Maltester Channel Dredging

Shoreline Marina Committee

November 18, 2008

Shoaling Study Summary

- Report Completed in October 2008
- Analyzed siltation rates at Marina
- Rate of siltation is dynamic ranging from 0 to 14 inches per year
- Long range projection is that without dredging the marina and channel would reach an equilibrium point similar to the mudflat areas north of El Torito
- Time to equilibrium difficult to estimate due to the number of factors

Short Term Shoaling Rates

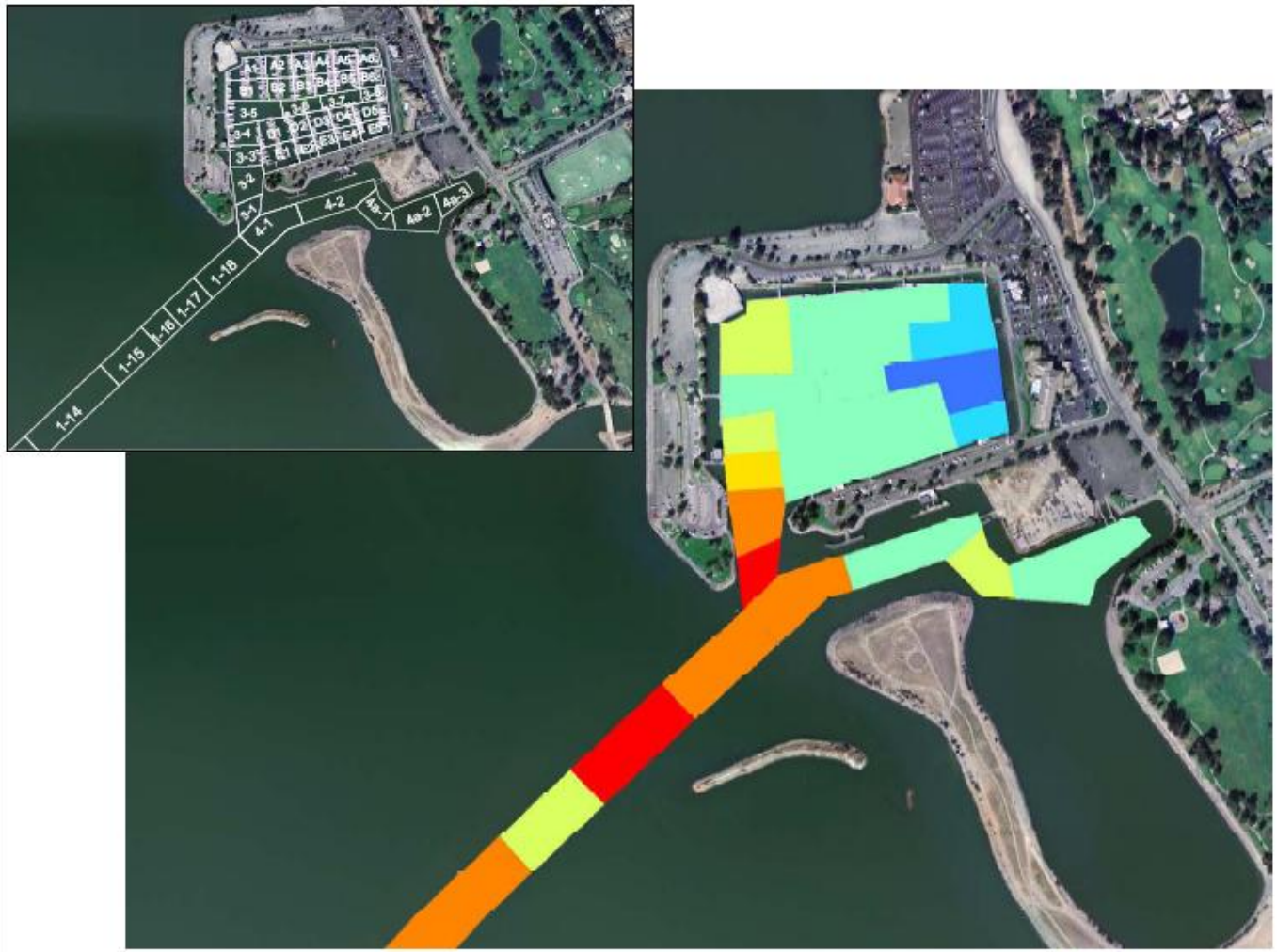


Figure 6A: Short-term Shoaling Rate for Marina (1998-2004) and Channels (2001-2004)

