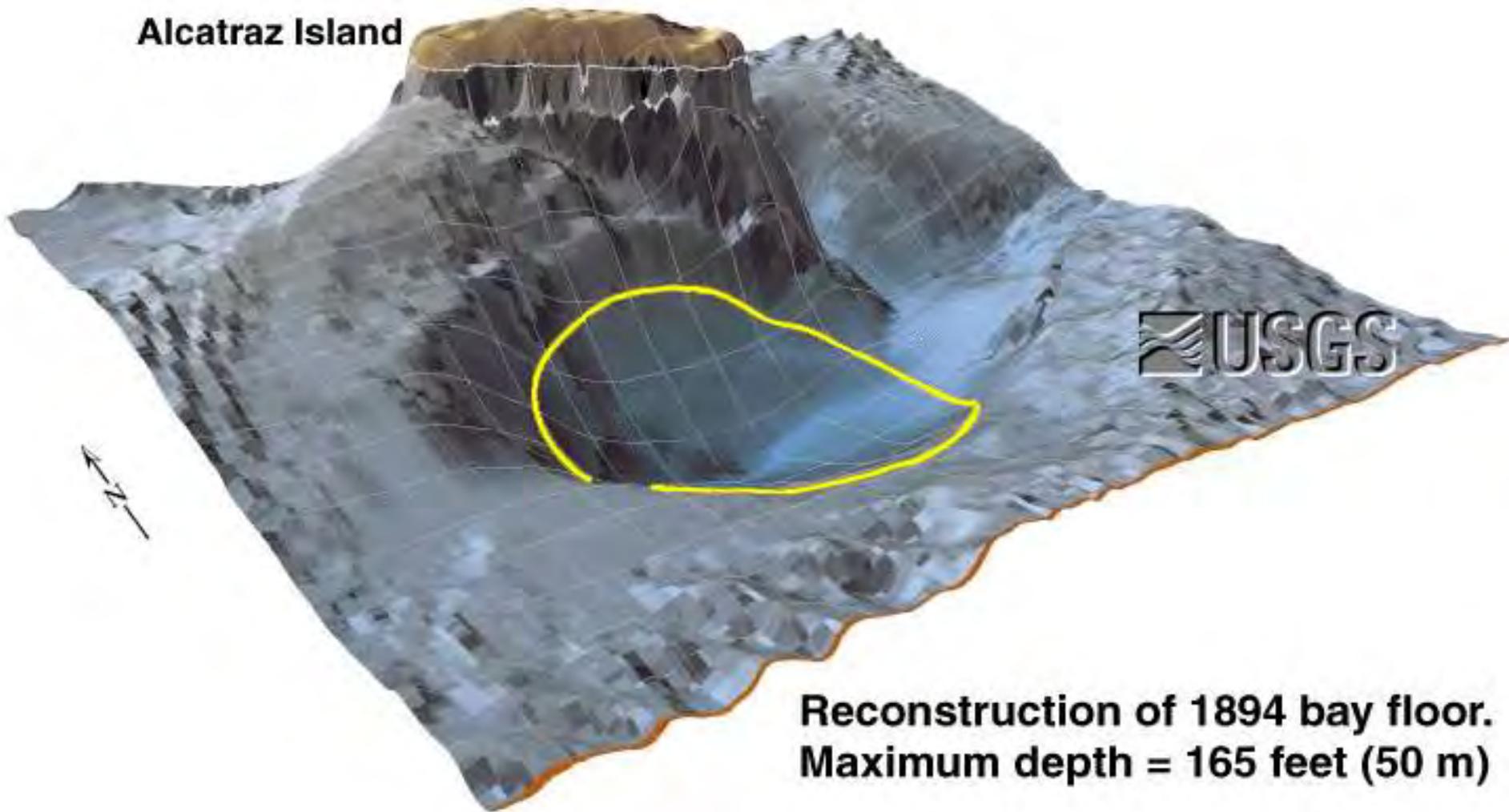
# In the Days Before LTMS

Public Objections to In-Bay Disposal - Blockade!



# Severe Mounding at the Alcatraz Disposal Site

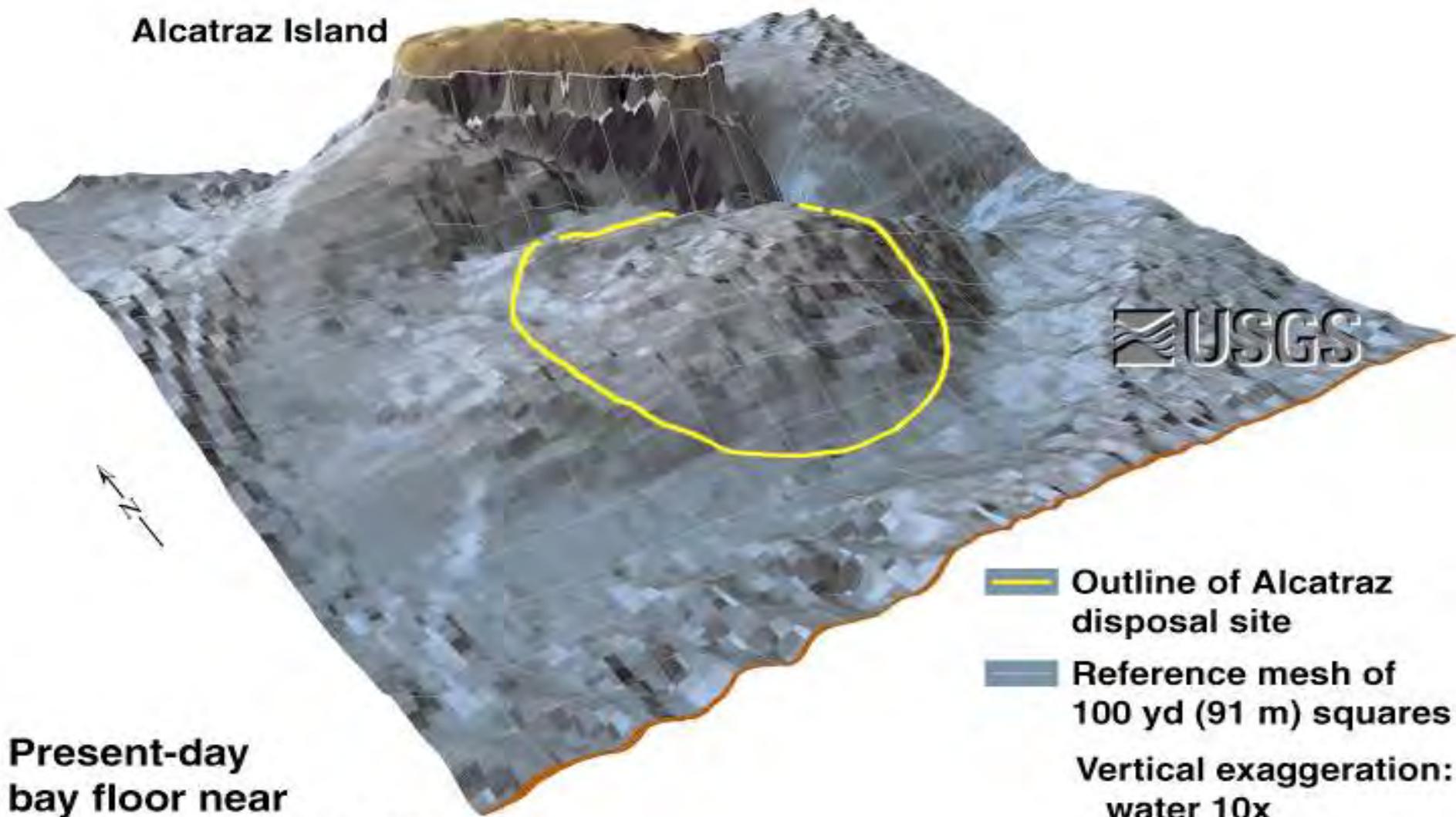
Alcatraz Island



Reconstruction of 1894 bay floor.  
Maximum depth = 165 feet (50 m)

# Severe Mounding at the Alcatraz Disposal Site

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

# In the Days Before LTMS

- Public concerns regarding dredging
  - Fisheries declines
  - Impacts to habitat
  - Water quality and turbidity
  - Contaminated sediment
  - Mounding at Alcatraz
  - Lack of trust in permitting process



# Origin of the LTMS

## The San Francisco Estuary Project's CCMP

- Five key challenges facing the estuary:
  - Decline of biological resources (especially wetlands and related habitats)
  - Increased pollution
  - Freshwater diversions and altered flow regime
  - Intensified land use and population
  - **Dredging and waterway modification**
- The San Francisco Bay LTMS
  - Implementing arm of the CCMP for Dredging and Waterway Modification



# LTMS Goals

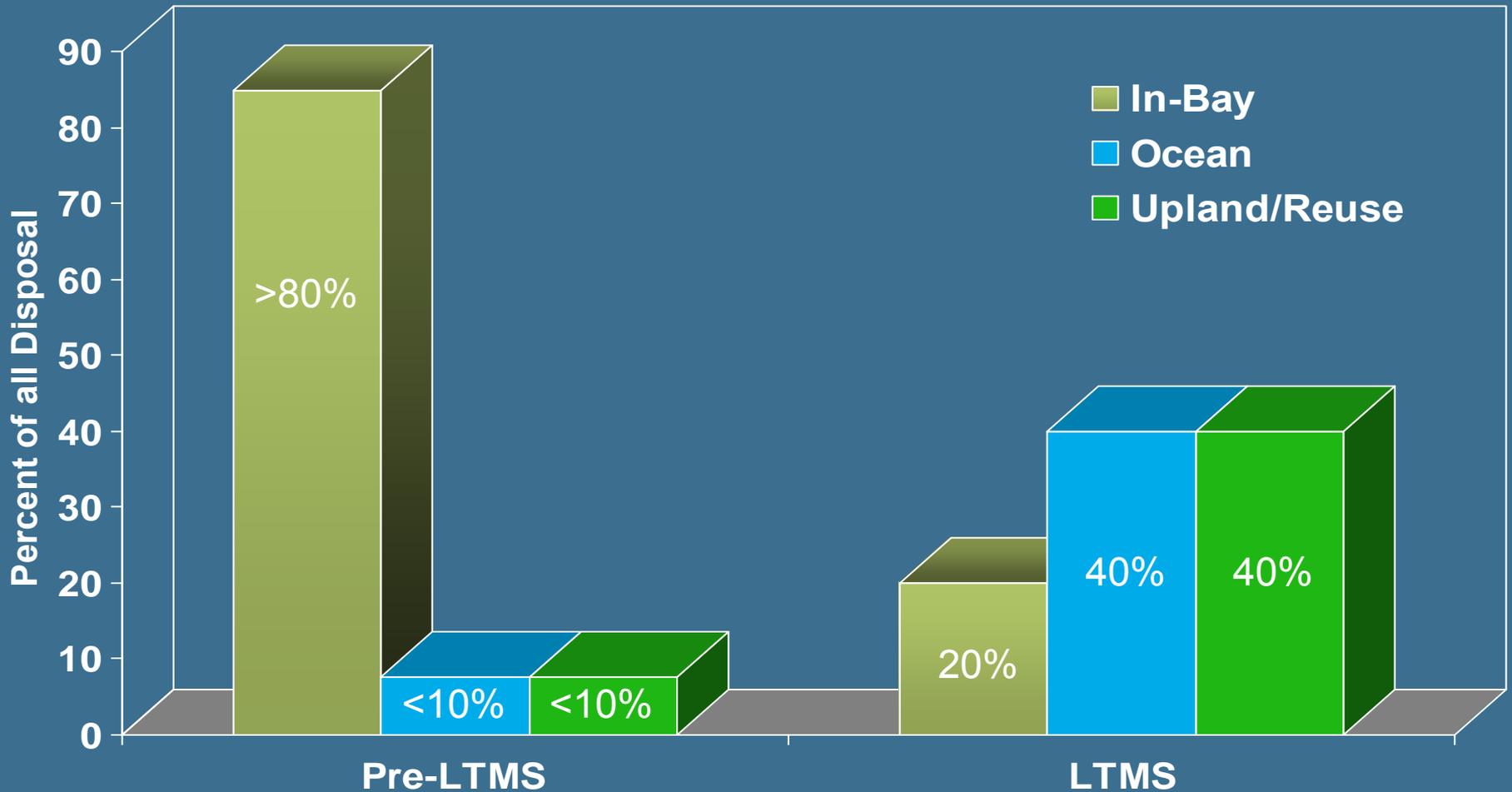
- Maintain...those channels necessary for navigation...and eliminate unnecessary dredging
- Conduct dredged material disposal in the most environmentally sound manner
- Maximize use of dredged material as a resource
- Establish a cooperative permitting framework

