

# **SAND STUDIES INDEPENDENT SCIENCE PANEL FINDINGS REPORT**

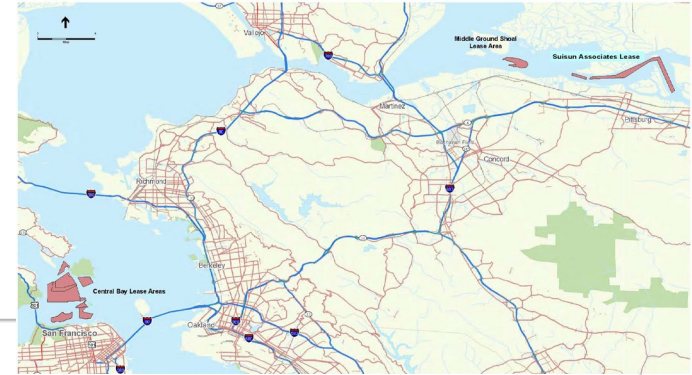
BRENDA GOEDEN  
SEDIMENT PROGRAM MANAGER  
SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION  
JUNE 20, 2024



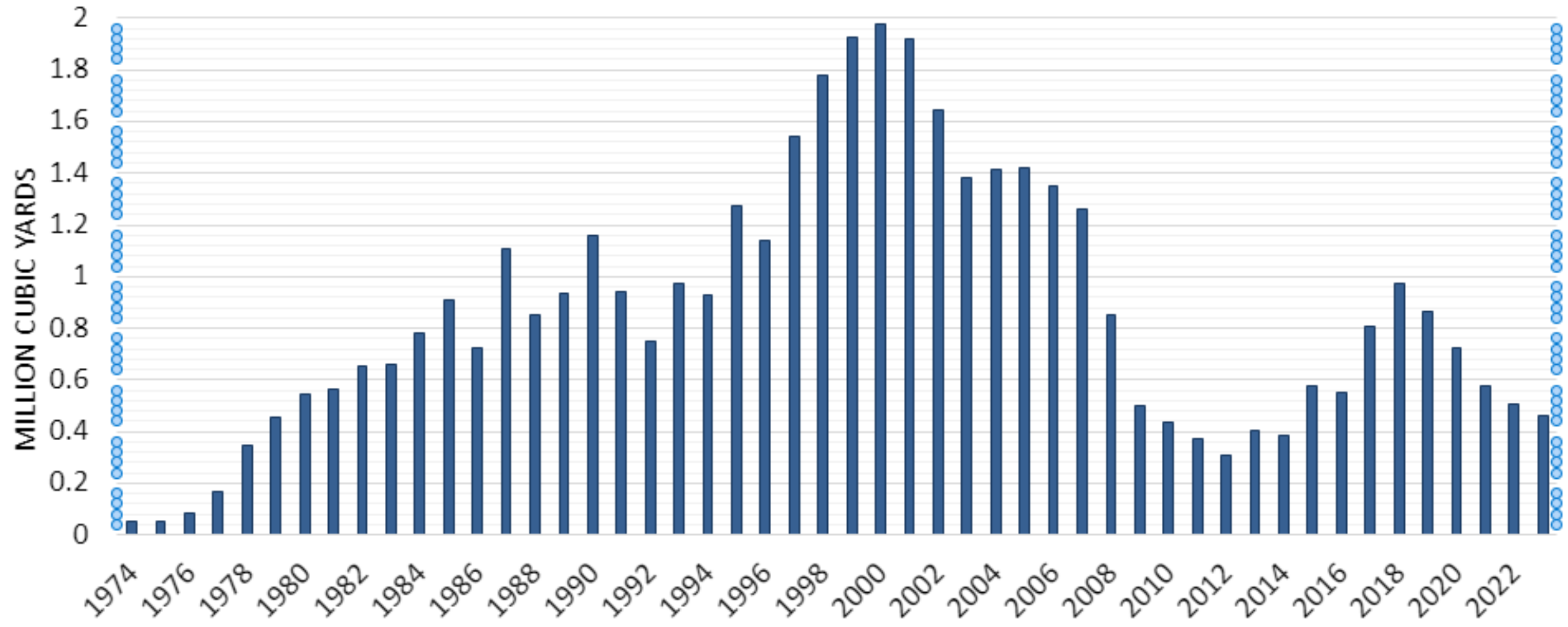
# PROJECT HISTORY

- Mining since 1930's
- Commission records from 1970's
- Multiple small mining companies
- 1990's mining leases consolidated:
  - Lind Marine
  - Martin Marietta
  - Suisun Associates





