



Sustaining Sediment for Survival

Considerations for Supporting
Baylands Resilience

Scott Dusterhoff

Program Managing Director & Senior Scientist

From Policy Shifts to Placement Pilots: Navigating Resilience through Strategic
Sediment Management in San Francisco Bay

State of the Estuary Conference | May 29, 2024

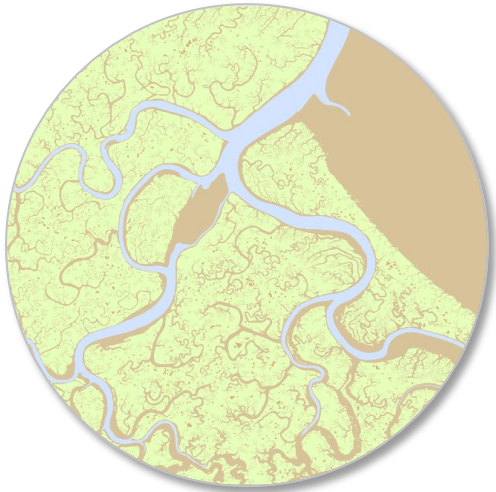
SFEI | San Francisco
Estuary Institute

What's the baylands story?

What's the baylands story?

Historical Baylands

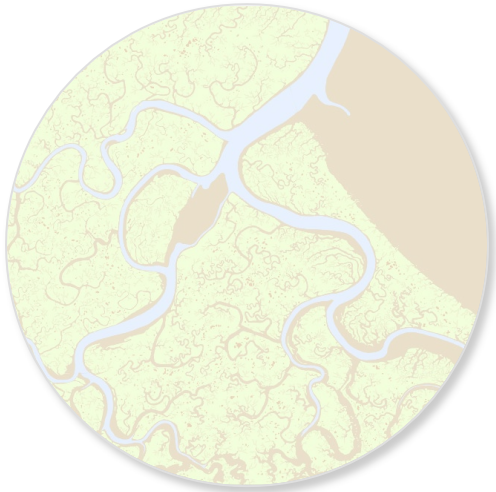
~250,000 acres



What's the baylands story?

Historical Baylands

~250,000 acres



Modern Baylands

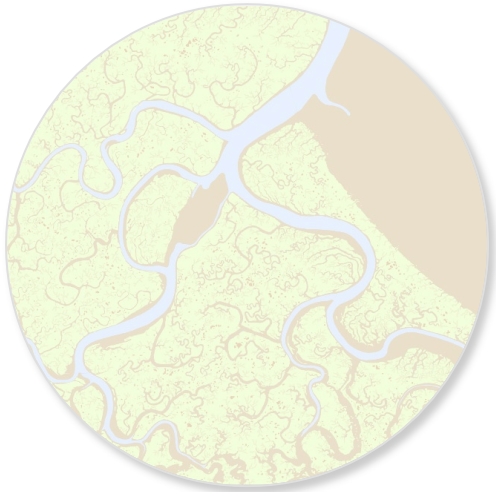
~80,000 acres



What's the baylands story?

Historical Baylands

~250,000 acres



Modern Baylands

~80,000 acres



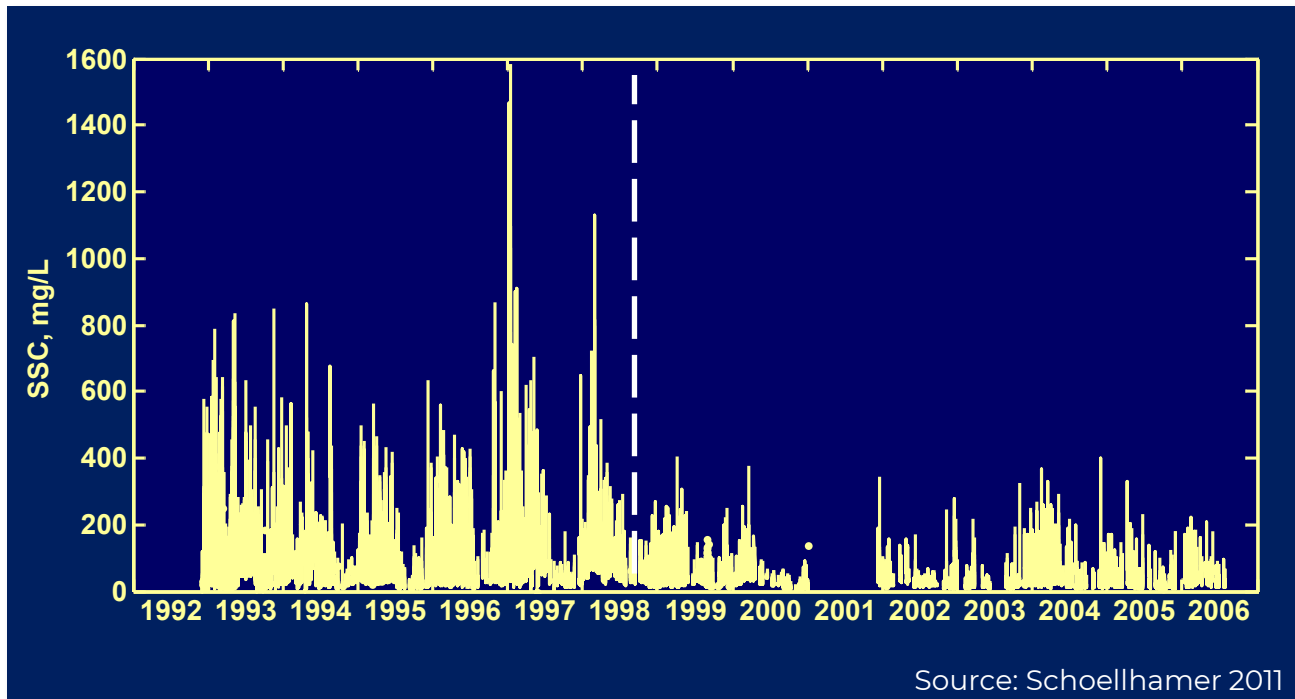
Planned/In-progress
Restoration

~24,000 acres



What's the current sediment story?

