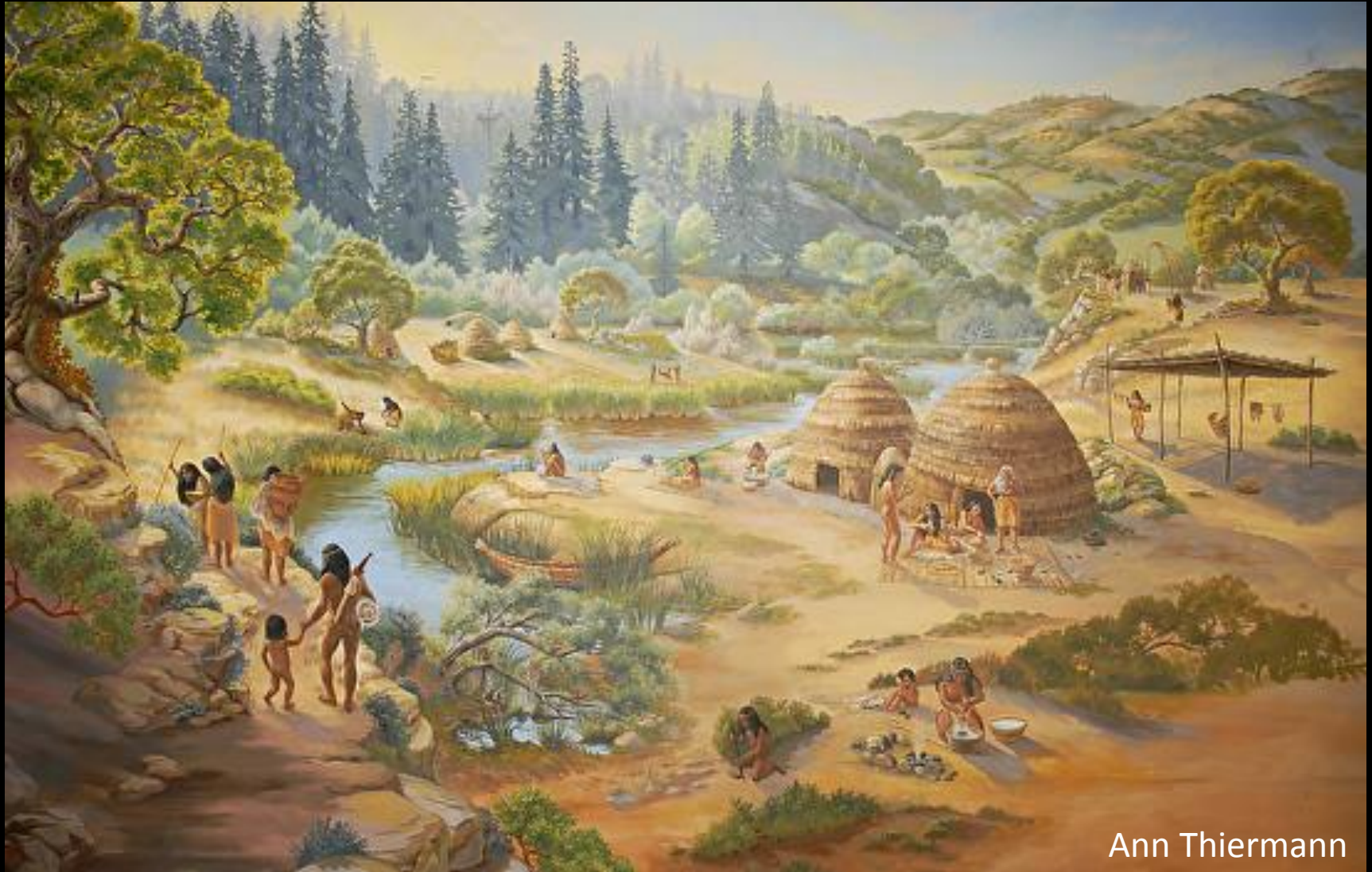


# History of water quality in San Francisco Bay

Melissa Foley  
7 June 2019



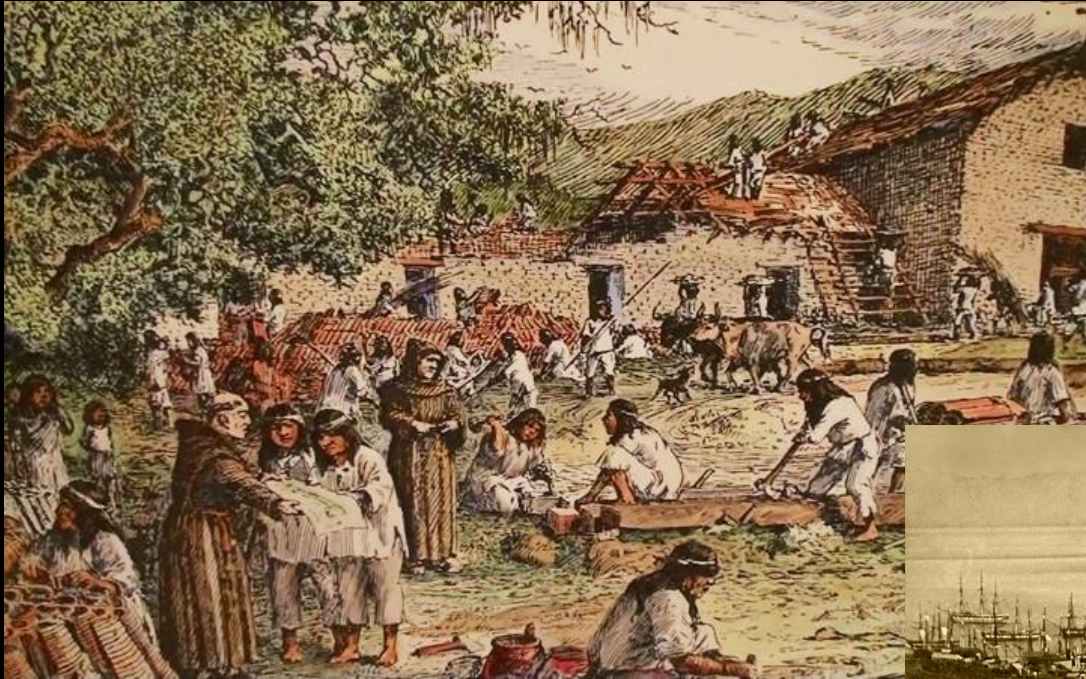
~10,000 years of inhabitation



