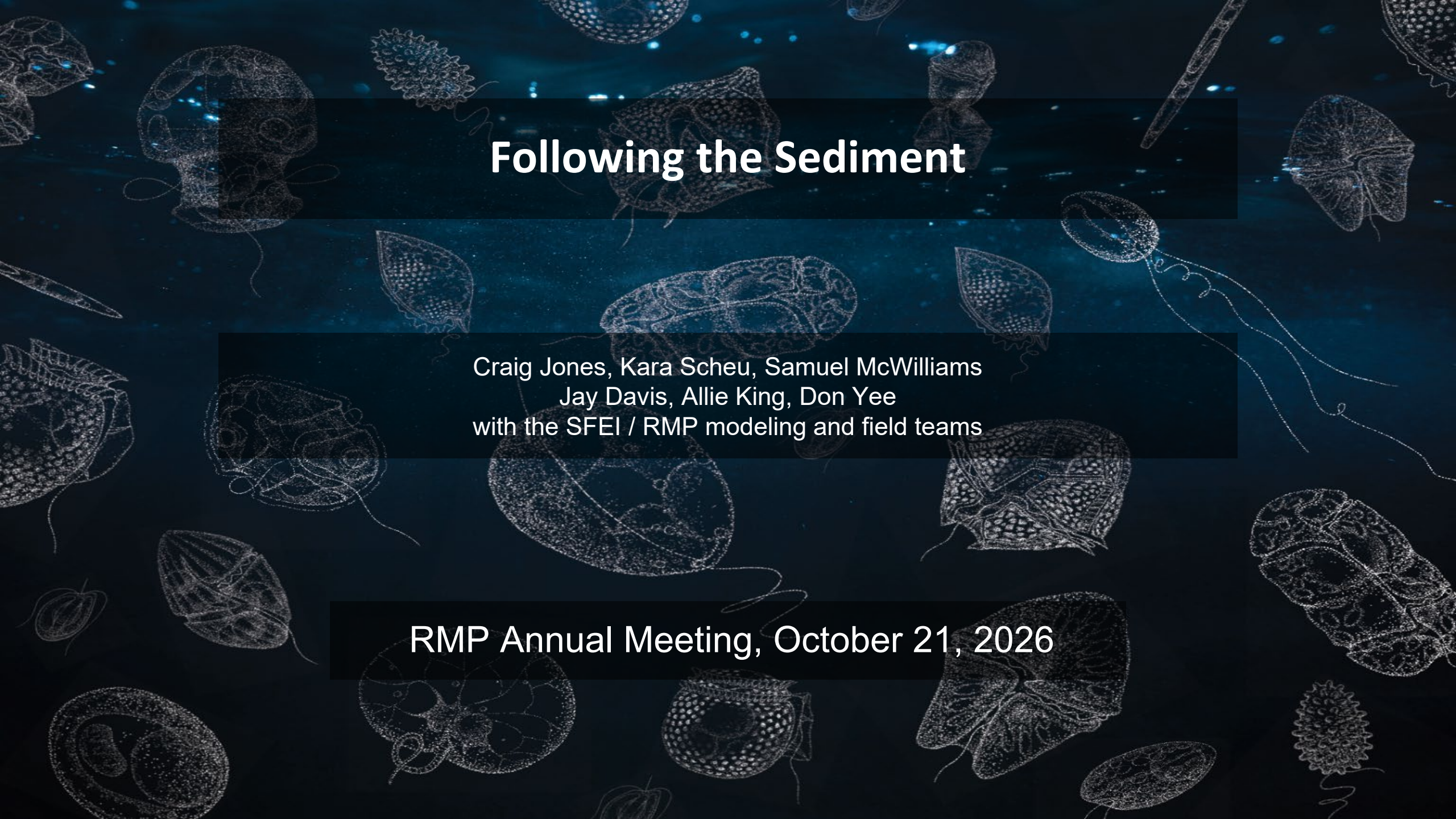


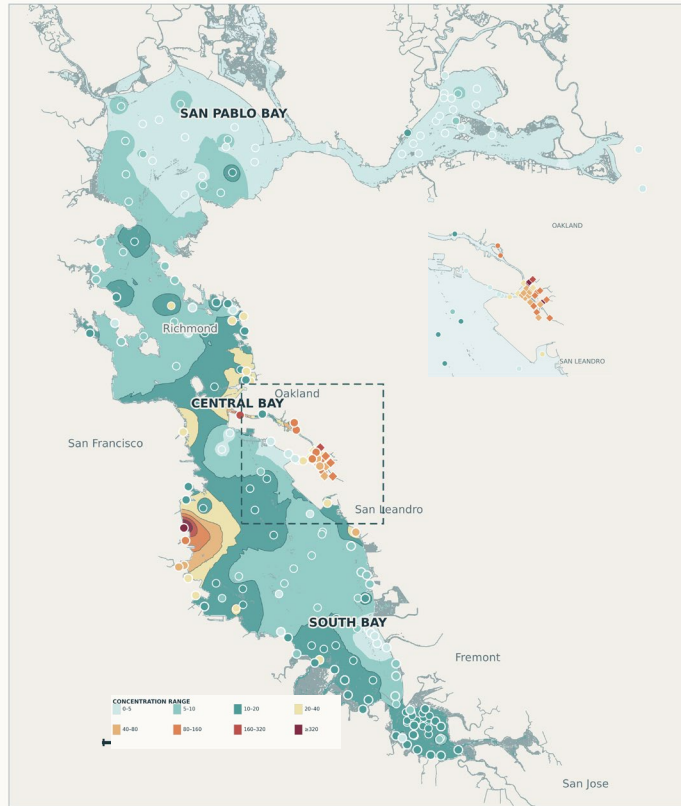


Following the Sediment

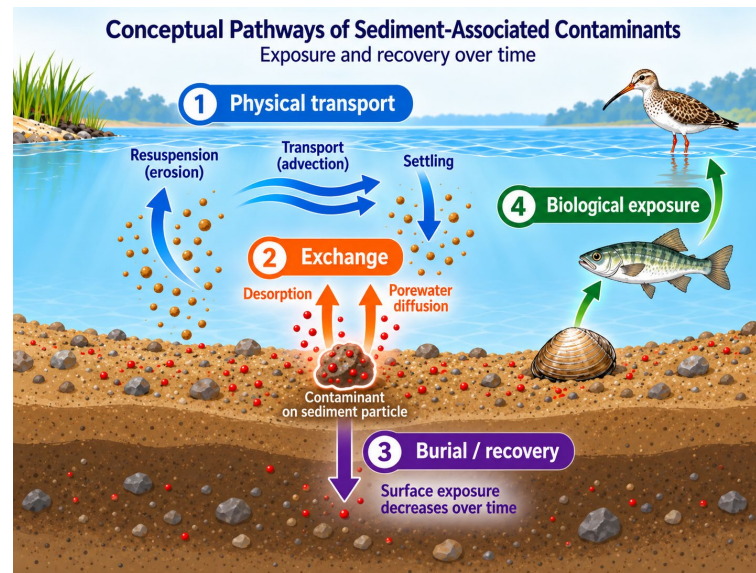
Craig Jones, Kara Scheu, Samuel McWilliams
Jay Davis, Allie King, Don Yee
with the SFEI / RMP modeling and field teams

RMP Annual Meeting, October 21, 2026

Why follow sediment?