Bay Suspended Sediment Concentration

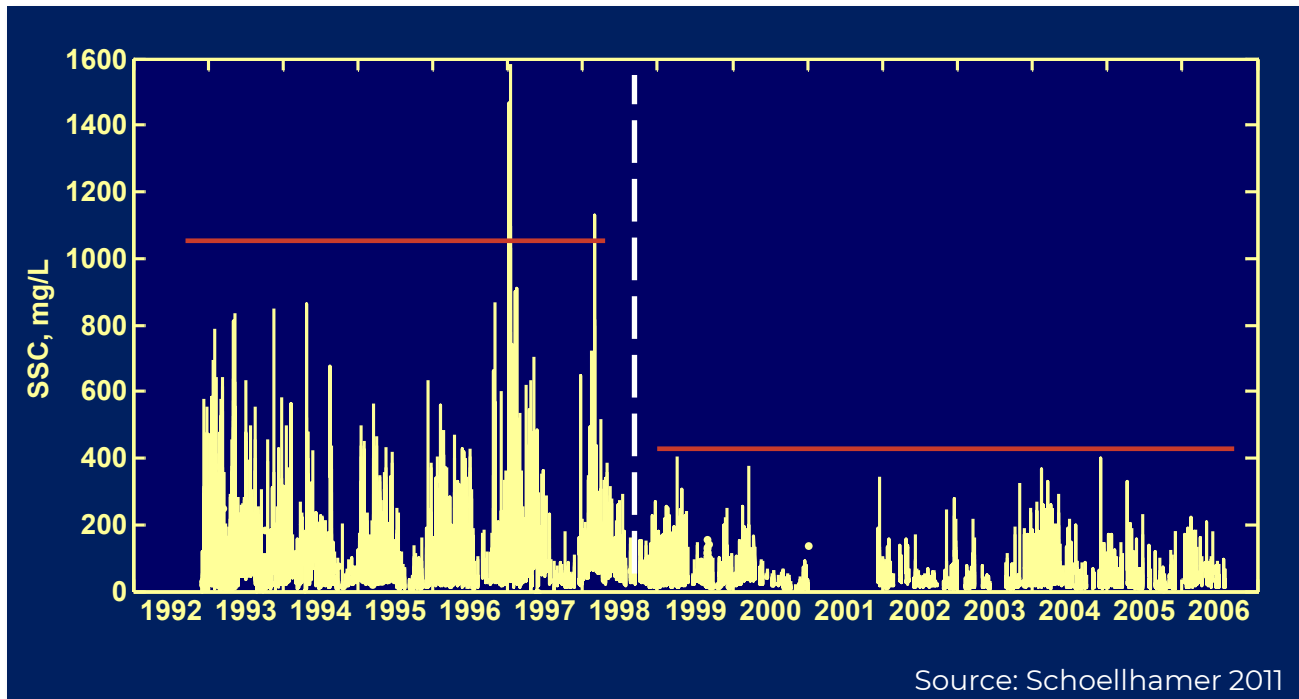


Source: Schoellhamer 2011

Courtesy of D. Schoellhamer

What's the current sediment story?

Bay Suspended Sediment Concentration

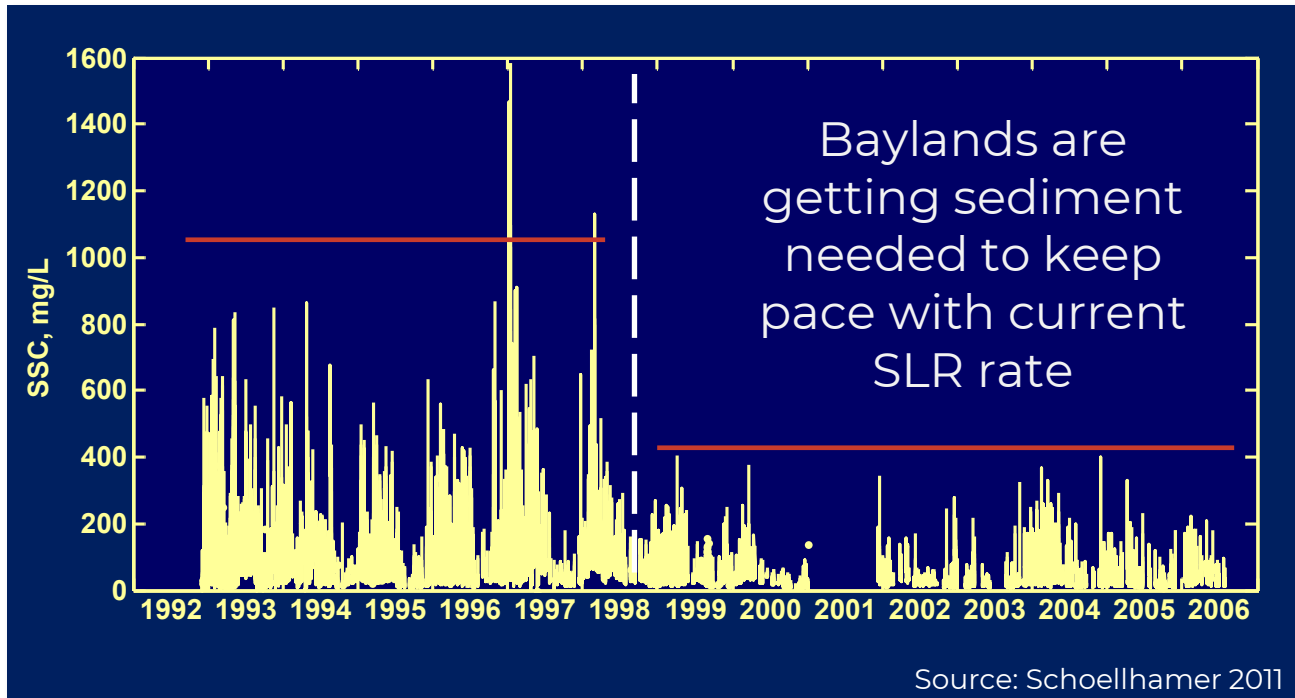


Source: Schoellhamer 2011

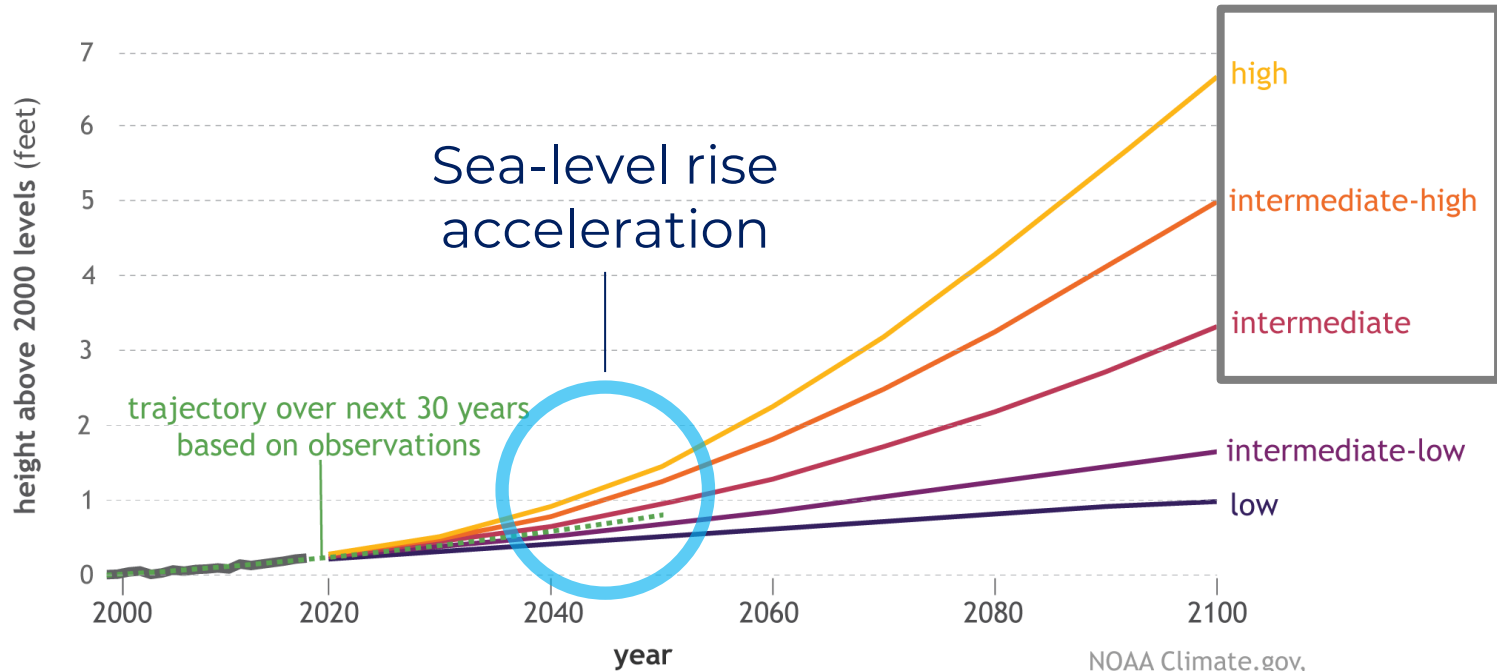
Courtesy of D. Schoellhamer

What's the current sediment story?

