



Reducing PCB Loads to San Francisco Bay

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San Francisco Bay Water Board



An aerial photograph of San Francisco Bay, showing the city of San Francisco on the right and the surrounding hills and water on the left. A red line is drawn across the water, indicating a specific location or boundary. The text is overlaid on the bottom left of the image.

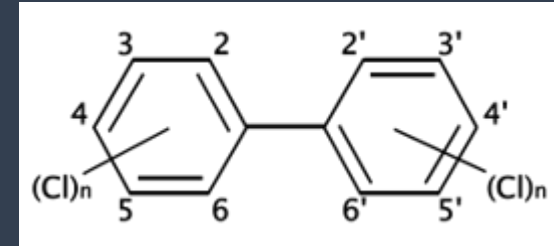
San Francisco Bay's PCB problem

Water Board's current actions

Future plans and actions in development

PCBs in San Francisco Bay and the TMDL

- Extensive historic use around the Bay
- High levels of PCBs in sport fish prompted a health advisory
- Water quality restoration plan adopted in 2010
- Fish tissue concentration target of 10 ppb
- PCBs TMDL is 10 kg/yr



FISH SMART in San Francisco Bay

Harmful chemicals like mercury and PCBs are in some fish in San Francisco Bay. **Women 18 - 45 years old and children should *only* eat the fish with less chemicals in them.**

有害化学物质如汞，多氯联苯等存在于三藩市海的某些鱼体内。妇女**18 - 45岁**和儿童应当只吃化学物质含量少的鱼。

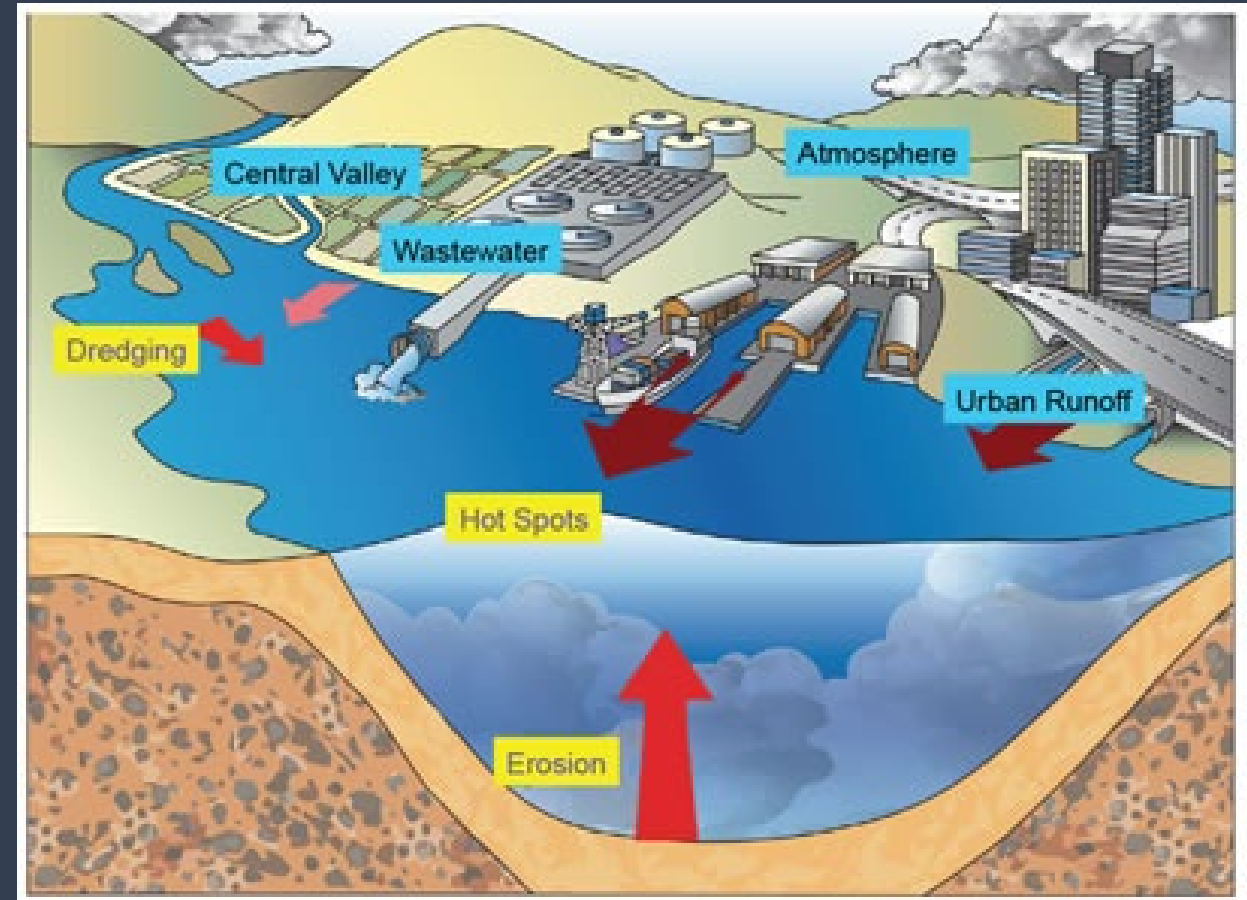
Algunos tipos de pescado de la Bahía de San Francisco contienen químicos dañinos como mercurio y PCBs. **Las mujeres de 18 a 45 años y los niños solo deben comer el pescado que contiene menos químicos.**

