

# The Critical Edge: Lessons Learned from 15 Years of Monitoring the Margins

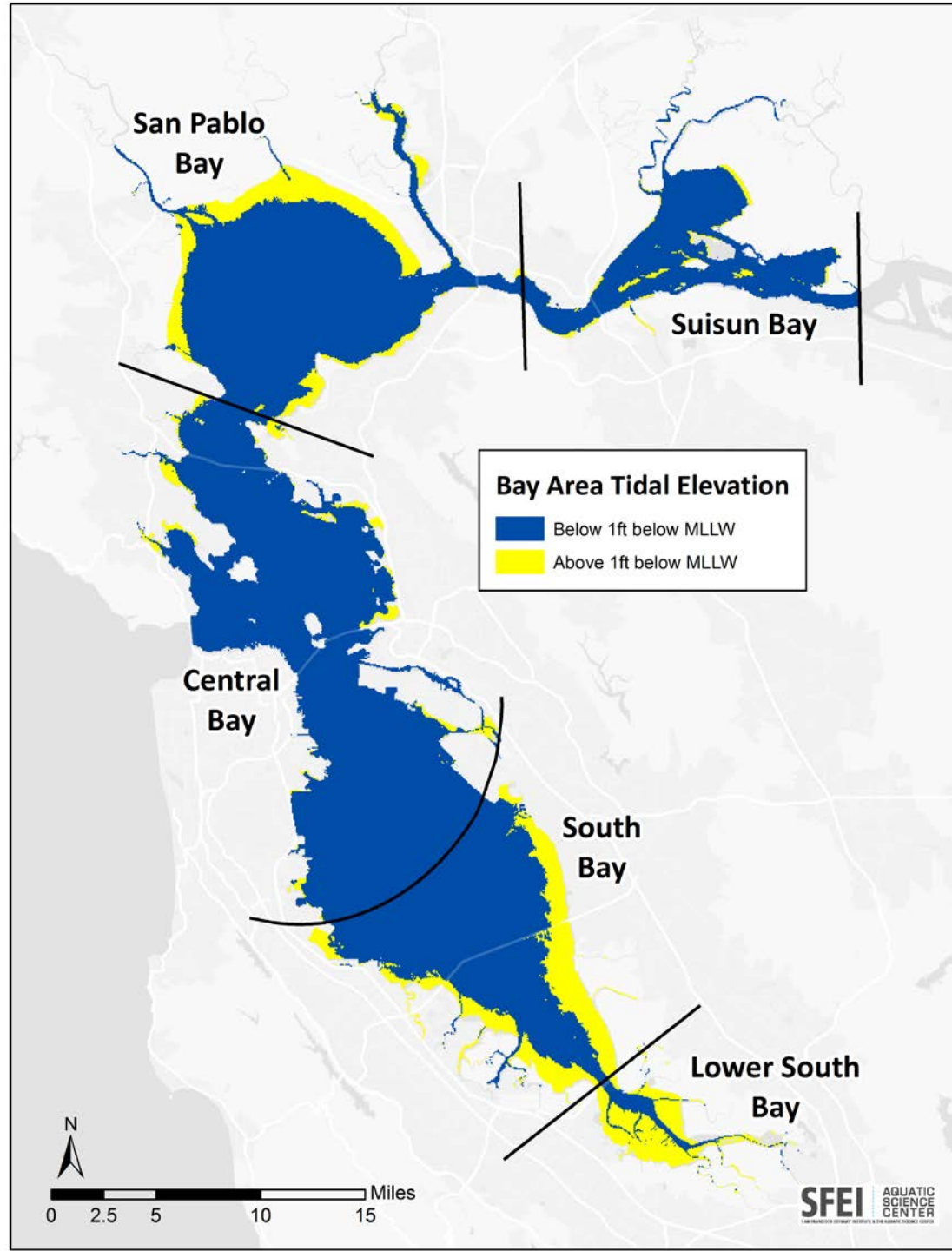
Philip Trowbridge  
Don Yee  
Jay Davis  
Scott Dusterhoff  
Lester McKee  
San Francisco Estuary Institute



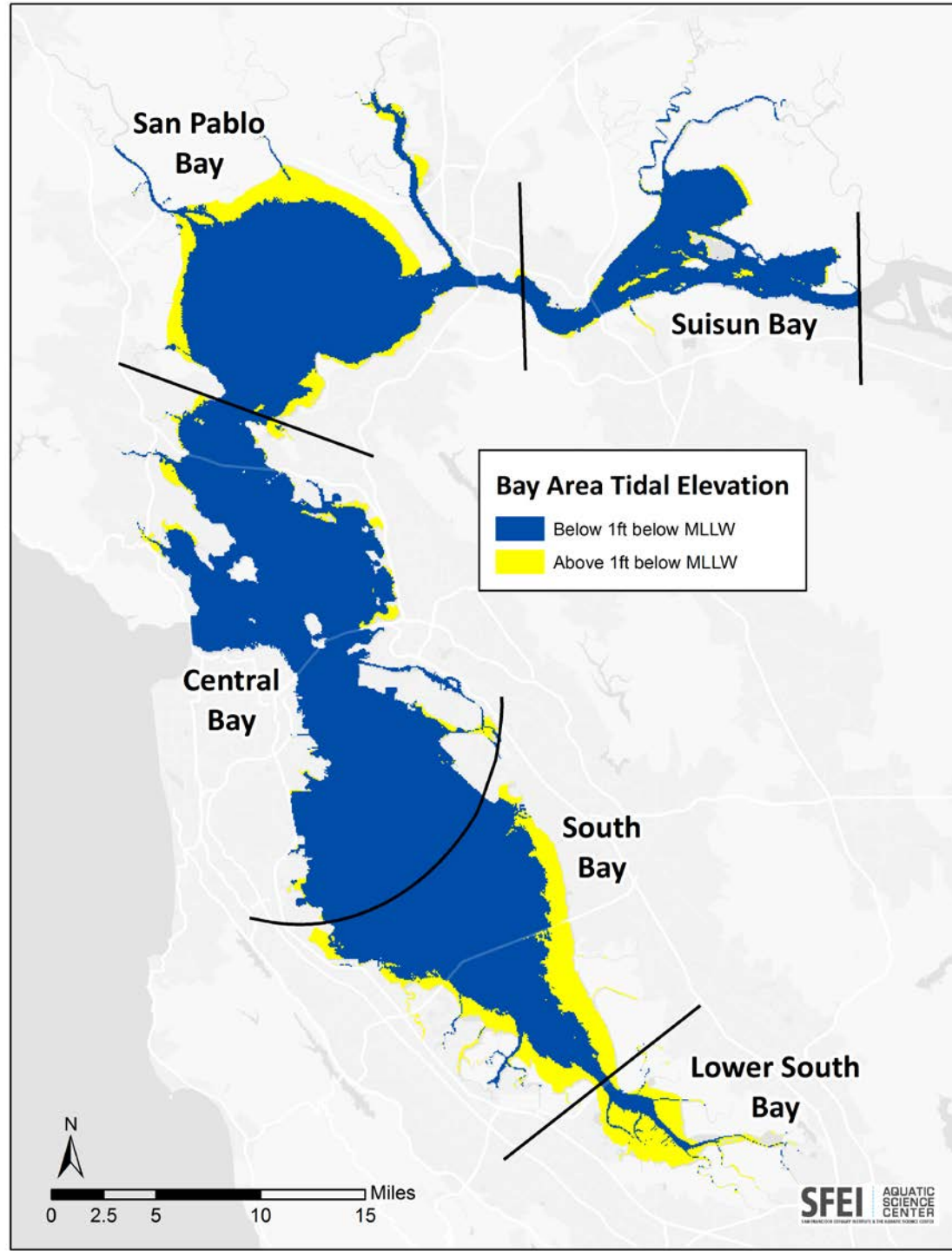
2017

Margins are...