Bay Suspended Sed Concentration



What's coming down the pike?



NOAA Climate.gov,
adapted from Sweet et al., 2022

What's coming down the pike?

Amount of sediment
needed for tidal marshes
and mud flats by 2100



~450 Million tons

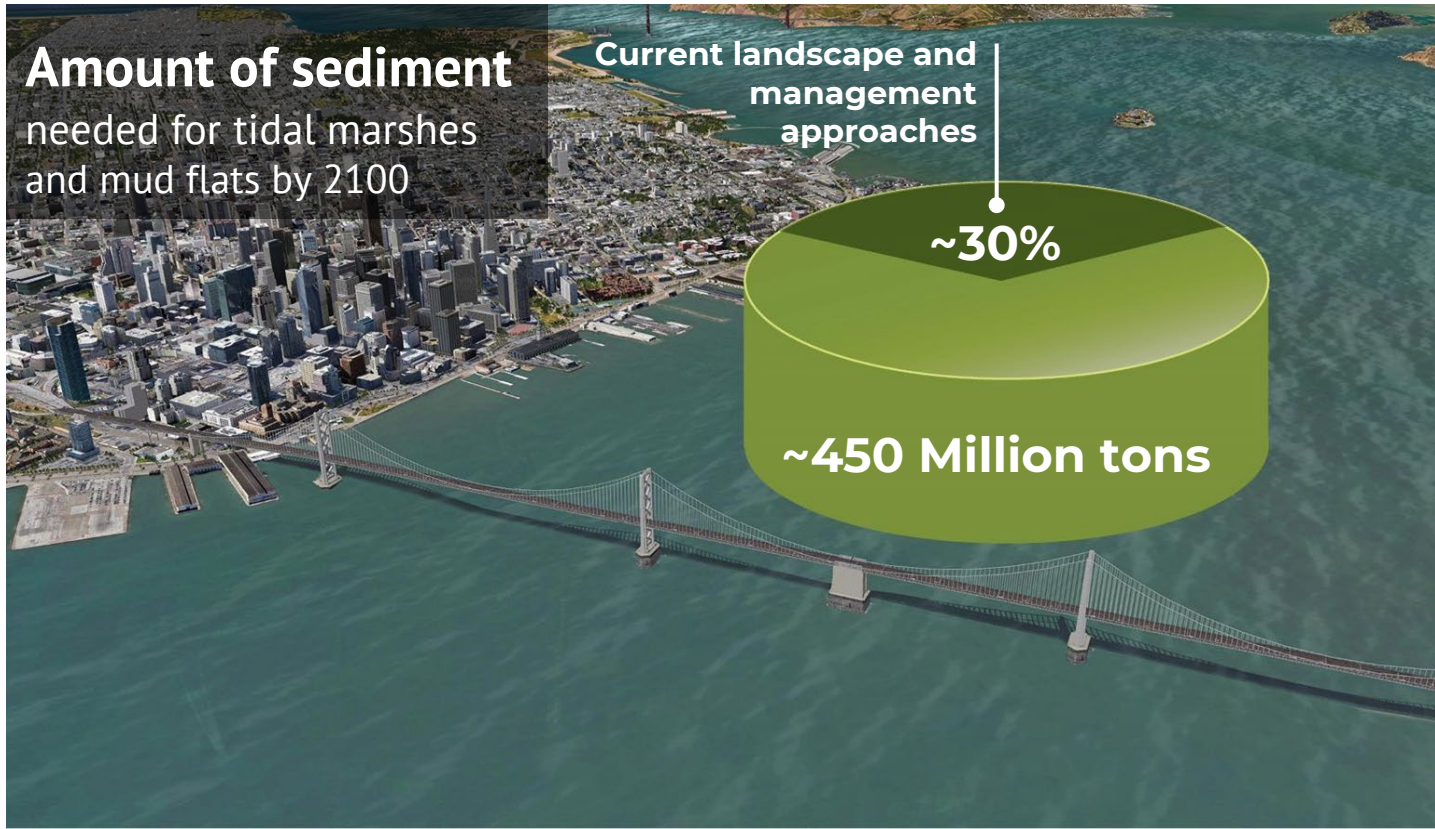
What's coming down the pike?

Amount of sediment
needed for tidal marshes
and mud flats by 2100

Current landscape and
management
approaches

~30%

~450 Million tons



What's coming down the pike?

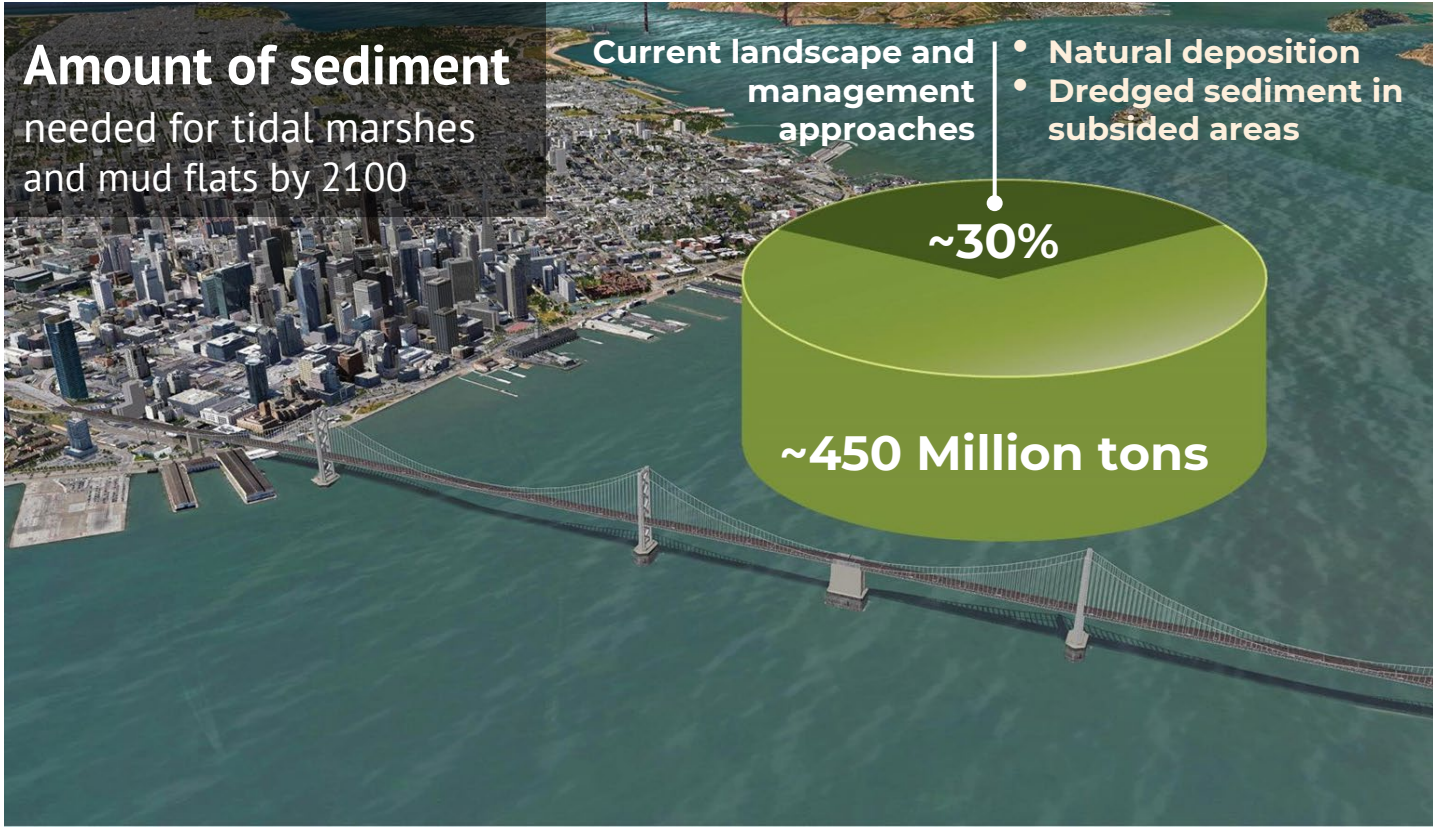
Amount of sediment
needed for tidal marshes
and mud flats by 2100