LTMS Executive Committee, 1991

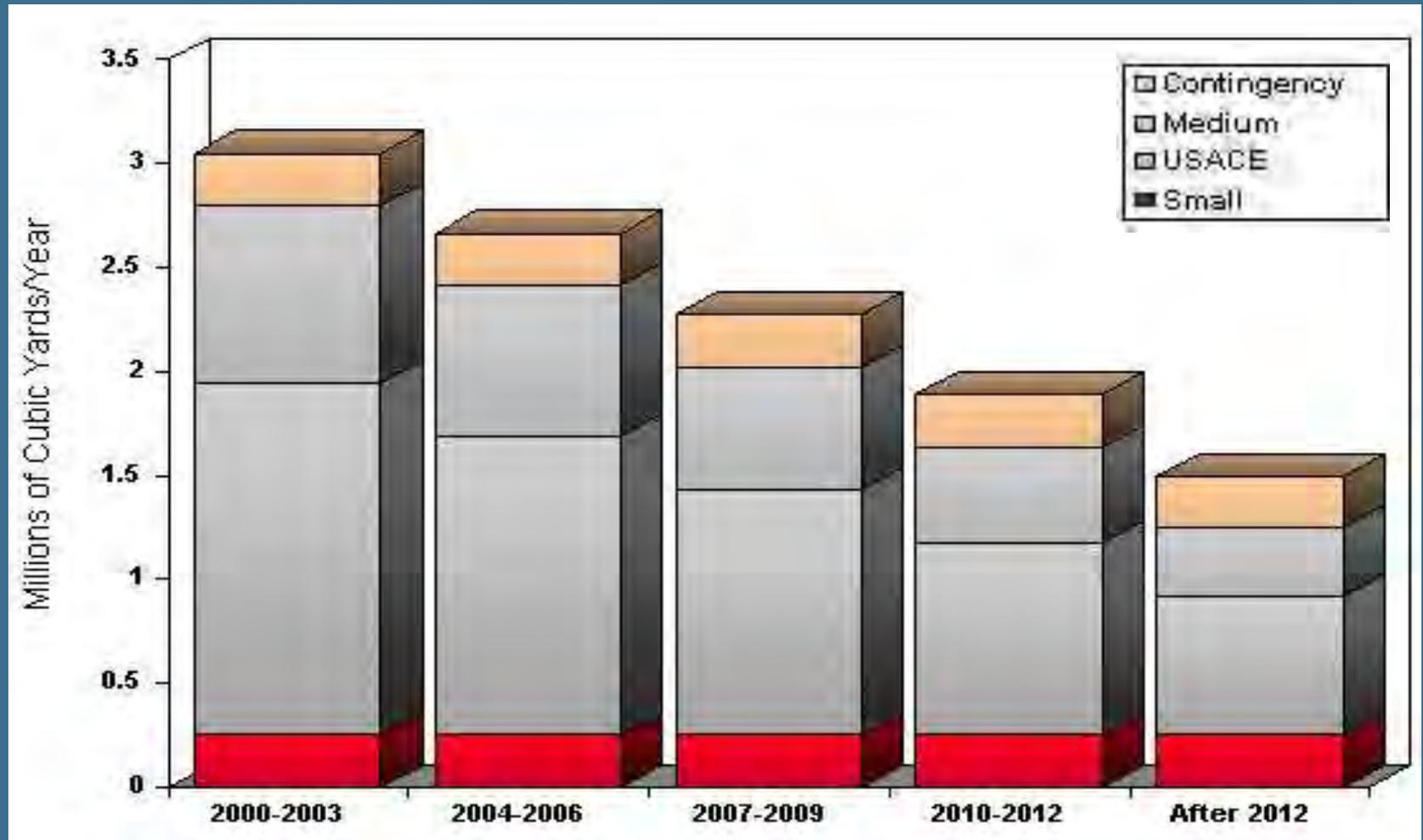


*LTMS 12-Year Review Meeting  
March 29, 2012*

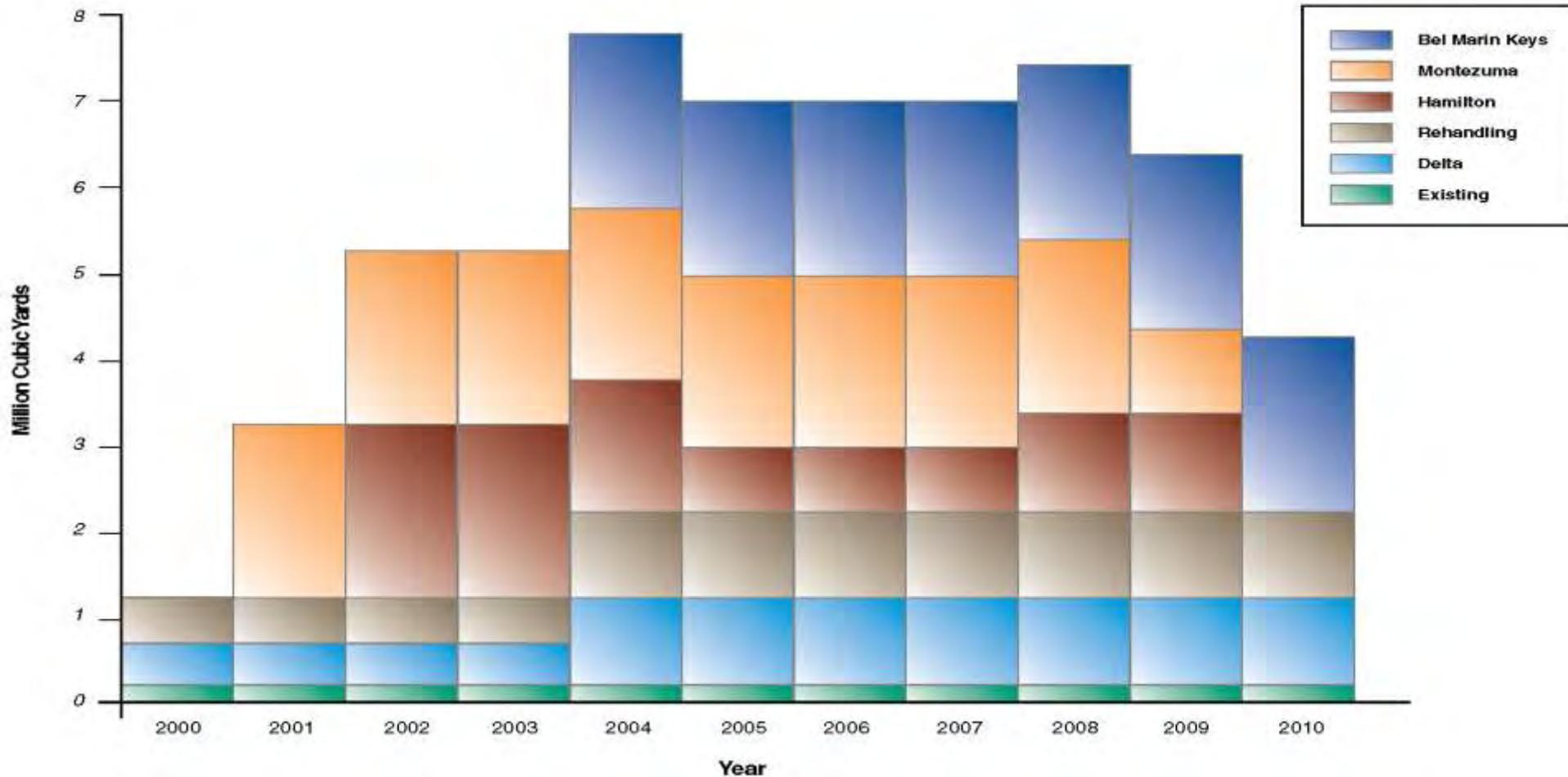
# The LTMS EIS/EIR Decision (1998-1999)



# 2001 Management Plan Transition Glide Path

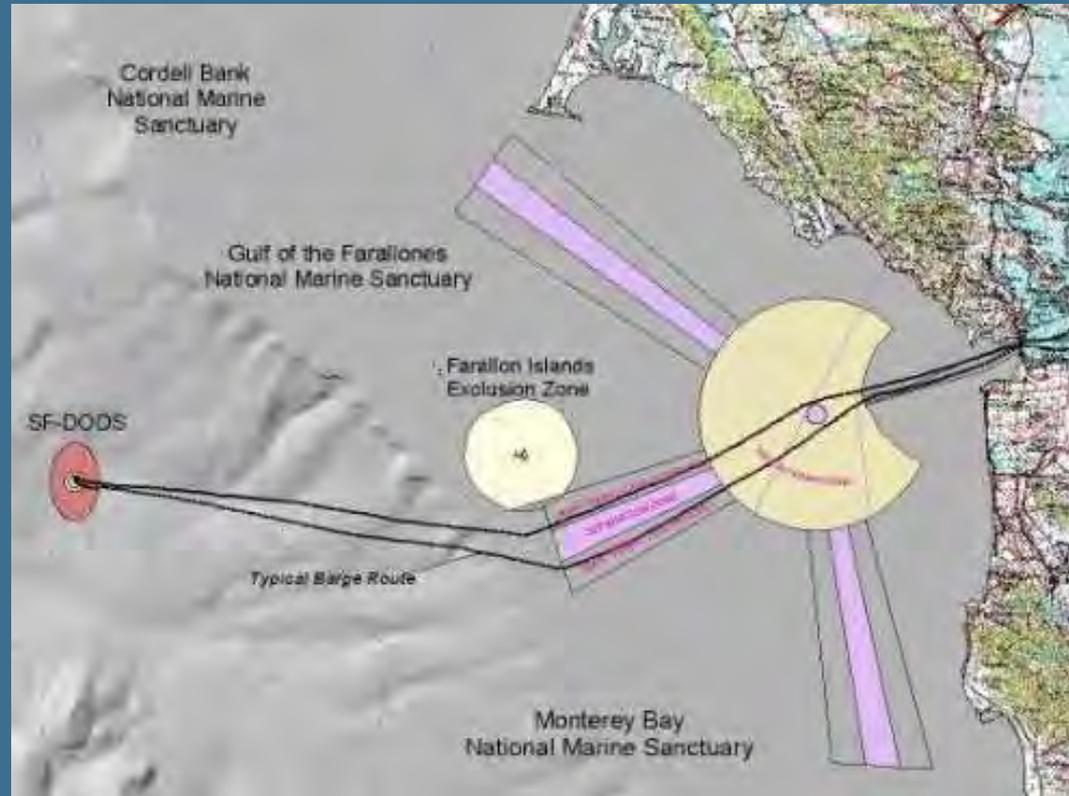


# Management Plan-Projected Beneficial Reuse and Upland Disposal Capacity



# Management Plan – SF-DODS as “Safety Valve”

- Deep ocean site ~ 55 miles offshore
- Successfully used and monitored since 1995
- Negligible ocean impacts
- Reduced risk to Bay resources
- Where practicable, preferred over in-Bay disposal when beneficial reuse sites not available
- But still “disposal”