Contaminated margins and priority areas (SFEI 2026)

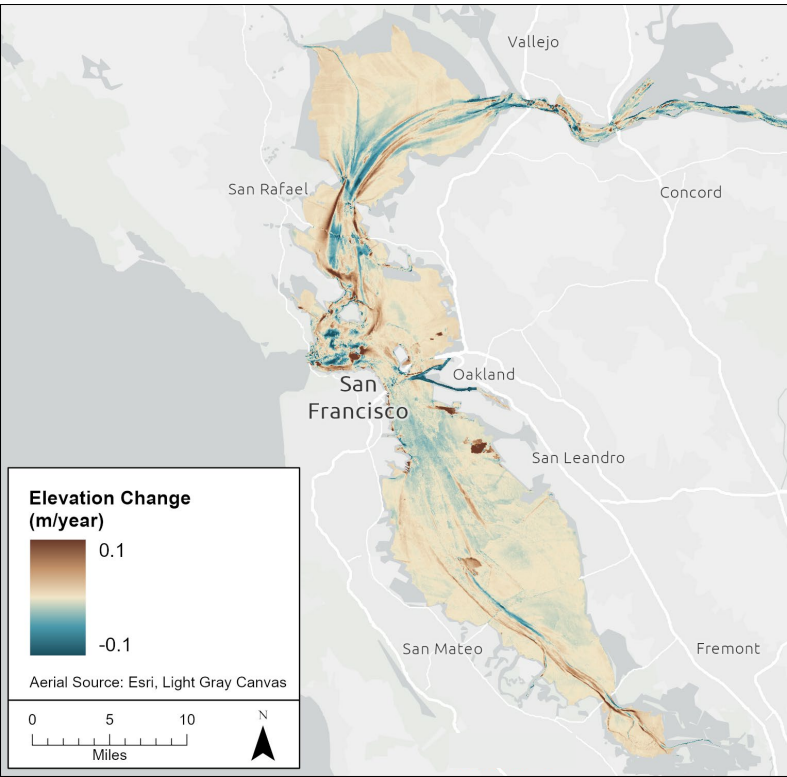


Physical transport, burial, exchange, and biological processes

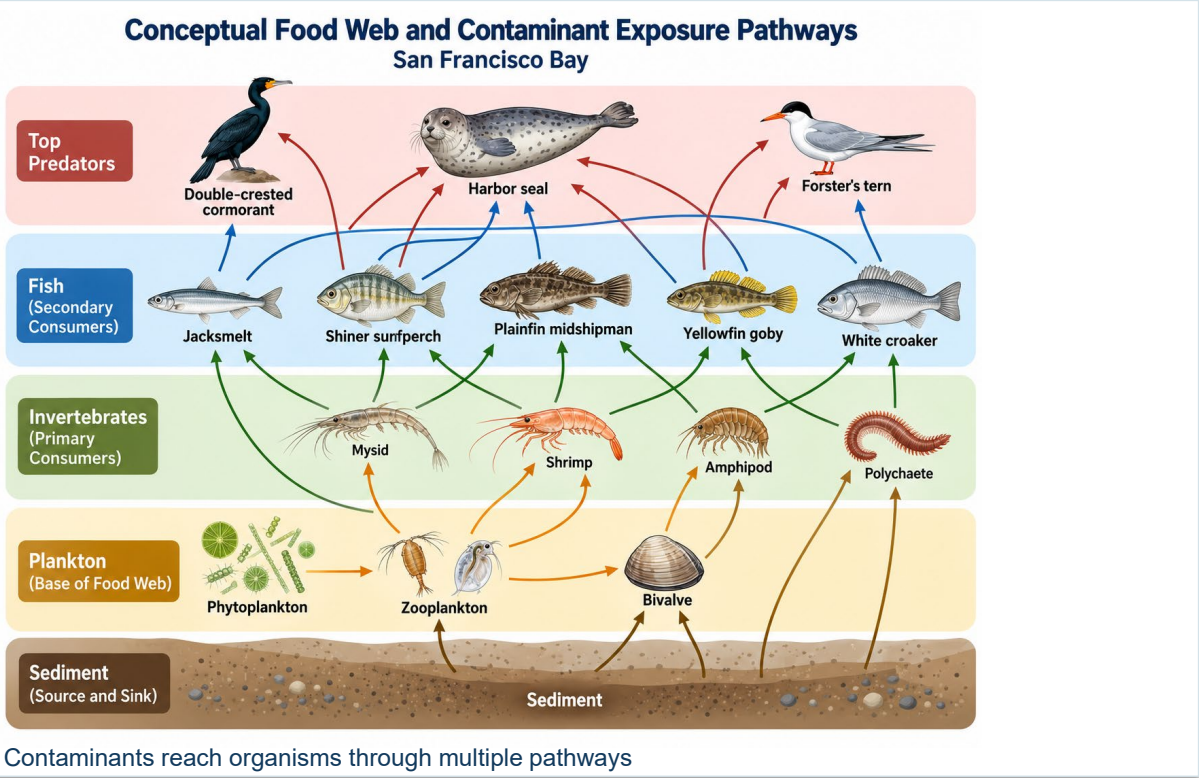
Management questions

- Where do sources accumulate?
- What controls recovery?
- Which interventions matter most?