MOFFATT & NICHOL

San Leandro Marina Shoaling Study

Mid Term Shoaling Rates

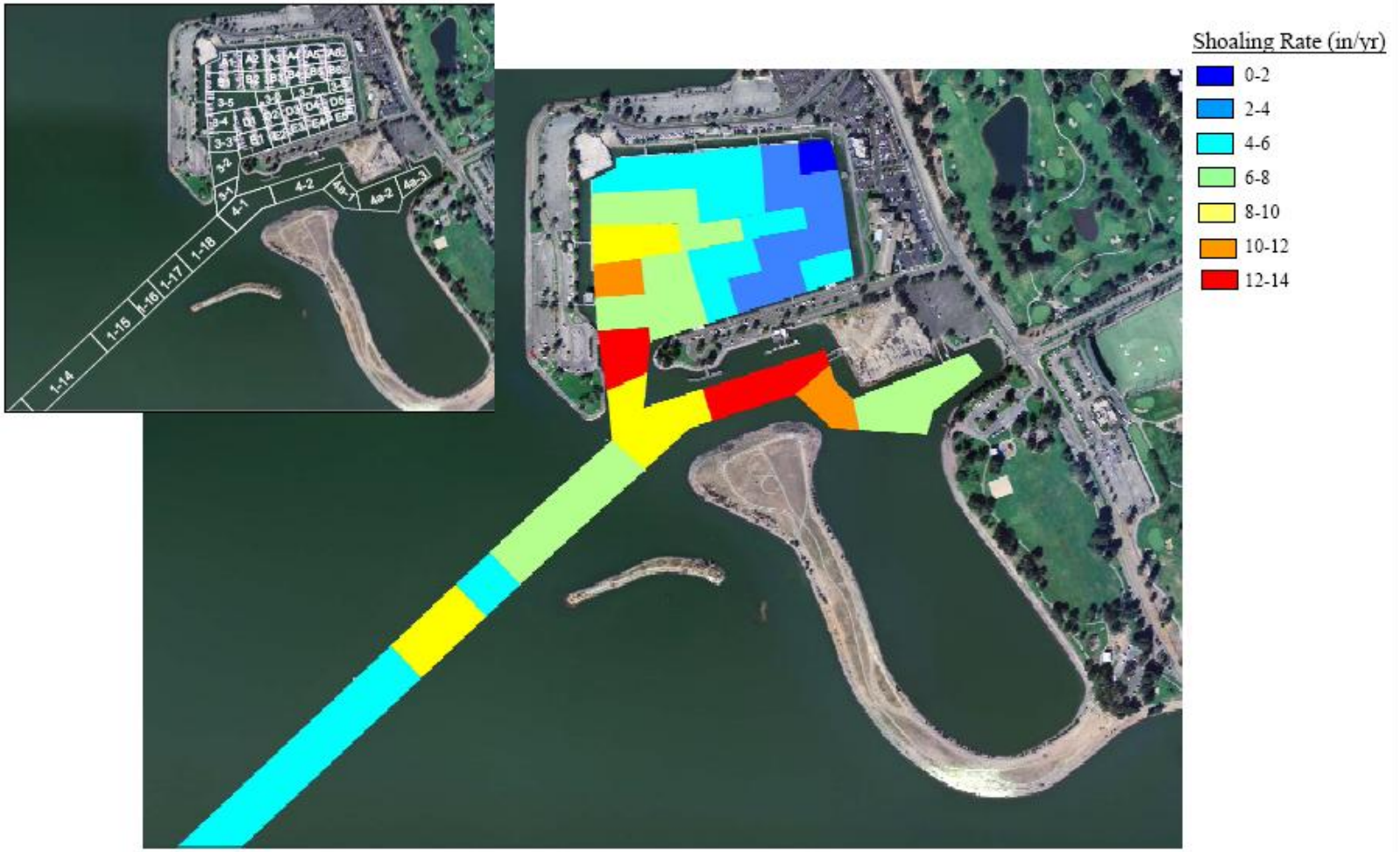


Figure 6B: Mid-term Shoaling Rates for Marina and Channels (2004 – 2008)