Current landscape and
management
approaches

- Natural deposition
- Dredged sediment in
subsidied areas

~30%

~450 Million tons



What are the options?

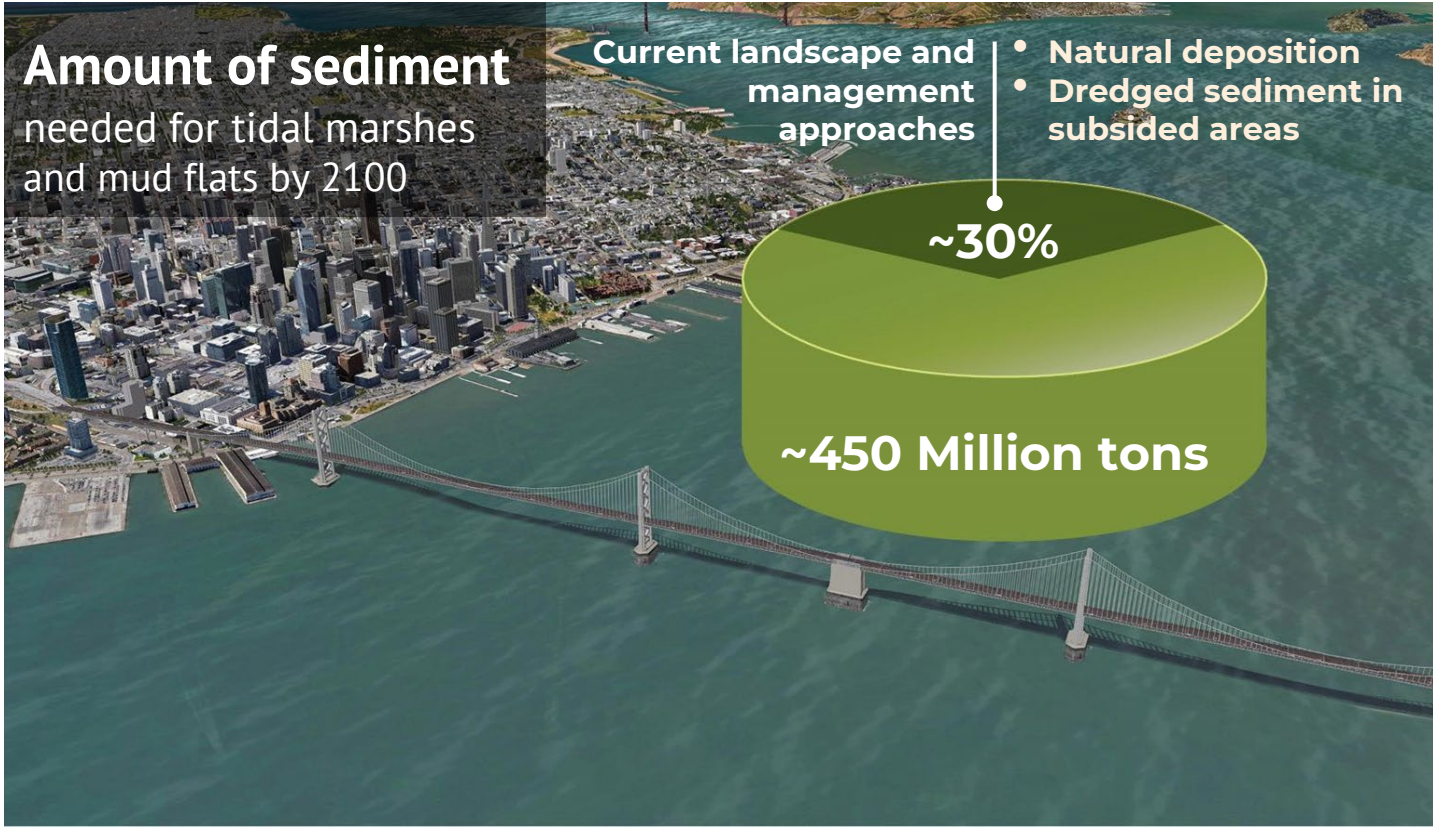
Amount of sediment
needed for tidal marshes
and mud flats by 2100

Current landscape and
management
approaches

- Natural deposition
- Dredged sediment in
subsidied areas

~30%

~450 Million tons



What are the options?

Amount of sediment
needed for tidal marshes
and mud flats by 2100

**New management
approaches to access
more *Bay* and
watershed sediment**



What are the options?

Amount of sediment
needed for tidal marshes
and mud flats by 2100

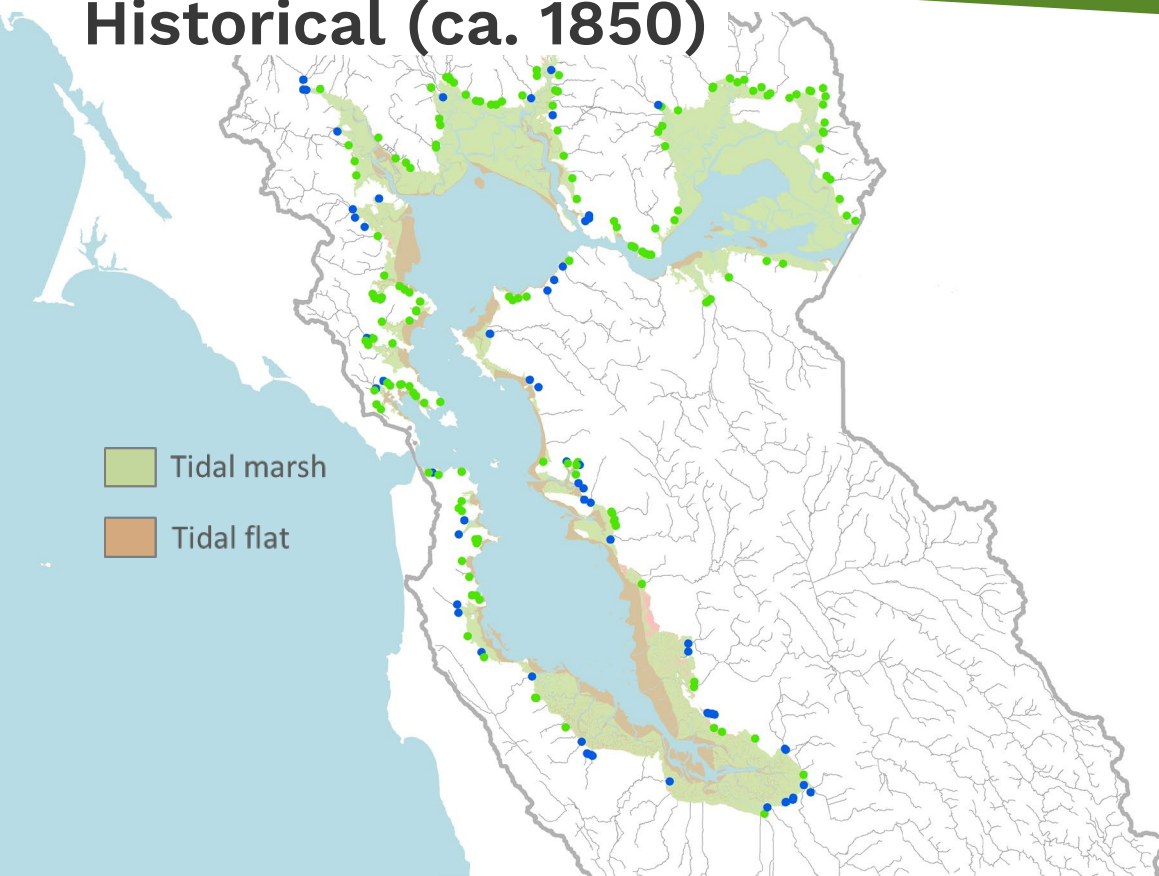
**New management
approaches to access
more *Bay* and
watershed sediment**