Ann Thiermann



# Discovery and development



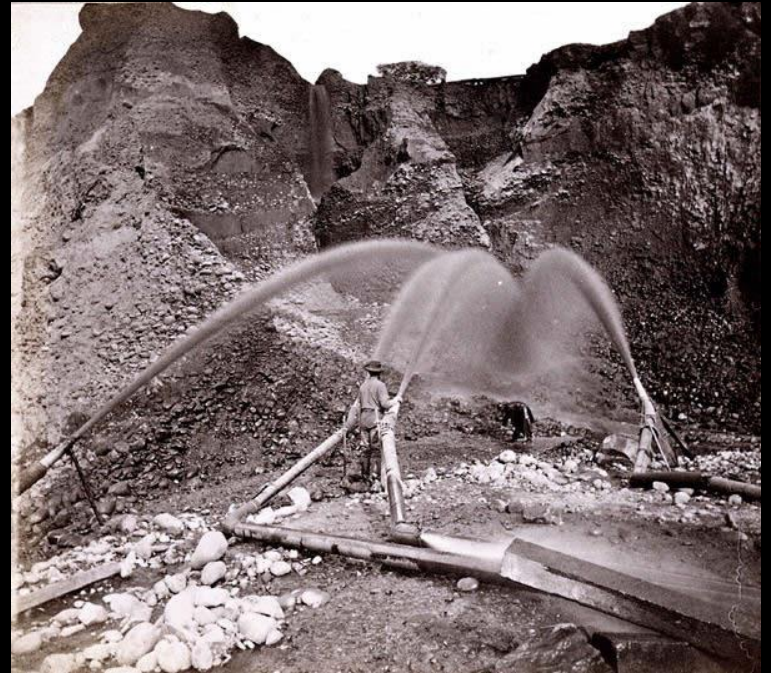
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Library of Congress