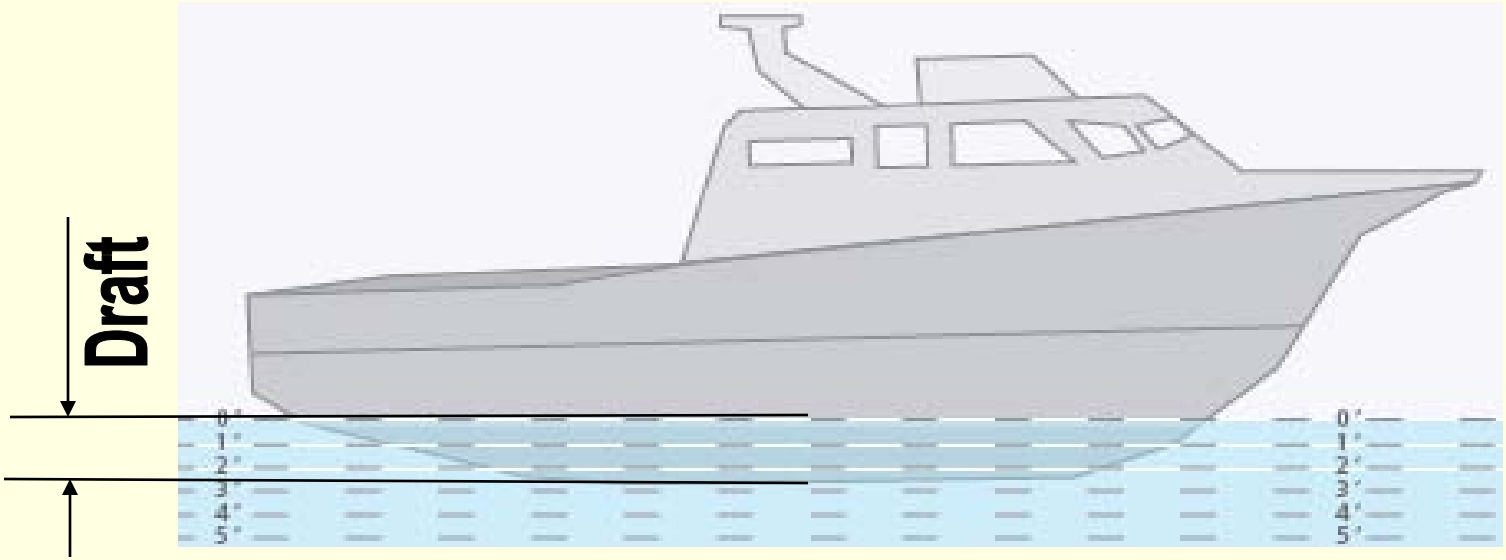
MOFFATT & NICHOL

San Leandro Marina Shoaling Study

San Leandro Tides

- At San Leandro Marina the extreme tide variation is approximately 11’ from + 9.0’ to – 2.0’ (mean lower low water)
- Tides are predominantly generated by the effects of the moon and the sun
- The highest and lowest tides (Spring Tides) occur consecutively and usually twice each month at full and new moon phases
- At other moon phases (Neap Tides) occur having lesser height variation

Boat Draft



- Draft - a measure of the boat's depth below the water surface
- For boats using the San Leandro launch ramp
  - Power boat hulls typically do not exceed 3.3'
  - Sail boats keels typically do not exceed 5'
  - Harbor berthed boats have drafts up to 7 feet
- Some boats have removable dagger boards or props etc. to temporarily reduce their overall draft

Dredging Alternatives
No Dredging

- Closure of the Marina
- Closure of the boat launch ramp
- COE dredge project abandoned
- Harbor and channel will continue to silt
- No future cost to remove dredge material from DMMS
- Future cost to remove improvements from harbor
- Future costs to return DMMS to wetlands

Dredging Alternatives
Full Dredging

- Federal Channel dredged to past depths
- All facilities capable of remaining open
- COE does not have sufficient funds for full dredge and does not permit supplemental funding by City
- City cost for full dredge including berthing area 310K CY $ 3.5M
- Material removal to Oyster Bay Park $7M
- Next dredge cycle costs range from $4.9M to $7.3M depending on disposal location