# 12-Year Program Review Metrics

1. Use the quantitative and qualitative success criteria from Chapter 8 of the LTMS Management Plan
2. Evaluate additional measures of effectiveness at meeting the LTMS Goals

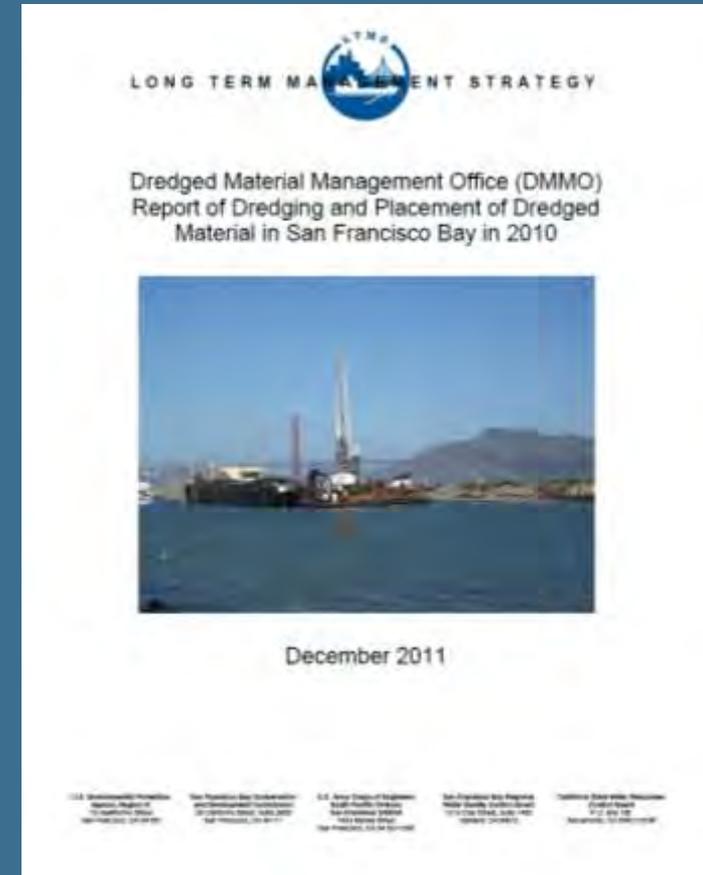
**But First:**

What are the dredging statistics under the LTMS?

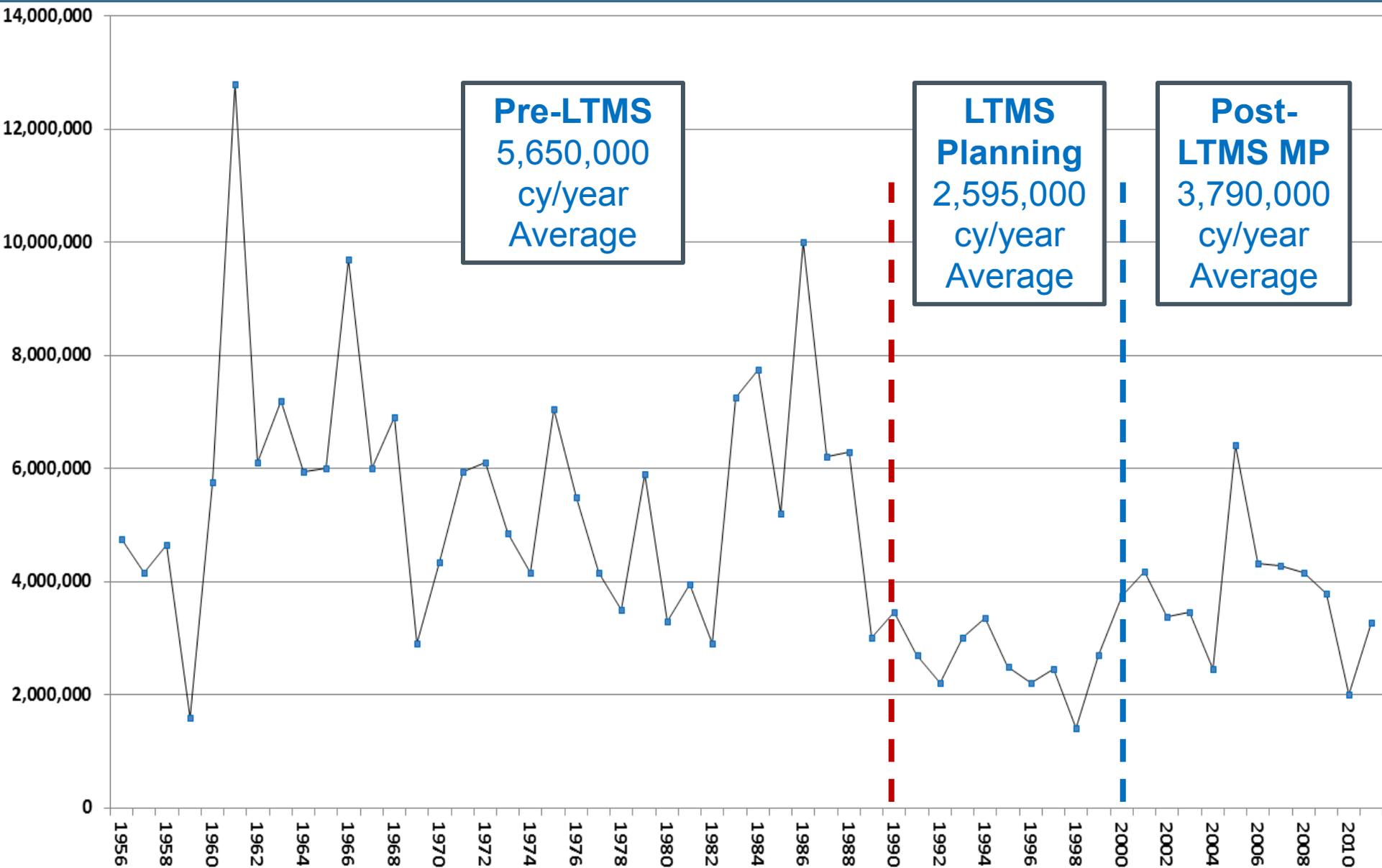


# Dredging and Disposal Trends Under the LTMS – 2000 to 2011

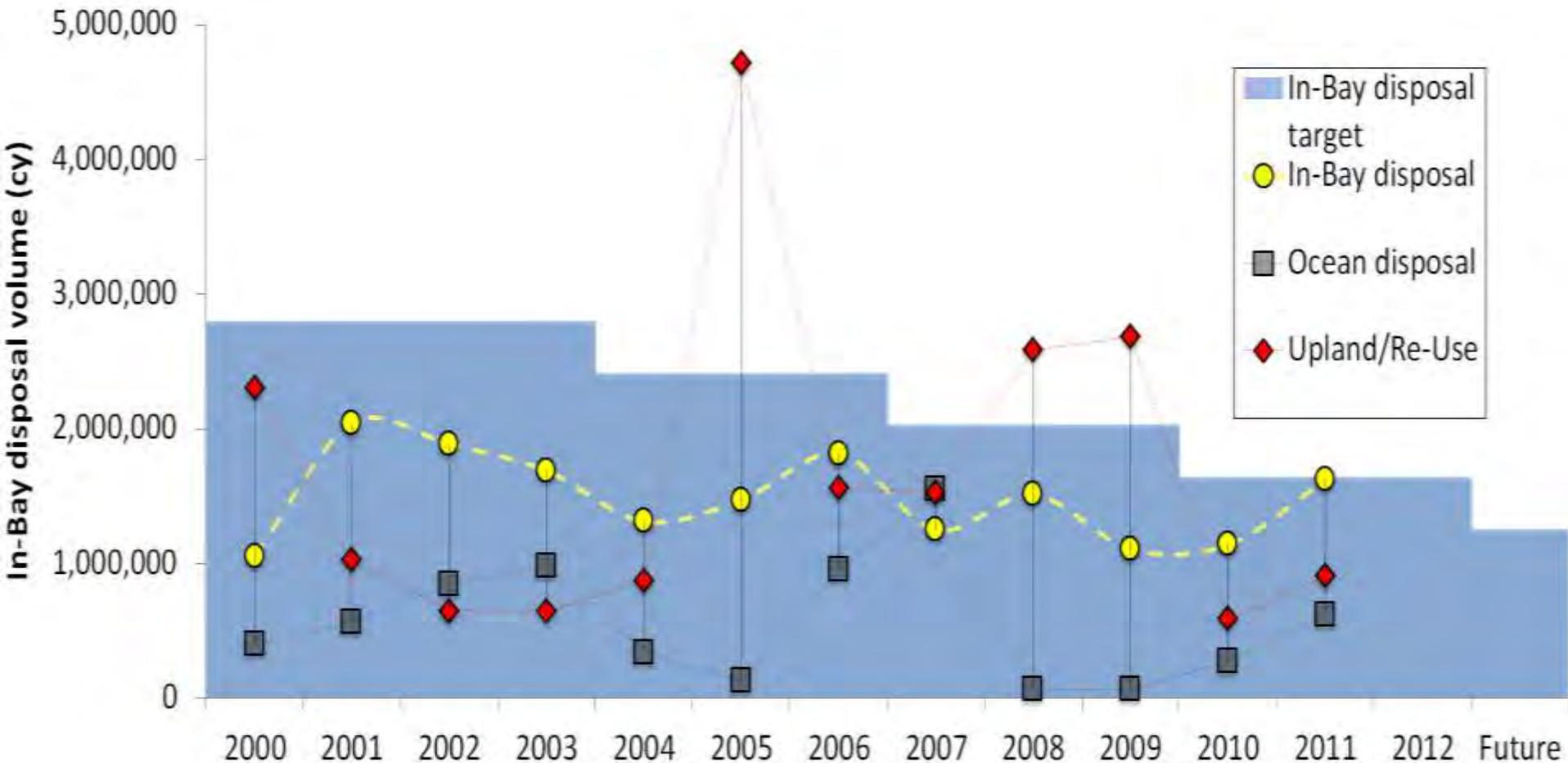
- Dredging and disposal volumes from DMMO Annual Reports
- Spreadsheets with the detailed data have been provided for stakeholder review



