



Proposed Methylmercury Basin Plan Amendment for the Sacramento-San Joaquin River Delta Estuary

Staff Workshop

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19 September 2006, Stockton

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Outline

- Background
- Fish Tissue Mercury Objectives, Linkage & Mercury Sources
- Recommended Implementation Plan
- Discussion

Delta MeHg TMDL & BPA

- TMDL draft staff report
(August 2005, revised June 2006)
 - ◆ Scientific background
- Basin Plan Amendment draft staff report
(scientific peer review June-July 2006)
 - ◆ Basin Plan language
 - ⇒ Control program

Delta Mercury Impairment



- High mercury levels in fish
- Fish consumption advisories
- Federal CWA 303d list
- TMDL Program – point and nonpoint sources – to address impairment

Goals:

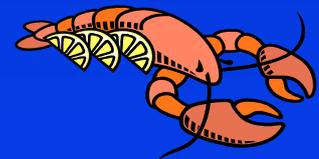
***Reduce methylmercury in
Delta fish***

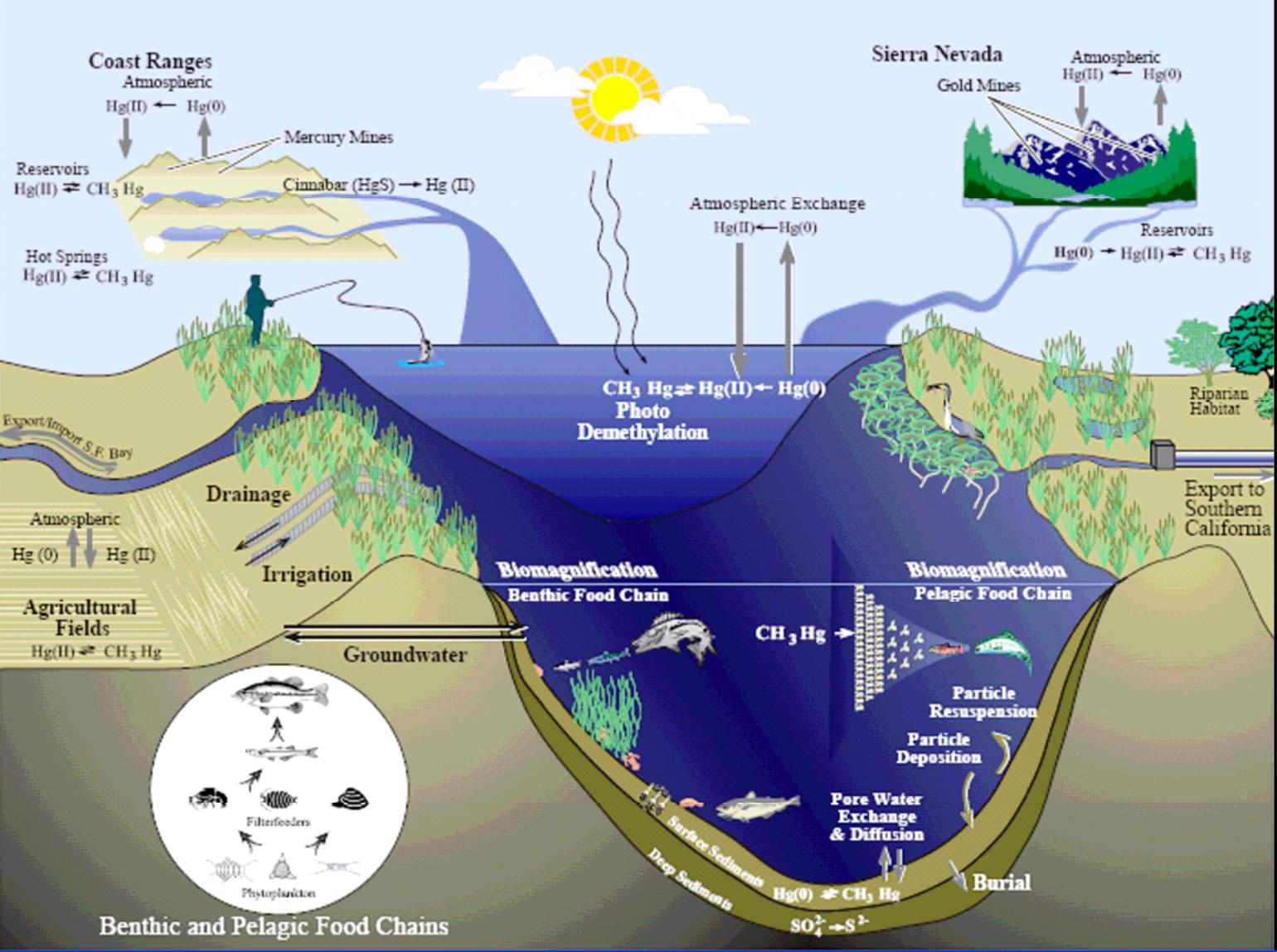
***Reduce mercury loads to
San Francisco Bay***