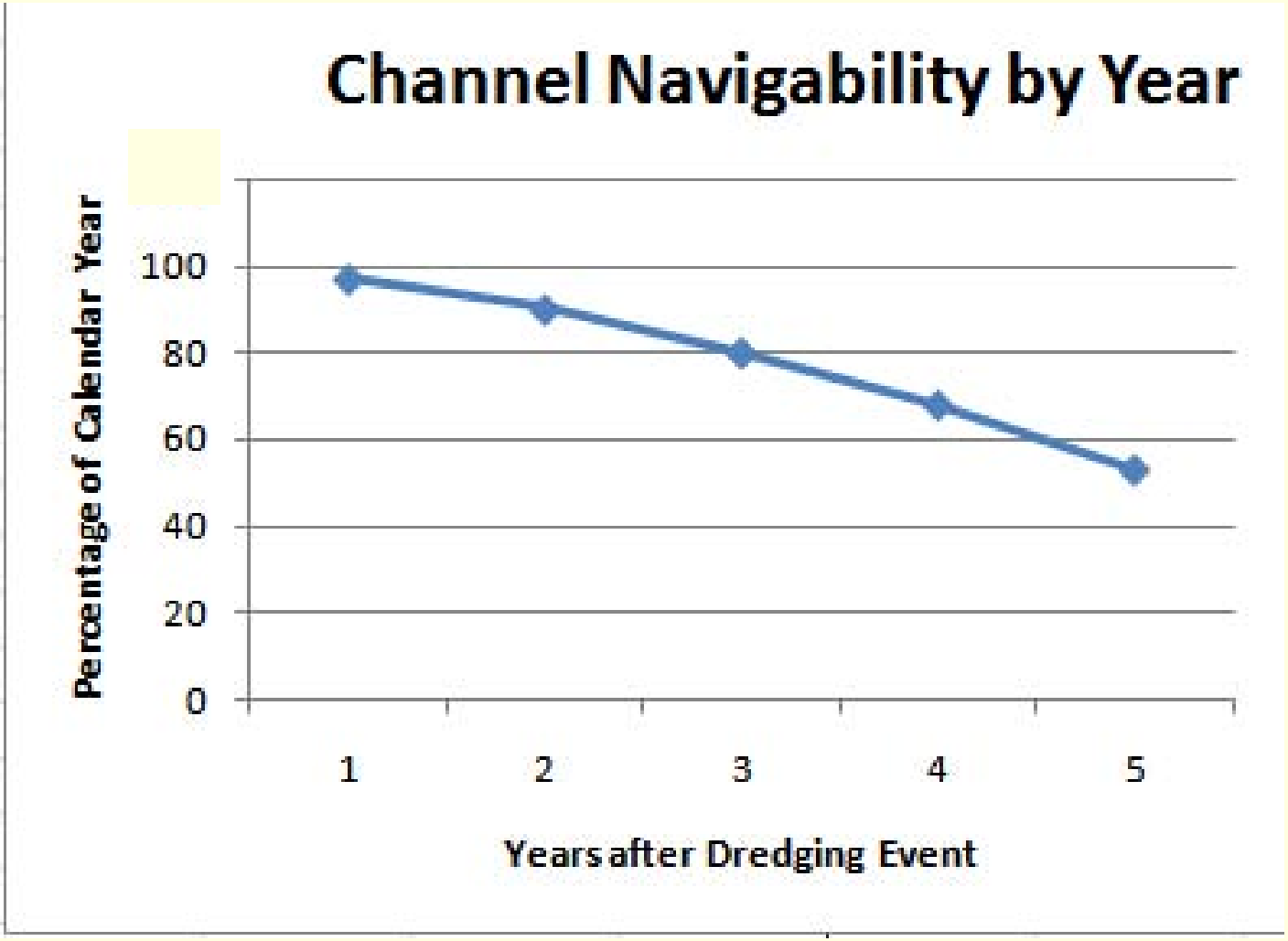
Dredging Alternative
Modified Dredging

- Boat launch ramp to remain open
- Harbor converted to small boat marina
- 2009 dredging funded by COE
- Future material removal (85K CY) by City $2M disposed at Oyster Bay Park
- Future maintenance dredging on a 4 year cycle to maintain approximately 69% yearly access to launch ramp by trailerable boats (50,000 CY)
- Future year maintenance dredging costs including removal $2.2M - $3.7M

Dredge Depth - 5 feet
Theoretical Navigation Limits

- A boat with a draft of 3.3’ will be able to navigate the channel dredged to a depth of 5 feet at tides of -0.5 and higher (3.3’ draft + 1.2’ clearance) 97% of the calendar year
- Each year approximately 12” of silting is deposited
- In the second year the same boat can only navigate portions of the channel at tides of + 0.5’ or higher. 90% of the time
- Similarly, in Year 3 navigation is restricted to 80% of the time
- And in Year 4 navigation is restricted to 69% of the time
- And in Year 5 navigation is restricted to 53% of the time