The same sediment sustains habitats and carries contaminants



USGS measured Bay floor elevation change, 1980s to 2010s



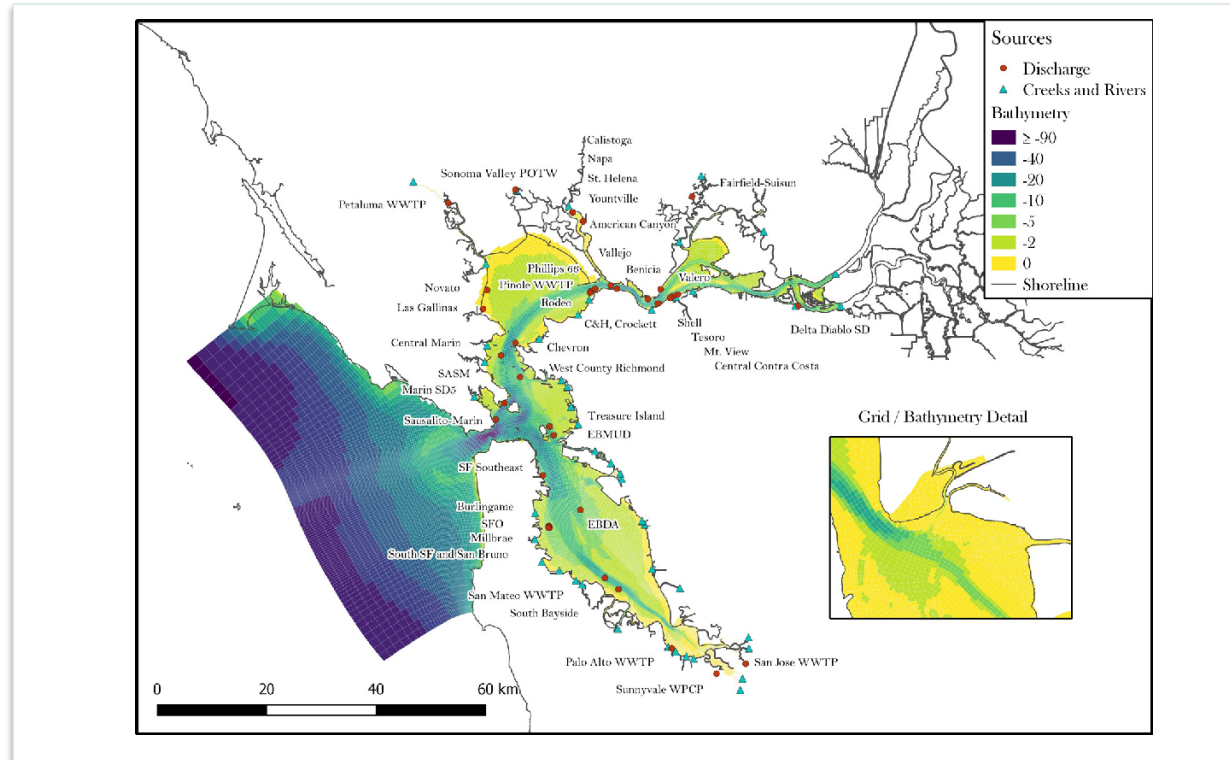
Sediment supply is an ecological resource.
Sediment redistribution also determines where
legacy contamination persists.



Sources: McKnight et al. (2023); Fregoso et al. (2023, rev. 2024), Fig. 7.

The plan: connect field evidence to models at the right scale

STRATEGY



Watersheds

Discharge and sediment loads

Local embayments

Fluxes, erosion, burial, and recovery

Baywide model

Connectivity and regional management scenarios

Build from existing hydrodynamics, use targeted data to test transport, and increase chemical complexity only when evidence warrants it.

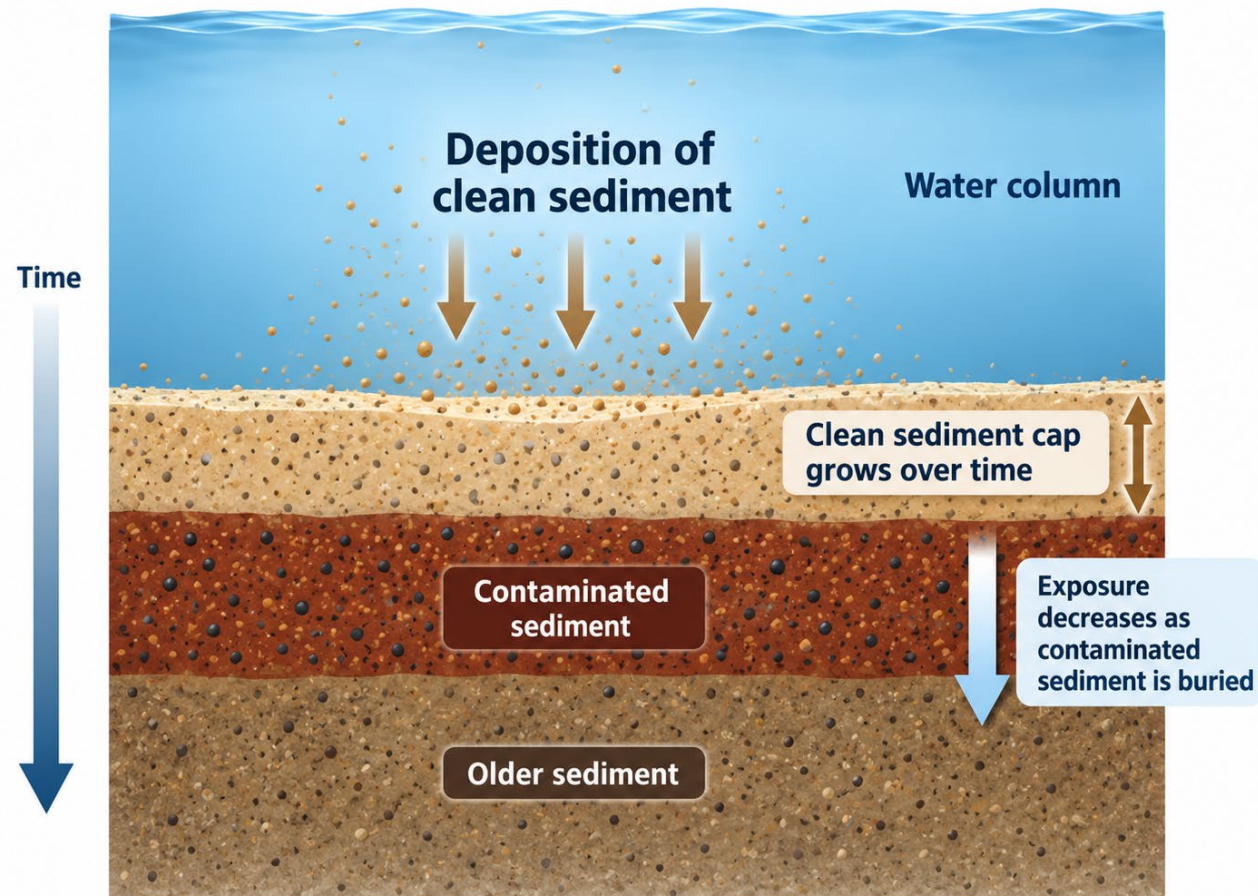
How does contaminated sediment recover?

