

Fine Grained Sediment Placement: Nearshore Challenges

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Why a discussion about fines?

- › Is it clean?
 - › Is it sand?
 - › Desire to beneficially reuse all dredged material
 - › Managing sand is easy
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Statutory Framework for Dredged Material Placement

Permit Authority	Core Question
MPRSA §103 (EPA / USACE)	Can dredged material be disposed in ocean waters?
CWA §404 (USACE, EPA oversight)	Can dredged or fill material be discharged into waters of the U.S.?
CWA §401 (California SWRCB)	Will the federally permitted activity comply with state water quality standards?
CDP - Coastal Zone Management Act (CCC)	Will this activity affect coastal uses or coastal resources?

Overview of Federal Regulatory Authorities Governing Dredged Material

- › Key Regulatory Statutes
 - › The Clean Water Act (CWA) and Marine Protection, Research, and Sanctuaries Act (MPRSA) govern dredged material placement with distinct frameworks.
- › Jurisdictional Distinctions
 - › Placement location determines which statute applies, focusing on inland waters versus ocean waters seaward of coastal baseline.
- › Roles of Regulatory Agencies
 - › USACE issues 404 permit under both laws; EPA's oversight varies from advising under CWA to mandatory concurrence under MPRSA.



The Coastal Baseline and Its Jurisdictional Significance

- › Definition of Coastal Baseline
 - › The coastal baseline is defined as the **mean lower low water** line shown on official nautical charts including bay-closing lines.
- › Jurisdictional Boundary
 - › The baseline separates Clean Water Act jurisdiction shoreward from MPRSA jurisdiction seaward in coastal environments.
 - › EPA must affirmatively concur with permits authorizing ocean disposal under MPRSA,
 - › EPA serves an advisory role for Clean Water Act (above MLLW)
- › EPA is setting limit to maximum of 50% fines in MPRSA. Above baseline, there is no limit set by EPA.



The geographic jurisdiction of the Marine Protection, Research, and Sanctuaries Act (MPRSA) begins at the U.S. baseline from which the territorial sea is measured and extends seaward. The baseline consists of the closing lines across bays, harbors, and river mouths and the mean lower low water (MLLW) along the coast.

Behind the Baseline

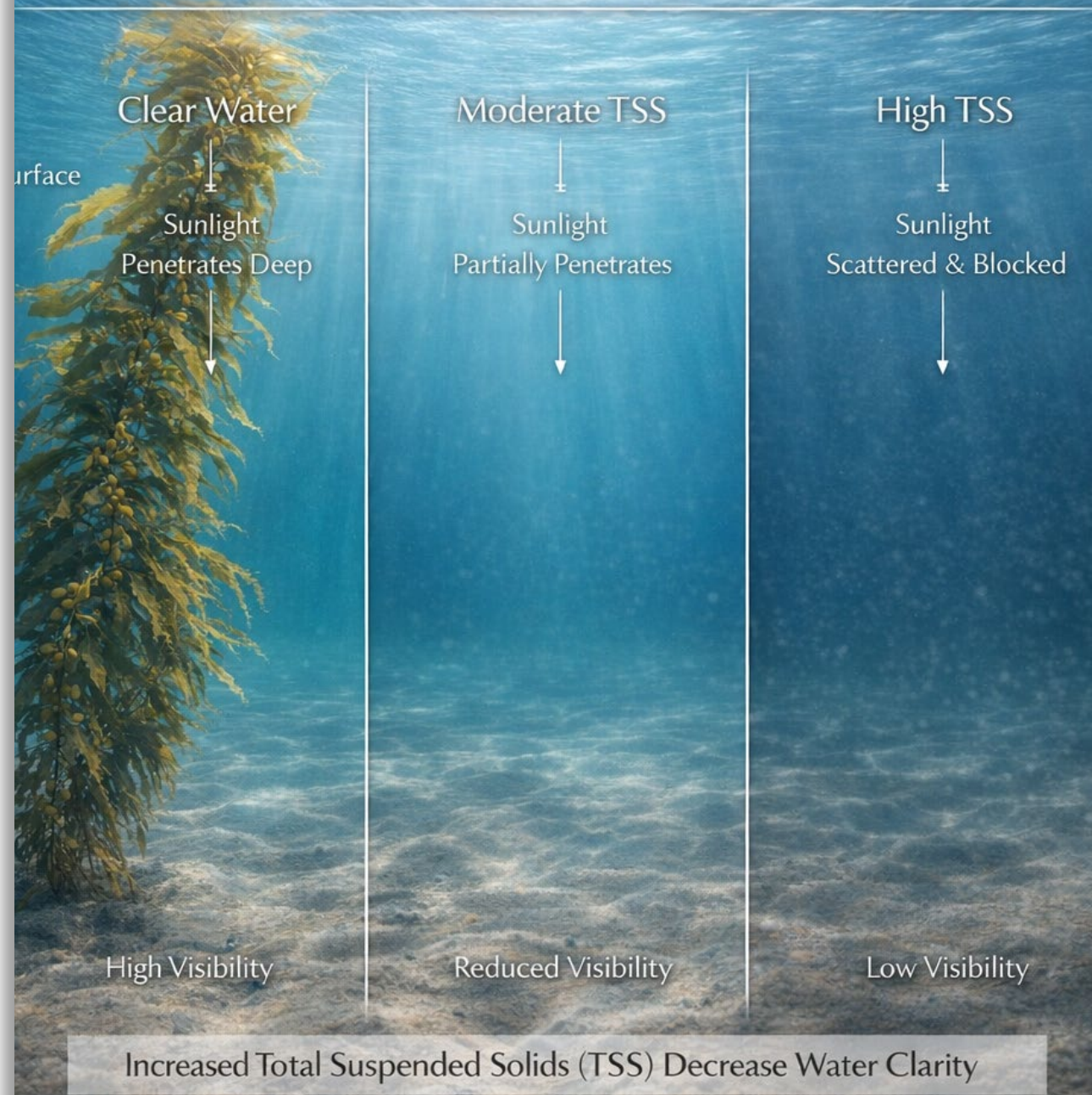
- › Below Mean Lower Low Water (MLLW) line along the coast
- › Modified in certain areas by:
 - › Bay closing lines (across large bays or estuaries)
 - › San Francisco Bay
 - › Humboldt Bay
 - › San Diego Bay
 - › Monterey Bay
 - › River mouth closing lines
 - › Other lines shown on official nautical charts
 - › San Pedro Breakwater
 - › Newport Bay



