



Coastal Erosion in Southern Monterey Bay

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NATIONAL MARINE
SANCTUARIES

MONTEREY BAY

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Agenda Topics

- Sanctuary actions to date
- Historic coastal erosion rates
- Brief history of sand mining in Monterey Bay
- Resource impacts
- Critical coastal erosion impacts

Sanctuary Coastal Erosion Actions to date

2008 Coastal Armoring Action Plan:

- Completed 2 Coastal Sediment Management Plans in partnership with US Army Corp:
 - Southern Monterey Bay CSMP
 - Study area - Wharf 2 in Monterey to Moss Landing
 - Completed in 2008
 - Santa Cruz Littoral Cell CSMP
 - Study area - Moss Landing to Ano Nuevo
 - Completed in 2015



Sanctuary Coastal Erosion Actions to date

Southern Monterey Bay Coastal Sediment Management Plan

- Collaborative regional approach to management for coastal erosion and sediment management issues
- The SMBCEW formed to assist development of the Plan
- Examined a set of options that restore coastal habitat by removing or lessening processes that exacerbate coastal erosion
- **Four recommendations were provided:**
 1. Investigate beach nourishment strategies to help manage erosion along the shoreline within the Cities of Sand City, Seaside and Monterey
 2. Allow dune erosion to continue without human intervention north of Sand City to the Salinas River

Sanctuary Coastal Erosion Actions to date

Southern Monterey Bay Coastal Sediment Management Plan

- Four recommendations were provided:
 3. Use the Coastal RSM Plan as a baseline to regionally comprehensive erosion abatement approach (a model)
 4. **Reduce or Eliminate removal of sand from the beach at Marina**
 - The section provides specific options to explore including communication with down coast communities, revisit agency jurisdictions (ie., USACE), examine permitting requirements, and examine alternative mining operations

Sanctuary Coastal Erosion Actions to date

Through MBNMS Settlement Plan funds, commissioned the 2012 report: *“Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay”*

- Produced by ESA PWA and supported by the Southern Monterey Bay Coastal Erosion Workgroup (SMBCEW) including:
 - Dr Ed Thornton, Meg Cauldwell, Dr Phil King, Aaron McGregor
- One of the key recommendations was **2.3.7: Cessation of Sand Mining from the Beach**