Sediment recovery

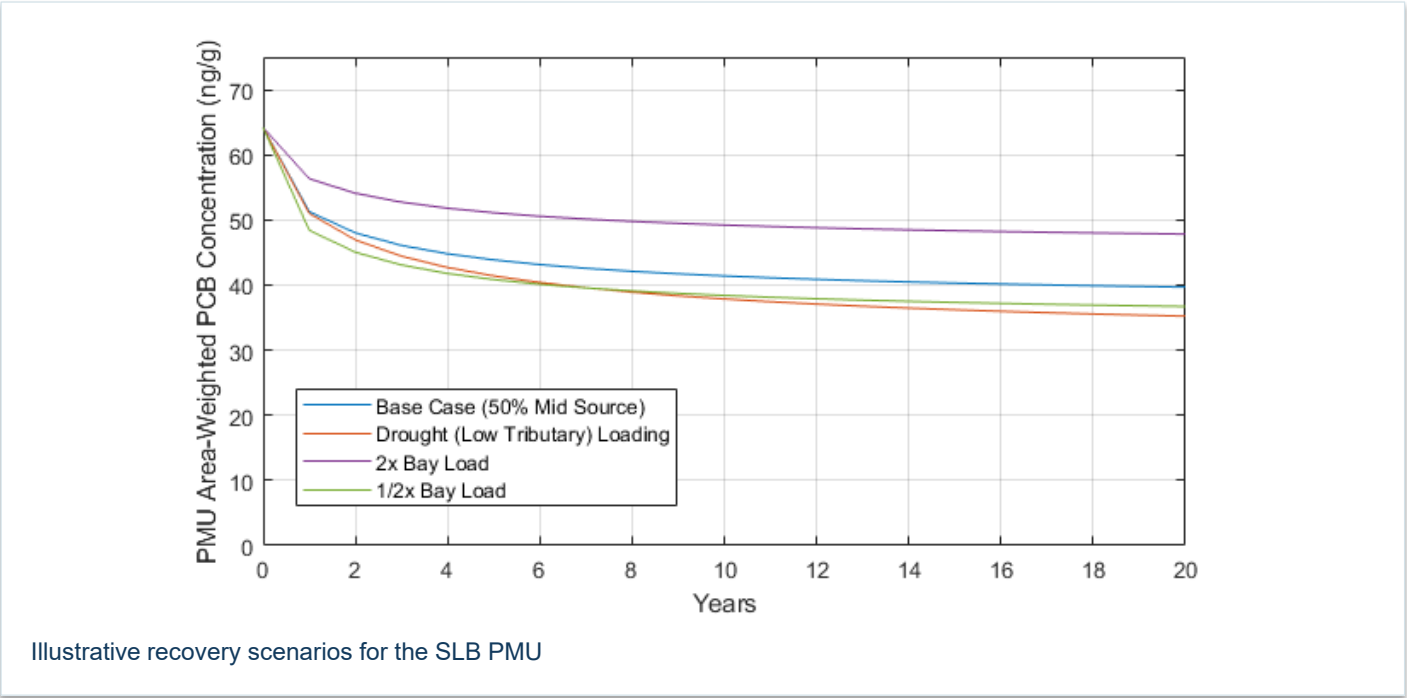
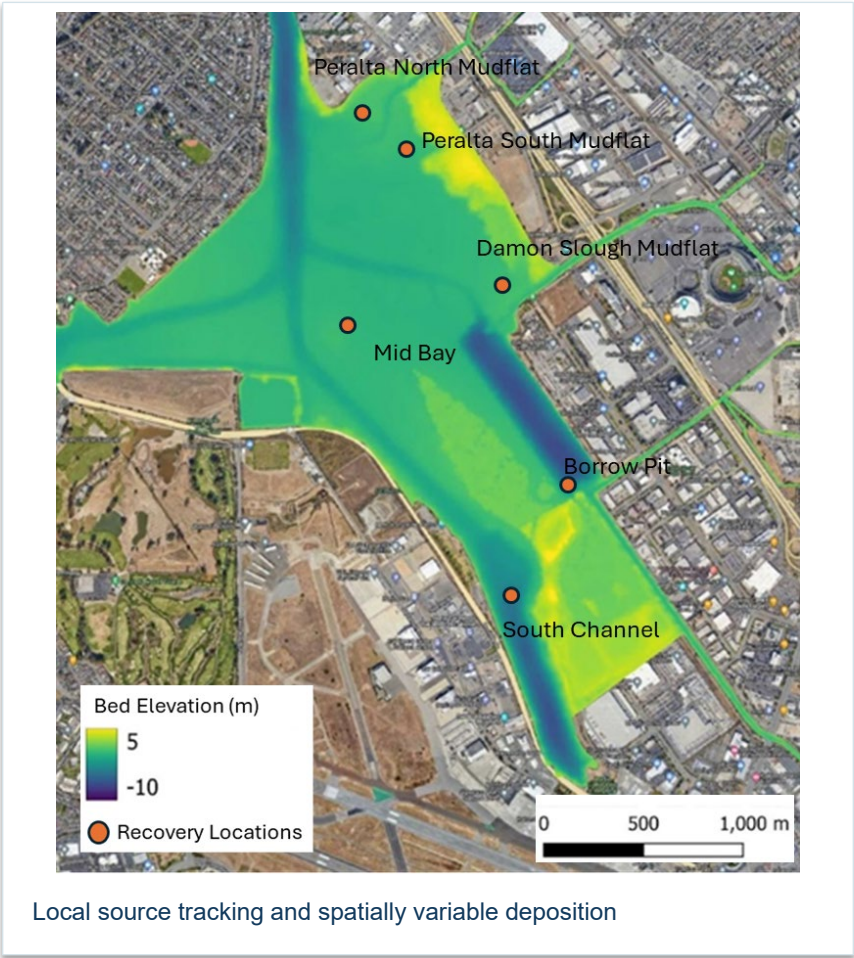
A decline in contaminant concentration in the biologically active surface sediment.

- 1 Cleaner sediment settles
- 2 Legacy contamination is buried
- 3 Potential surface exposure declines

Burial reduces accessibility but does not remove contaminant mass.