**What are your ideas for
other alternatives?**

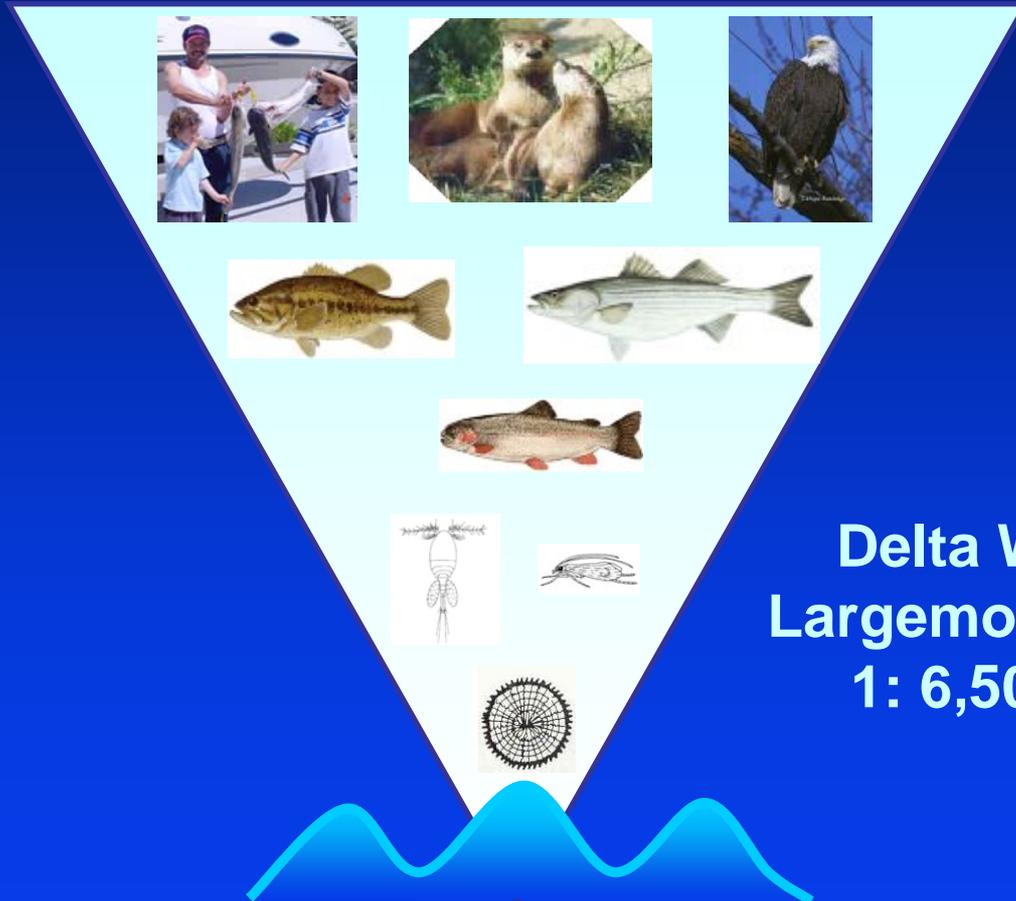
Why is Methylmercury a Problem?