Watershed sediment

- Reconnecting creeks to baylands
- Flood control channel sediment
- Excavated sediment
- Reservoir sediment

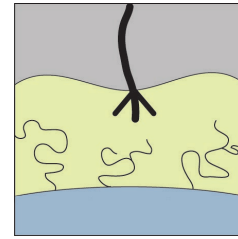
Creek-Bayland Reconnection

Historical (ca. 1850)

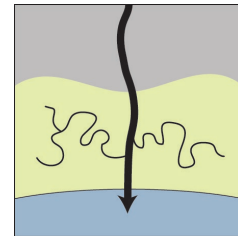


- Tidal marsh
- Tidal flat

- Drains onto a tidal marsh

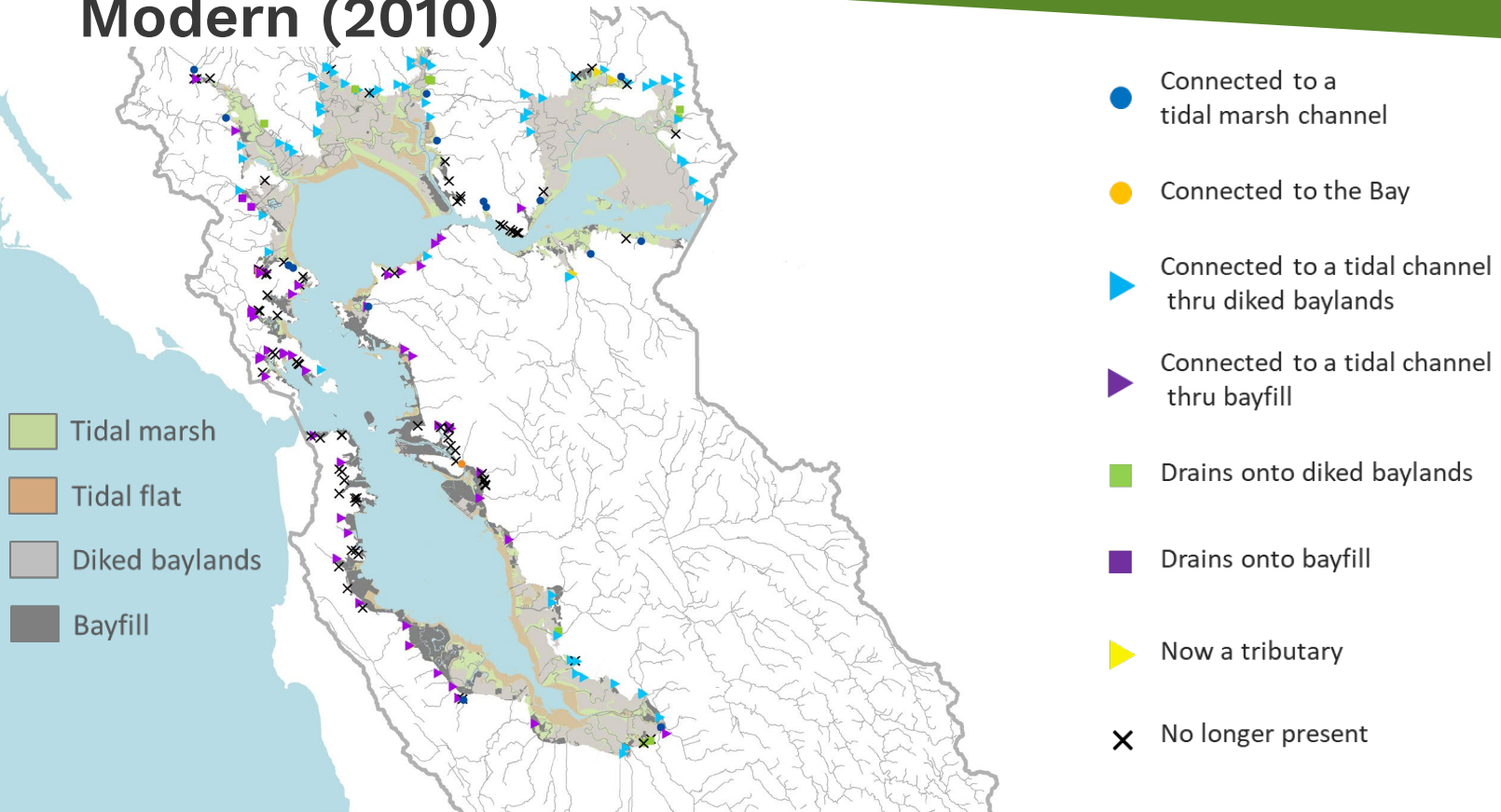


- Connected to a tidal marsh channel



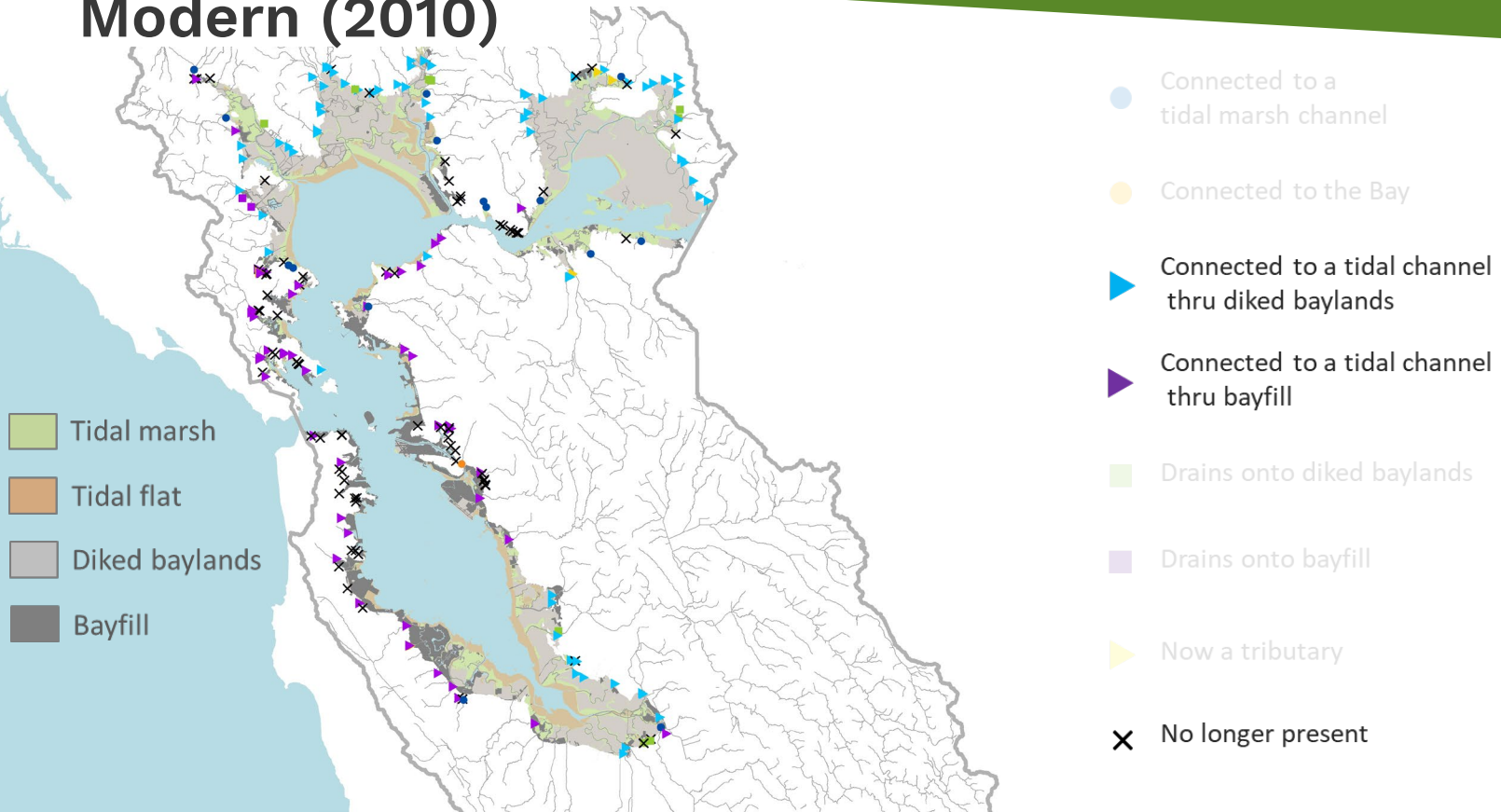
Creek-Bayland Reconnection

Modern (2010)



Creek-Bayland Reconnection