Learn more: www.sfbayfish.org • (510) 622-3170

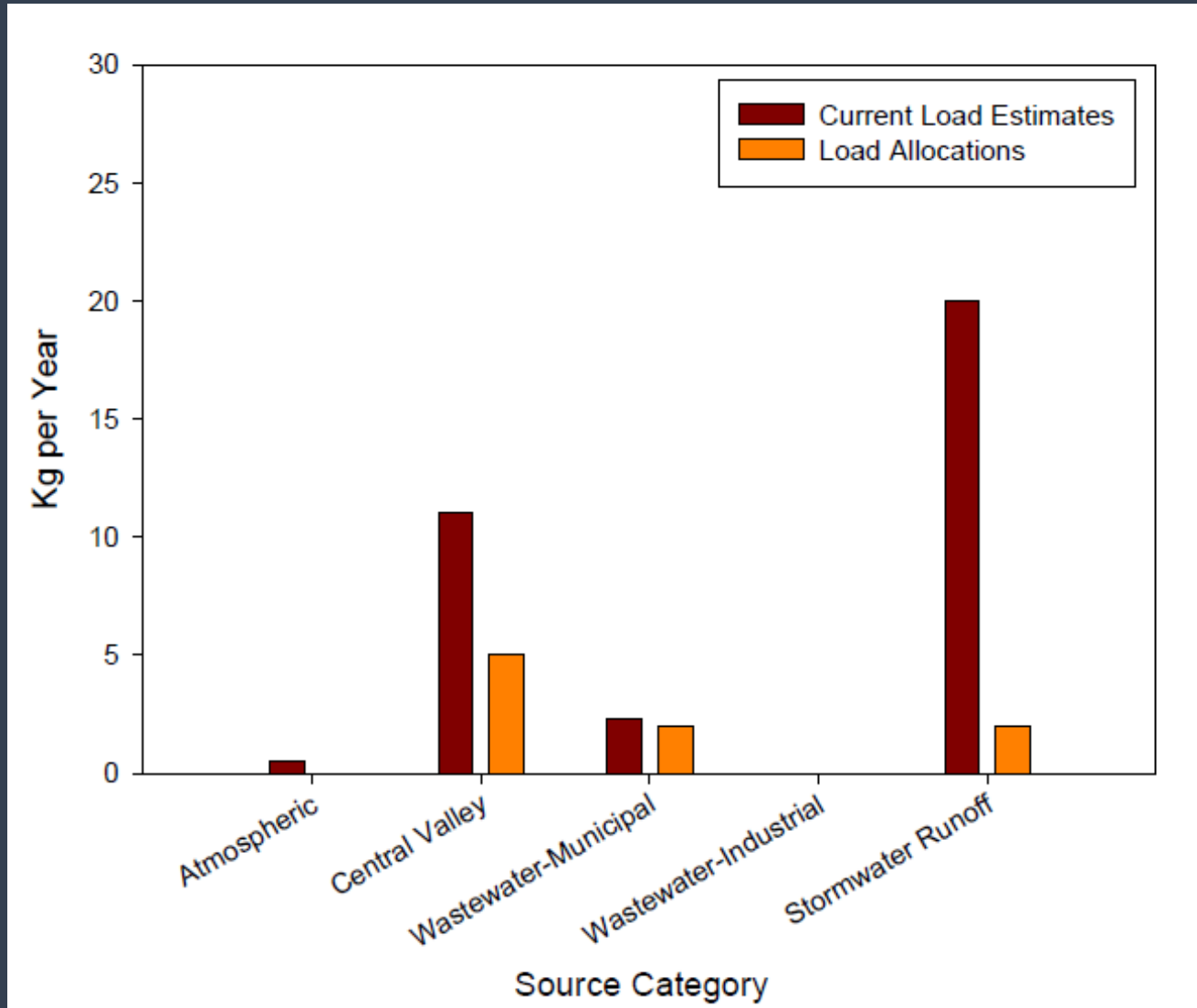
EAT THIS Less Chemicals	NOT THIS More Chemicals
 Jacksmelt	 Striped Bass (Safe to eat for women over 45 and men)
 Brown rockfish	 Surperches
 Red rock crab	 Sharks
 California halibut	 White croaker (Kingfish)
 Chinook (king) salmon	 White sturgeon