# Gold and mercury mining

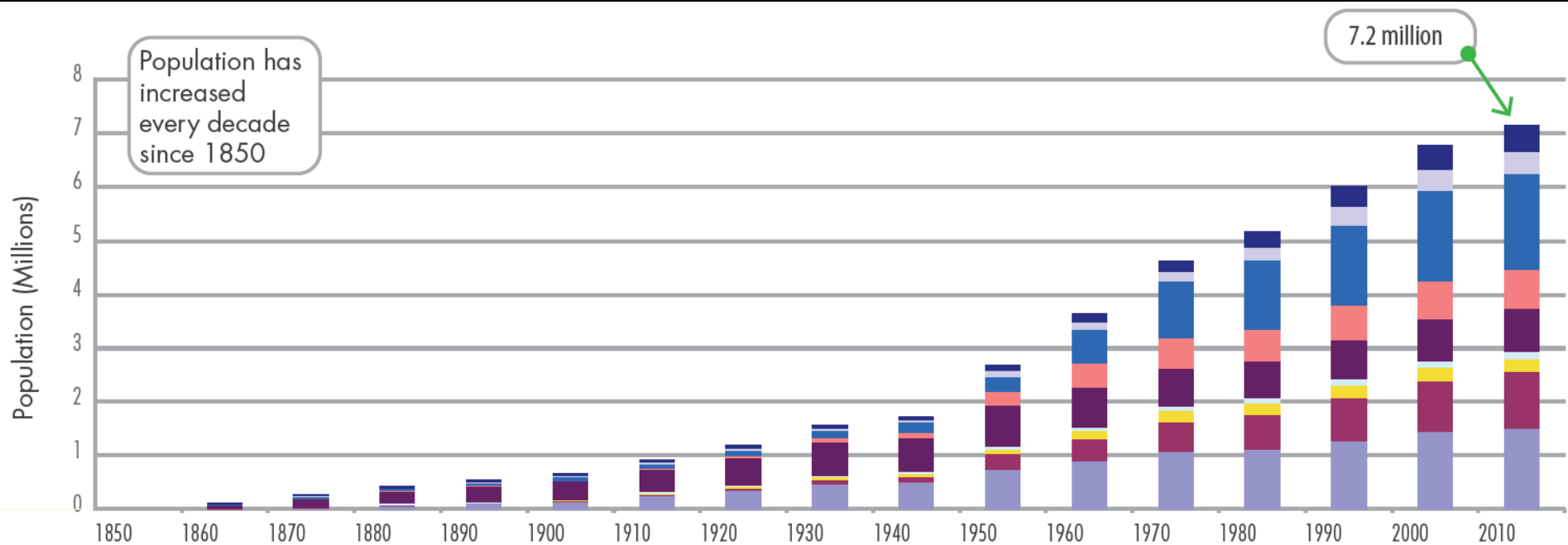




# Gold and mercury