# Total Annual Dredging Volumes Since 1956

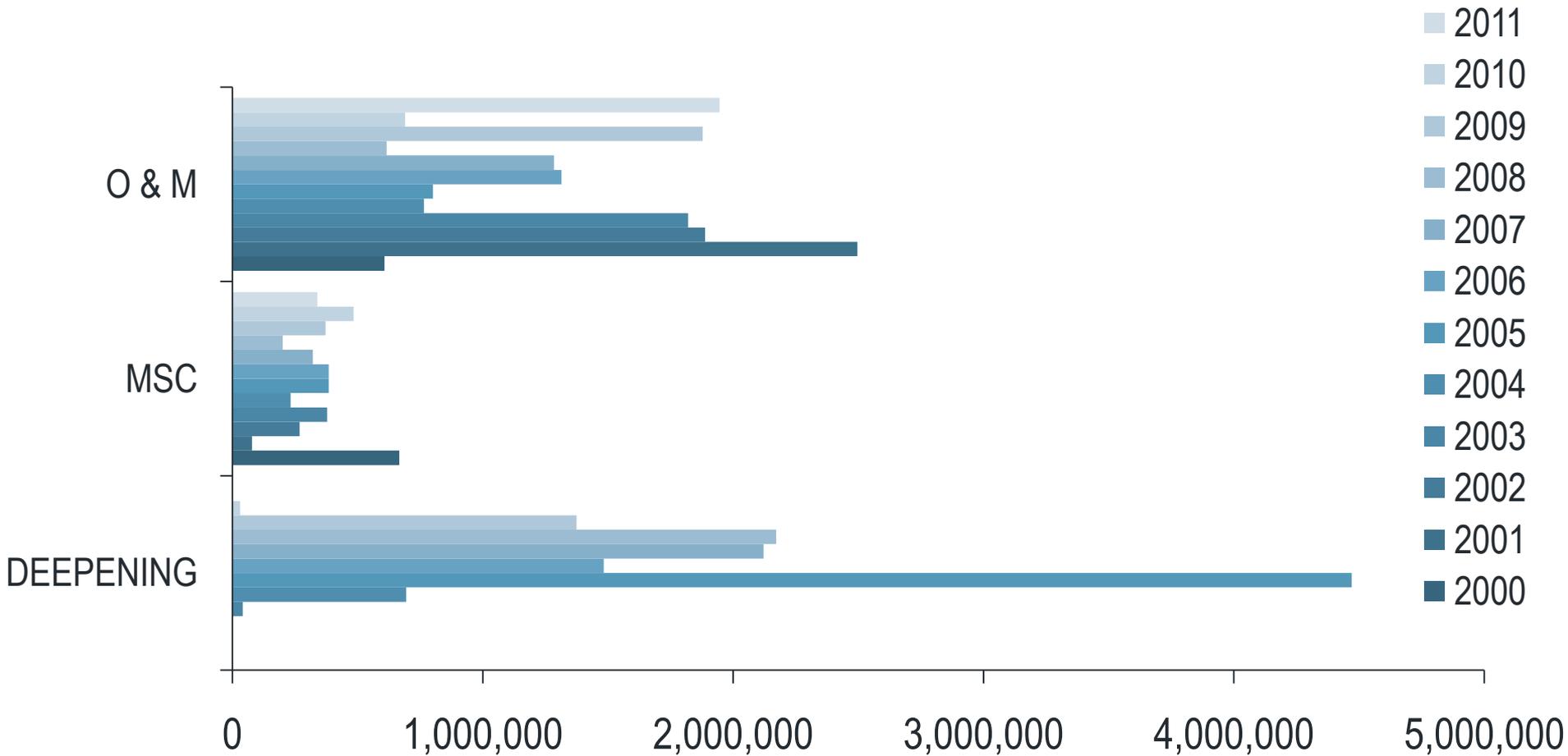


# In-Bay Disposal vs. Transition Glide Path – 2000 to 2011

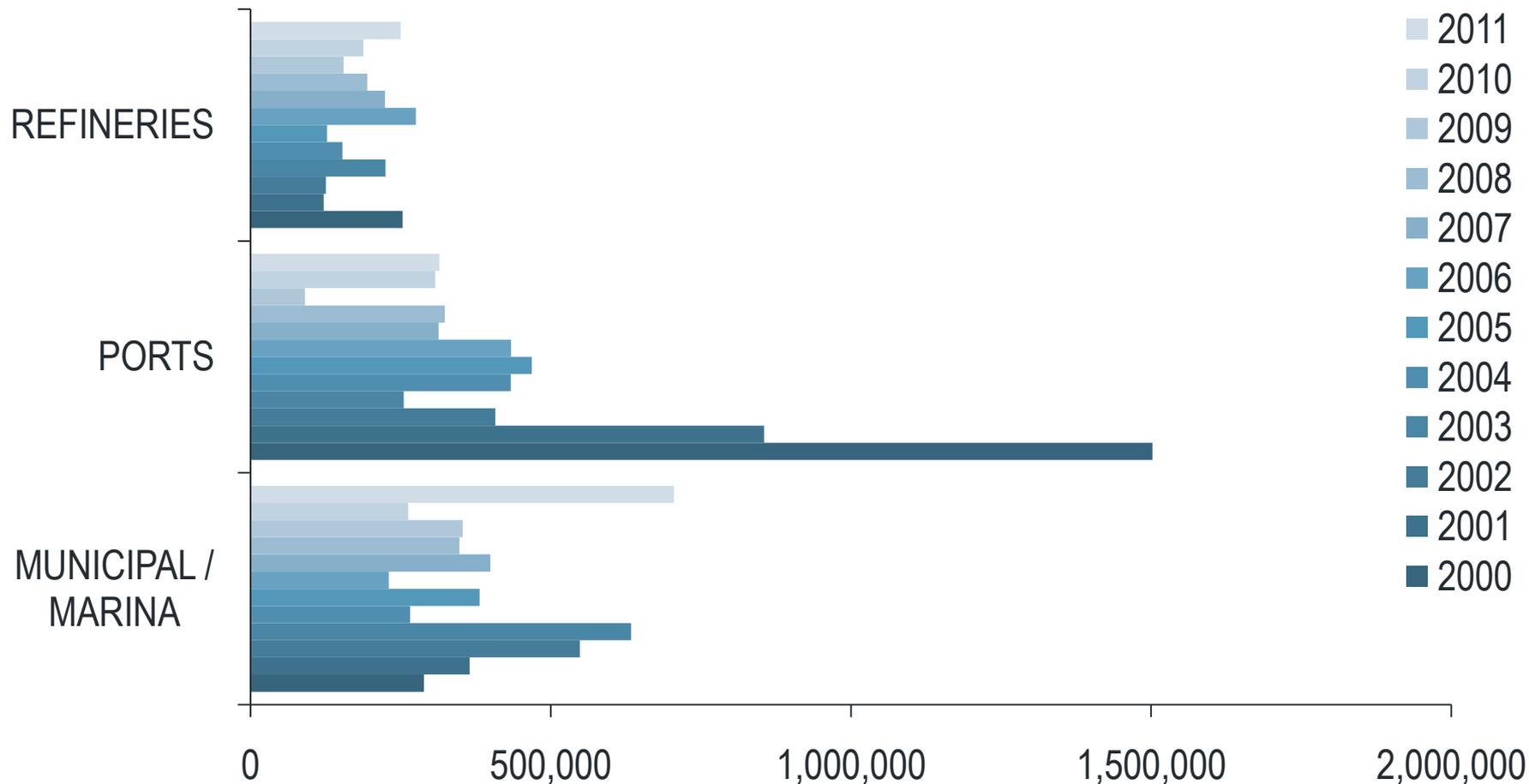




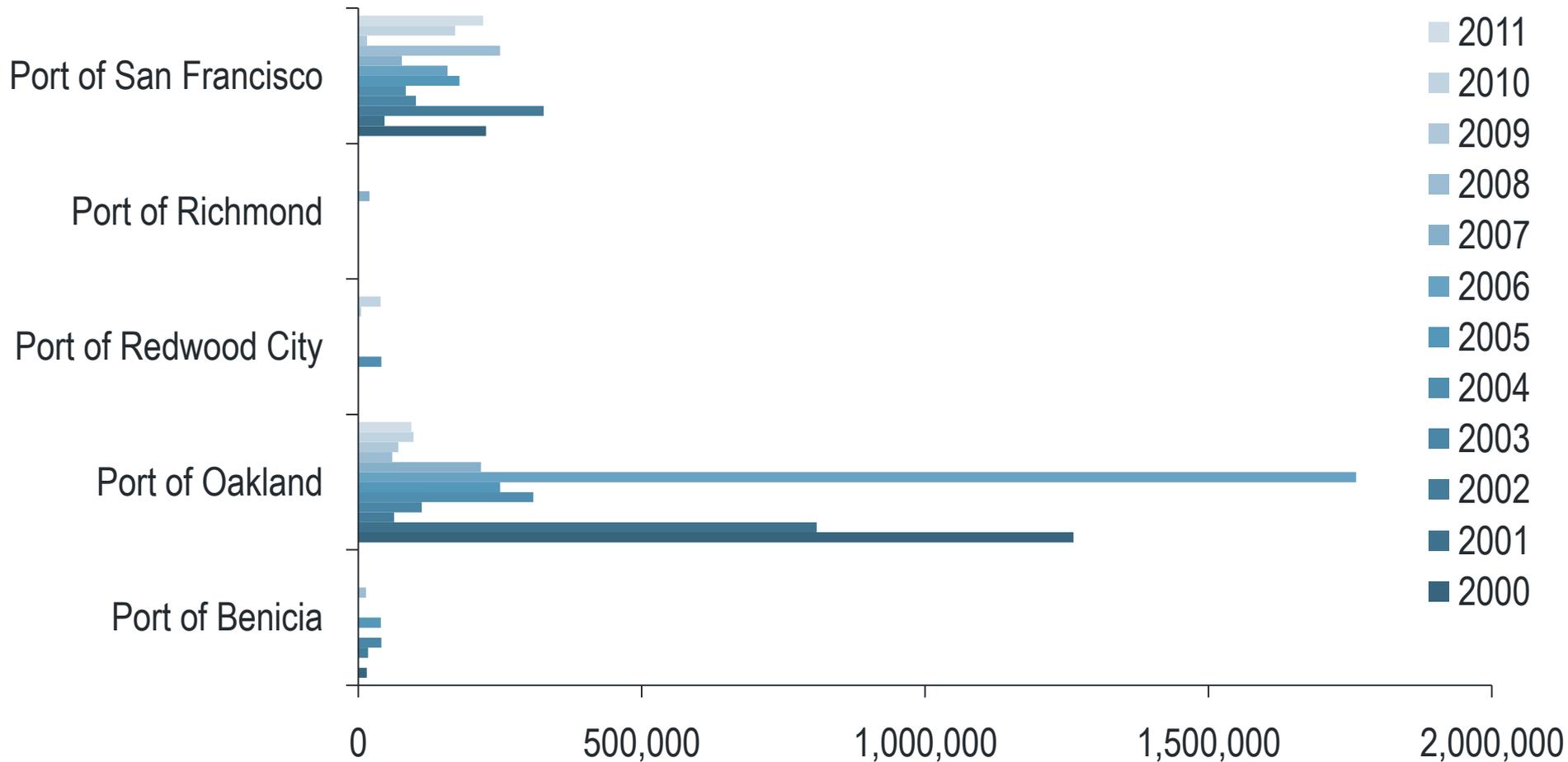
# Total USACE Dredging Volumes by Activity Type – 2000 to 2011



# Maintenance Dredging Volumes for Select Sectors – 2000 to 2011



# Total Dredging Volumes for Ports – 2000 to 2011



# Questions and Comments



*Photo: Brian Ross, USEPA*



# Program Review Per LTMS Management Plan Criteria

- Uses the quantitative and qualitative success criteria included in Chapter 8 of the LTMS Management Plan
- More detailed information is provided in Tables 1 and 2 of the Background Information Document



# Review Issues Per Management Plan

Quantitative Measures (Chapter 8)	Performance
Document long-term trends and variability in dredging volumes	☺
Meet or beat transition glide path	☺
Increased number of approved alternatives to in-Bay disposal	☺
Available in-Bay disposal capacity	☺
Number of sites for material that is not suitable for unconfined aquatic disposal to be reused	☺
Increased number of re-handling facilities	☺
10% increase in funding for upland disposal annually	☹
Adequate funding for LTMS	☹
Reduced cost for upland disposal	☹