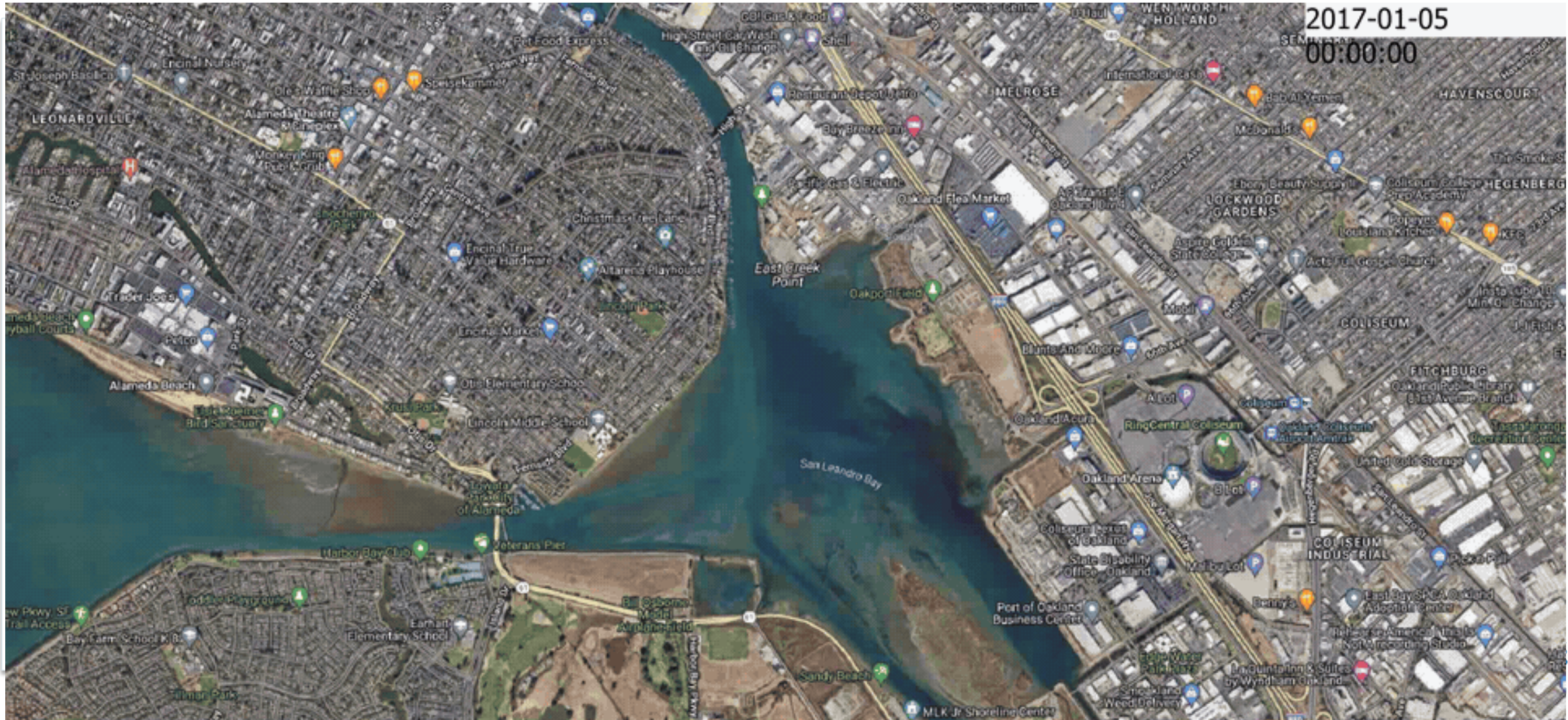
Where we were last year: SLB recovery scenarios



Initial model results suggested watershed source reductions could accelerate PCB recovery. Key loading and bed properties still needed testing.



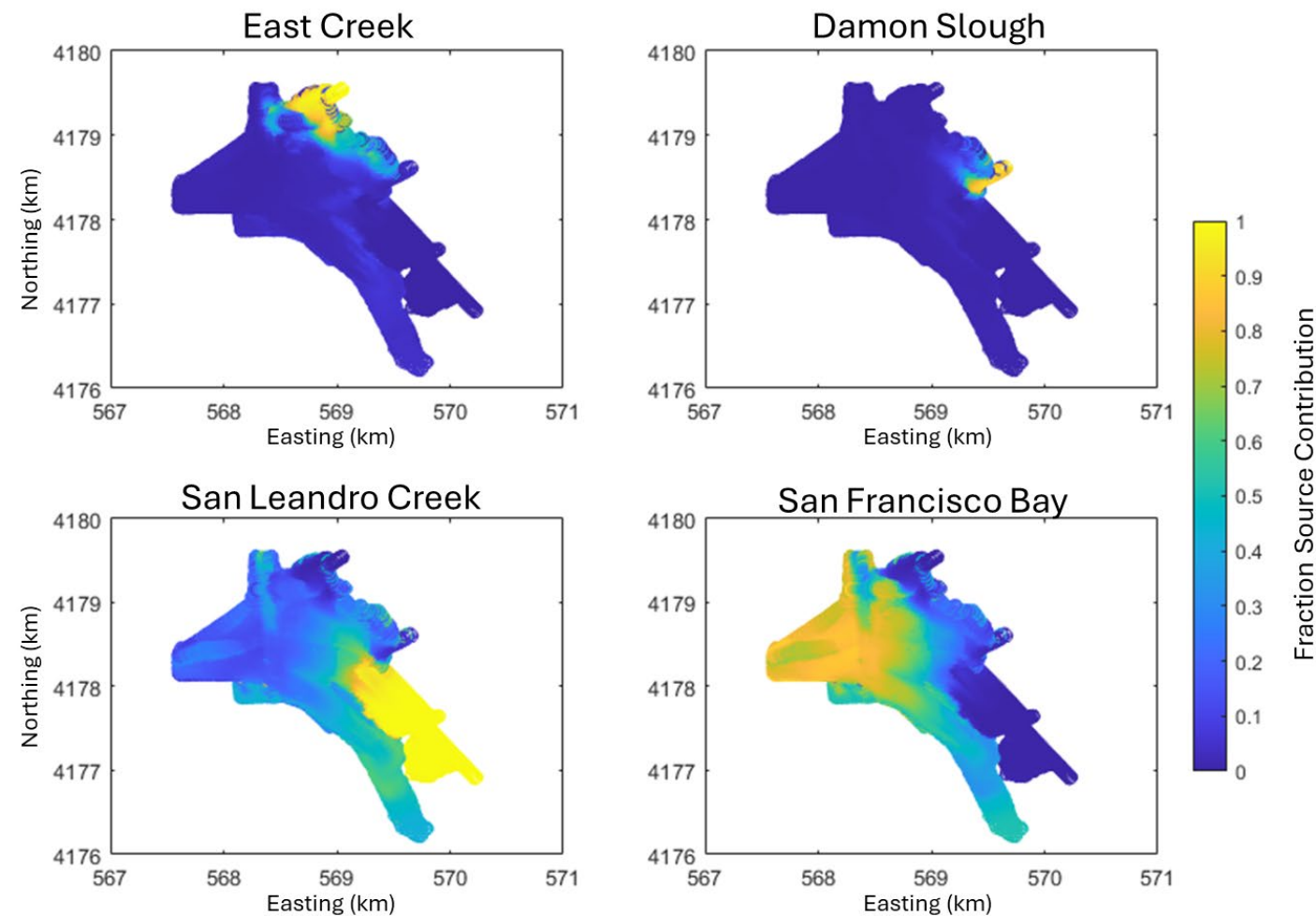
San Leandro Bay: a test bed for transport and recovery



Sources: Jones et al. (2022); Scheu et al., OPTICS presentation (2026), slides 2 and 6.