EVALUATION OF EROSION MITIGATION ALTERNATIVES
for Southern Monterey Bay

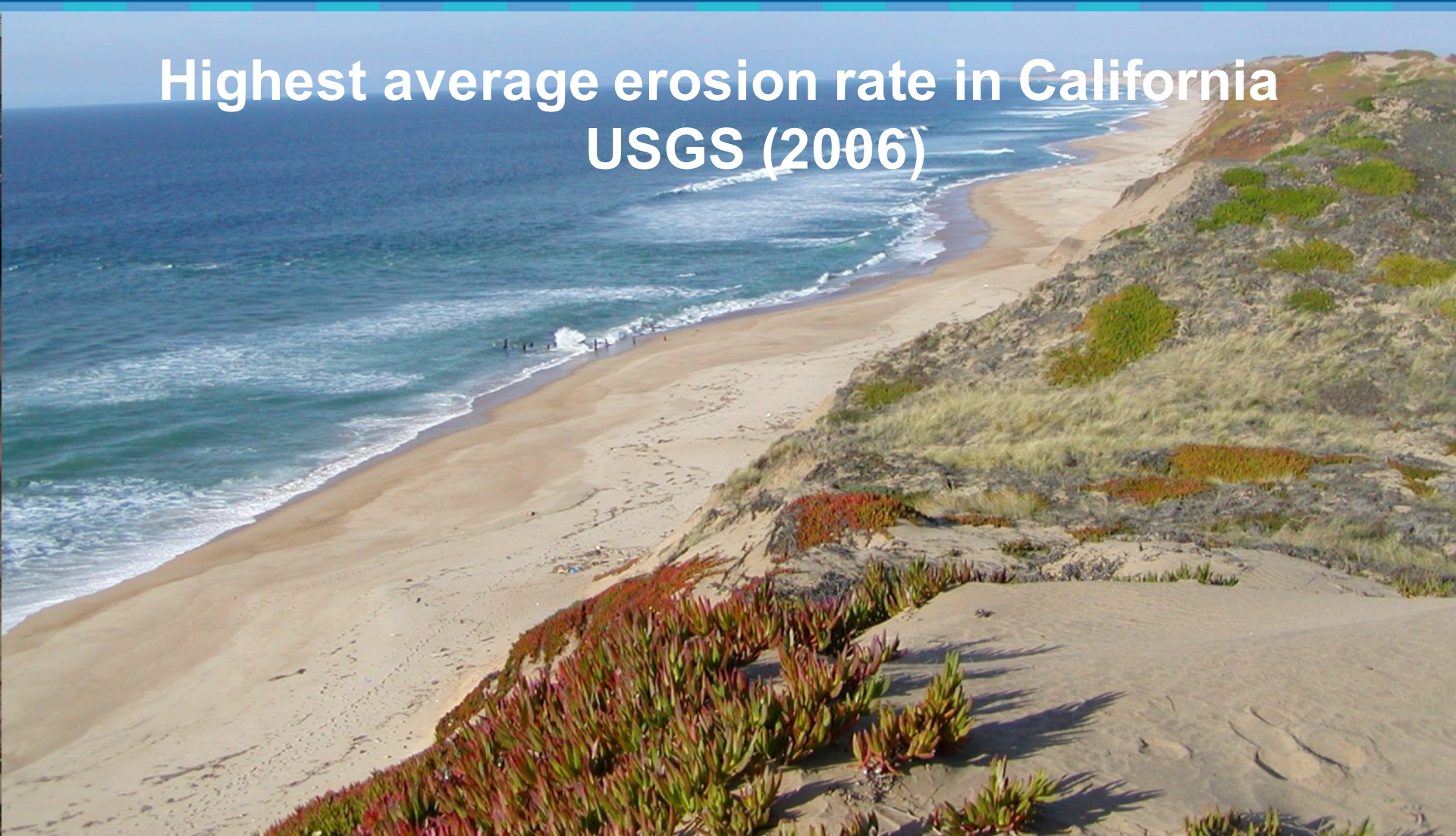
Prepared for
Monterey Bay Sanctuary Foundation
and
The Southern Monterey Bay Coastal
Erosion Working Group

