San Francisco Bay - Past and Present

- Over 90% of wetlands filled
- Declining sediment rates into estuary
- Present morphology is levees fronted by mudflats
- No buffer for marsh progression

New Orleans, July 2014
San Francisco Bay – Major Ports & Navigation Channels

Dredging
- Oakland, Richmond, Redwood City, Stockton, San Francisco
- Bar, Pinole, Suisun Channels
- About 4 mcgyr by USACE now (>6 mcgyr before BRAC)

Disposal
- Historic open-water disposal
- Some Deep Ocean
Genesis of LTMS

• Severe mounding around disposal site
• Impacts to water quality, fisheries, ecosystem in general until 1991
• Led to Blockade by fishery industry

• Led to creation of the *Long Term Management Strategy (LTMS)* for dredged material
Foundation of LTMS Goals

- LTMS EIS/EIR Finalized (1999)
- Established goals
- Transition over 12-year period
- Emphasis on beneficial reuse
- Creation of “safety valve” (60 miles offshore in >5000’)
Good Early Project Implementations

- Hamilton Army Airfield (700 ac)
  Oakland 50’ deepening

- Montezuma Wetlands (2000 ac ongoing)
  Oakland 50’ deepening, now maintenance
Good Early Project Implementations

• Sonoma Baylands (300 ac)
  Oakland 42’ deepening

• Bair Island (35 ac)
  Redwood Creek maintenance
- USACE is largest dredger
- 51% of CA’s O&M $$ ($95 million) comes to SF Bay
- Half of it (~$45 million) goes to Oakland, Redwood, Richmond, Pinole

**Total USACE Dredging**
- 10-yr average ~2 MCY
- 10-yr average ~1 MCY (most deepening done)
• Deepening projects constituted almost all of the beneficial reuse since LTMS
• However, almost all of the deepening projects completed in Bay
• Maintenance dredging going to DODS (supposed to be safety valve)
Challenges....

Clear that we need beneficial reuse of *Corps-dredged O&M Material*, but......

**Technical Challenges:**

- Urbanized areas around ports (sponsor provided site)
- Distance to disposal site (clamshell dredging + scows)
- Mudflats fronting beneficial reuse site (shallow draft scows)
- Federal Standard (beneficial reuse more expensive)
- Annual appropriations (multi-year contracts difficult)
Benificial Reuse Costs Unsustainable....

![Graph showing maintenance dredging cost per cubic yard by fiscal year.](image)

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
<th>Cost/CY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Construction</strong></td>
<td></td>
<td></td>
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<tr>
<td>Design and PED</td>
<td>$34.9 m</td>
<td>$6.20</td>
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<tr>
<td>Construction Management</td>
<td>$3.3 m</td>
<td>$0.59</td>
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<tr>
<td>LERRDs and Relocation</td>
<td>$2.6 m</td>
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<tr>
<td>Site Shaping, Culverts, and Nursery</td>
<td>$26.7 m</td>
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<tr>
<td>Planting, Surveys, and Monitoring</td>
<td>$2.0 m</td>
<td>$0.36</td>
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<tr>
<td>Other</td>
<td>$1.3 m</td>
<td>$0.23</td>
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<tr>
<td>Off-loading/Placement Increment (HWRP Share)</td>
<td>$24.9 m</td>
<td>$4.42</td>
</tr>
<tr>
<td><strong>Dredging/Off-loading (Paid by 50-Foot Project and USACE O&amp;M Projects)</strong></td>
<td></td>
<td></td>
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<tr>
<td>50-Ft Project (3.46 mcy)</td>
<td>$99.3 m</td>
<td>$28.70</td>
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<tr>
<td>Oakland Harbor O&amp;M (1.02 mcy)</td>
<td>$23.2 m</td>
<td>$22.75</td>
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<tr>
<td>Richmond Harbor O&amp;M (0.75 mcy)</td>
<td>$12.4 m</td>
<td>$16.53</td>
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<td>Pinole + RWC O&amp;M (0.40 mcy)</td>
<td>$7.6 m</td>
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<tr>
<td><strong>Total Cost to Construct HWRP</strong></td>
<td>$238.2 m</td>
<td>$42.31</td>
</tr>
</tbody>
</table>

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How To Make It Happen?

1. If you build it, will they come? (Montezuma, Bair, Cullinan worked..)
   - Leverage EVERY New Work project for building site infrastructure to accommodate future O&M material

2. How to address Federal Standard for baseline costs?
   - Make beneficial reuse cost similar to DODS. Incentivize with >5 yr offloading contract by restoration agency, with cost structure disclosed (each 5 yr contract could represent a “project” of 4 to 5 MCY)

3. Who will build offloader?
   - Private enterprise with public $$ (tipping fee). Bair Island, Montezuma, landfills are models
1. Corps commitment needed to include beneficial reuse as alternative already doing that.....but only 1 private disposal site

2. Restoration community’s acceptance that restoration $$ are better leveraged by building infrastructure flood control, containment berms, offloading infrastructure

3. Regulatory agencies’ support for facilitating permitting
   • wetting/drying (bioaccumulation)
   • decant water quality (turbidity)
   • sediment quality (acceptability)
EDEN LANDING

- Alameda County & SCC/DFW partner to build infrastructure (berms)
- Corps brings Redwood City deepening material (2 - 3 mcy)
- Land mass built!
- SCC lets out 5 yr offloading contract to private entity
- Corps brings Oakland/ Richmond/ Redwood maintenance material
- Eden Landing ponds E1, E2, E4, E5, E6, E7 restored!