The model follows sediment from each tributary and from the Bay

MODELING HOW



Four independently tracked sediment inputs across the embayment

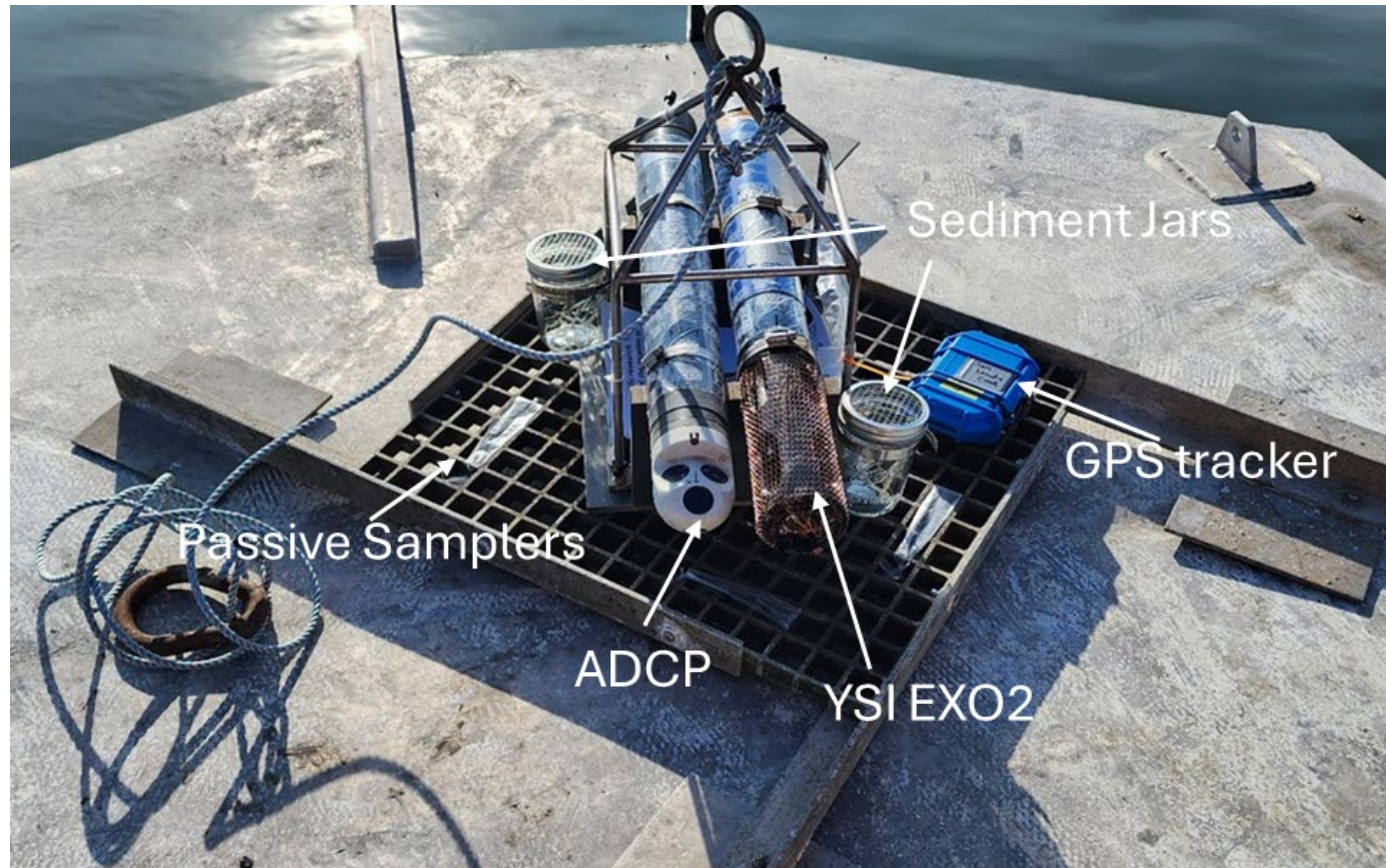
What it predicts

- Transport and deposition
- Source fractions in the bed
- PCB concentration of the active layer
- Management scenarios



Sources: McWilliams et al. (2025), RMP Annual Meeting, slide 8; SLB modeling report draft (2025).

Measuring the transport that drives our understanding



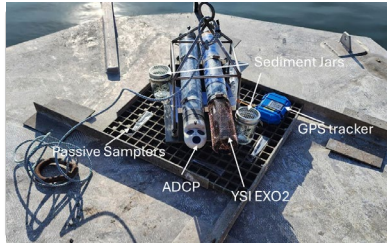
Actual monitoring platform with hydrodynamic and optical instruments

- 7 monitoring locations
- 155 surface water samples
- 120 current and discharge transects
- 6 SEDFlume sediment cores



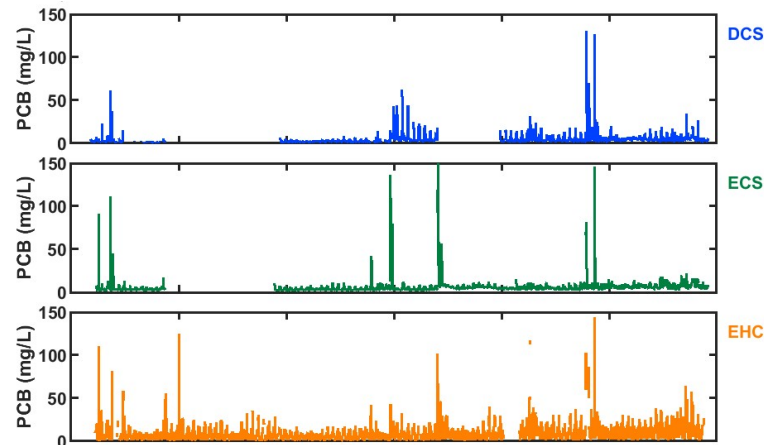
What the observations reveal: storms reshape PCB concentrations

***In Situ*
Environmental
Data**



OPTICS

**Discrete
Surface Water
Sample Data**



Estimated PCB concentration time series (ng/L) at seven stations

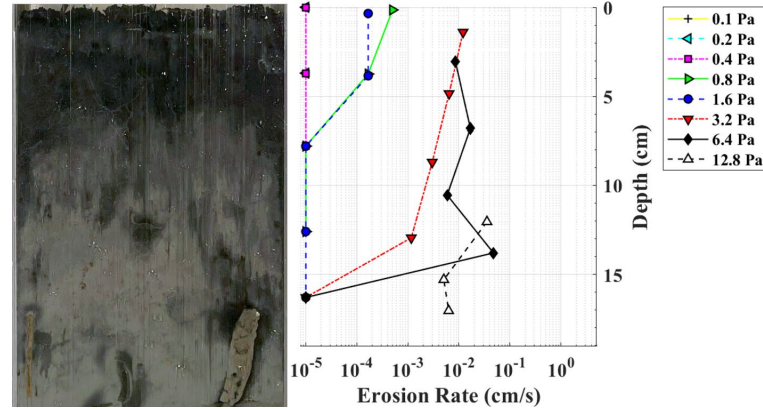
Preliminary findings

- East Creek, Damon Slough, and Elmhurst Creek have storm event peaks exceeding 100 ng/L
- Low estimated concentrations at the open Bay boundaries (<5 ng/L)
- Event timing matters for load integration

What about the sediment bed?