May 30, 2012

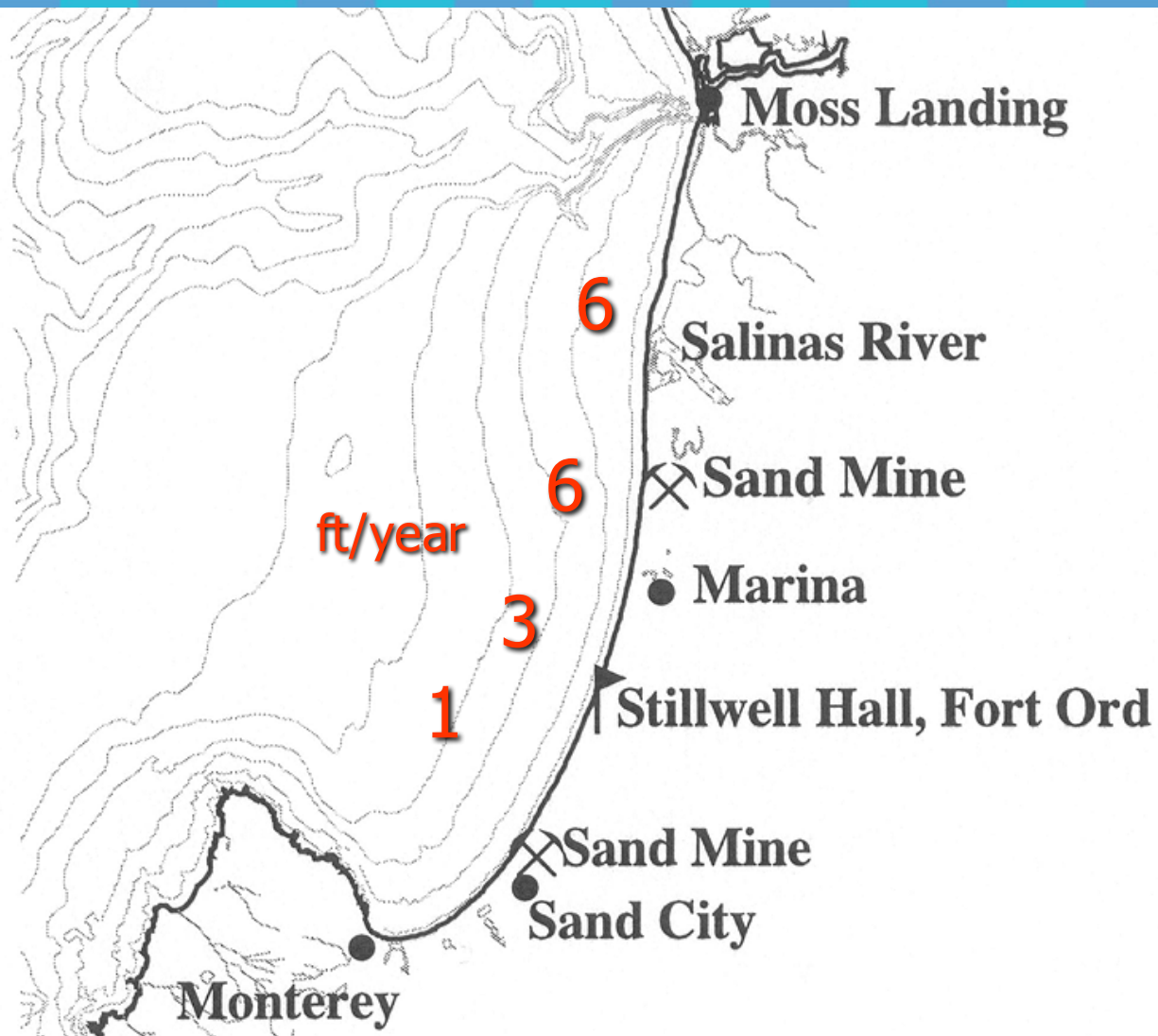


Southern Monterey Bay Shoreline

Highest average erosion rate in California
USGS (2006)



Coastal Dune Erosion Rates



Historic mining in So. Monterey Bay

~200,000 yd³/year
for last 70 years

CEMEX (operational)

Seaside Sand & Gravel (closed)

Monterey Sand (closed)

Lone Star Industries (closed)

Granite Construction (closed)