mining

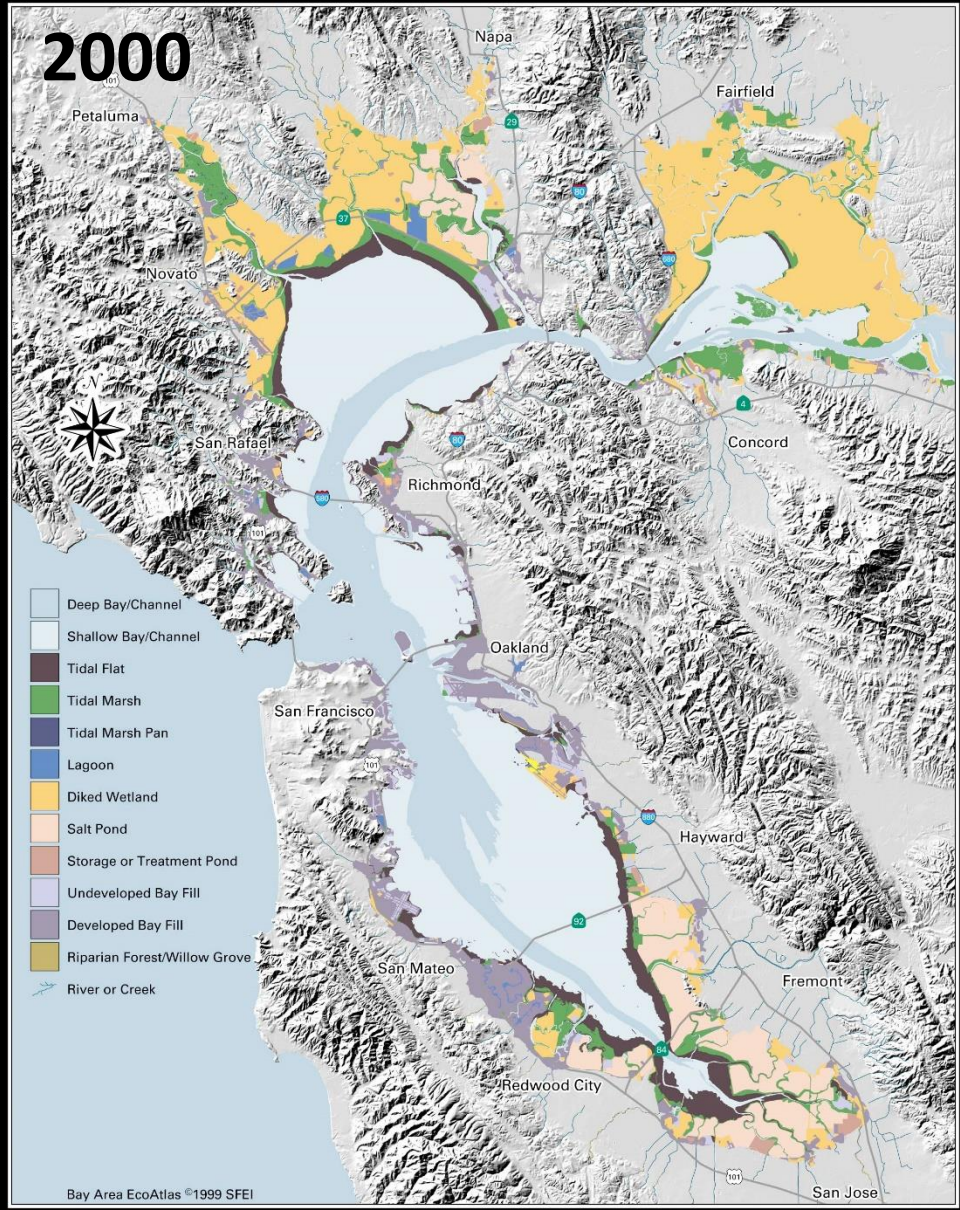
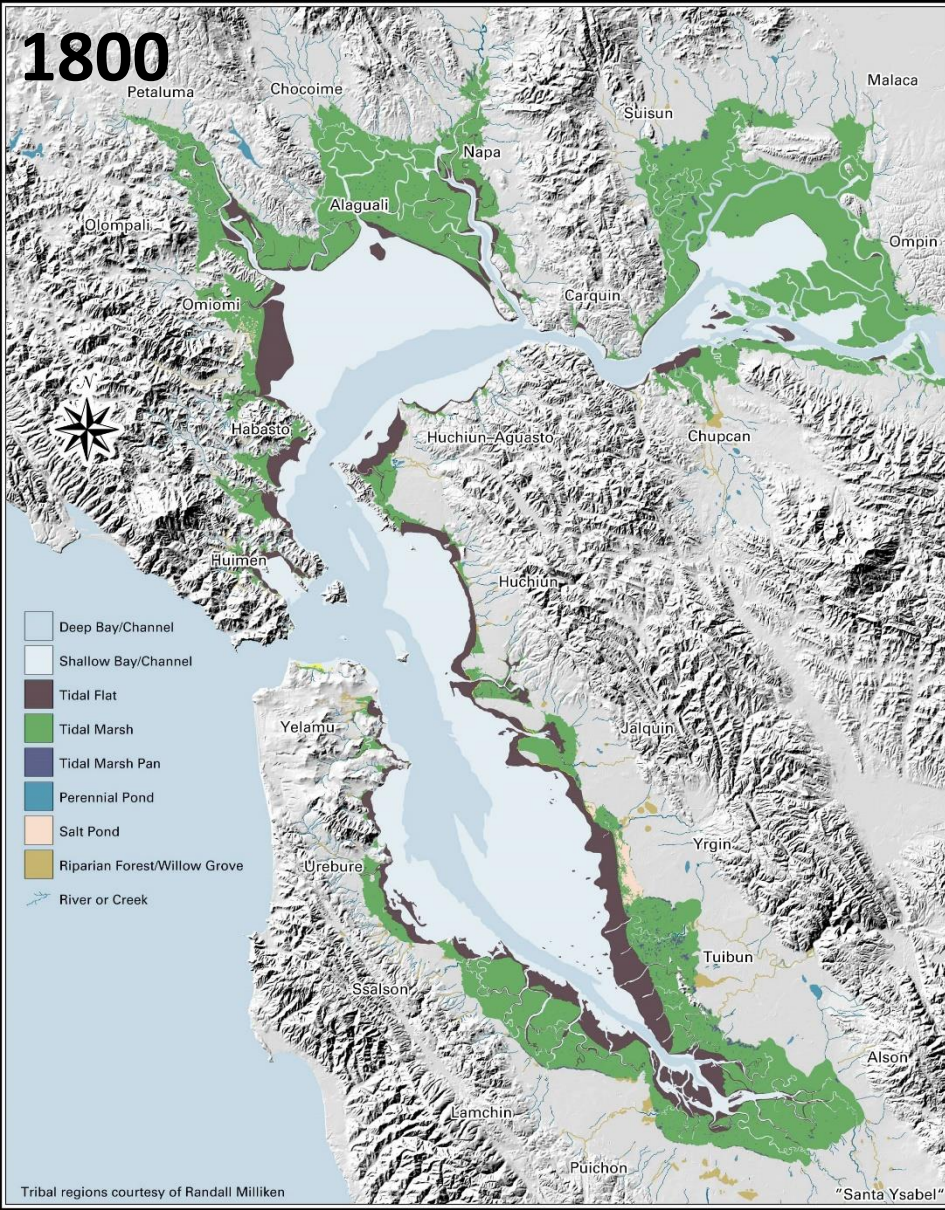