San Leandro Bay SEDFlume core sampling locations



Measured erosion response and sediment properties



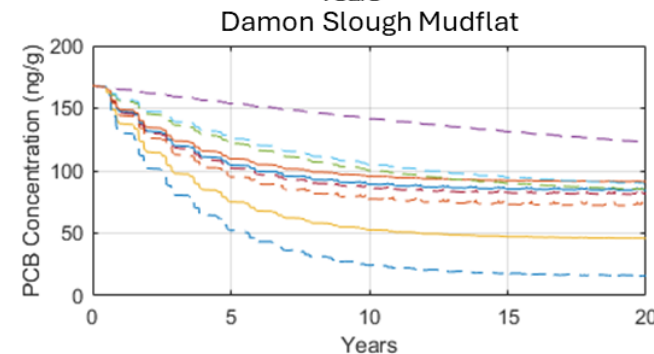
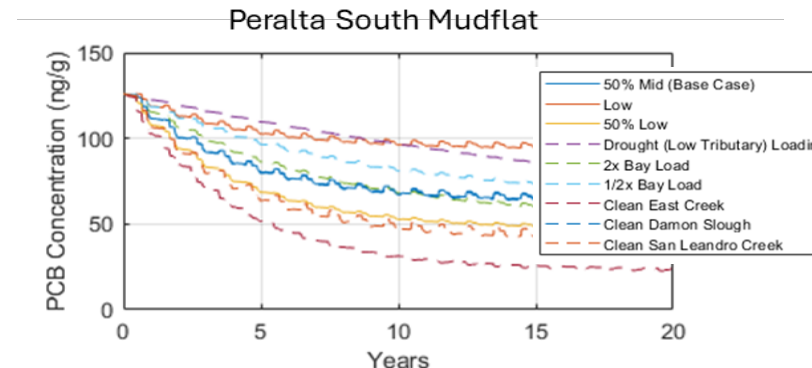
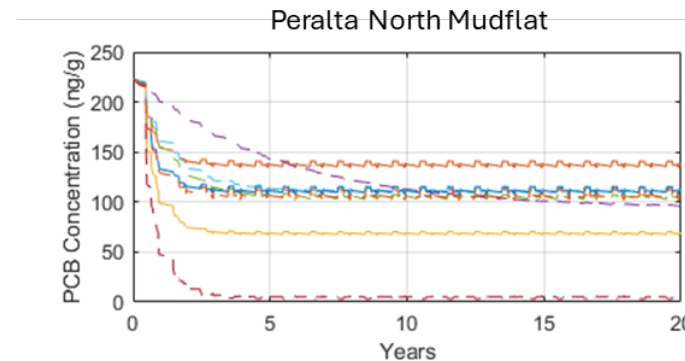
Biogenic structure and sediment mixing

Location, depth, grain size, biological activity, and bed consolidation can all change erosion behavior. Field measurements help replace assumed uniform bed properties.

Management test: How much does reducing sources change recovery?



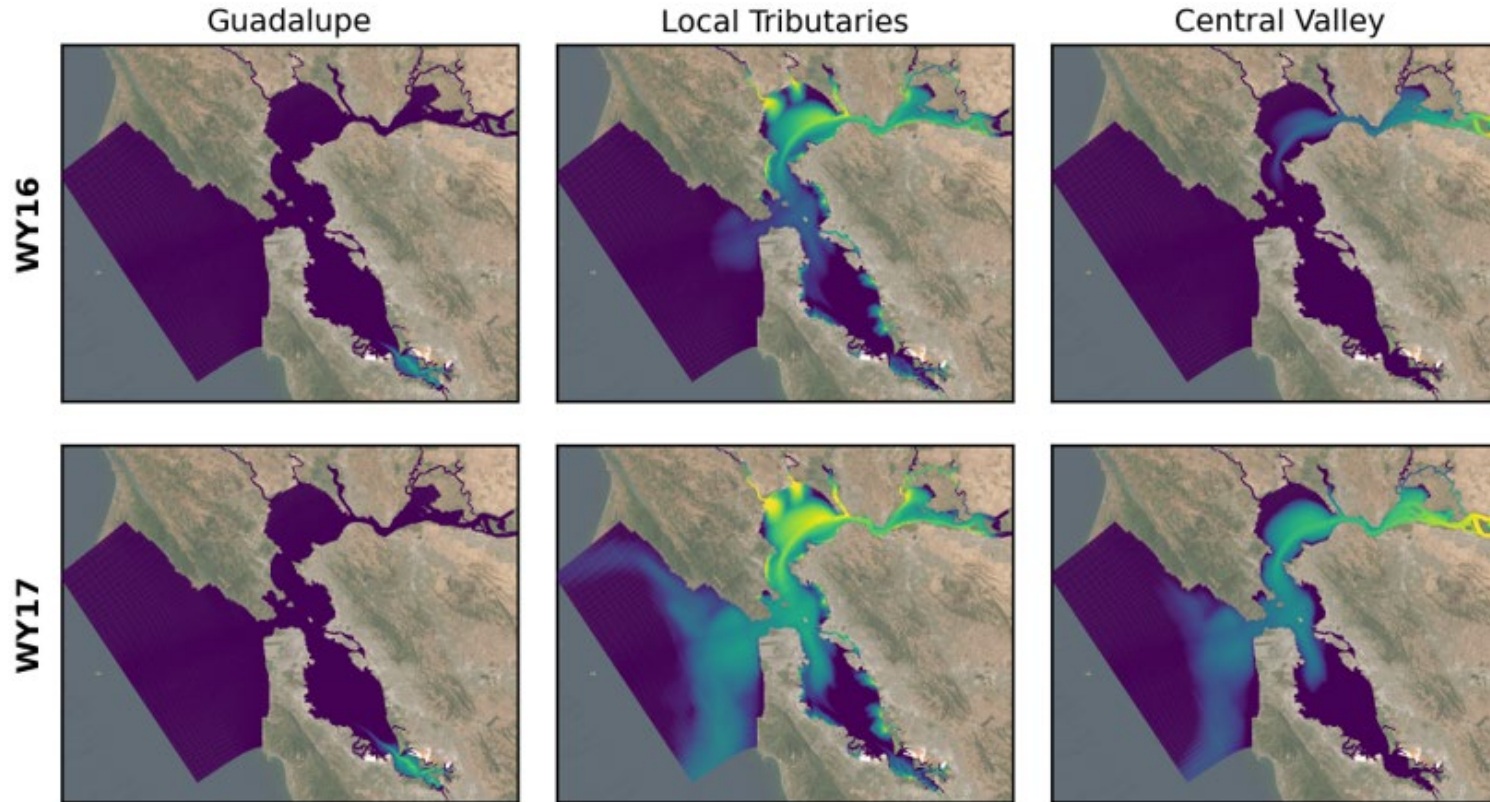
Illustrative 20 year SLB surface sediment PCB recovery curves