Modern (2010)



Creek-Bayland Reconnection

Modern (2010)



**Example:
Novato Creek**

- Tidal marsh
- Tidal flat
- Diked bayland
- Bayfill

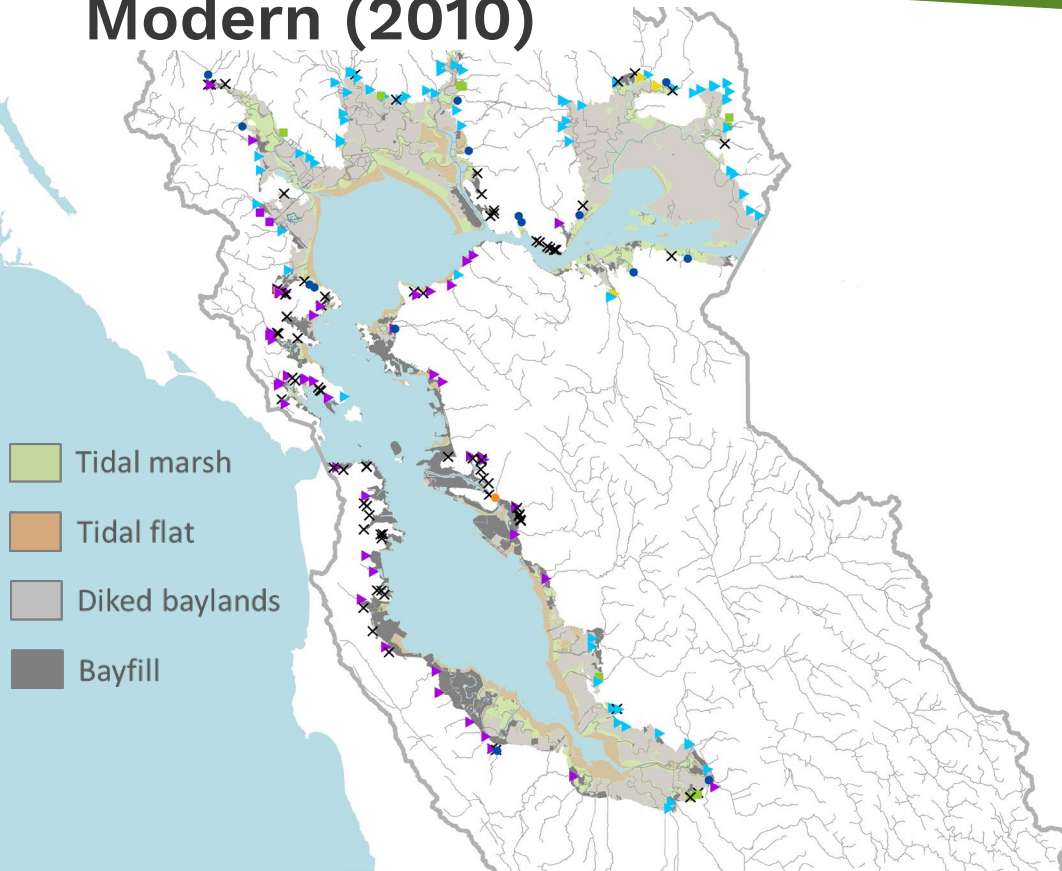


**Example:
Foster City**

- Connected to a tidal marsh channel
- Connected to the Bay
- Connected to a tidal channel thru diked baylands
- Connected to a tidal channel thru bayfill
- Drains onto diked baylands
- Drains onto bayfill
- Now a tributary
- No longer present

Creek-Bayland Reconnection

Modern (2010)