# Population increase



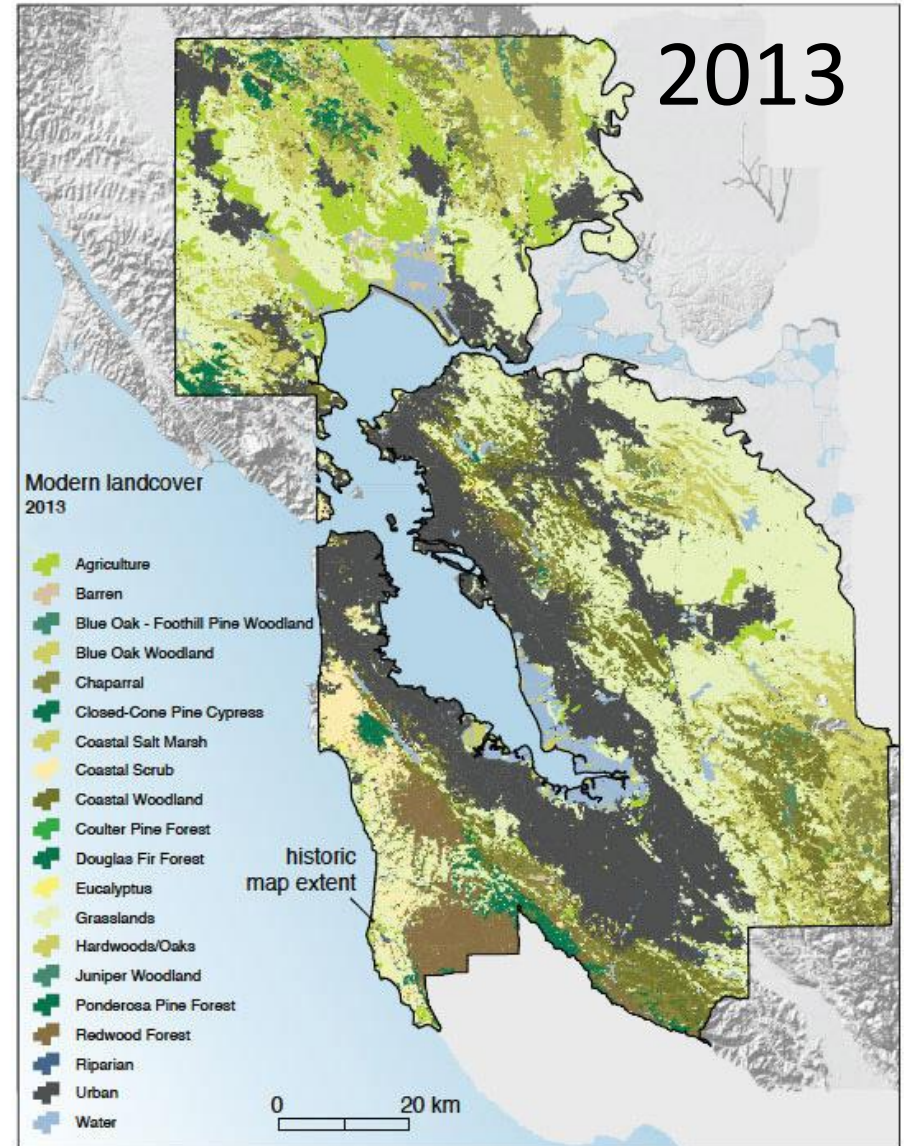
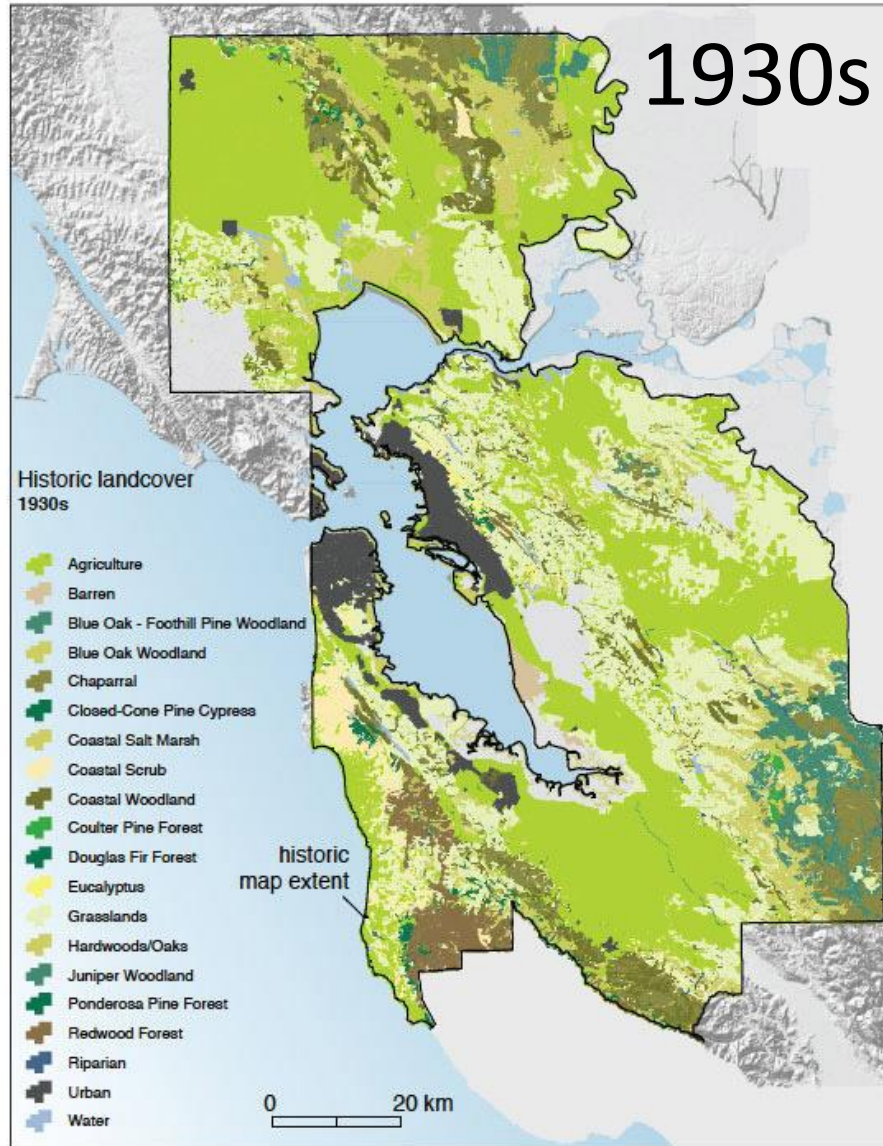


# Change in Bay habitats





# Urban expansion





# Bay hit rock bottom in 1960s

Untreated sewage  
flowed into the Bay



Landfills ringed the Bay

Chemicals entered  
the Bay via runoff





# Environmental revolution

McAteer-Petris  
Act

Created BCDC &  
stopped Bay fill

Porter Cologne  
Act

Water quality standards &  
sewage treatment facilities

Clean Water Act





# Regional Monitoring Program for Water Quality



- Began in 1993
- \$3.7 million/year of stable funding
- Multi-faceted
- Continually adapting