# Review Issues Per Management Plan

Quantitative Measures (Chapter 8)	Performance
Acreage of Bay habitat restored using dredged material	😊
Acreage of habitat created for threatened and endangered species	😊
Reduced impact of dredged material on native species	😊
Footprint of Alcatraz and other sites	😊
Maintain navigability and project depths	~
Reduced navigational incidents or accidents (i.e., groundings)	😊
Depth of Alcatraz disposal site	😊
No lawsuits	😊



# Review Issues Per Management Plan

Qualitative Measures (Chapter 8)	Performance
Do we have upland sites?	😊
Is regional planning under way?	😊
Documented participation of all stakeholders	~
Local governments aware of LTMS process and taking action in reviewing dredging and disposal projects in support of LTMS (CEQA)	~
Sustained regional economic contribution from maritime community	~
In-Bay monitoring efforts of LTMS and RMP linked	😊



# Old Review Issues Per Management Plan

Qualitative Measures (Chapter 8)	Performance
Healthier Bay	😊
Reduce uncertainty as to adverse effects of disposal or reuse of dredged material	😊
Predictability of testing (Regional Implementation Manual approved/adopted)	😊
Process for dredging is “predictable”	😊
Consensus on nomenclature for suitability of dredged material	😊



# Questions and Comments



*Photo: Doug Lipton*



*LTMS 12-Year Review Meeting  
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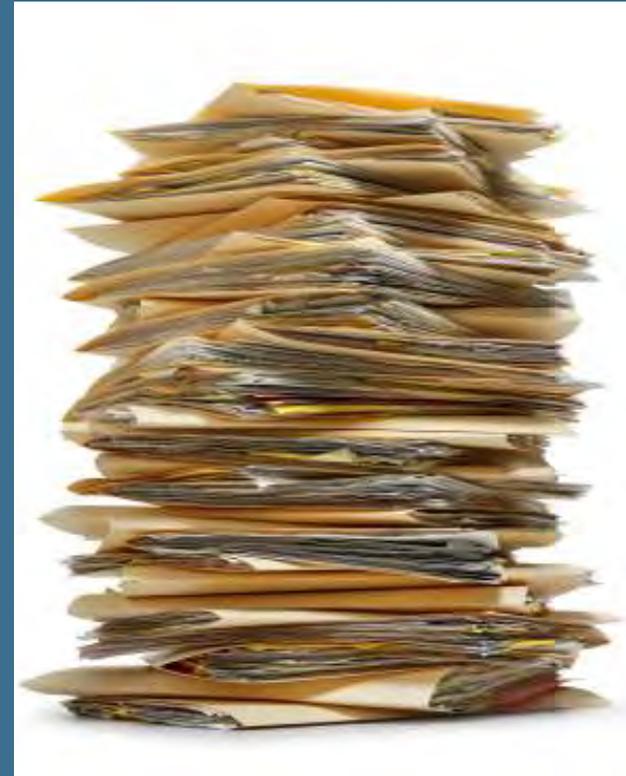
# Review Issues By LTMS Goal

- Establish a cooperative permitting framework
- Conduct dredged material disposal in the most environmentally sound manner
- Maximize use of dredged material as a resource
- Maintain...those channels necessary for navigation...and eliminate unnecessary dredging



# Dredged Material Management Office/Permit Coordination

- Issues:
  - Complicated coordination between agencies and applicants
  - Inconsistent project descriptions and permit conditions
  - Delays in permit issuance and thereby dredging



# Dredged Material Management Office/Permit Coordination

- Benefits:

- Consolidated permit application used by all LTMS agencies
- Regular public meetings offer coordination opportunities
- Permit processing time and consistency has improved and predictability has increased
- Fewer permit revisions
- 10 year permits available from all agencies
- Permitting of advance maintenance dredging where need is demonstrated

The image shows a screenshot of a web-based form titled "CONSOLIDATED DREDGING-DREDGED MATERIAL REUSE/DISPOSAL APPLICATION". The form is divided into several sections, including "GENERAL INFORMATION" and "PERMITTING INFORMATION". It contains various input fields for applicant details, project information, and permit specifications. The form is presented in a clean, structured layout with clear labels and input areas.



# Dredged Material Management Office/Permit Coordination

- Benefits (continued):
  - Authorization of in-place knock-downs in permits (monitoring required for projects above 5,000 cy)
  - Multi-year sediment testing schedules
  - Less frequent environmental review
  - Increased flexibility in meeting LTMS goals through:
    - Programmatic alternative disposal site analysis for small projects
    - Integrated alternative disposal site analysis for larger projects
- Constraints:
  - Database has not yet been made public
  - Separate agency permits are still required



# Testing/Suitability

## Pre-LTMS situation:

- PN 87-1 (1987)
  - Chemistry + 1 water column toxicity test
  - Alcatraz as its own reference => “hot spot”
- PN 93-2 (1993)
  - Chemistry + 1 water + 1 sediment (amphipod) toxicity test
  - New “Alcatraz Environs” reference area and database
  - Minimum sampling and compositing guidance



# Testing/Suitability

- Under the Management Plan
  - PN 01-01: meets National testing guidelines (ITM)
    - Chemistry + 1 water and 2 sediment toxicity tests
    - Bioaccumulation testing when needed
  - In-Bay and ocean suitability have similar basis
  - Tier I exclusions where baseline is adequate



# Testing/Suitability

- Continued improvements
  - Testing for dredging is distinct from CA SQOs
  - Integrated with TMDLs for Mercury and PCBs
    - TMDL limits directly reflected
    - Program recognized as “net remover” of contaminants
  - Integrated with programmatic EFH agreement
    - Predictable bioaccumulation and “residuals” testing
    - Some triggers recalculated annually by SFEI:
      - Mercury
      - PCBs (40)
      - PAHs (25)



# Testing/Suitability

**Table 1. Initial (2011) Sediment Chemistry Bioaccumulation Trigger (BT) Levels, for Unconfined in-Bay Placement at Designated San Francisco Bay Disposal Sites**

	Mercury (mg/kg)	Total PAHs (µg/kg)	Total PCBs (µg/kg)	Total DDTs (µg/kg)	Total Chlordane (µg/kg)	Dieldrin (µg/kg)	Dioxins/ Furans (pg/g)
Bioaccumulation Trigger (Initial)	0.33	4800	16	50	37	1.9	10
Basis	a	a	a	b	b	c	d

EFH consultation established testing triggers for 7 compounds



<http://www.spn.usace.army.mil/conops/LTMSEFHfullsignedagreementFINAL6-9-2011.pdf>

Testing triggers for 3 of the compounds vary as calculated annually by SFEI



**Thresholds Effective in Calendar Year 2012 (Based on 2002-2010 RMP Data)**

Contaminant	90% UTL of 90th percentile	DMMO BTs	90% UTL of 99th percentile (TMDL Disposal Limits)	Notes
Hg (mg/kg dry wt.)	0.341	0.34	0.471	Total Mercury
PCB (µg/kg dry wt.)	16.8	17	26.4 <sup>1</sup>	Sum of 40 congeners <sup>2</sup>
PAH (µg/kg dry wt.)	4,735	4,700		Sum of 25 PAHs <sup>2</sup>

<http://www.sfei.org/content/dmmo-ambient-sediment-conditions>



# Programmatic EFH Consultation

- LTMS Programmatic EFH consultation process completed in June 2011
  - Provided further protection of eelgrass
  - Added testing requirements for specific chemical analytes (bioaccumulation and residuals)
  - Required further study of impacts of dredging on benthic invertebrates and subaquatic vegetation
  - Technical modification has since been made limiting the need for additional mercury testing



# Programmatic EFH Consultation

- Benefits

- Less permit processing time for USACE, NMFS and permittees
- Establishment of BMPs that reduce frequency of disturbance to EFH
- Study of recovery following dredging disturbance
- Certainty in minimization and mitigation measures for projects with proximity to eelgrass
- Better reporting



# Programmatic EFH Consultation

- Impacts
  - Additional testing requirements (including residuals and bioaccumulation testing) may increase cost and timelines for some projects
  - Inclusion of silt curtains and/or light monitoring for projects adjacent to eelgrass beds increases costs



# CESA and ESA



Photos: Brenda Goeden, BCDC



# Environmental Work Windows

Site	Species	Jan	Jan	Feb	Feb	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sep	Sep	Oct	Oct	Nov	Nov	Dec	Dec	
		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	
SF Bay to Carquinez Strait	Chinook Salmon, Steelhead																									
SF Bay to Richmond	Chinook Salmon, Steelhead, Herring																									
Carquinez Bridge to Collinsville	Delta Smelt, Salmon and Steelhead																									
Berkeley Marina to San Lorenzo Creek within 1 mile of coastline	Least Tern Salmon and Steelhead																									
Napa and Petaluma Rivers, Sonoma Creek	Steelhead, Delta Smelt (Napa Only)																									
North SF Bay & San Pablo Bay shallow berthing areas	Dungeness Crab																									
Baywide within 250 feet of Salt Marsh Habitat	California Clapper Rail																									
Within 300' of known roost site	California Brown Pelican																									
In Areas with Eelgrass Beds	California Least Tern																									
Baywide in Areas of Salt Marsh Habitat	California Clapper Rail																									
In and Adjacent to Salt Marsh Habitat	Salt Marsh Harvest Mouse																									

For more detailed information, see Appendix F of the LTMS Management Plan or the LTMS EIR/EIS.

\* Depths are represented in MLLW, and are project depth, not including over dredge allowance