Impairs nervous, reproductive & immune systems in humans & wildlife





MeHg Bioaccumulates



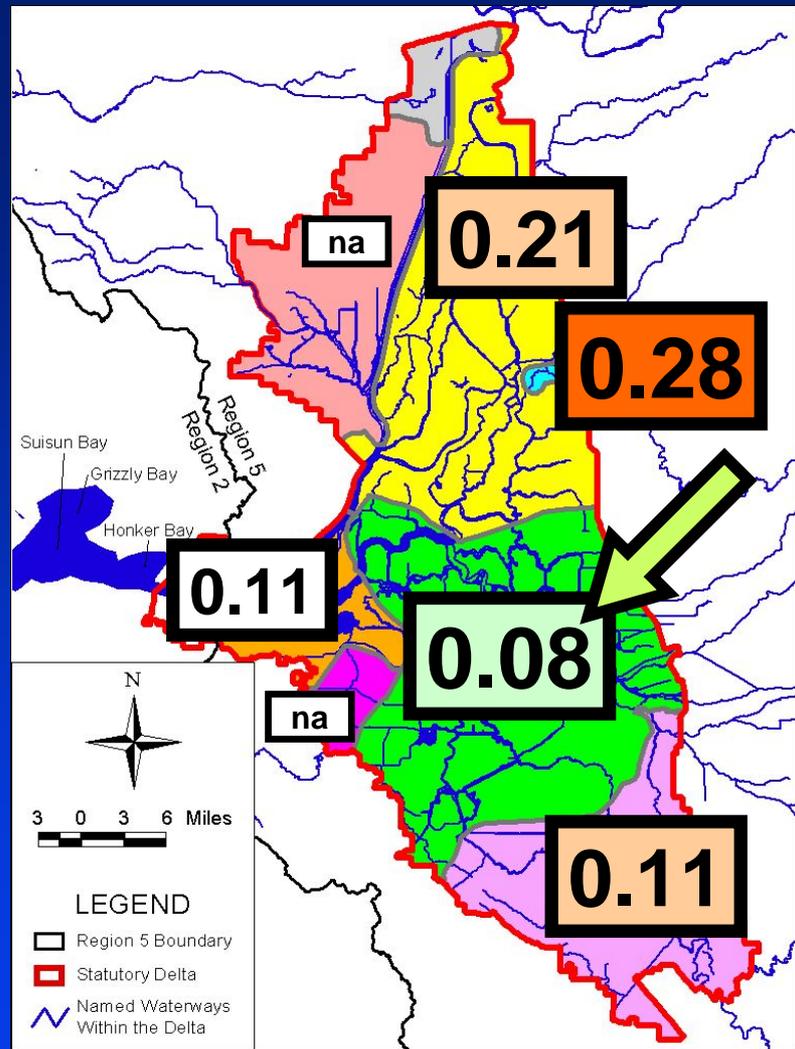
Delta Water :
Largemouth Bass
1: 6,500,000

Proposed Delta Fish Tissue MeHg Objectives

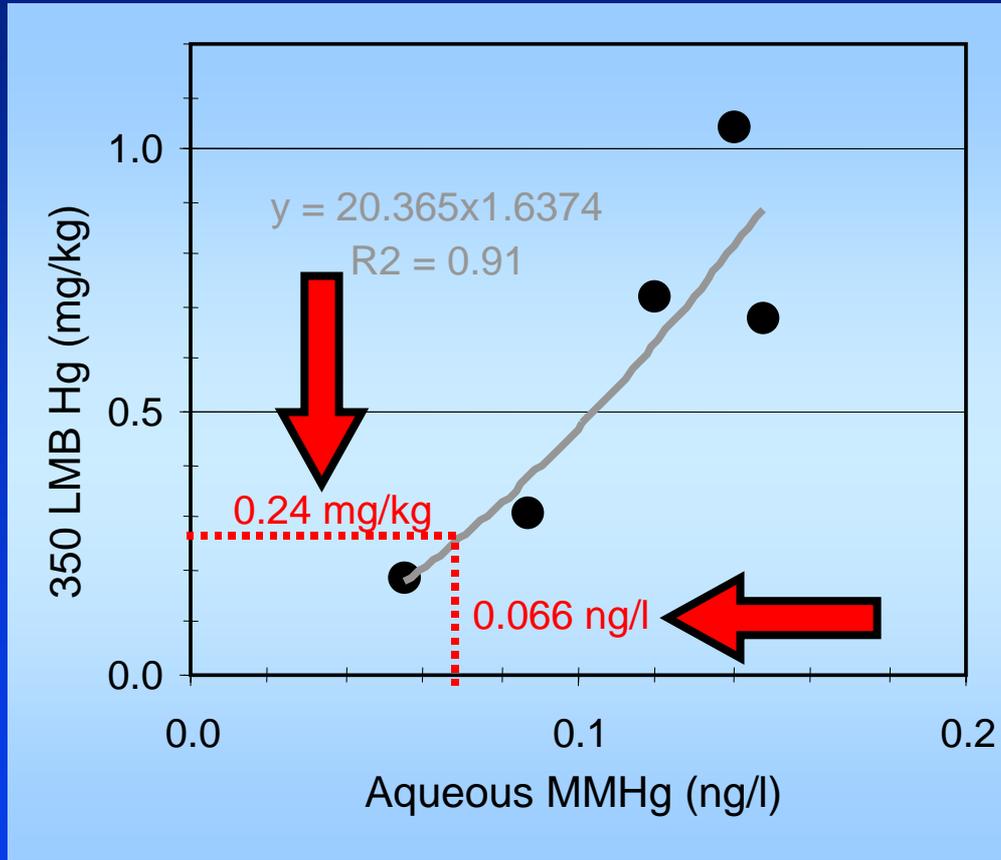
- Large TL4 fish (bass): 0.24 mg/kg
Large TL3 fish (bluegill): 0.08 mg/kg
Small TL2 fish (silverside): 0.03 mg/kg
- Protects humans eating 1 meal/week of TL 3 and 4 fish
- Protects Delta wildlife species