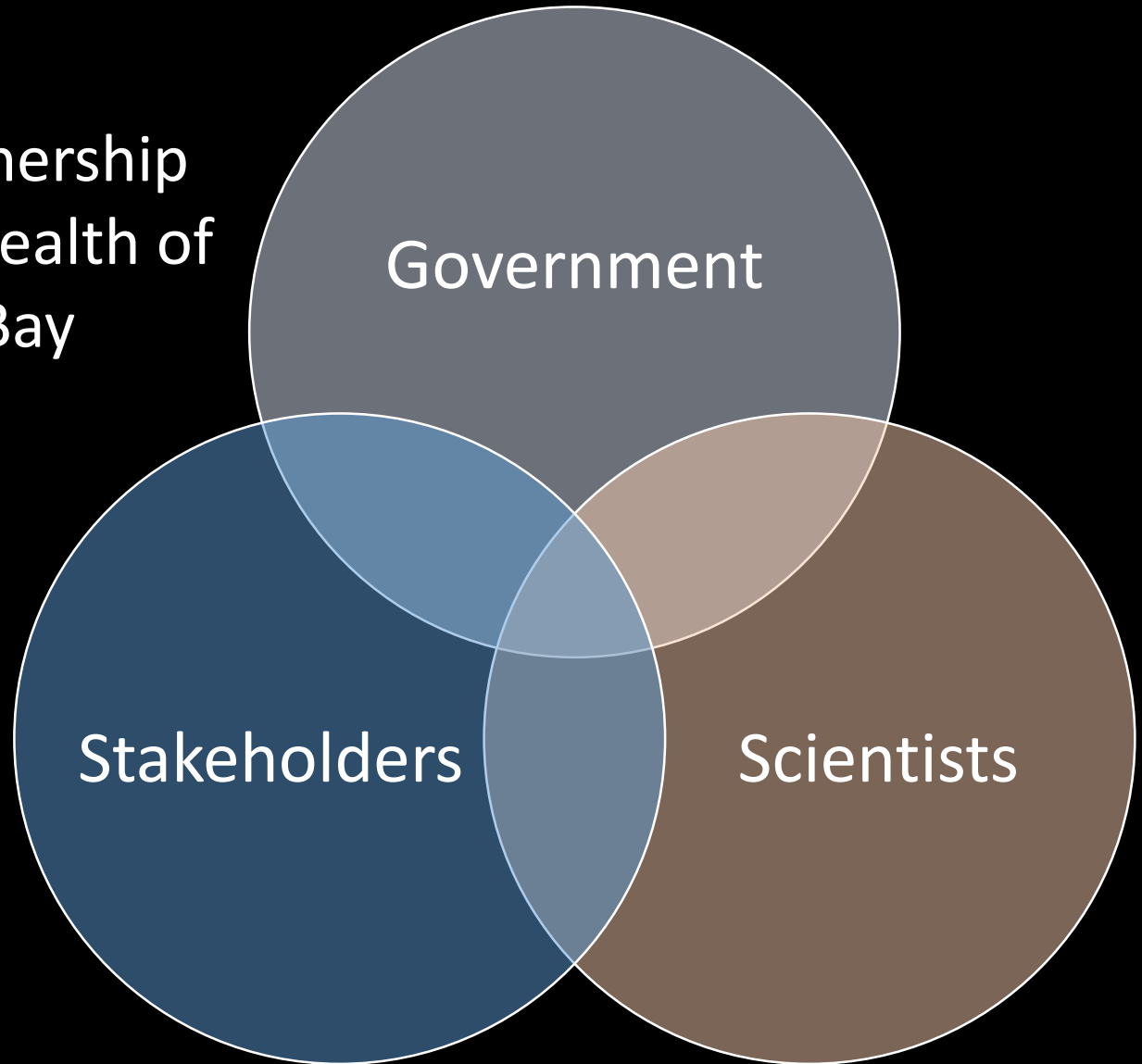
# **Goal of the RMP**

**Collect data and  
communicate information  
about water quality in San Francisco Bay  
in support of management decisions**