- Deposition rates and quality influence how rapidly surface sediment responds
- Model results depend on source load assumptions
- Model uncertainty can guide where we have the highest leverage with measurements

Scaling up. Sediment sources throughout the Bay

WHOLE BAY RESULTS



- Bedded sediment from northern reaches redistributes more widely.
- Lower South Bay and Guadalupe sediment remain more localized.
- High flows change transport footprints and deposition.

Modeled distribution of sediment during WY2016 and 2017

The next step: observations, sediment physics, and contaminant fate

MOVING FORWARD

1

Constrain loading

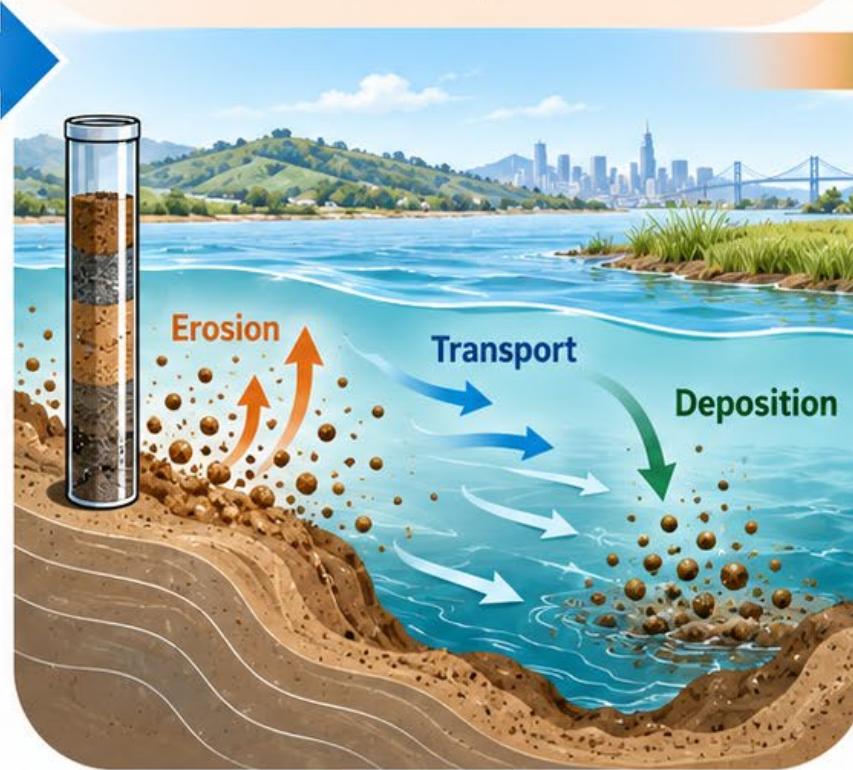
Reconcile observed flux and watershed estimates



2

Understand sediment behavior

Use available tools to quantify sediment transport



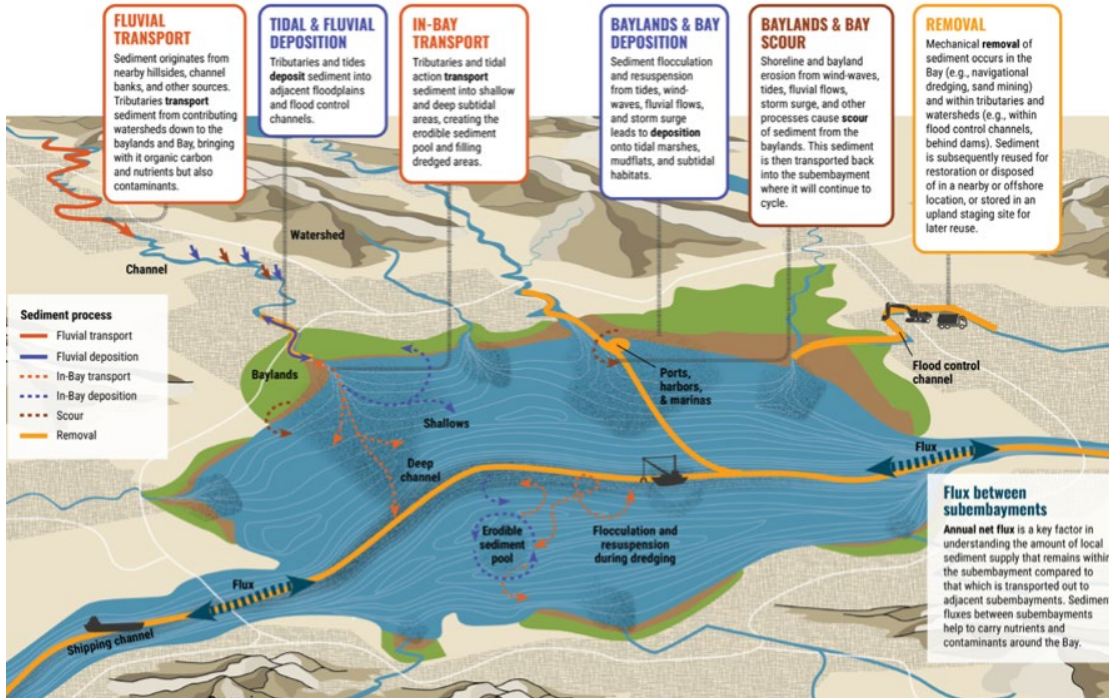
3

Connect to exposure

Build Baywide contaminant fate and bioaccumulation



So What?



The science begins with specific Bay environments and pathways

Sources: McKnight et al. (2023); SFEI/Integral RMP workgroup studies, 2025–2026.

Predicting recovery is the management opportunity

Sources matter

Tributary inputs and historical reservoirs have disproportionate consequences on sediment recovery

Place matters

Local margin dynamics differ from whole Bay sediment redistribution

Measurements matter

Better flux and bed data support more defensible recovery scenarios