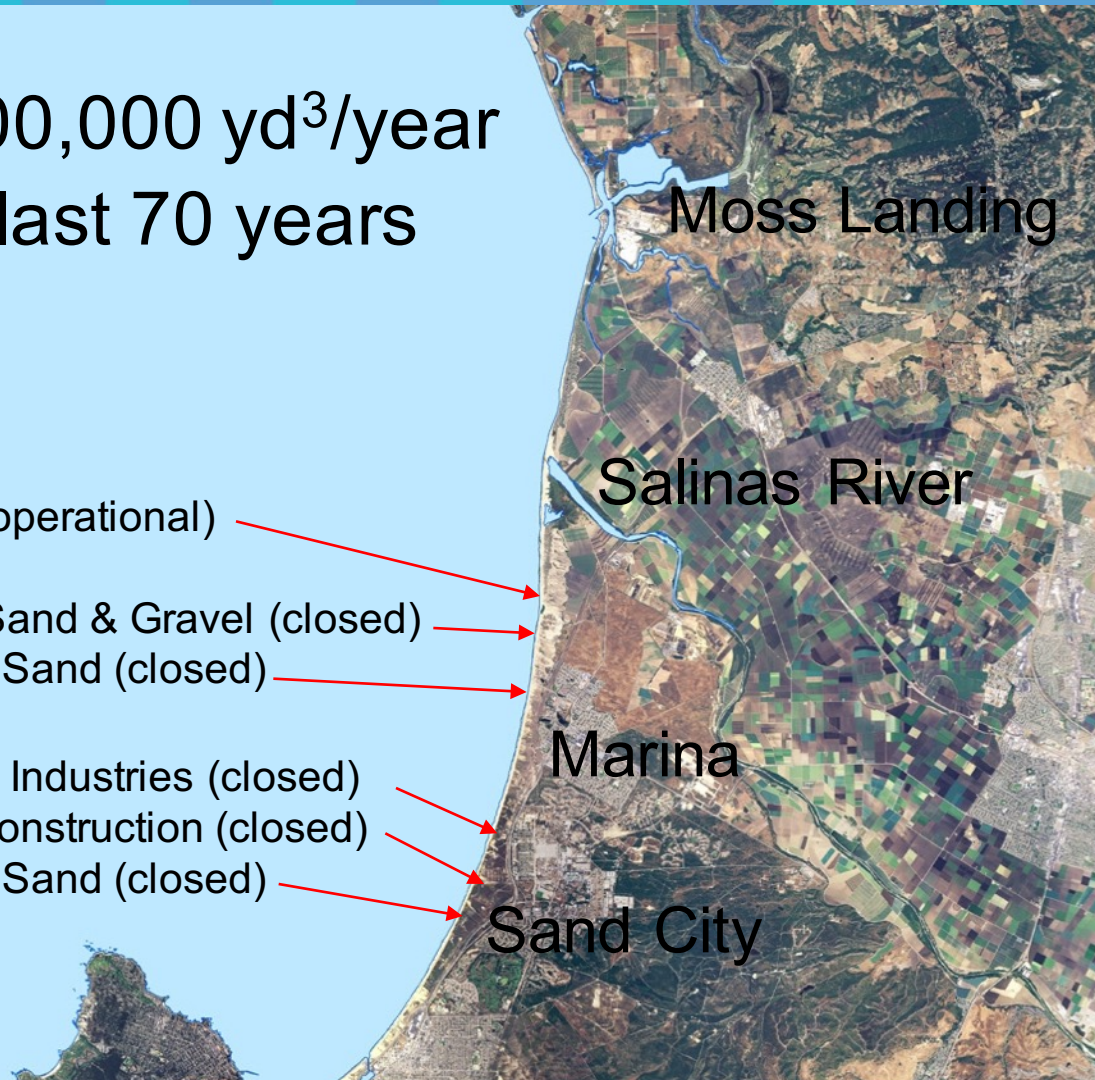
Monterey Sand (closed)