PCB Sources

- **External Sources (34 kg/yr)**
 - Urban stormwater (60%)
 - Delta inflow (33%)
 - Municipal wastewater (6.9%)
 - Industrial wastewater (0.1%)
- **Internal Sources (100s-1000s kg)**
 - In-Bay reservoir of bottom sediments



PCB Reductions and Wasteload Allocations



Stormwater Runoff Allocations

~20 kg/yr



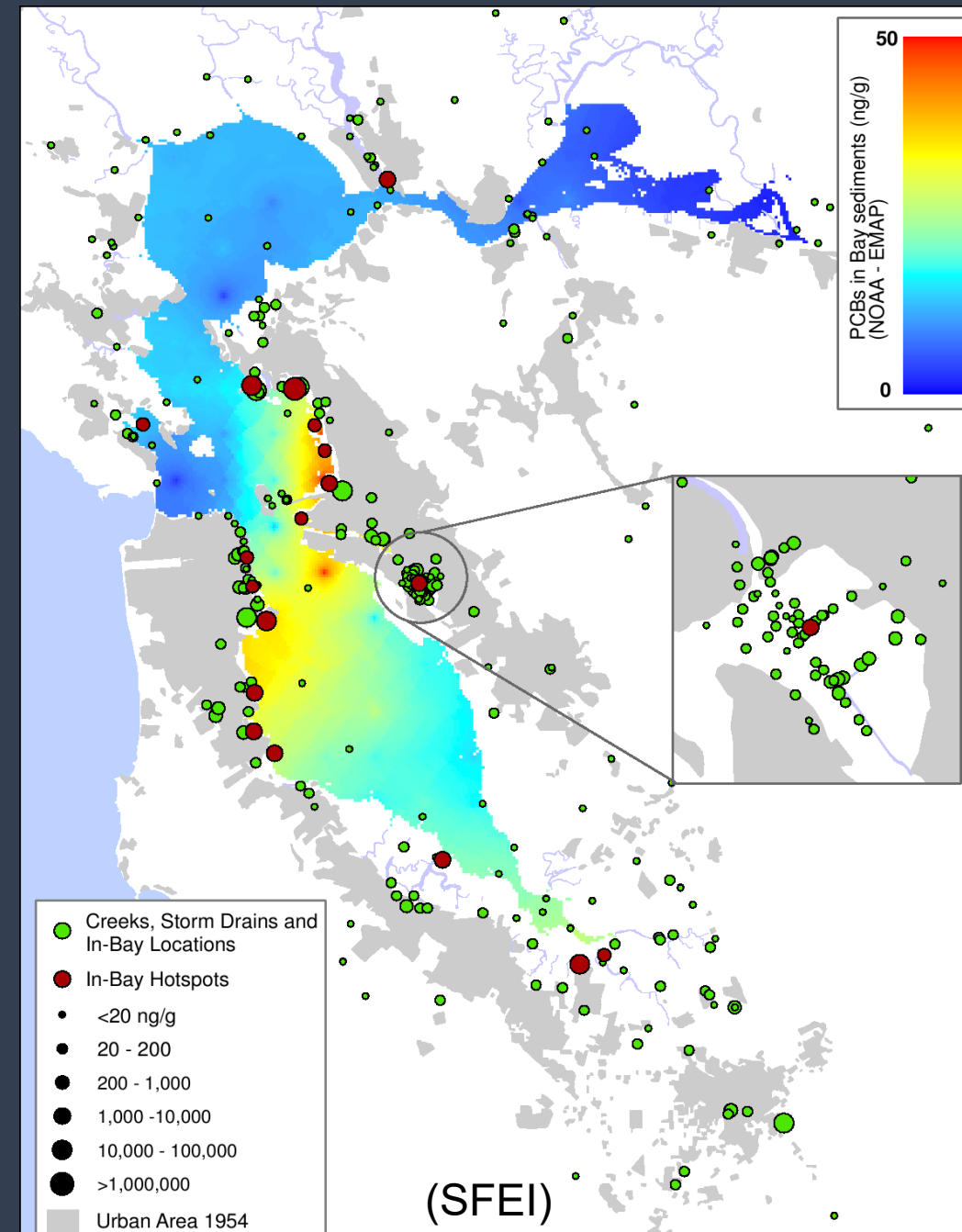
2 kg/yr

90% load reduction



PCBs in Sediments

- **Uneven distribution around the Bay**
 - North Bay is relatively clean
 - Central Bay has highest concentrations
- **Associated with old industrial areas**
- **Important to consider**
 - Environmental justice
 - Racial equity aspects
 - Sea level rise and groundwater impacts due to climate change



What's Being Done About PCB Pollution

- Municipalities are working on stormwater management to reduce PCBs in runoff
- Industry and military are cleaning up “hot-spot” sites
- Dredgers are testing Bay sediments and properly disposing of materials with high levels of PCBs
- RMP continues to sample Bay water, sediment, and fish

Implementation Approach

- Science-based
- Phased and evolutionary
- Collaborative
- With consideration of climate change, environmental justice, and racial equity issues



Municipal Regional Stormwater Permit Urban Stormwater Management Phased Approach



NPDES requirements to reduce PCBs to the maximum extent practicable

1st permit = pilot scale implementation to determine effectiveness

2nd permit = focused implementation of effective and feasible controls to attain allocation(s)

3rd permit = programmatic approach to advance focused implementation to attain allocation(s)

Urban Stormwater Management Actions

1. Attend to old industrial areas to reduce loads
“turn off the tap”

2. Identify PCB source properties
and refer for cleanup



Urban Stormwater Management Actions



Expansion joint material on bridge
containing > 4000 ppm PCBs
Photo courtesy of BASMAA

3. Control materials containing PCBs

→ Roadway caulk, demolition debris, electrical equipment

10,000 kg estimate of PCBs in older buildings' caulk!