# RMP contributors

An innovative partnership  
to understand the health of  
San Francisco Bay





# RMP components



Status &  
Trends

Special  
studies

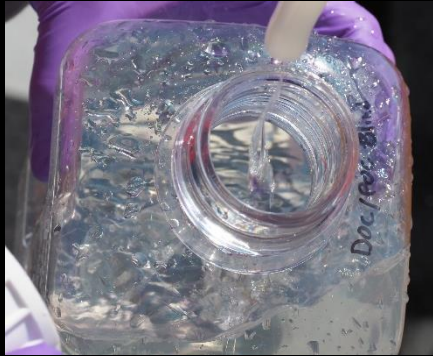
Program  
management



# Status and Trends Monitoring

Every 2 Years

**WATER**



**BIVALVES**



Every 3 Years

**BIRD EGGS**



Every 4 Years

**SEDIMENT**



**SPORT FISH**

Every  
5 Years



# Special studies - workgroups

Emerging  
contaminants

Selenium

Microplastics

PCBs

Sediment

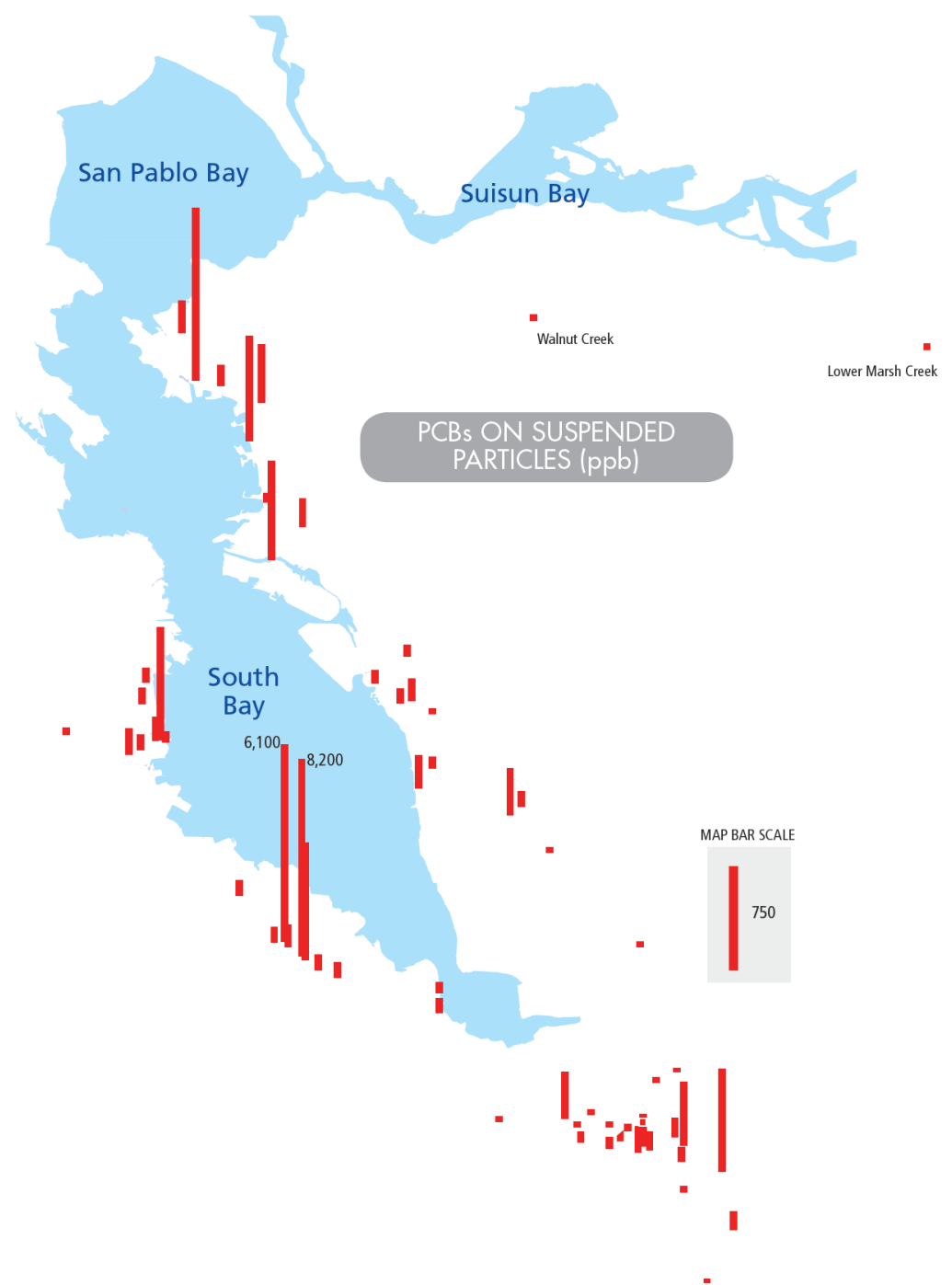
Exposure &  
effects

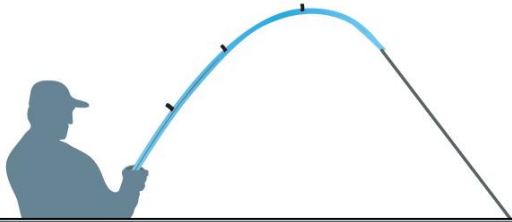
Sources,  
pathways, &  
loadings



Sources,  
pathways, &  
loadings

Stormwater studies  
identify priority  
watersheds





# PCBs & mercury



## A guide to eating San Francisco Bay fish and shellfish

### Women 18 - 45 and children 1 - 17

**Safe to eat  
2 servings per week**



**Safe to eat  
1 serving per week**

**Do not eat  
AND  
Do not eat any fish from the  
Lauritzen Channel in  
Richmond Inner Harbor**



Brown rockfish



Jacksmelt



Red rock crab



Chinook (king) salmon 



California halibut



White croaker



Striped Bass



Surfperches



Sharks



White sturgeon



# Emerging contaminants

## High Concern

moderate or  
high impact

None currently

## Moderate Concern

low impact

---

PFOS, PFOA, Long-chain carboxylates  
Fipronil, Imidacloprid  
Alkylphenols, Alkylphenol ethoxylates  
Bisphenols, Organophosphate esters

---

## Low Concern

limited impact

PBDEs and HBCD  
Pyrethroids\*  
Pharmaceuticals  
Personal care & cleaning  
PBDDs / PBDFs

---

## Possible Concern

uncertainty as  
to impact

---

Alternative flame retardants  
Other PFAS (fluorinated chemicals)  
Pesticides, Plastic additives, Microplastic  
Siloxanes, SDPAs, UV-BZTs, others

Emerging  
contaminants

## High Concern

moderate or  
high impact

None currently

## Moderate Concern

low impact

PFOS, PFOA, Long-chain carboxylates

Fipronil, **Imidacloprid**

Alkylphenols, Alkylphenol ethoxylates

**Bisphenols**, Organophosphate esters



## Low Concern

limited impact



**PBDEs** and HBCD

Pyrethroids\*

Pharmaceuticals

Personal care & cleaning

PBDDs / PBDFs

## Possible Concern

uncertainty as  
to impact

Alternative flame retardants

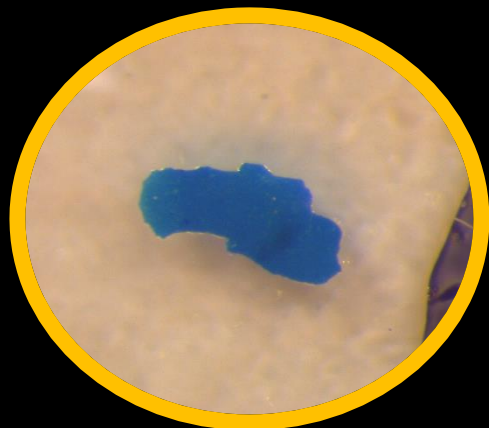
Other PFAS (fluorinated chemicals)