Dredge Depth - 5 feet
Theoretical Navigation Limits



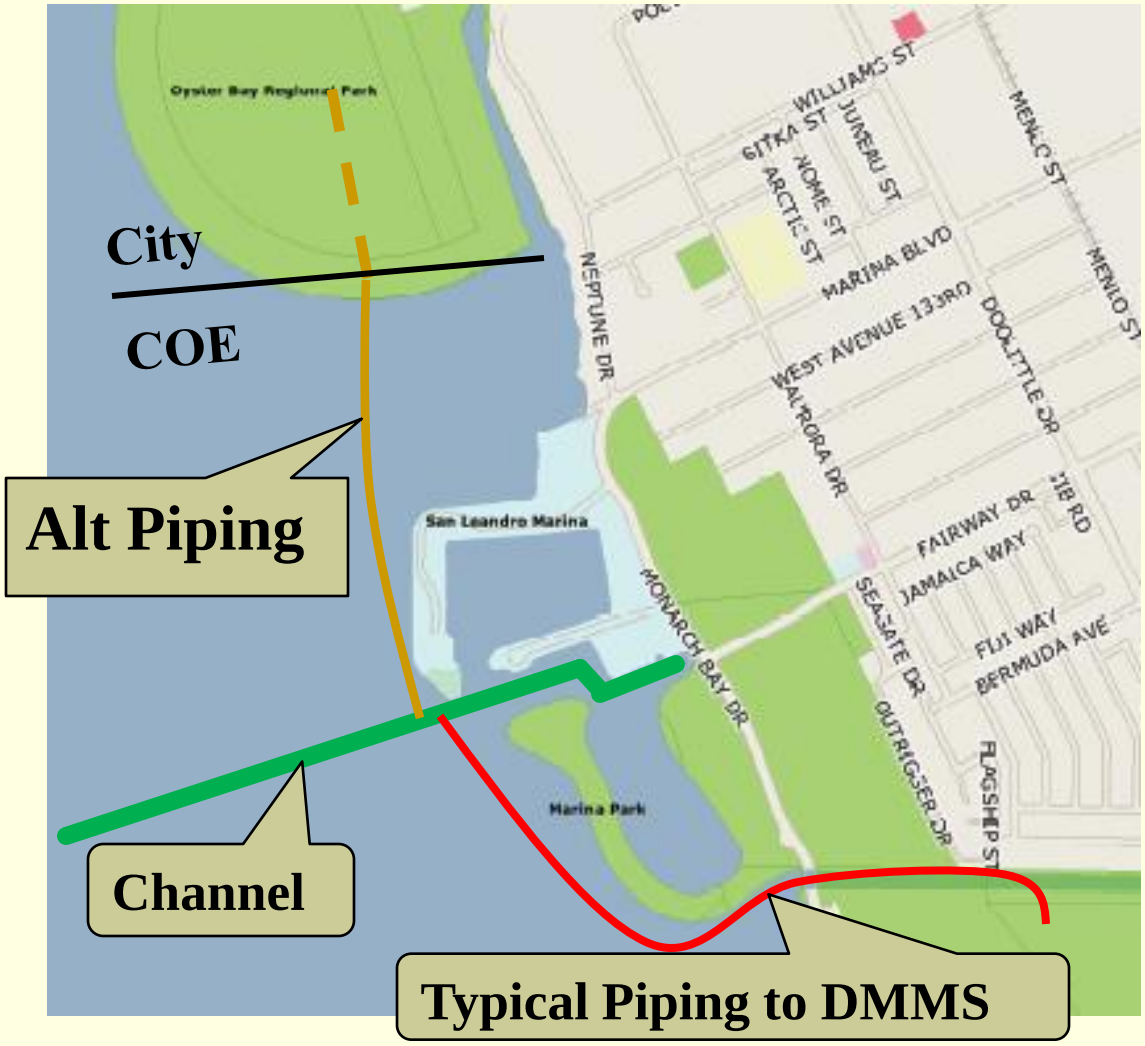
Typical Dredge Process

- USACOE hydraulically dredges channel and pumps 15%-20% slurry to the DMMS
- High water content slurry decants in the DMMS for a year or more until the material dries sufficiently to be transported
- At City's expense the dried material is removed, and trucked to a disposal area. In 2004, the material was disposed at the Oyster Bay Regional Park
- Cost for disposal depending on disposal location range from $24 to $53/cubic yard

Oyster Bay Park Disposal Alternative

- USACOE willing to pump slurry to other similar location where it becomes property of City
- Piping is possible to the near water area of Oyster Bay Park
- City would be responsible to transport slurry to disposal area and decant material to remove water to consolidate material

Disposal to Oyster Bay Park



Oyster Bay Park Disposal Alternative

- EBRPD open to receiving dredge material directly to park but significant issues exist with method
- City must pump slurry about ½ mile uphill to disposal area requiring additional pumping and pipeline
- Dewatering process must accept slurry at the rate the COE pumps and coordination will be extremely difficult
- Trails & public areas will be disrupted by temporary piping
- Additional permitting will be required that could impact 2009 dredging schedule
- City costs of disposal incurred at time of dredging
- Mechanical dewatering process expensive $15-$30/cy City of Santa Cruz incurred a cost of $35/cy with a similar process

Questions ?