A major gap in  
the RMP



Margins are...  
15% of the Bay



# Margins are...

Essentially mudflats  
(by our definition at least)



# Why do you care?

- Everyone: Recreational and wildlife impacts
- Stormwater: Finding sensitive watersheds
- Dredgers: Dredged material beneficial reuse
- Wastewater: Nutrient effects, CEC screening
- NGOs & Public: Fish consumption advisories
- Water Board: Sediment hot spots, all of the above



# What have we learned?

**TOP  
5**



# 5

Margins are ...



# 5

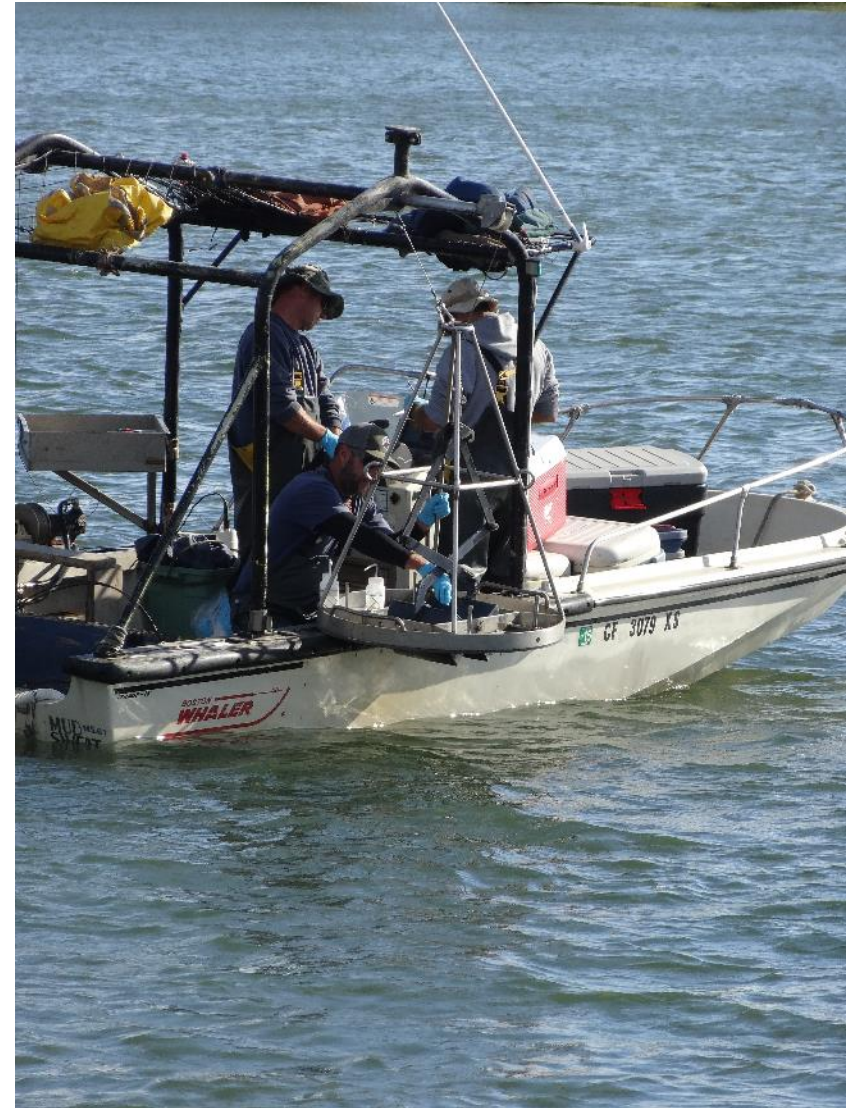
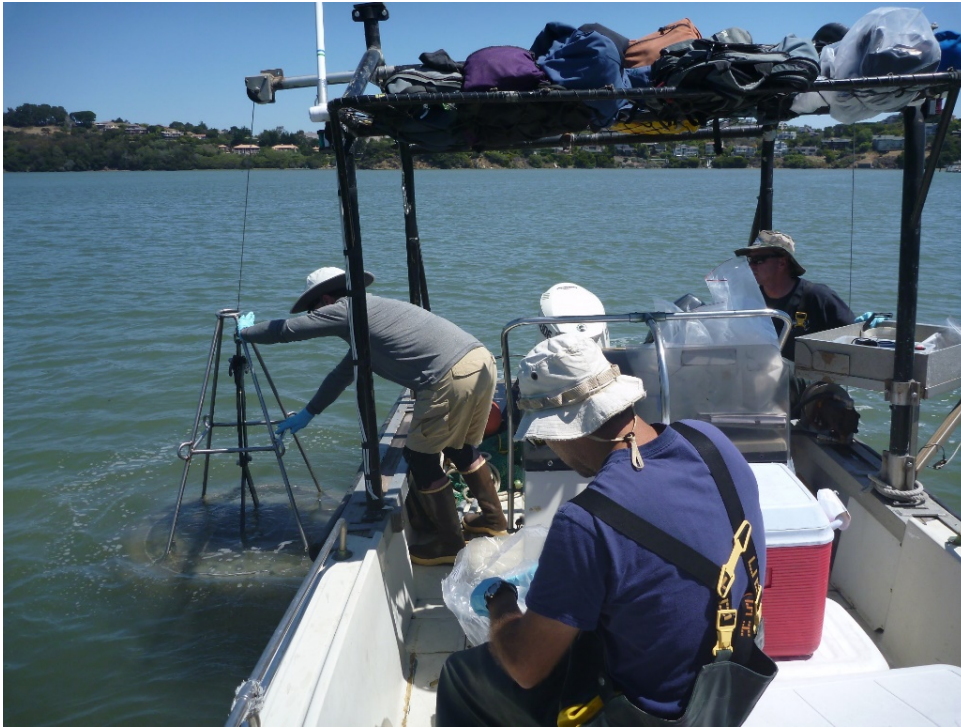
Margins are ...

possible to sample after all!





# Small Boats



# Even Smaller Boats





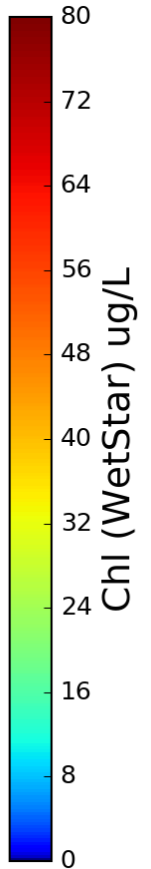
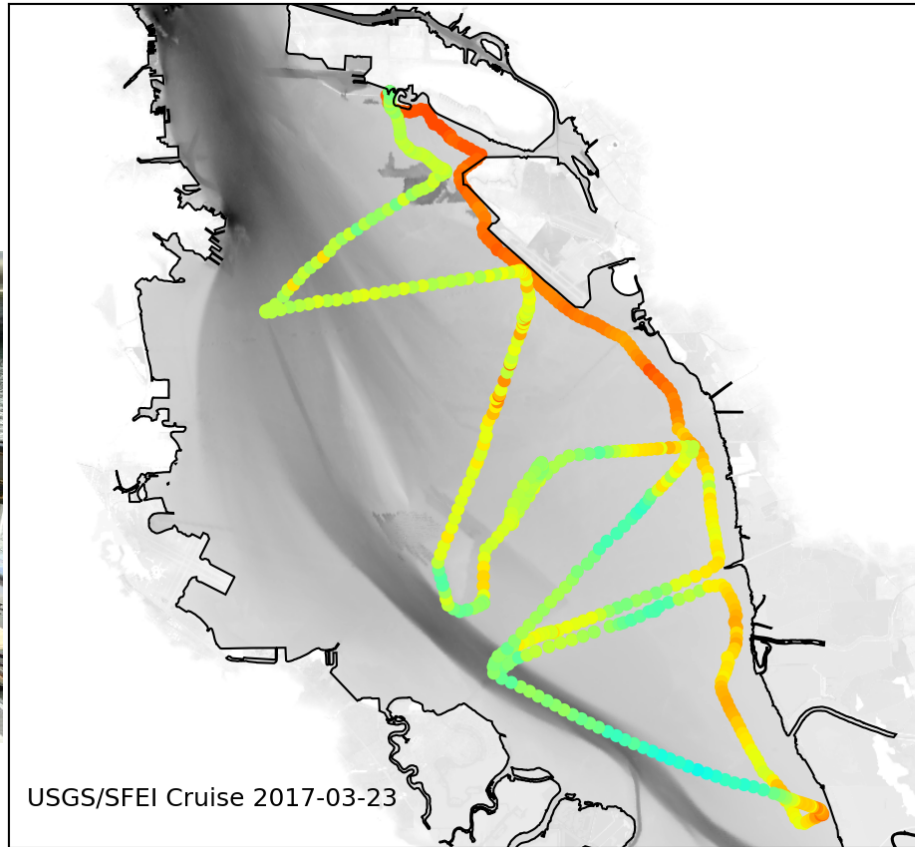
# Passive Samplers