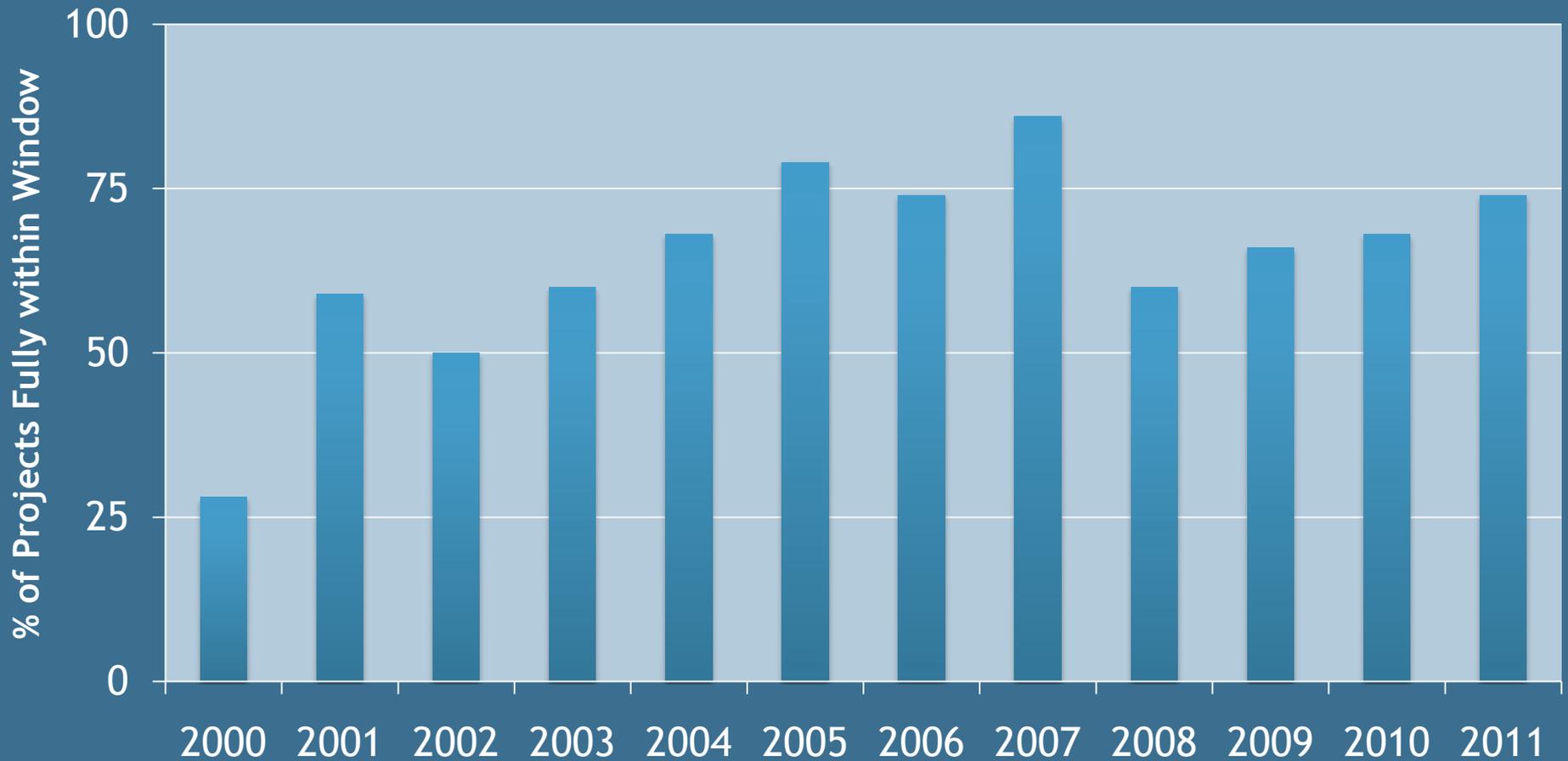
\*\*This chart is for operations and maintenance dredging of existing navigational facilities. Other species may be affected by work in other areas.

**WORK WINDOW**

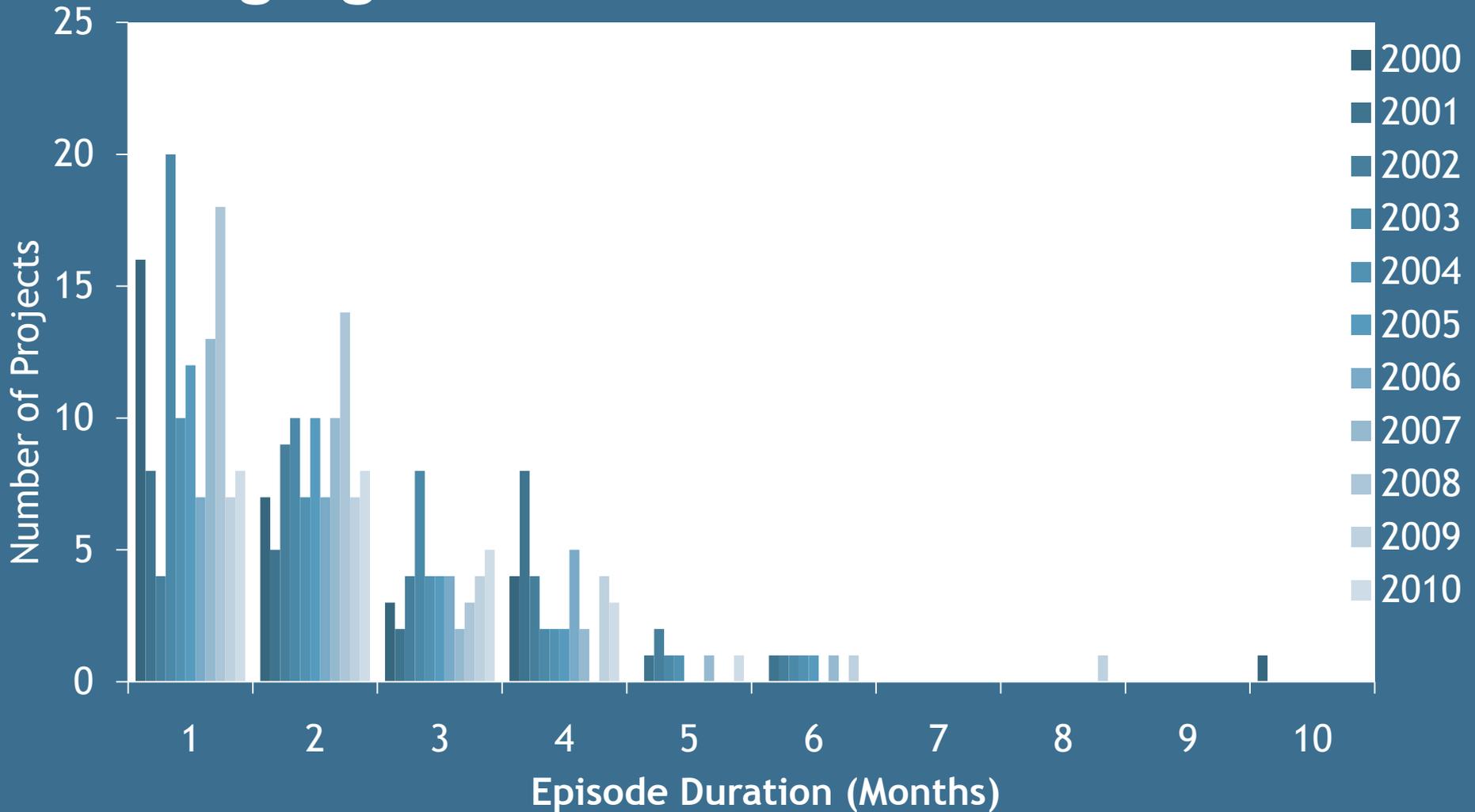
**CONSULTATION REQUIRED**



# Overall Compliance with Work Windows



# Dredging Duration



# Emerging Permitting and Testing Issues

- Equipment: entrainment by hydraulic dredges
- Water quality: dredging scow water “overflow”
- Recent listings: green sturgeon and longfin smelt
- New R.I.M.: updating PN 01-01
- Updated reference site(s)?
- Emerging contaminants
- Changing chemical thresholds (TMDLs, etc.)



# Questions and Comments



*Photo: Eric Jolliffe, USACE*

# Review Issues By LTMS Goal

- Establish a cooperative permitting framework
- Conduct dredged material disposal in the most environmentally sound manner
- **Maximize use of dredged material as a resource**
- Maintain...those channels necessary for navigation...and eliminate unnecessary dredging