Moss Landing

Salinas River

Marina

Sand City



Dragline Sand Mining 1927-1990

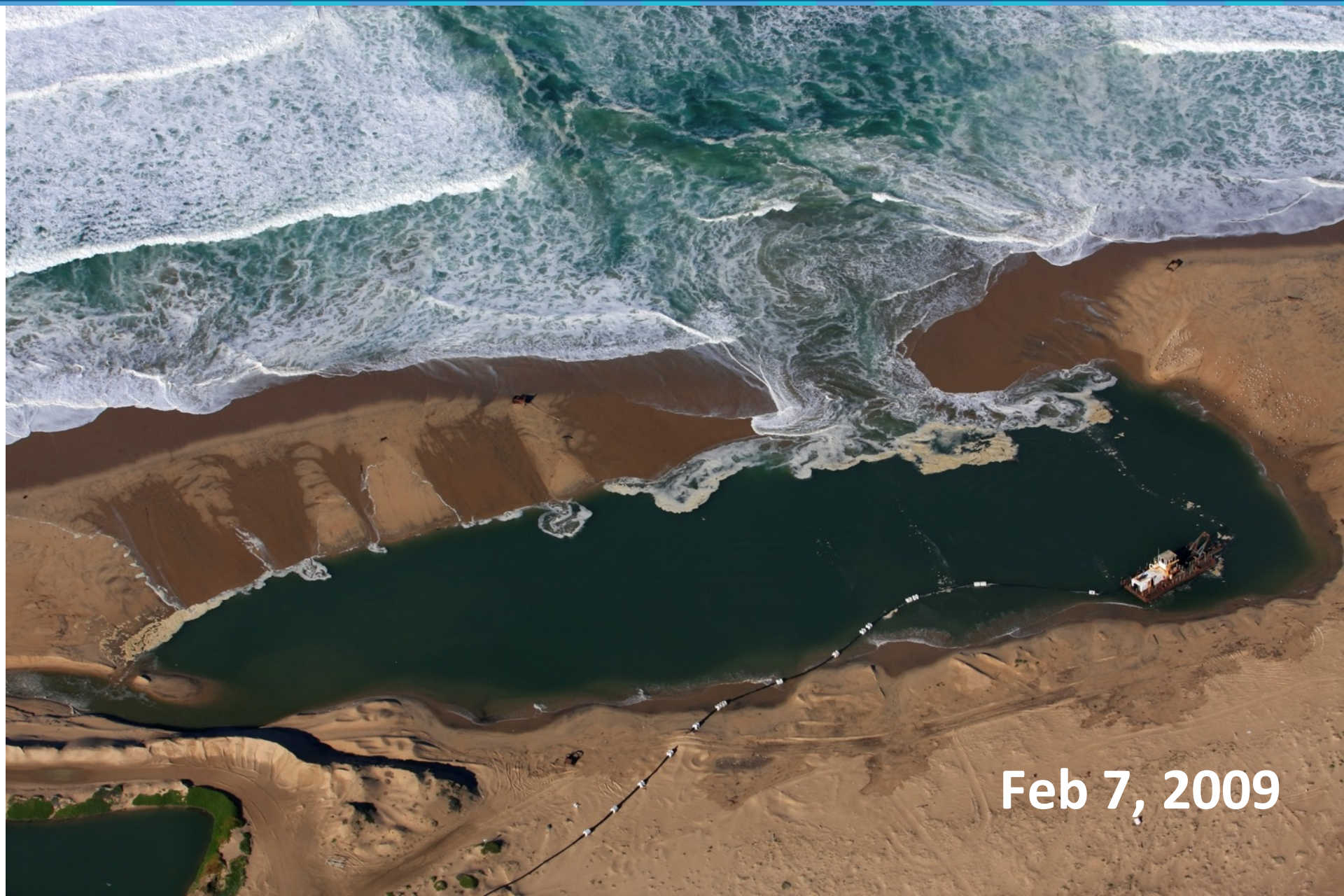
All closed in 1990 due to USACE concerns about beach erosion



CEMEX sand mine at Marina

Dredge mining $\sim 200,000$ yd³/yr





Feb 7, 2009

Dredge pond filled during winter
~200,000 yd³/yr loss from system



January 2008

Sanctuary Resource Impacts from Coastal Erosion

Ecological values and functions of sandy beach and dune ecosystems in Southern Monterey Bay include:

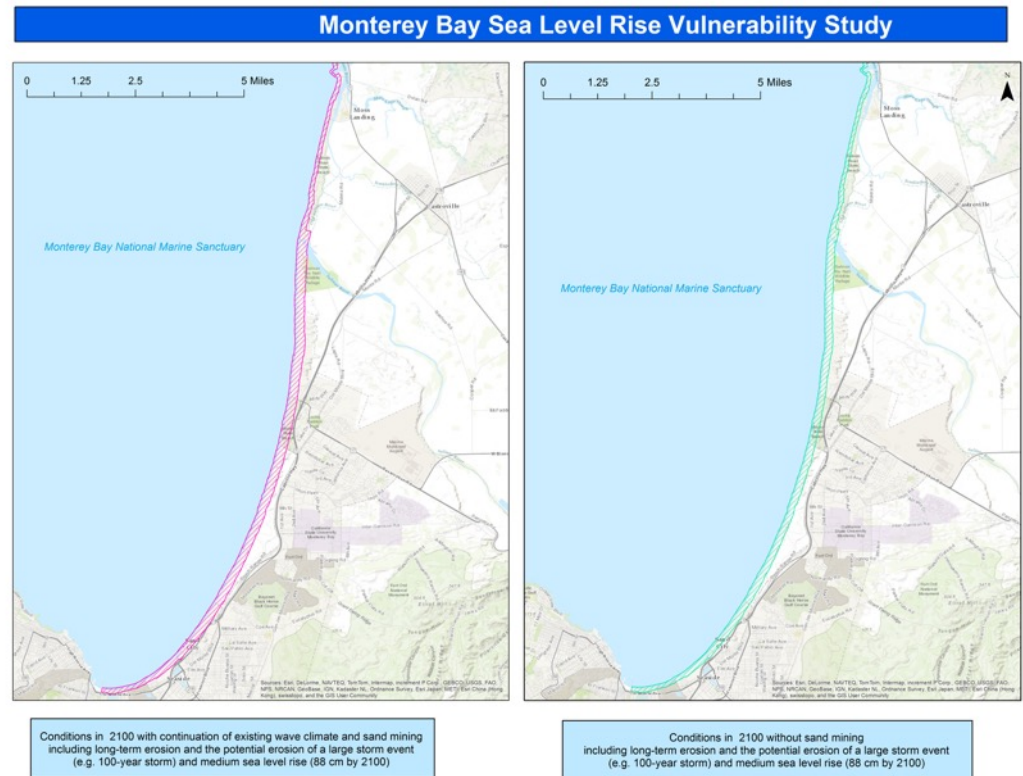
- Rich invertebrate communities that are prey for shorebirds, fish and marine mammals (i.e., sand crabs, amphipods)
- Interstitial organisms (bacteria, protozoan and meiofauna) inhabit the spaces between sand grains
- Fish spawning areas (ie. CA grunion)
- Essential habitat for leatherback sea turtle and green sturgeon
- Critical habitat (nesting and foraging) for declining and endangered wildlife, such as shorebirds (i.e., Snowy plover) and pinnipeds, and for a variety of threatened dune plants (i.e., Monterey spine flower)

Data from California beaches indicate that recovery times for some intertidal taxa (clams, upper shore invertebrates) may extend over years and even decades

Sanctuary Resource Impacts from Coastal Erosion

The Monterey Bay shoreline also absorbs wave energy and protects against coastal hazards, including:

- Flooding and inundation
- Sea level rise
- Coastal storm surges
- El Nino/La Nina events
- King Tide events



Critical Erosion Areas



- Coastal erosion threatens public structures (Monterey Beach House)

January 2016

Critical Erosion Areas



- Flooding of public & private property occurs during King tides

January 2016

Critical Erosion Areas



- Building up back beach to protect against flooding

January 2016

Critical Erosion Areas

- Building up back beach is a temporary fix and must be repeated annually or more



January 2016

Critical Erosion Areas



- Coastal Erosion threatens housing complex with flooding (Del Monte Beach Town Houses)

February 2016

Critical Erosion Areas



- Coastal Erosion threatens public works structures (pump house for sewage pipe)

February 2016

Critical Erosion Areas



- Coastal Erosion threatens dune habitat and old trees along Del Monte beach

February 2016

Critical Erosion Areas

Additional Critical Erosion Areas:

- Marina Coast Water District Parking Lot at end of Reservation Road
- Marina State Park facilities
- Sanctuary Beach Resort
- Sand City & Tioga Avenue
- Seaside Pump Station at Bay Avenue