# Flow-Through Sensor Systems

Chlorophyll-a in South Bay  
March 23, 2017

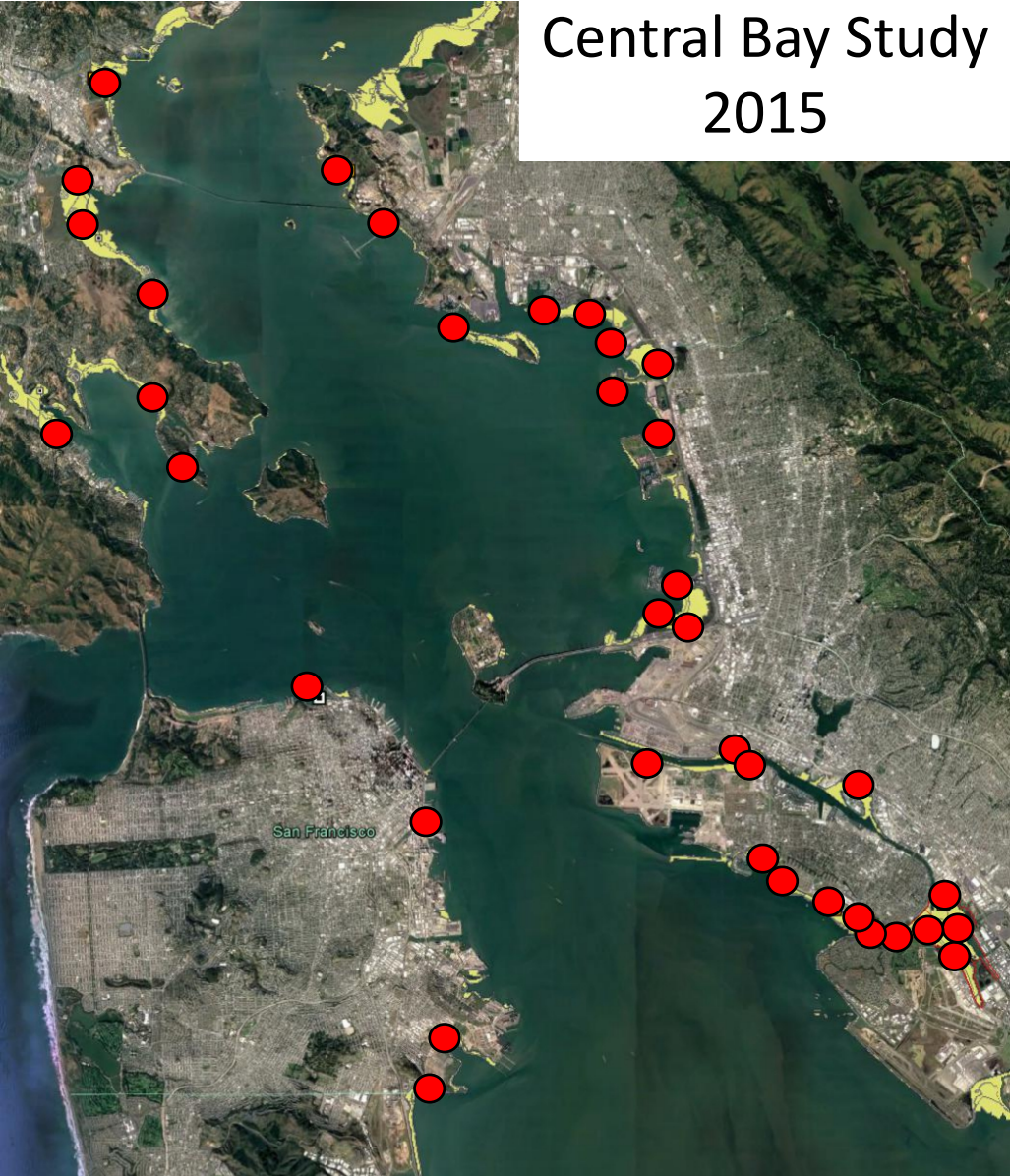
USGS "Suitcase of Science"  
Flow-Through System



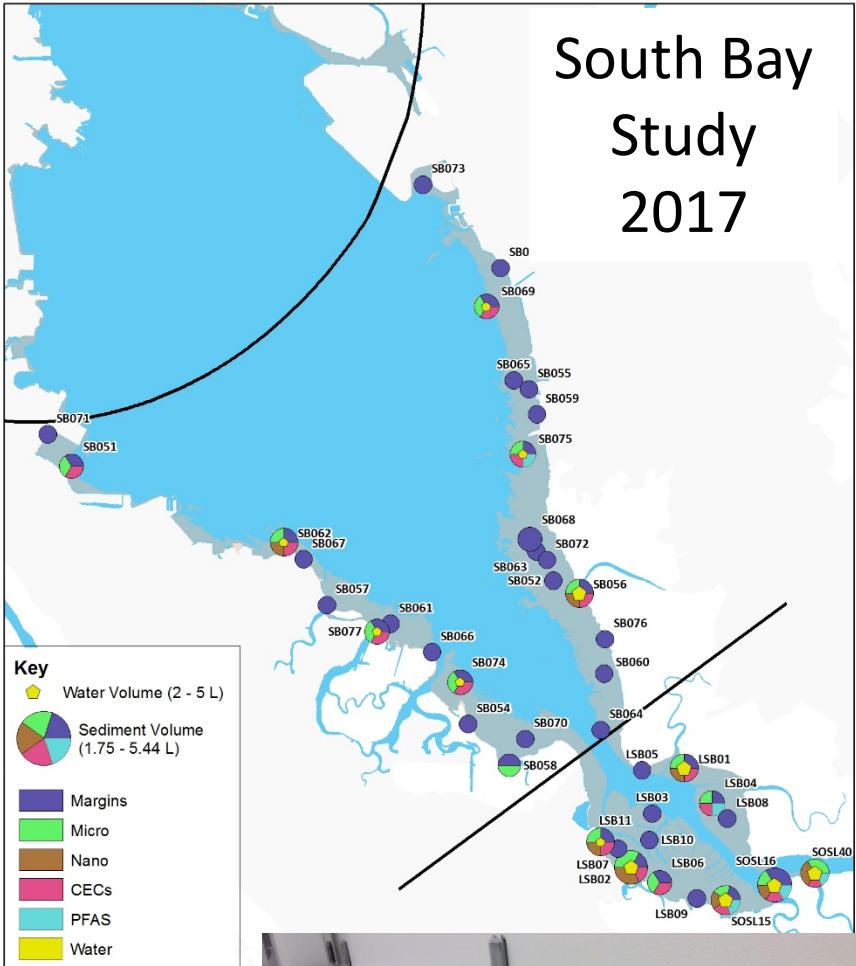


# Regional Monitoring

## Central Bay Study 2015



Proposed Margins Sites



# Site Specific Studies of PCBs

- Focus on priority margin units
- Comprehensive study of San Leandro Bay



# 4

Margins are ...