## Annual Volumes of Sand Mined in San Francisco Bay



# COMMISSION PERMITTING 2015



- Three permits issued:
  - Central Bay – Martin Marietta – 1.14 M cy
  - Suisun Bay – Suisun Associates – 185,000 cy
  - Middle Ground Shoal – Lind Marine – 100,000 cy
- Ten-year mining period
- Studies required:
  - Water Quality Monitoring Study
  - Benthic Habitat Study
  - Sand Transport, Budget, and potential impacts
    - \$1.2 million
- Mitigation required:
  - Removal of Bay fill
  - Installation and use of fish screens

# 2015 COMMISSIONER QUESTIONS

- How much sand in the Bay (volume) and where is it?
- Which areas are in transport and which areas are relic sands?
- Is the sand that is being mined in transport or relic, and what the impacts of mining relic sand?
- What is the impact to active sands (in transport) and the consequences to the Bay's beaches and tides that it feeds?
- If you dig a big hole there and some sediment comes down from the Delta, will it fill in that hole rather than go to the Bay beaches?
- Should there be a modification of mining volume, sites, and conditions?
- What is a sustainable volume for mining? What is "substantial depletion" ?
- Suggested monitoring the impact of the extraction of relic sand and sand in transport.
- What are the limits of BCDC's authority and jurisdiction in relation to sand mining?
  
- What's the impact to benthic life?

# STUDY PROCESS

## Funds Provided

Lind & Martin Marietta  
\$1.2 Million

## Sand Technical Advisory Committee

Management Questions  
Formed  
Study Scopes Developed  
RFQ Posted  
Proposals Reviewed

## Independent Science Panel

Proposals Reviewed  
Scope Revised  
Science Teams Identified  
Studies Completed  
Findings Report Developed

# SAND STUDIES TECHNICAL ADVISORY COMMITTEE

- State Coastal Conservancy
- San Francisco Bay Conservation and Development Commission
- California Coastal Commission
- State Lands Commission
- US Army Corps of Engineers
- San Francisco Bay Regional Water Quality Control Board
- National Marine Fisheries Service
- California Department of Fish and Wildlife
- San Francisco Bay Keeper
- Martin Marietta
- Lind Marine

## INDEPENDENT SCIENCE PANEL

- Bob Battalio, PE, Environmental Science Associates
- Dr. Craig Jones, Integral Consulting
- Dr. John Largier, UC Davis at Bodega Marine Laboratory
- Dr. David Schoellhamer, US Geological Survey, Emeritus
- Dr. Paul Work, PE, US Geological Survey, Emeritus

# SAND STUDIES QUESTIONS

Is sand mining at existing lease areas, at permitted levels, having a measurable or demonstrable impact on sediment transport and supply within San Francisco Bay?

- What is a sustainable number? What is “substantial depletion”?

What are the anticipated physical effects of sand mining at permitted levels on sand transport and supply within San Francisco Bay and the outer coast?

- What is the impact to active sands and the consequences to the beaches and tides that it feeds?
- What’s the impact to relic sands? How much is the volume and where is it?

Are there other feasible sand mining approaches to consider in San Francisco Bay?

- Should there be a modification of volume and site and conditions?



# RESEARCH TEAMS

## **Sand Budget, Supply, Morphological Change and Transport Analysis**

### **San Francisco Estuary Institute**

- Lester McKee, Tan Zi, Sarah Pearce, Cristina Grosso, Adam Wong, Michael Weaver, Scott Dusterhoff, Jeremy Lowe Jen Hunt