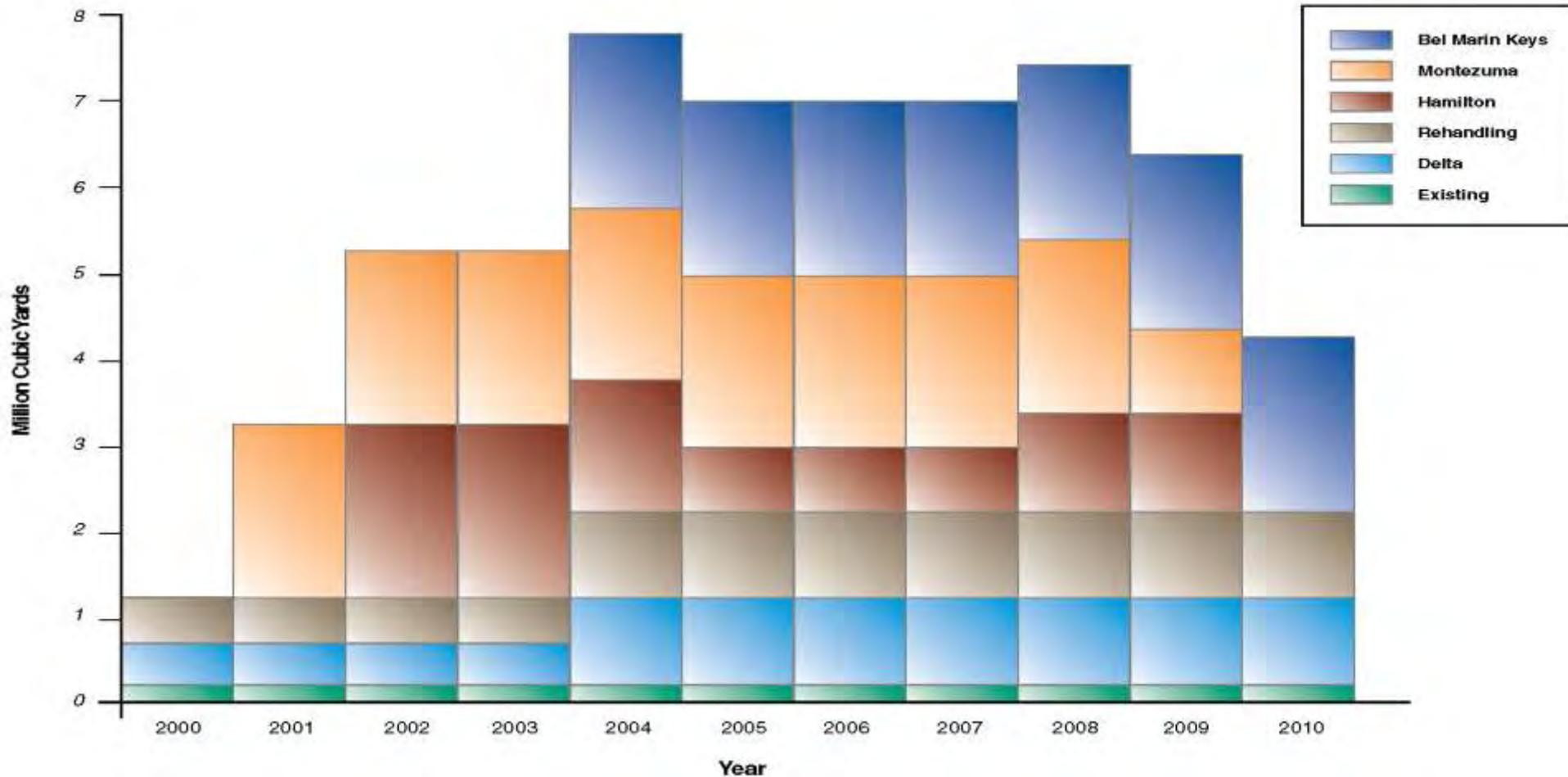


# Beneficial Reuse

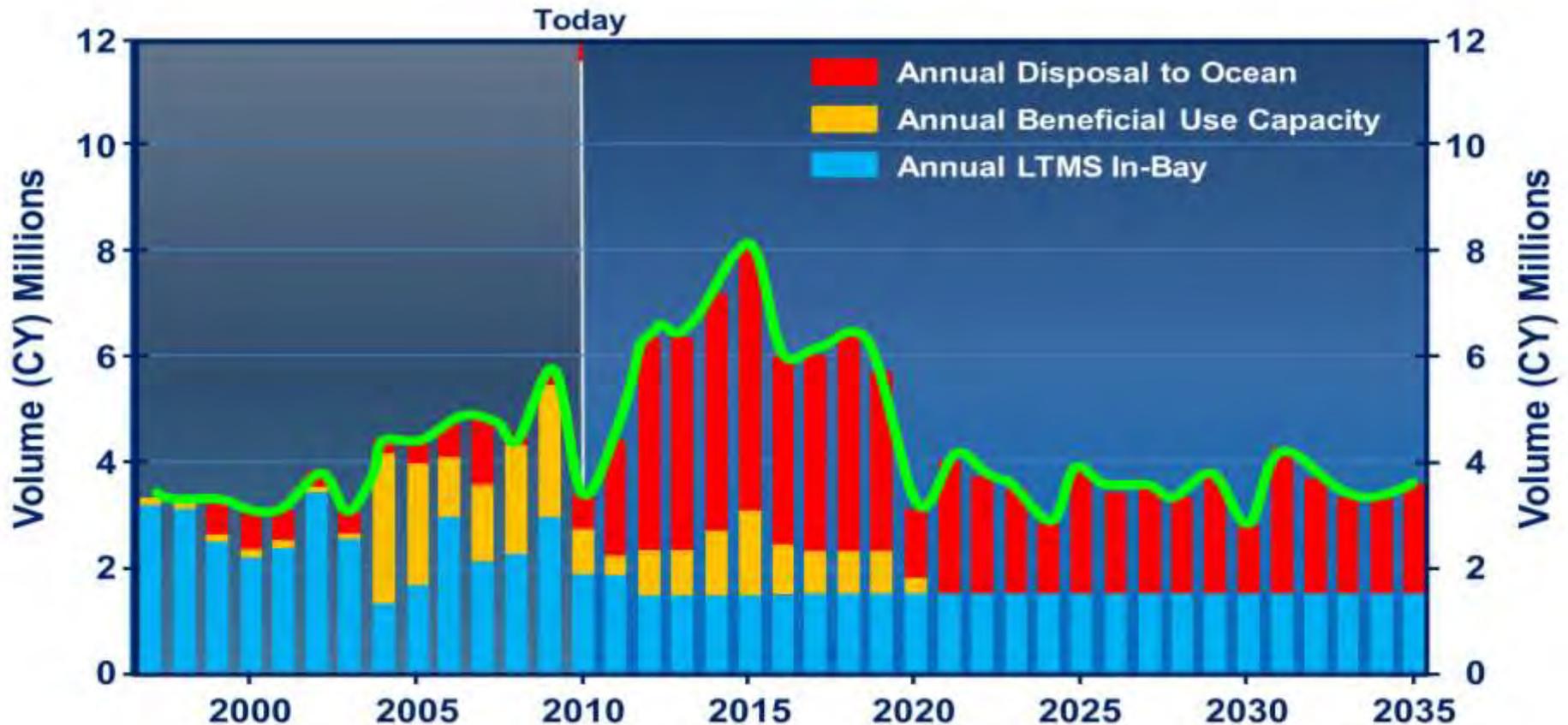
- Over 19 million cy of dredged material has been beneficially reused for wetland creation and restoration, levee maintenance, construction fill, sand, and landfill daily cover
- Over 2,100 acres of habitat have been restored using dredged material:
  - Middle Harbor Enhancement Area, Inner Bair Island, Hamilton, Montezuma, Sonoma Baylands, Castro Cove, Yosemite Slough, Port of Richmond Shipyard 3, Stege Marsh, and Peyton Slough



# Management Plan-Projected Beneficial Reuse and Upland Disposal Capacity



# DMMP-Projected Ocean, Beneficial Reuse, and In-Bay Disposal Capacities







# Questions and Comments



*Photo: Brian Ross, USEPA*



# Review Issues By LTMS Goal

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# Maintaining Navigation



*Photo: Javier del Castillo, BCDC*

# USACE Maintenance Dredging and Disposal Costs

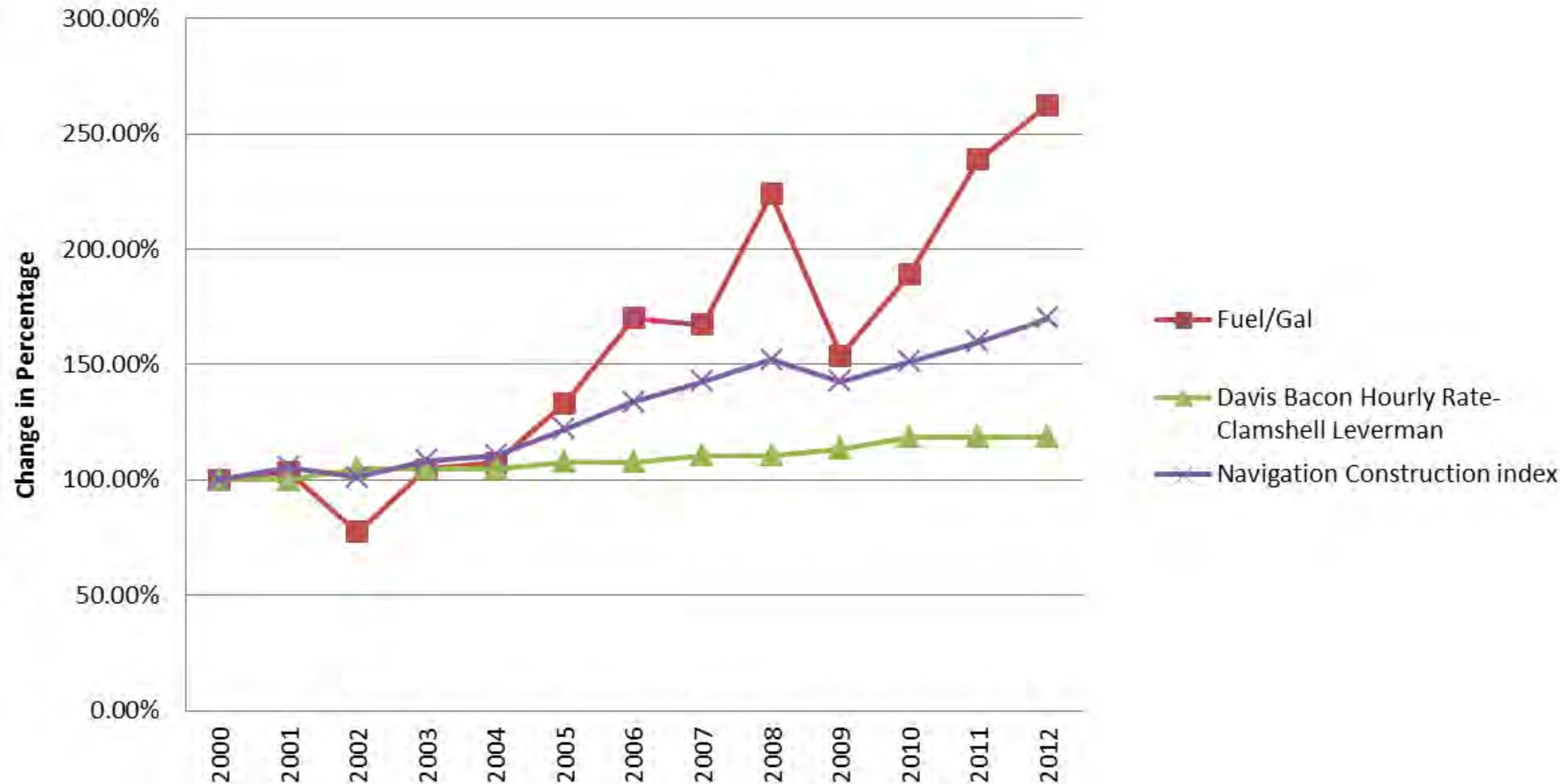
- Information was collected from official USACE contract documents and *Essayons* and *Yaquina* records
- All deepening costs have been removed



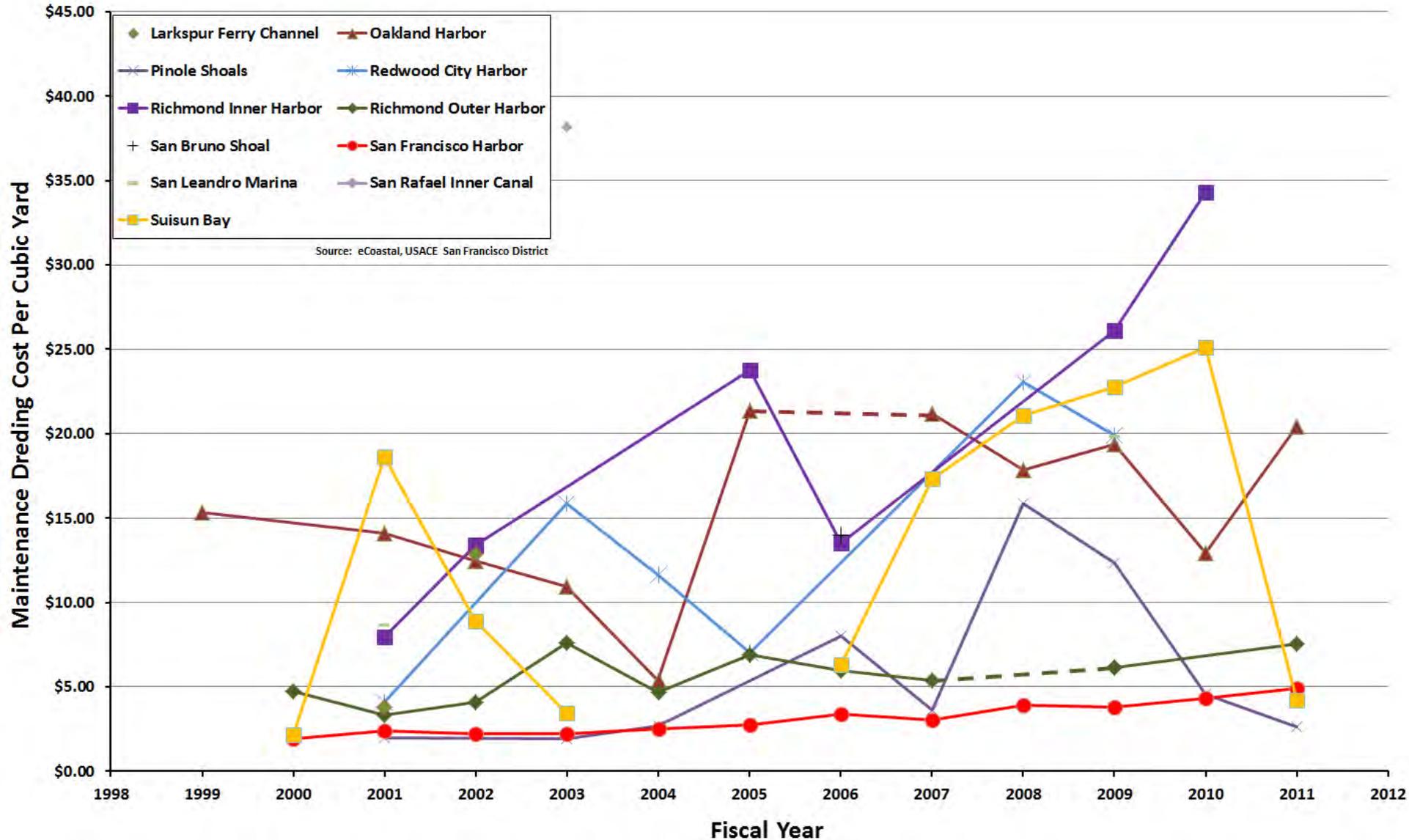
*Essayons and Yaquina Dredges*  
Photos: USACE, Portland District