# 4

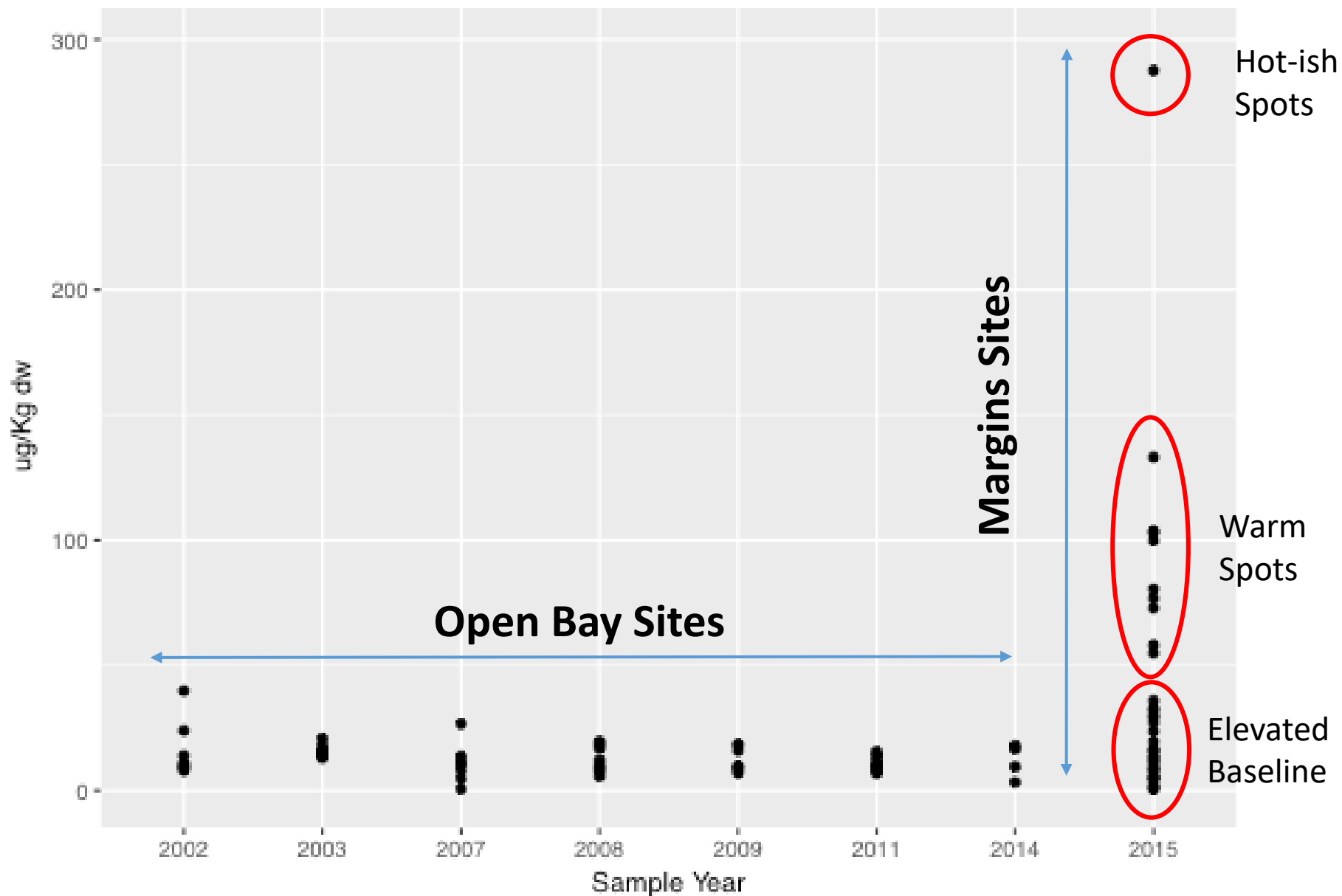
Margins are ...

more contaminated  
than the open Bay





# Sum 40 PCBs in Central Bay Sediment



Corollary to #4

Margins are ...

hard to make more  
contaminated by reuse of  
dredged material



# 3

Margins are ...



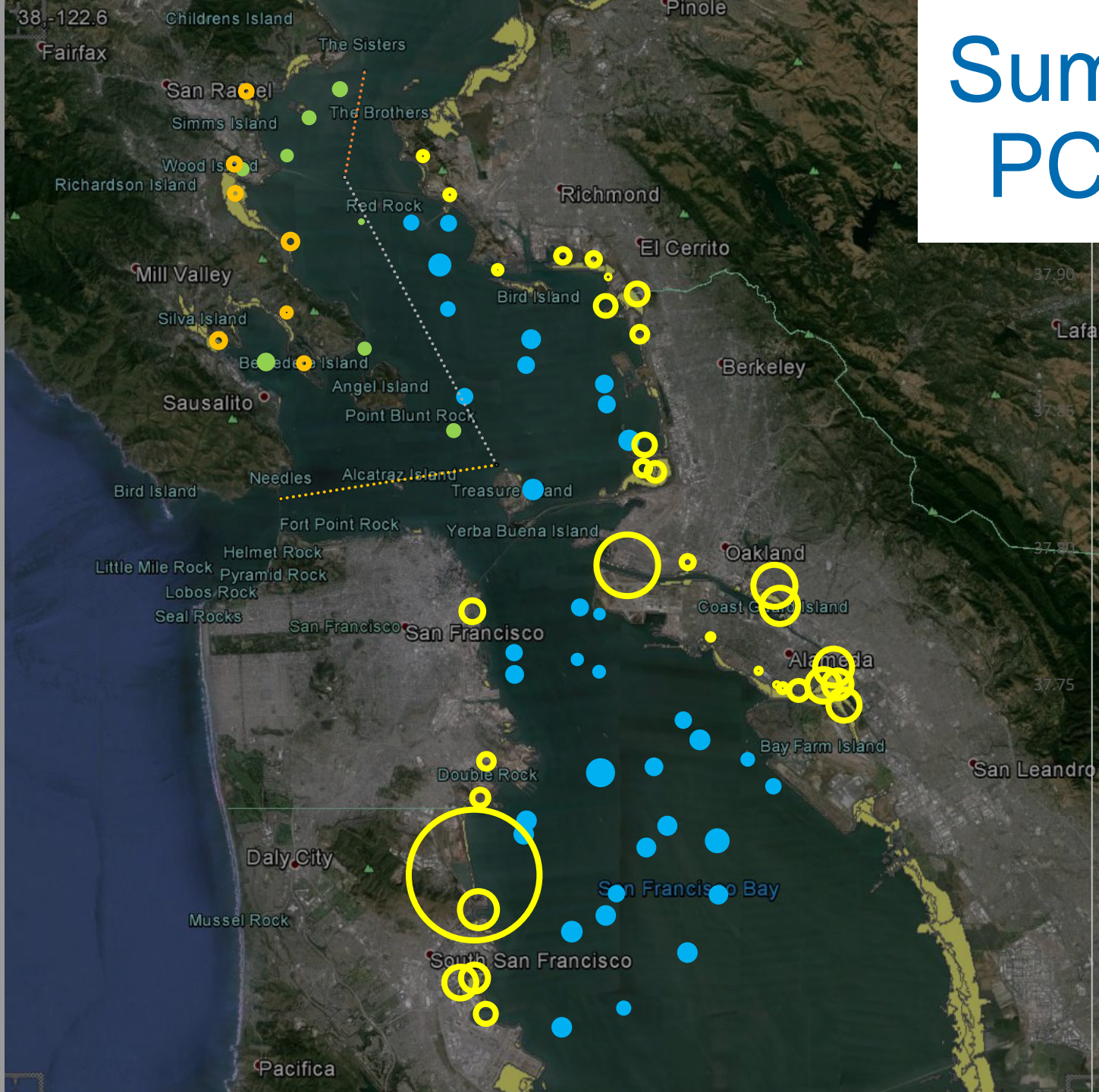
# 3

Margins are ...