4. Pursue opportunities for green stormwater infrastructure

PCB Cleanups

- Cleanup completed in 19 upland & 8 in-Bay sites
- Cleanup ongoing in 19 upland & 6 in-Bay sites
- ~50,000 metric tons of PCB-contaminated soils has been removed from 9 sites.
Concentration range 2-2,000 ppm
- Challenges: linking contamination to upland source properties, identifying dischargers, dealing with multiple dischargers, and high costs



India Basin, Hunter's Point, SF

Future Actions

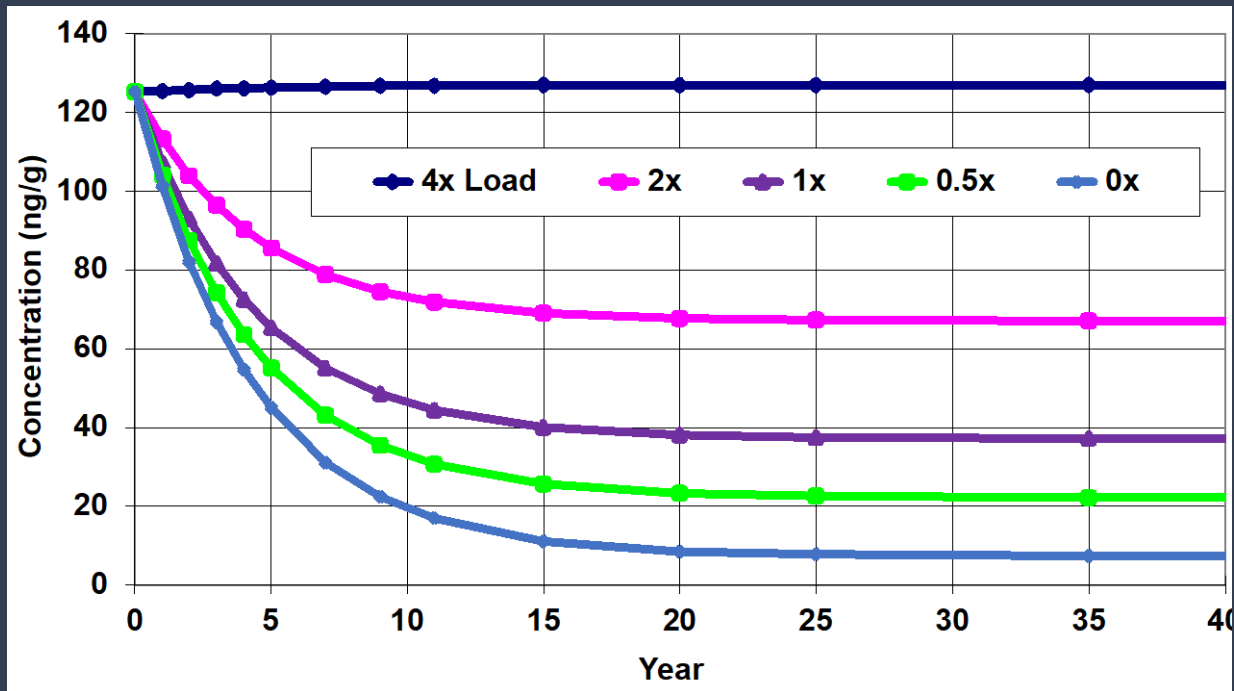


Emeryville
Crescent

San Leandro
Bay

Steinberger
Slough

Bay-wide PCB reduction progress is slow; however, focusing on PMUs will result in significant load reductions and have a profound impact in Bay's recovery



Change in sediment concentration with changing loads in SLB

Future Actions and Plans

In the future, we may focus on certain segments of the Bay and/or margin areas with elevated PCBs

Regional Watershed Dynamic Model (WDM)

Continued collaboration

More focus on cleanups

TMDL revision may be considered in ~5 years to revise WLAs and/or schedule



7 subregions of the Bay as modeled in WDM to capture spatial variation of physical processes across the Bay

An aerial topographic map of a coastal region, showing a large body of water on the right and a landmass on the left. A small, rectangular area on the landmass is highlighted with a red border. The map is rendered in grayscale with a dark overlay.

QUESTIONS?