# San Francisco Dredging Industry Cost Trends – 2000 to 2012

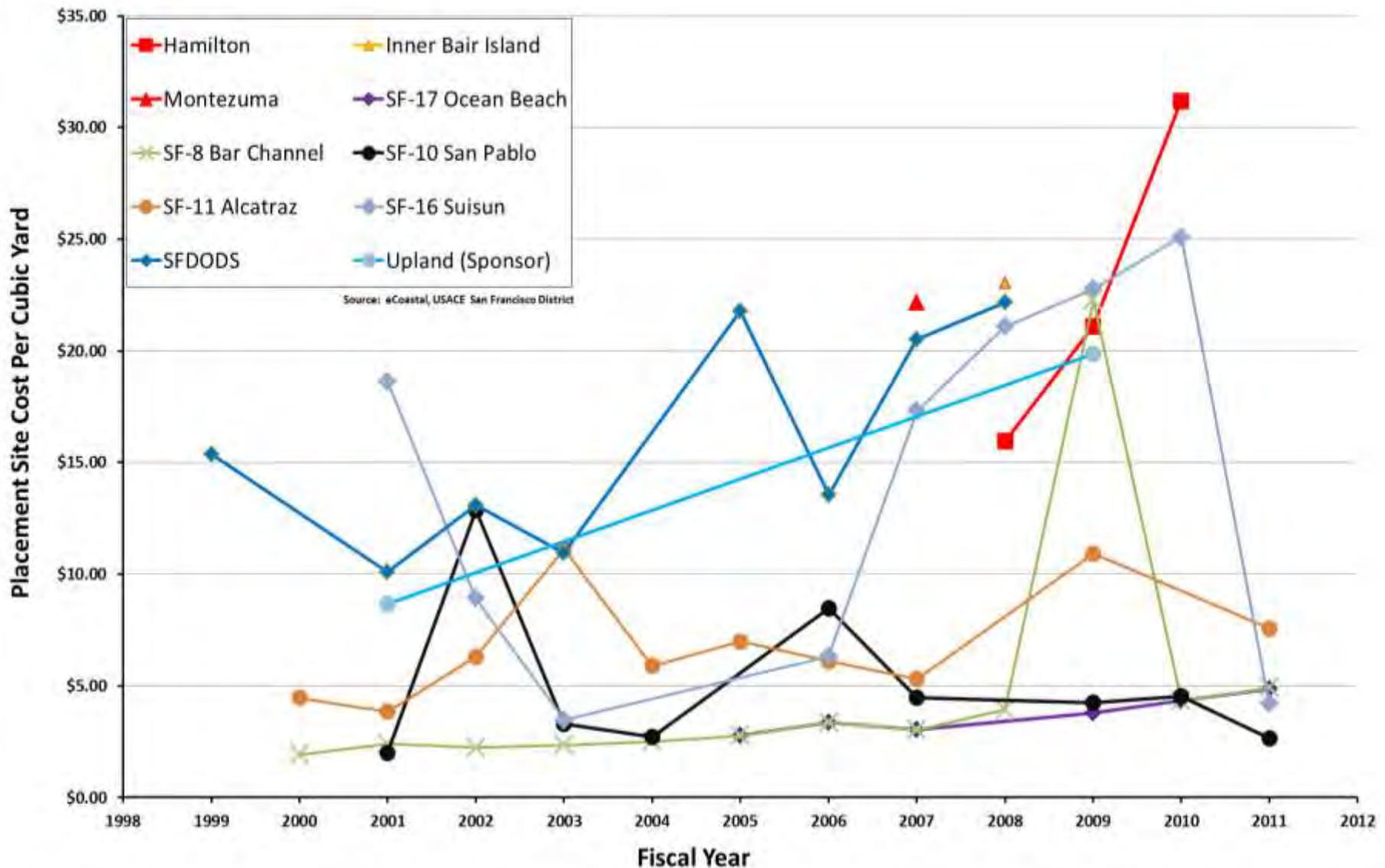


# Cost Per Cubic Yard by USACE Maintenance Dredging Project

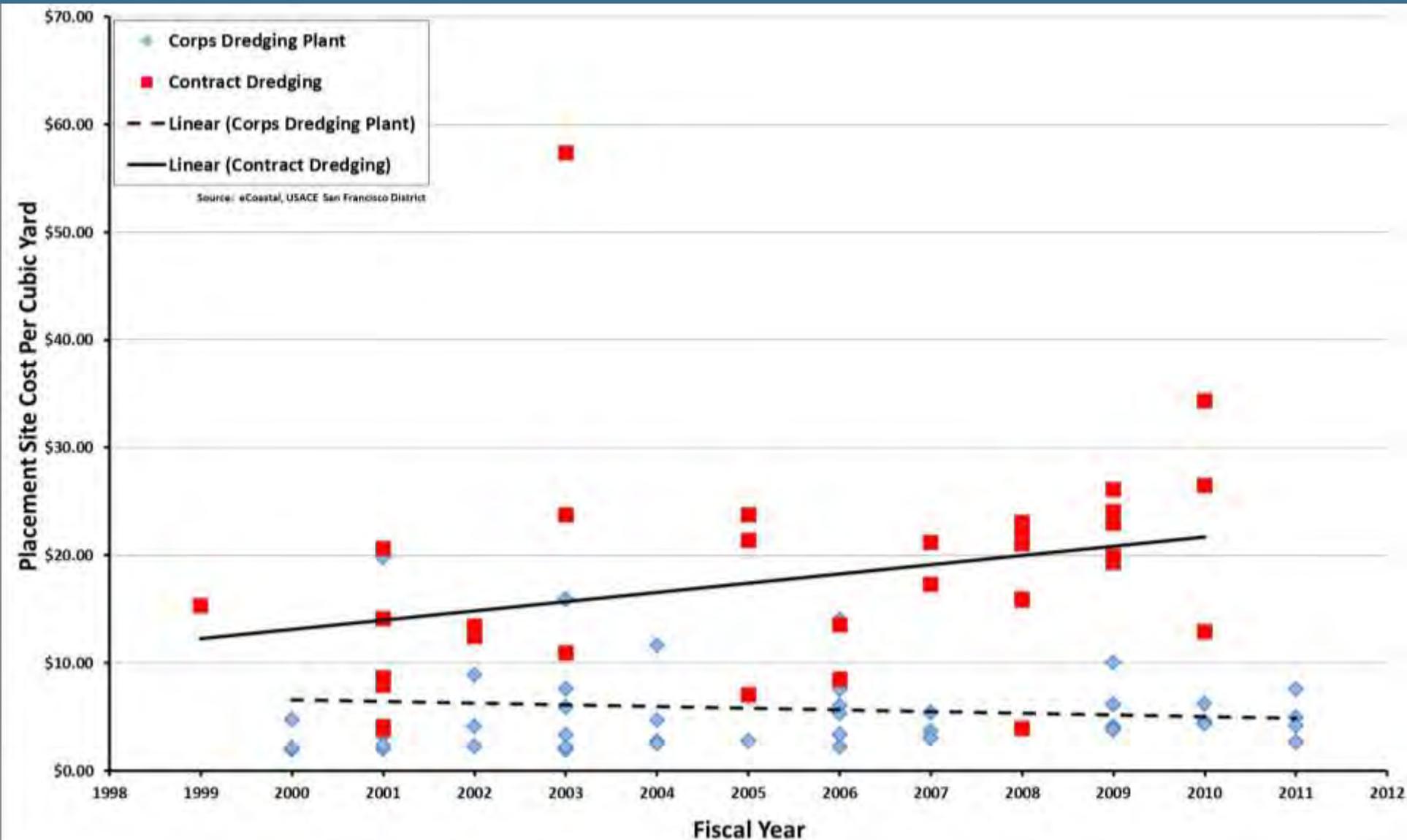




# Placement Site Cost Per Cubic Yard for USACE Maintenance Dredging Projects



# Comparison of Cost Per Cubic Yard for USACE Dredge Plant vs. Contract Dredging



# Additional USACE Dredging Cost Analyses to Come

- Evaluate USACE's mobilization/demobilization costs (percent of total contract cost)
- Evaluate Hamilton/Port of Oakland/Middle Harbor costs (looking at specific components, including offloading, dredging, transport, and on-land, etc.)



*Photo: Jenny Quay, BCDC*



# Non-USACE Anecdotal Information on Increase of Dredging Costs

- Reduced in-Bay disposal increases distances to placement sites and fuel costs
- When special equipment is required to use certain sites, costs increase and efficiency decreases
- Short (6 months or less) dredging window
  - Prices seem to be set based on dredgers earning their annual income in half a year
  - Scheduling is competitive and prices increase later in the season



# Non-USACE Anecdotal Information on Reducing Dredging Costs

- Nearby project proponents can consider scheduling joint dredging projects
- Development of the aquatic transfer facility project would increase efficiency
- Project proponents can consider creating their own upland disposal sites



# Non-USACE Anecdotal Information on Reducing Dredging Costs

## Montezuma

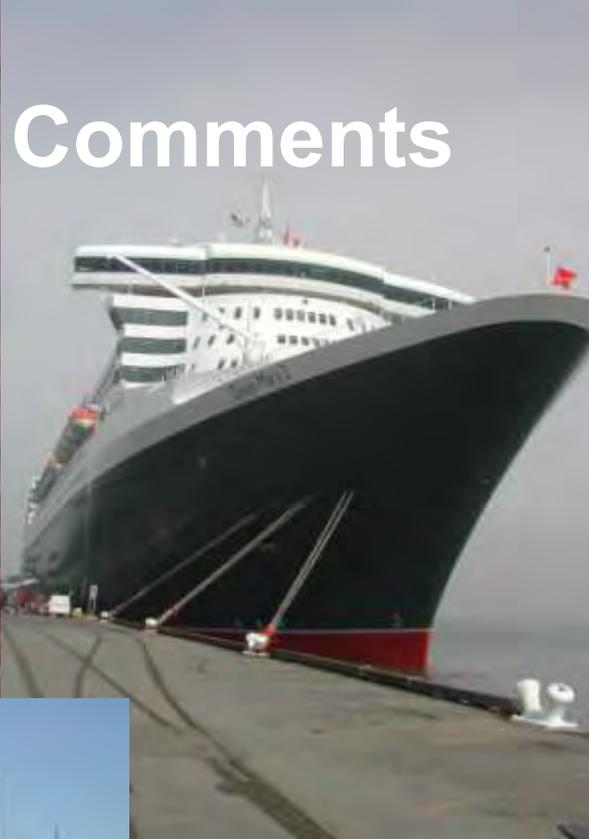
- Beneficial reuse project that accepts “noncover” sediment
- 3.5 million cy received since December 2003
- Competitive with SF-DODS: reported total cost is \$21-\$29/cy (dredging, transport, and placement of cover sediment, includes the \$9-\$12/cy tipping fee)



*Photo: Jenny Quay, BCDC*



# Questions and Comments



# Meeting Recap

- LTMS program has largely met its goals
  - In-Bay disposal significantly reduced
  - Many beneficial reuse successes
  - Sediment quality/testing improvements
  - Coordinated permitting/DMMO



# Looking Forward

- Increasing costs; level or decreasing federal budget
- Contracting improvements for beneficial reuse: example - 2011 Value Engineering Study
- Long-term planning:
  - Sea level rise
  - Reduced Bay sediment supply
  - Subtidal Habitat Goals integration/coordination
  - Identification of new beneficial reuse approaches
  - Regional Sediment Management



# Open Discussion



*LTMS 12-Year Review Meeting  
March 29, 2012*

# Next Steps

- Finalize 12-Year Review Report
  - Some additional analyses will be included. Is a meeting needed to cover the final report?
- Proceed with stakeholder meetings focused on recommendations for program improvements
  - Topics for future meetings?
  - Anticipated time frame for future meetings
- Consider whether there is a need to revise elements of the Management Plan