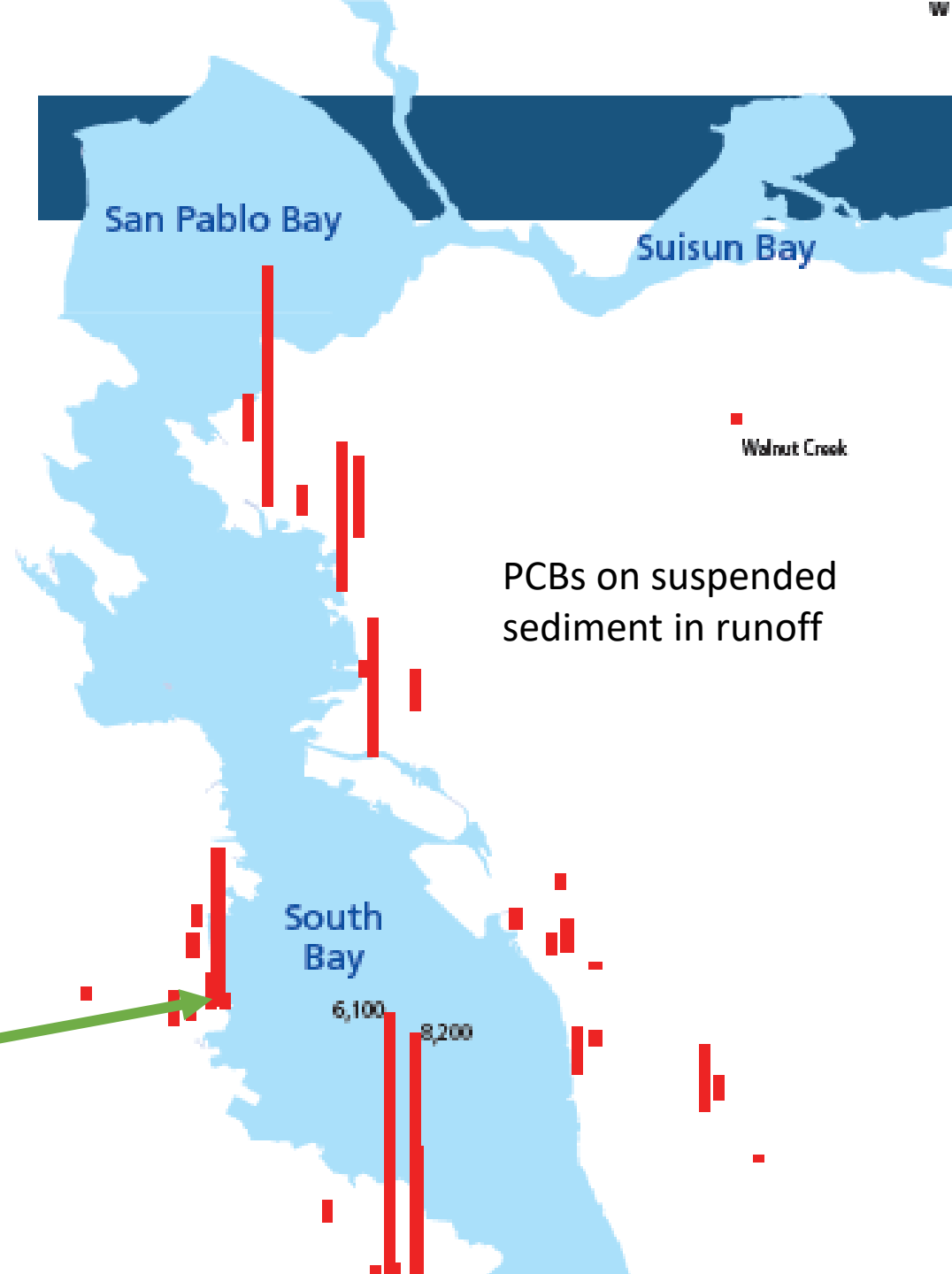
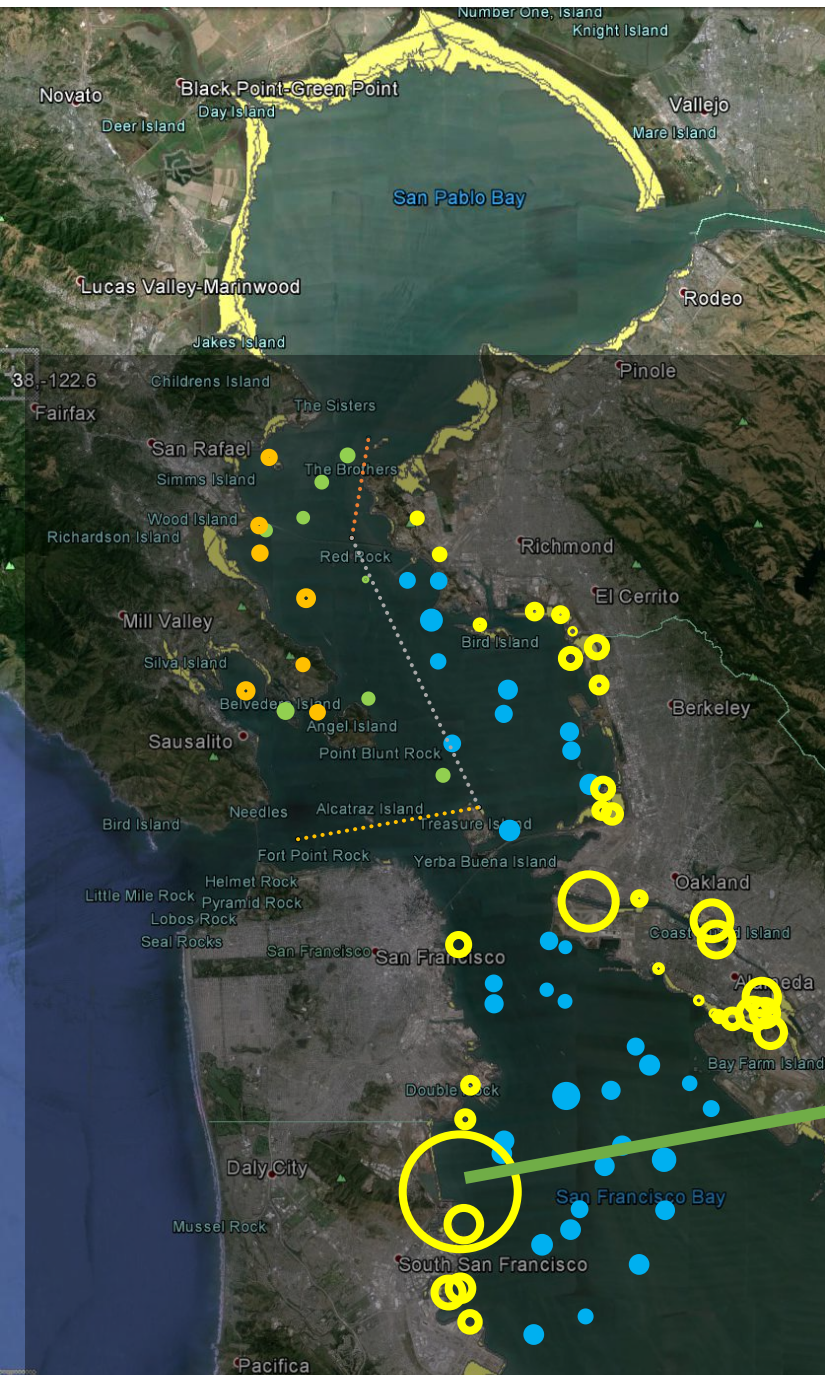
sensitive to nearby sources.