Pesticides, Plastic additives, Microplastic

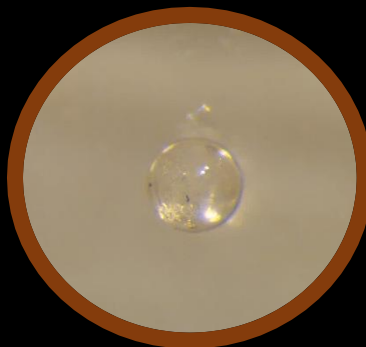
Siloxanes, SDPAs, UV-BZTs, others



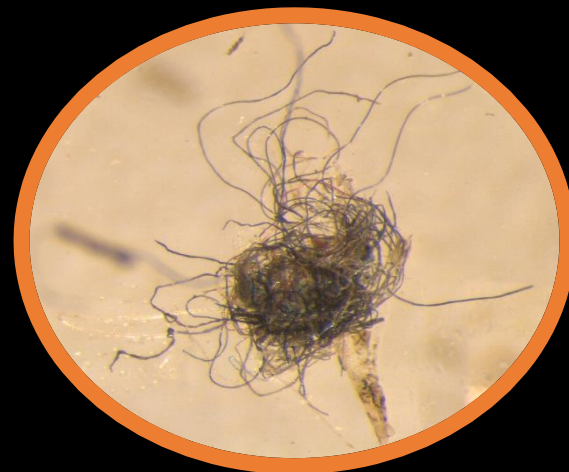
# Microplastics



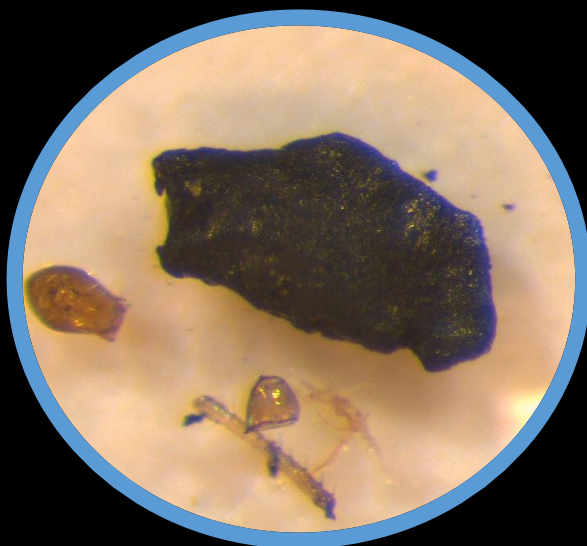
# Microbead



# Fibers



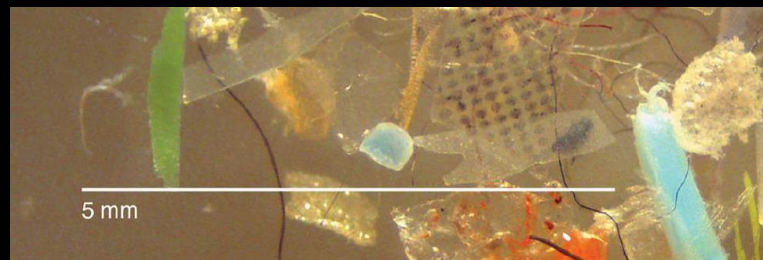
# Fragment



# Rubber fragment



# Paint fragment



# Communication & outreach

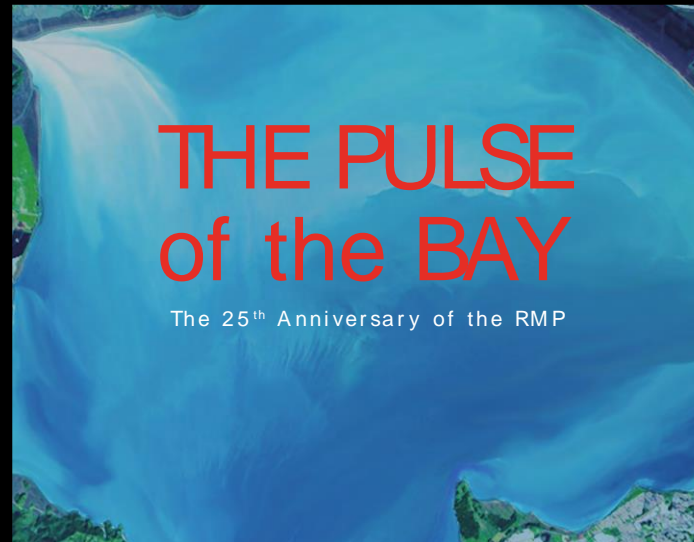
## Website

[www.sfei.org/rmp](http://www.sfei.org/rmp)

## RMP Update



## Pulse of the Bay Report



## Articles



## Annual Meeting



# Future of the Bay?







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