Average MeHg Levels in Large TL3 Fish [bluegill, carp] (mg/kg)

Compare to
Proposed WQO of
0.08 mg/kg



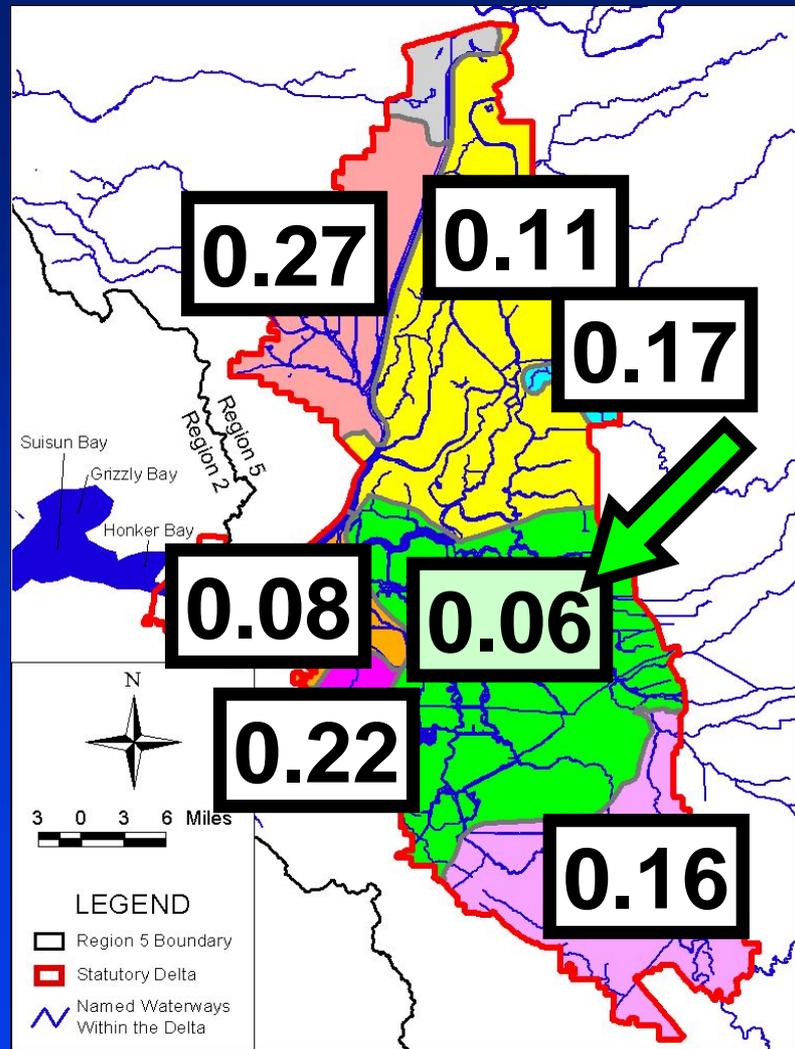
MeHg Linkage: 350 mm Largemouth Bass & Avg. Annual Water MeHg



Proposed Methylmercury Implementation Goal

- 0.06 ng/l in unfiltered ambient water, annual average (~10% margin of safety)
- Use goal to establish how much reduction from each source is needed to achieve WQOs

Average Annual Ambient MeHg Levels in Water (ng/l)



Delta TMDL: MeHg Sources

Within-Delta Sources (~40%)

- Wetlands (16%)
- MeHg flux from open water sediments (15%)
- Waste water treatment plants (4%)
- Agricultural return flows (3%)
- Urban runoff (1/2%)

Tributary Watersheds (~60%)

Control Program

1. Control MeHg sources
2. Control total Hg sources
3. Reduce MeHg exposure to the fish eating public
(through expanded public outreach)