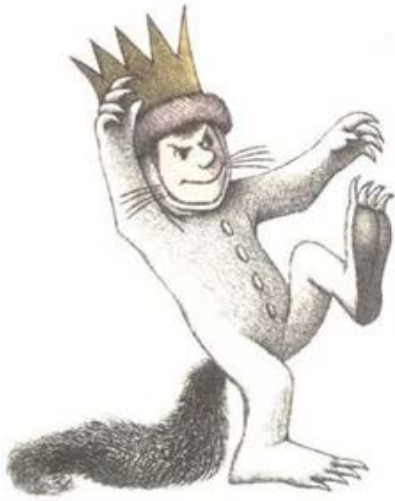


# Sum 40 PCBs







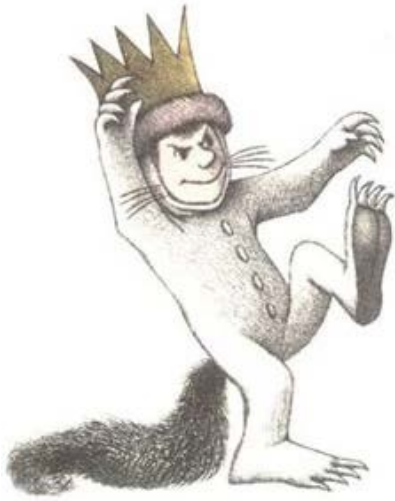


2



Margins are ...





2



Margins are ...

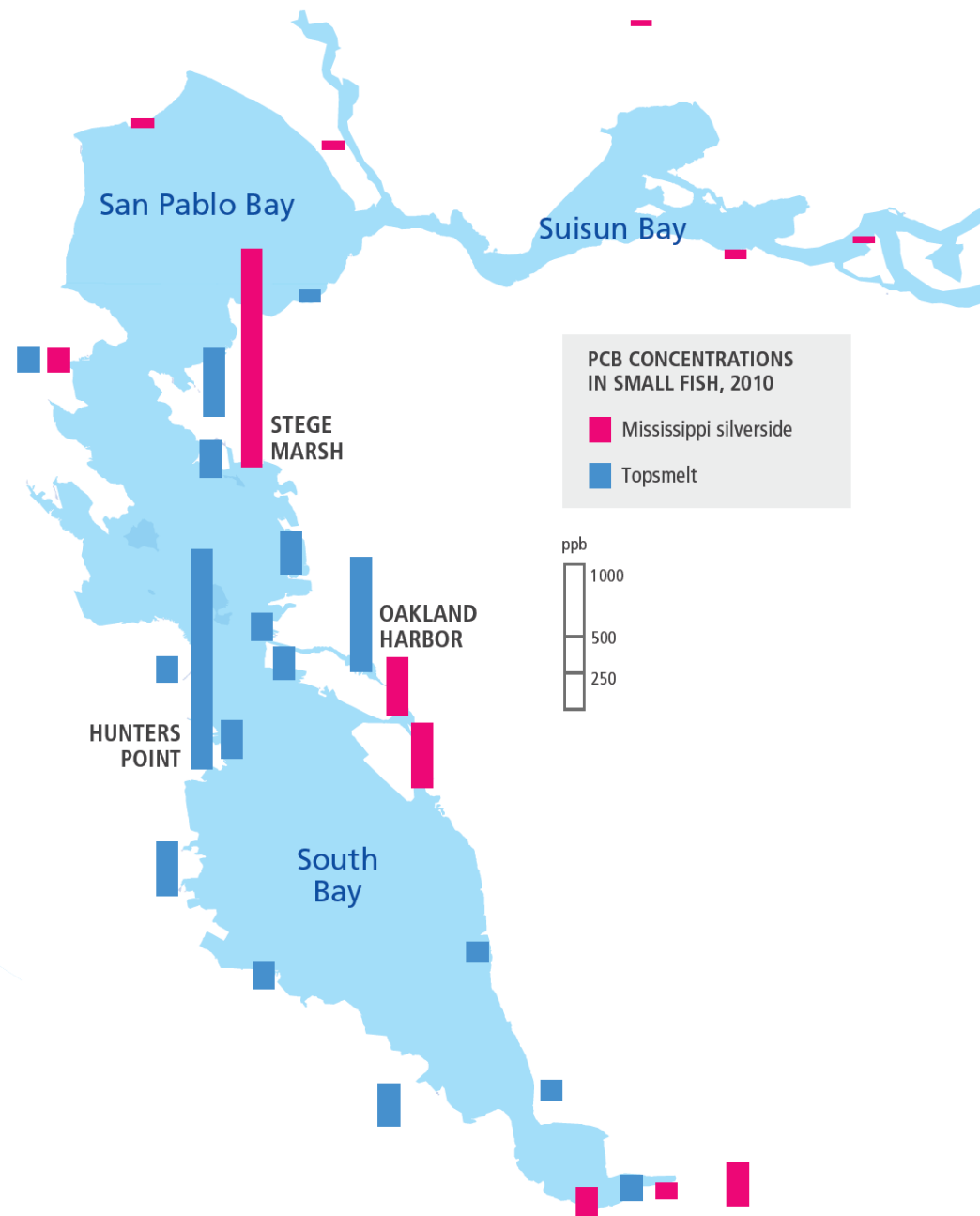
where the wild things are





# PCBs in Small Fish – An Eye Opener

- Very high concentrations
- High spatial heterogeneity
- Conceptual model upgrade needed



# Charismatic monitoring targets



# 1

Margins are ...