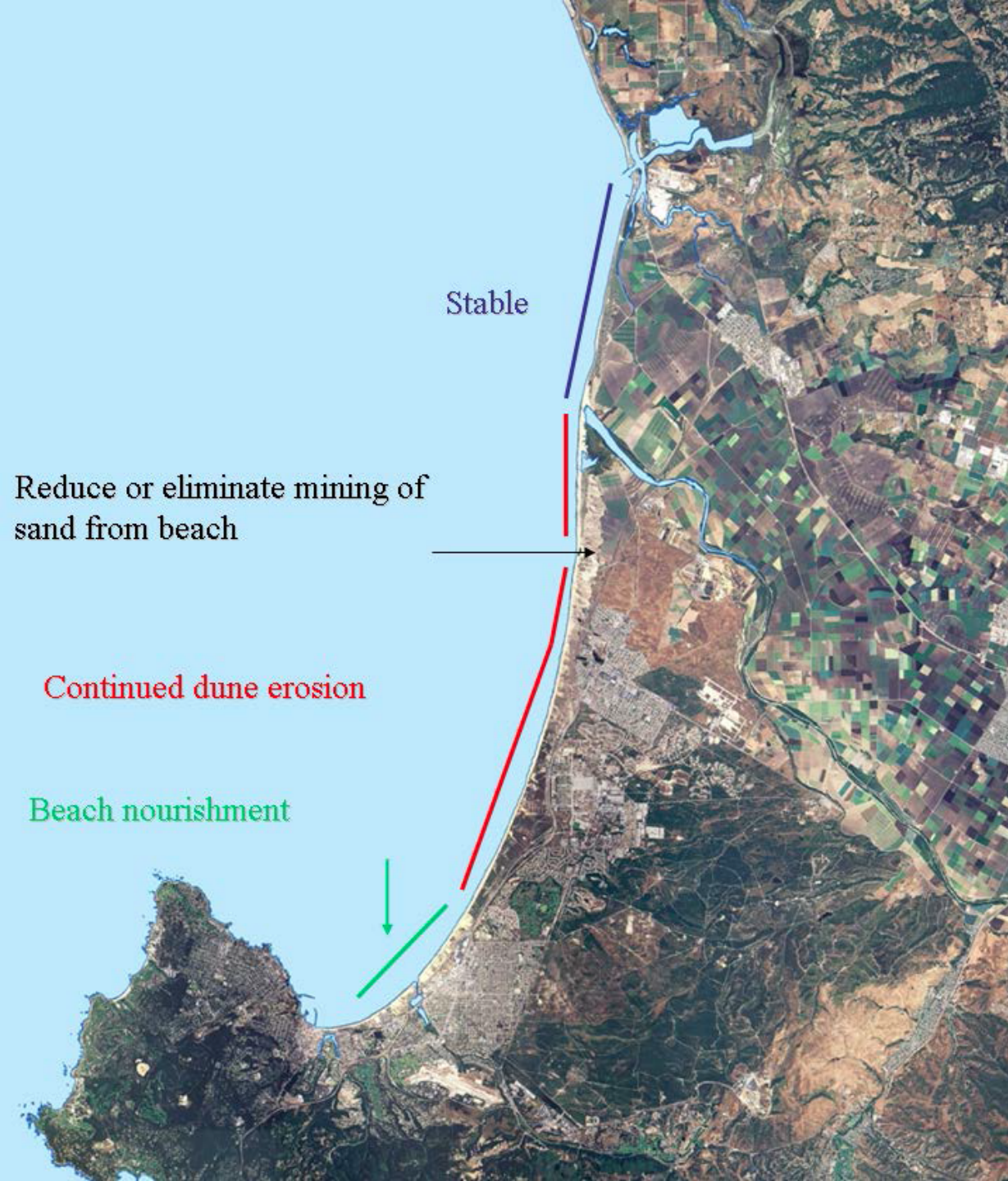


Figure 1: Summary of Recommendations from 2008 Southern Monterey Bay Coastal Regional Sediment Management Plan

Stable

Reduce or eliminate mining of sand from beach

Continued dune erosion

Beach nourishment