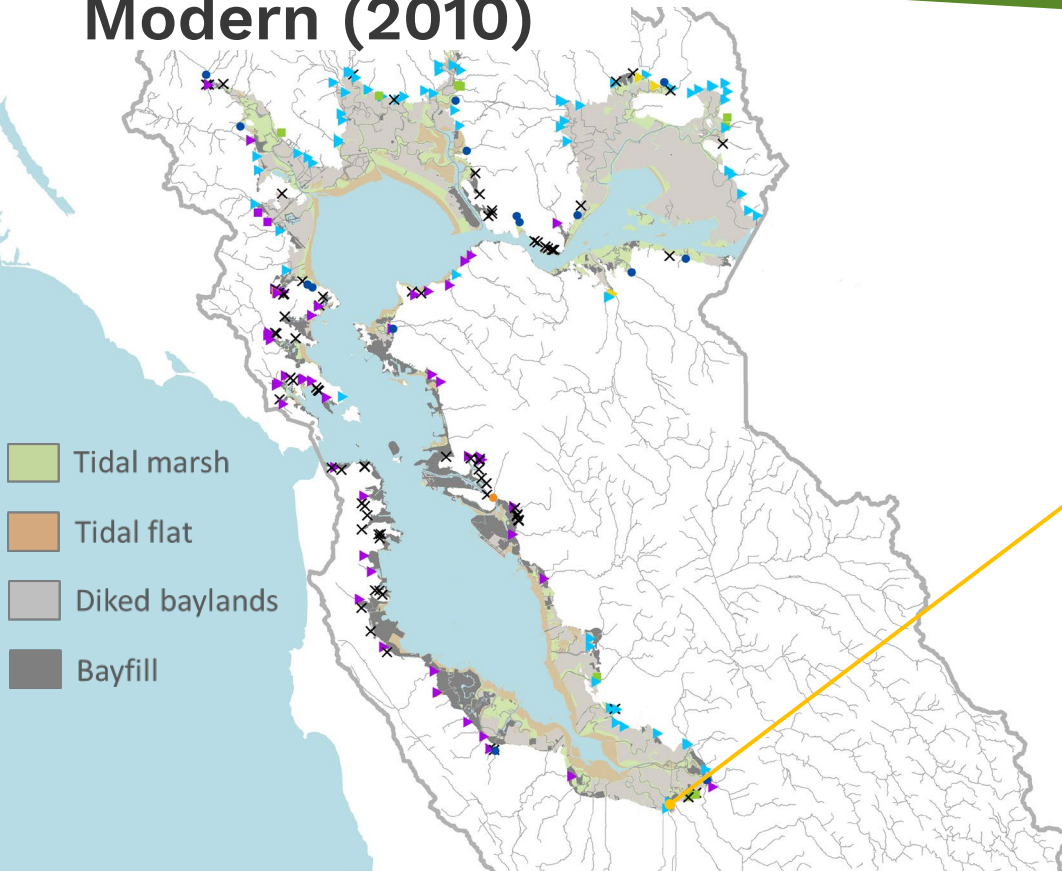
THE *Baylands* AND *Climate Change*

WHAT WE CAN DO

BAYLANDS ECOSYSTEM HABITAT GOALS
SCIENCE UPDATE 2015

Creek-Bayland Reconnection

Modern (2010)

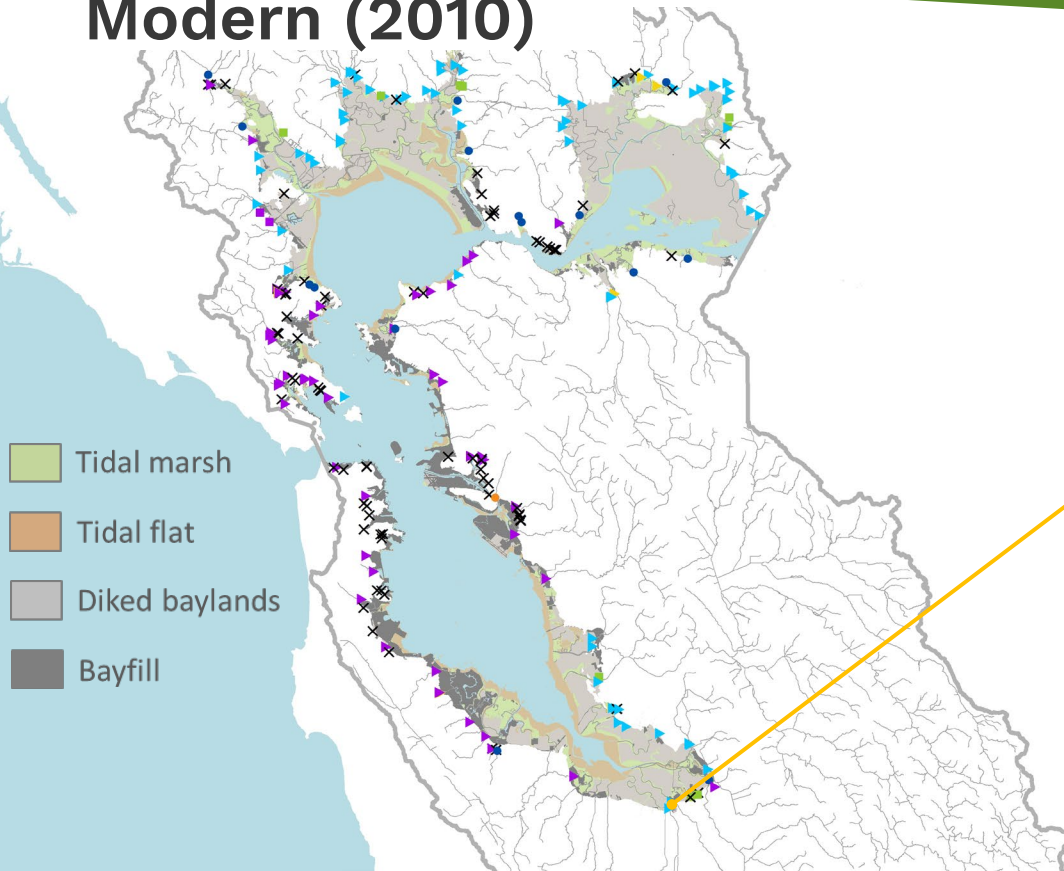


Calabazas-San Tomas Aquino Creeks

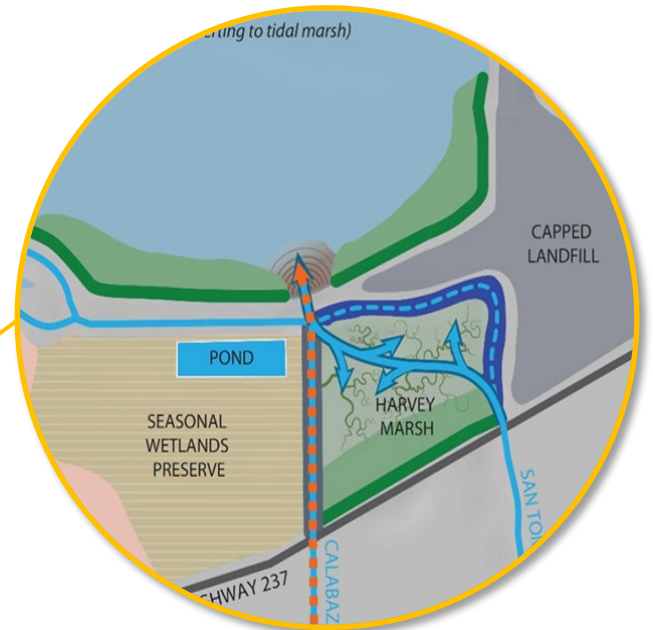


Creek-Bayland Reconnection

Modern (2010)



Calabazas-San Tomas Aquino Creeks



Flood Control Channel Sediment Reuse



On average, approximately **200,000 tons of sediment** is removed from local flood control channels each year

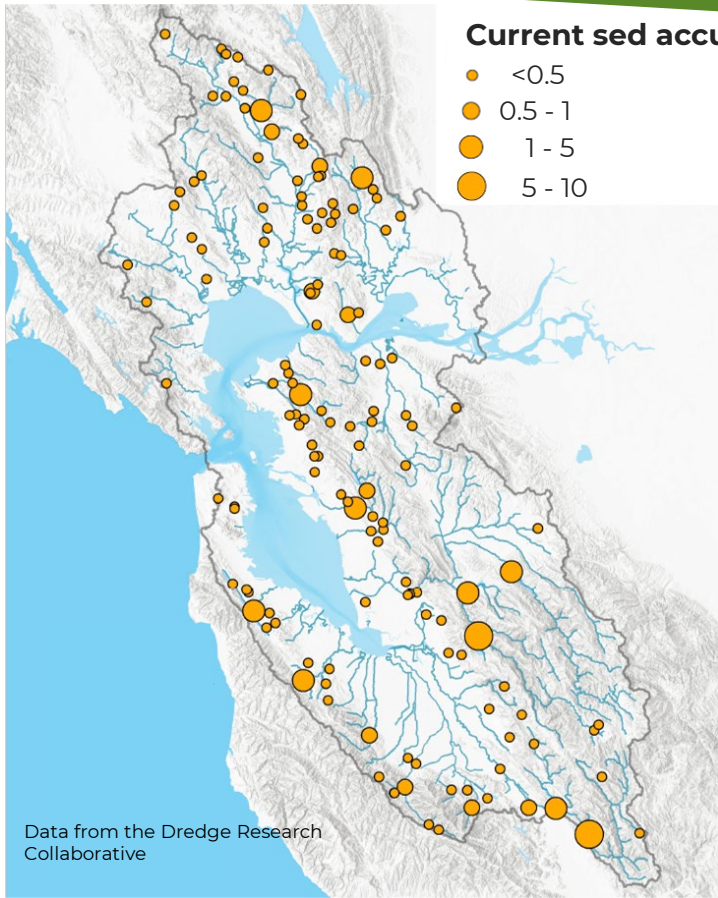
Upland Excavated Sediment Reuse



Over **2 million tons of sediment** is removed from local construction projects each year