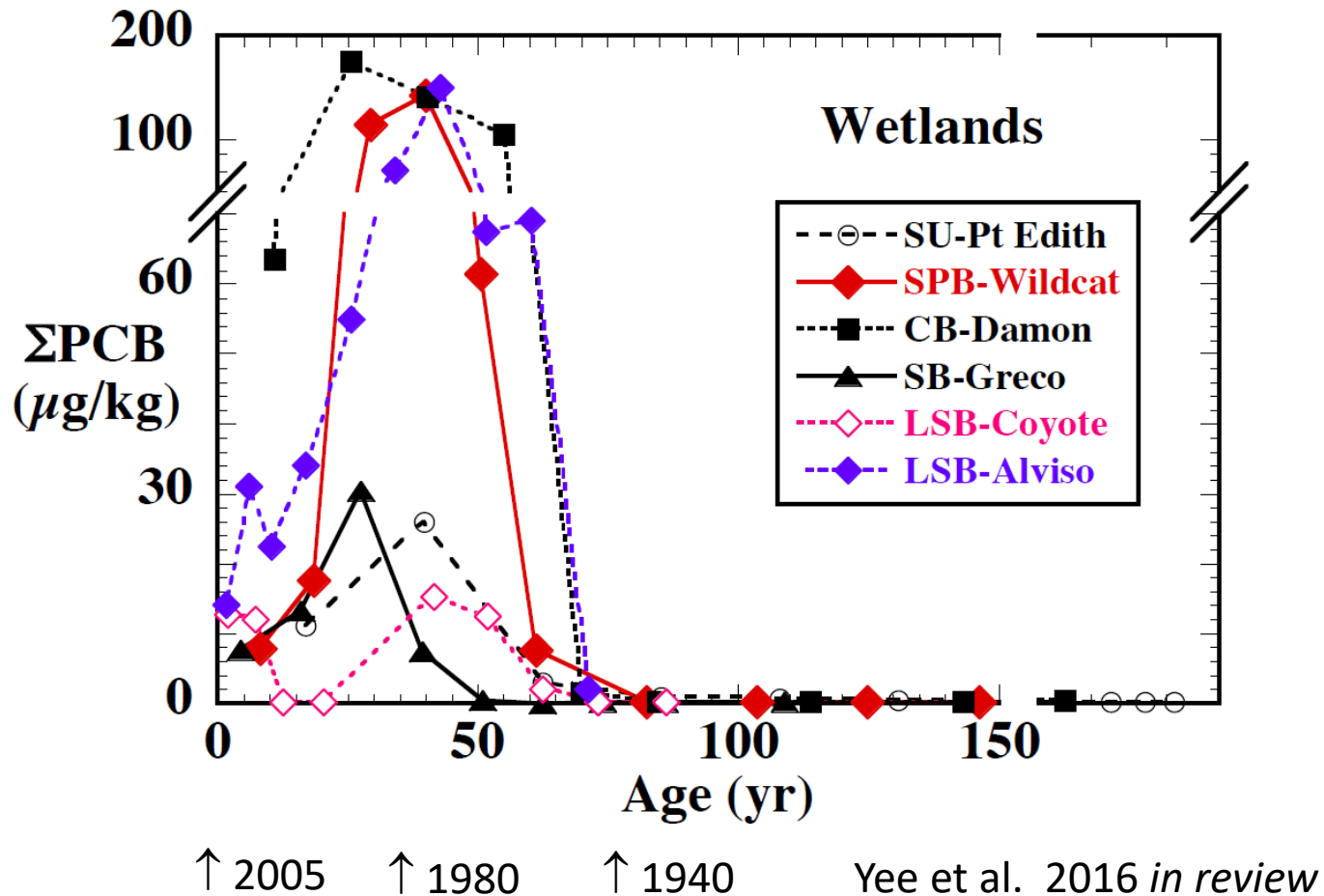
# 1

Margins are ...

responsive to management  
actions (maybe?)



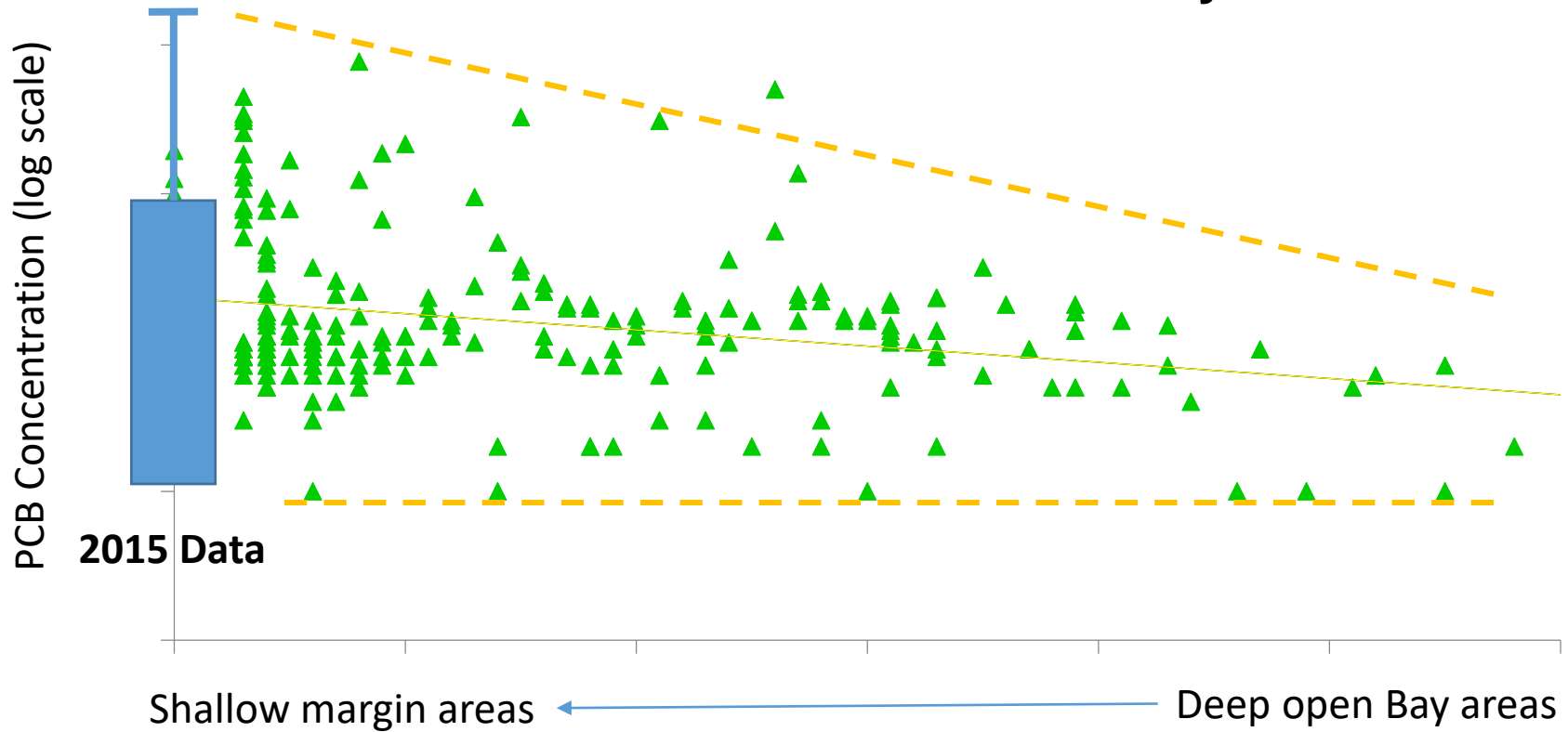
# Sediment cores show response to major actions





# But, have margins improved in the last 20 years?

## PCBs in Sediment in Central Bay



No downward shift apparent for new margins data

# The Emeryville Crescent



Models predict  
30% reduction  
in 10 years if  
sources stopped



Why are margins  
growing in importance  
for the region?