### **Deltares, Netherlands**

- Edwin Elias, Floortje Roelvink

### **US Geological Survey**

- Bruce Jaffee, Theresa Fregoso, Mathieu Marineau, Christopher Ely, David Hart

## **Sand Transport Modeling**

### **Anchor QEA**

- Michael MacWilliams, Aaron Bever

## **Sand Provenance**

### **University of Texas at Austin**

- Matthew Malkowski, Zachery Sickmann

### **US Geological Survey**

- Bruce Jaffee, Theresa Fregoso

# INDEPENDENT SCIENCE PANEL KEY FINDINGS

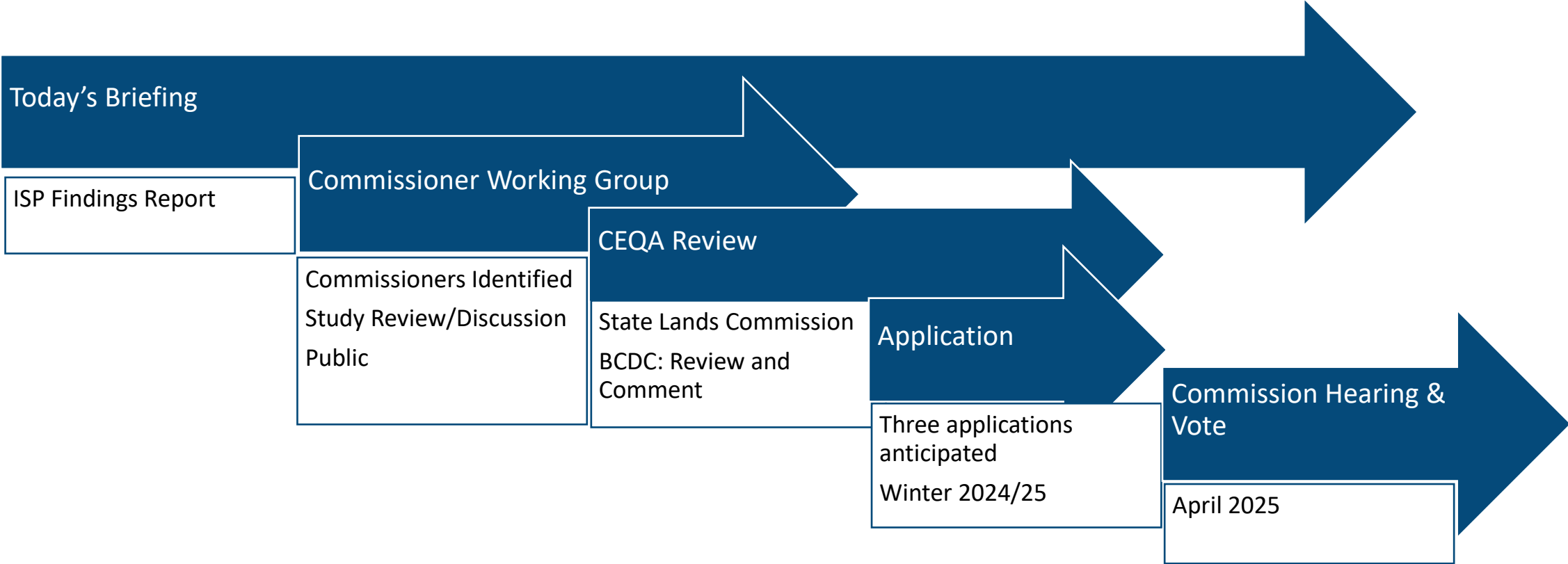
1. The volume of mined sand is significant relative to the Bay sand budget (it represents the largest outflow of sand from the Bay), including the net sand discharge to the ocean. Additionally, sand is mined faster than it is replenished; therefore, sand is a non-renewable resource over the long term.
2. Suisun Bay sand is not replenished; thus, it is a finite resource, and the bed is being lowered. The bathymetric, modeling, and budget studies all support this. Sand mining effects in lease areas appear to be highly localized, with effects diminishing with distance from the event location. The effect is pronounced in areas of negligible sand transport such as Suisun Bay, where the depressions caused by mining persist in the bed over time.

# INDEPENDENT SCIENCE PANEL KEY FINDINGS

3. Central Bay sand is relic (i.e., deposited between 20,000 and 6,000 years ago as sea levels rose, and the river discharge point migrated through the Bay to its present location in the Delta) and is part of a large bay-ocean reservoir of sand. Sands derived from the watersheds of the Sacramento and San Joaquin Rivers are no longer a significant source to the Bay and ocean, and large volumes of sand do not move through the system during times of high flows (e.g., wet winters), as was previously assumed. Effects of mining to beaches and ecologically important shoals remain unquantified.

4. San Francisco Bay and the Pacific Ocean share a common pool of sand which sand mining reduces. In each tidal cycle, a huge amount of sand is transported between the Bay and the ocean effectively linking the two sand deposits into a shared pool. The size of this shared pool of sand, and thus the significance of the reduction due to mining, is unknown.

# PROCESS GOING FORWARD



# SAND STUDIES COMMISSIONER WORKING GROUP

**Chair:** Pat Showalter

**Members:** Andy Gunther, Barry Nelson

July 12, 2024: 1 pm to 3 pm

August 21, 2024: 10 am - 12 pm

September 4, 2024: 10 am – 12 pm

November 22, 2024: 9 am to 11 am



# THANK YOU

## QUESTIONS?



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<https://bccdc.ca.gov/event/june-20-2024-commission-meeting/>