Reservoir Sediment Reuse



By 2100, approximately
100 million tons of sediment could be stored
in local reservoirs

BAY AREA

Feds order South Bay reservoir drained amid fears of catastrophic dam failure

By Bob Egelko, Michael Cabanatuan

Updated Feb 25, 2020 7:09 p.m.

NEWS

Earthquake risk prompts order to drain Bay Area dam

by: [The Associated Press](#)

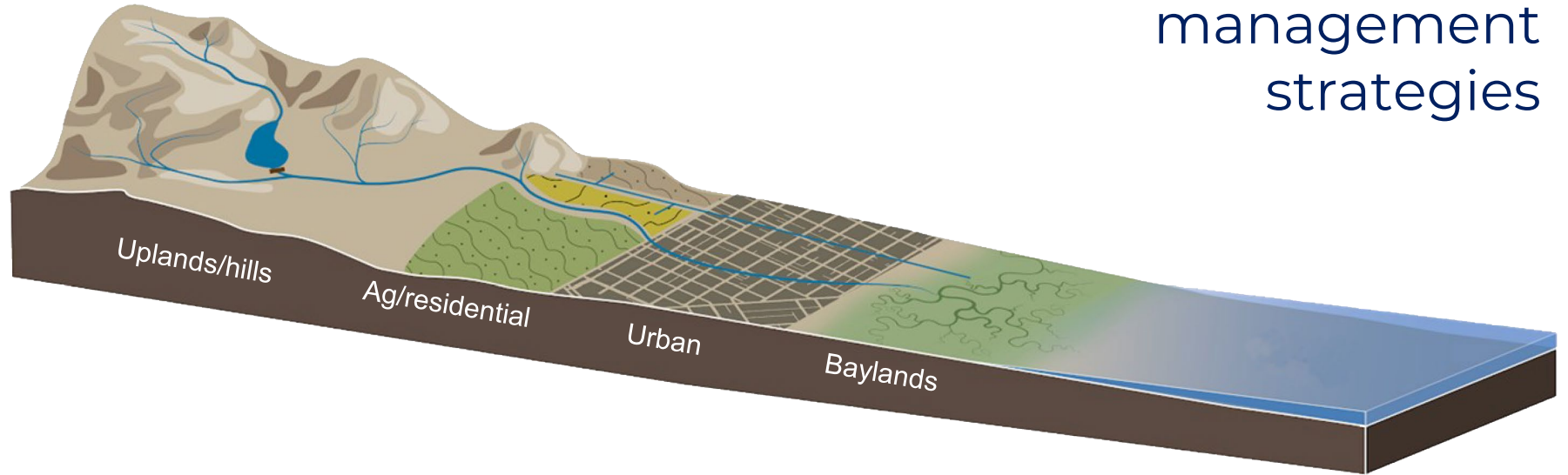
Posted: Feb 25, 2020 / 04:05 PM PST

Updated: Feb 25, 2020 / 04:05 PM PST

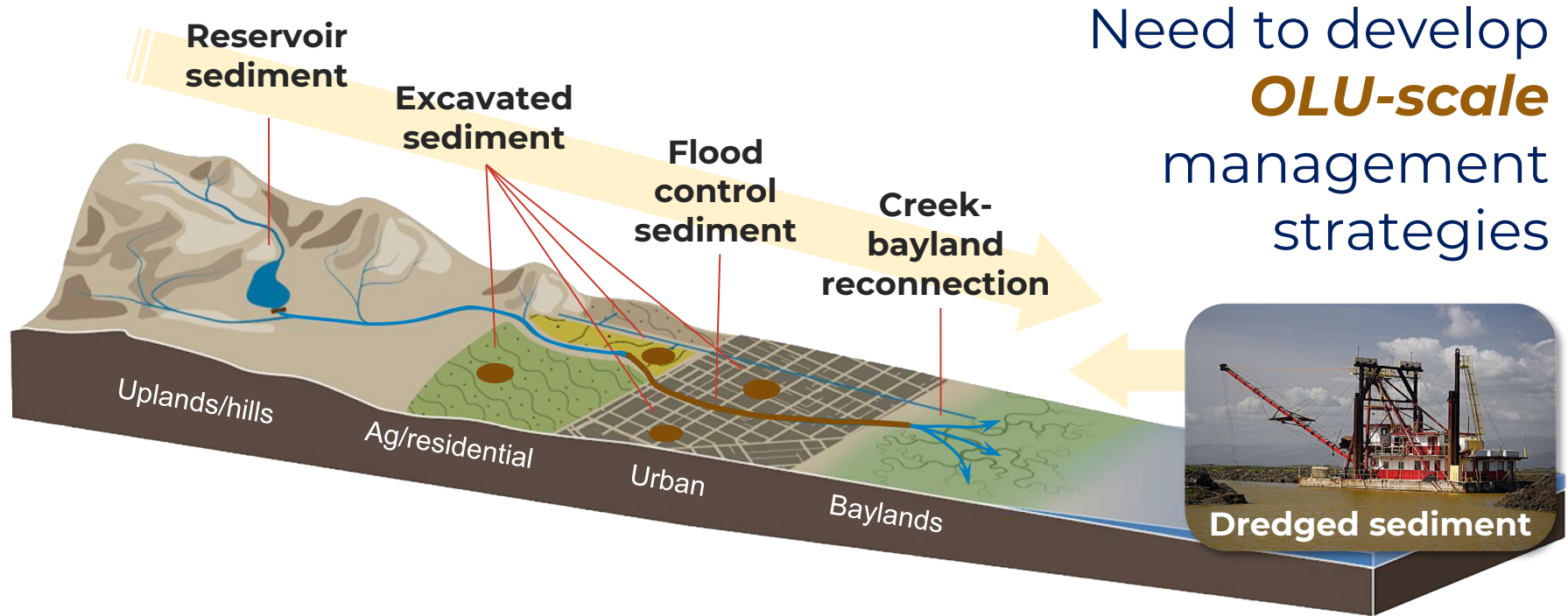


Think regionally, act locally

Need to develop
OLU-scale
management
strategies



Think regionally, act locally



A wide-angle photograph of a San Francisco Estuary. The foreground is dominated by a calm, blue body of water that reflects the sky. The water is bordered by lush green marshlands with tall grasses. In the distance, a low-lying hill with some buildings is visible under a clear blue sky with light, wispy clouds.

Thank you!

scottd@sfei.org

SFEI | San Francisco
Estuary Institute

Photo: Shira Bezalel