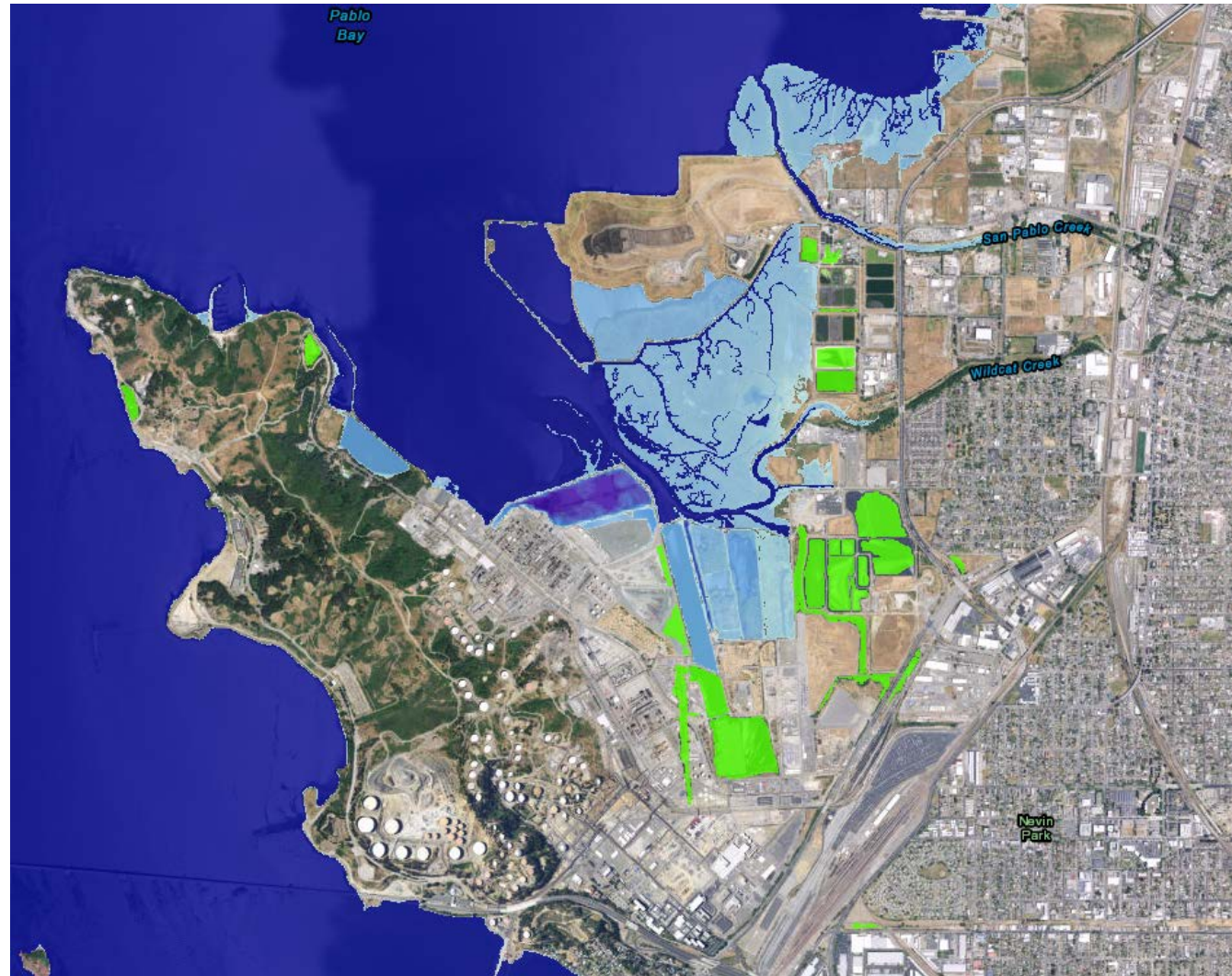




# By 2050, flooding of contaminated sites is likely

24 inch SLR scenario in Richmond

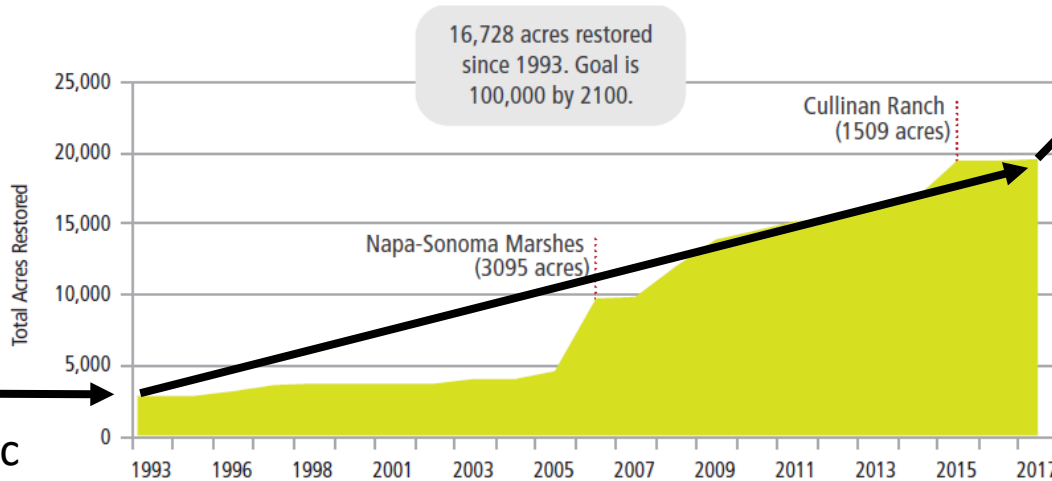
Source:  
NOAA SLR Viewer



# The pace of wetland restoration will double

Goal  
(100k ac)

## Acres of wetlands restored



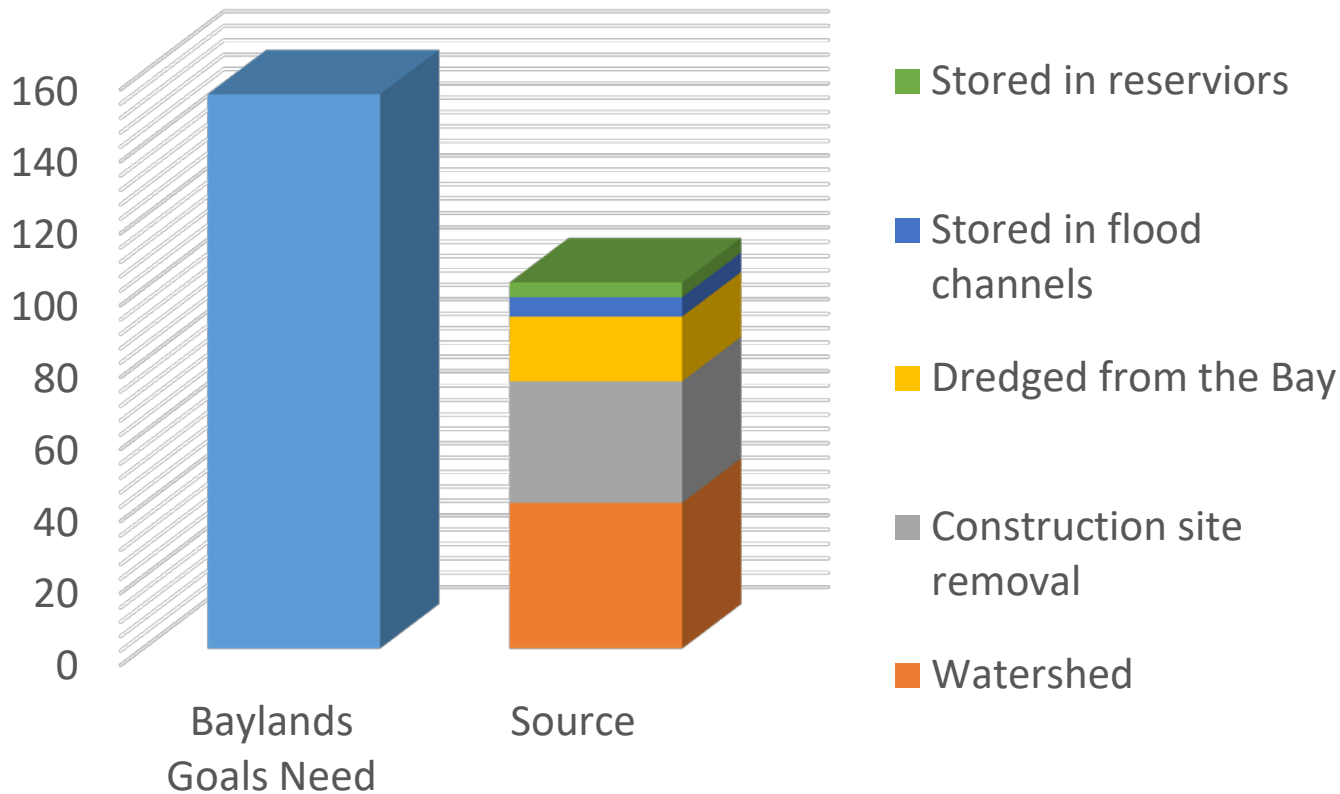
Measure AA Funding  
\$500M over 20 years

40k ac  
existing

Footnote: Data summarized from Project Tracker ([ptrack.ecoatlas.org](http://ptrack.ecoatlas.org)).

# Wanted: More sediment

Sediment (MCY over 15 years)



## Preliminary Information

MCY = Million Cubic Yards

# How can the RMP help?

- Status and trends monitoring for contaminants in the margins
- Sediment supply monitoring and modeling
- Regional wetlands monitoring



# Summary

## Margins are...

- #5 ... possible to sample after all
- #4 ... more contaminated than open Bay
- #3 ... sensitive to nearby sources
- #2 ... where the wild things are exposed
- #1 ... potentially responsive to mgmt actions
- ... ground zero for management decisions
- ... a good fit for the RMP!