State Water Quality Policy

- › *Turbidity is an expression of the optical property that causes light to be scattered in water due to particulate matter such as clay, silt, organic matter, and microscopic organisms.*
- › *Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.*
- › *Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.*
- › ***Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Waste Discharge Requirements***

Light Transparency & Total Suspended Solids (TSS)



Studies Around Nearshore Placement

- › USACE Nearshore Nourishment Knowledge Hub,
- › USACE Beneficial Uses of Dredged Sediment,
- › USACE Navigation Sediment Placement: A Regional Sediment Management Program Database,
- › USACE Depth of Closure Information
- › Fines –
 - › Imperial Beach studies by USGS (Warrick, J.A et al., 2012 and Warrick, J 2013)
 - › Santa Cruz Harbor Dredge Management Plan (2009)



Santa Cruz Harbor Dredge Management Plan (2009)

- › In 2009, Santa Cruz Port District requested that all clean sediment be considered for nearshore disposal
 - › Following approval from regulatory agencies, the Port District conducted three monitored dredging demonstration projects
 - › Goal to determine if clean, fine-grain harbor sediments could be disposed of into the nearshore area for beneficial use without harm to coastal resources
 - › ***Monterey Bay is behind the baseline
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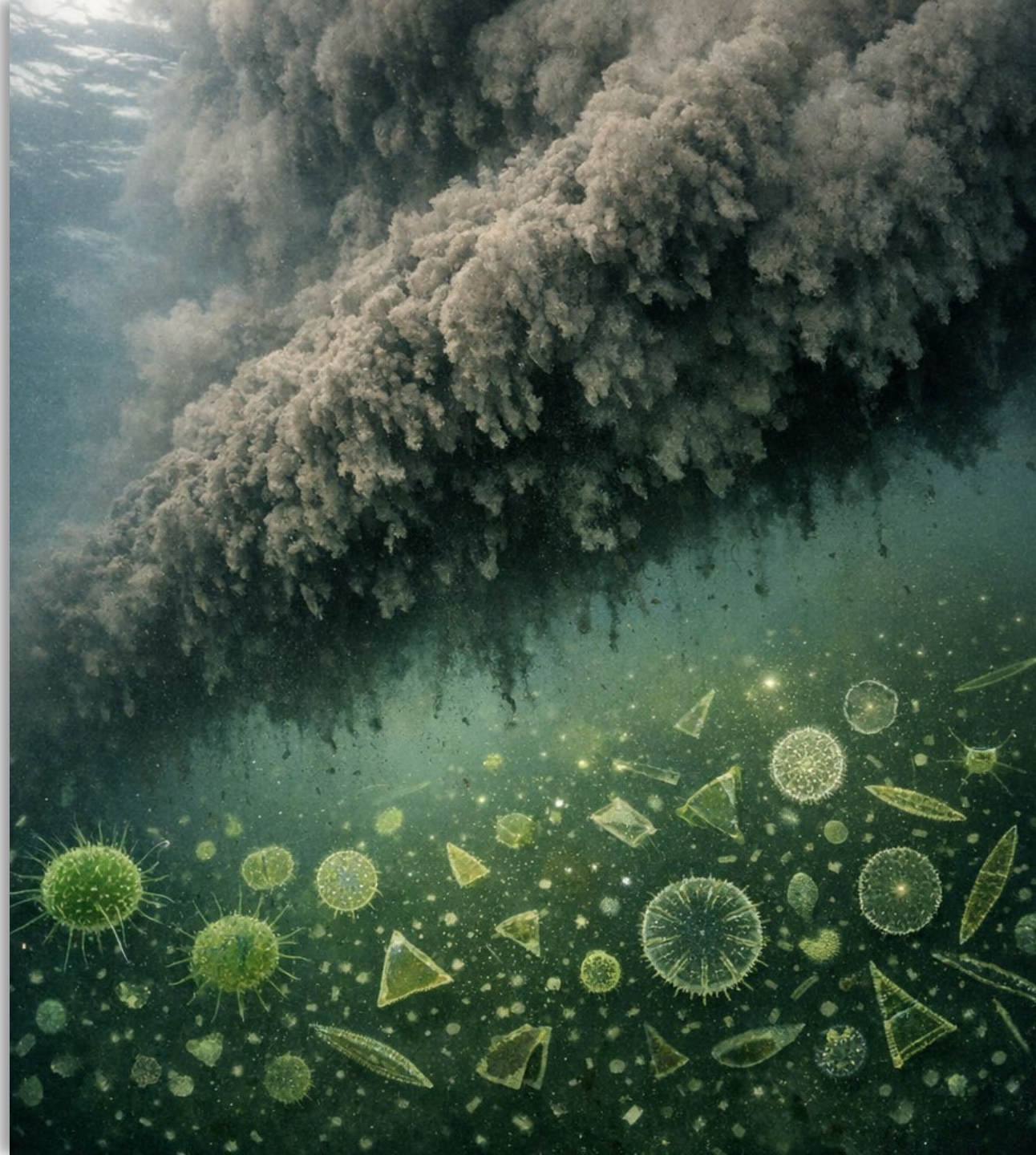


Santa Cruz Harbor Dredge Management Plan (2009)

- › The results of the demonstration projects indicate that:
 - › Fine-grained material, when placed in the nearshore environment at the correct time of year, transit to and replenish soft bottom areas seaward of the nearshore (Monterey Bay mid-shelf mudbelt) – **Modeling**
 - › Local wave and current energy are capable of transporting silt and clay sediment away from the immediate disposal area – **Modeling and observations**
 - › Santa Cruz Harbor District's approved proposal included:
 - › Maximum yearly limit of dredging and disposal of sediment classified as silt/clay (63µm or less) is set at 10,000 cy/yr
 - › Maximum daily limit of dredging and disposal of sediment classified as silt/clay (63µm or less) is set at 550 cy/day (demonstration volume)
 - › Nearshore disposal limited to October to April (demonstration period)
 - › Inner Harbor sediment must pass chemical and biological tests
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Proposed Approach

- › Scale down the projects, like Santa Cruz
 - › Figure out how much the system can handle (like a TMDL)
 - › Conduct model to confirm potential mixing in the nearshore and potential fines accumulation along the nearshore
 - › Conduct pilot study to confirm model assumptions
 - › Evaluate potential for fines to build up
 - › Evaluate potential water column impacts
 - › Find placement areas with naturally elevated fines
 - › Encourage dispersion – hydraulic dredge – high dispersion
 - › Pulse placements, let system recover
 - › Document and share information / experience
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Questions/Discussion