Concerns about Mercury Reduction

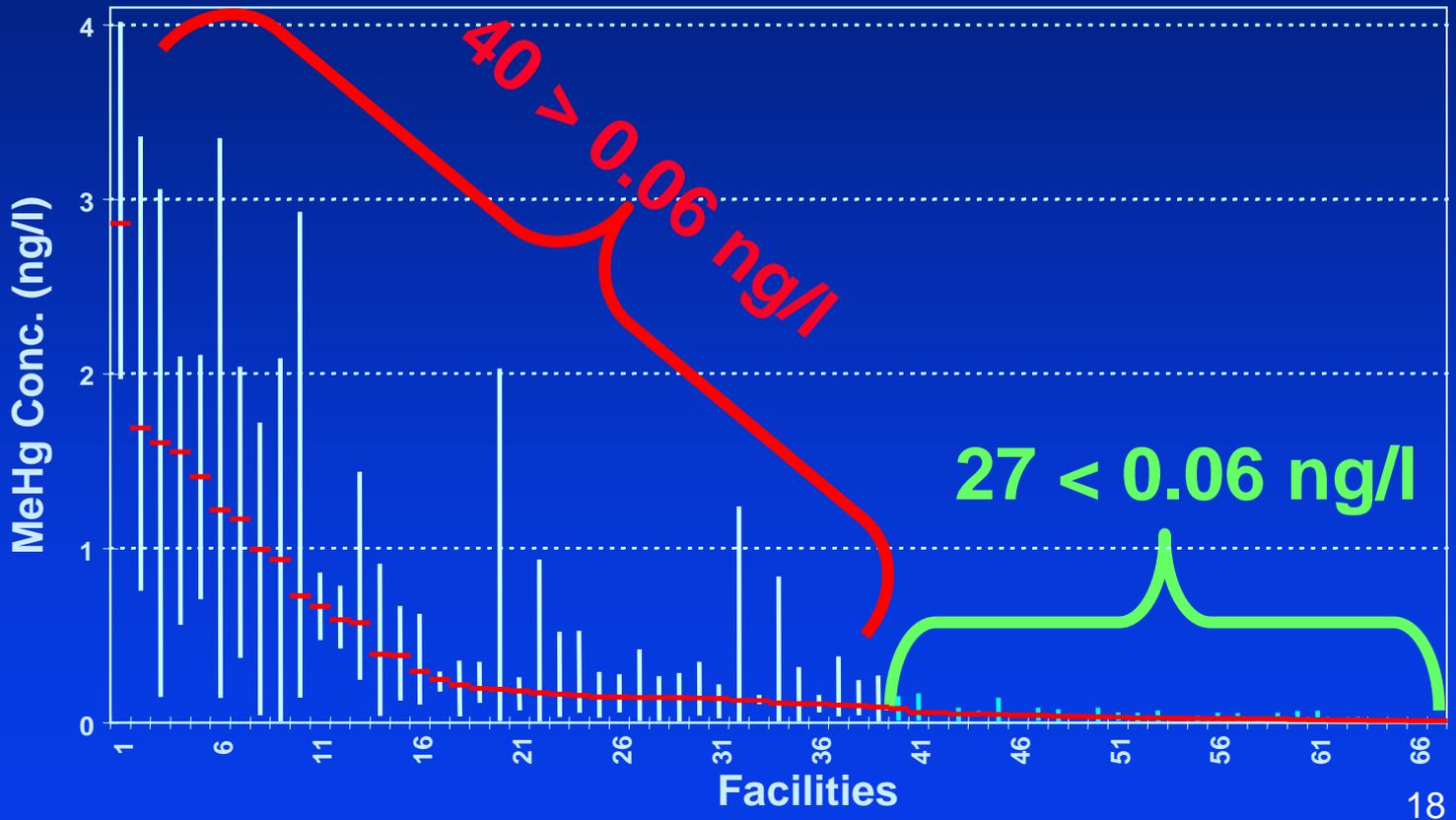
- Millions of kilograms released to waterways by historic mining
- Much remains in channels & may be untreatable
- Natural erosion will remove some mercury, but it may take centuries to wash the mercury from the waterways

Controllable Methylation Factors

- Inorganic mercury in sediment
- Sulfate in sediment
- New or enlarged water impoundments
- Habitat type (e.g., seasonal and permanent wetland)

Shorten time to reach lower levels in fish from centuries to decades

Municipal WWTP MeHg Monitoring Results

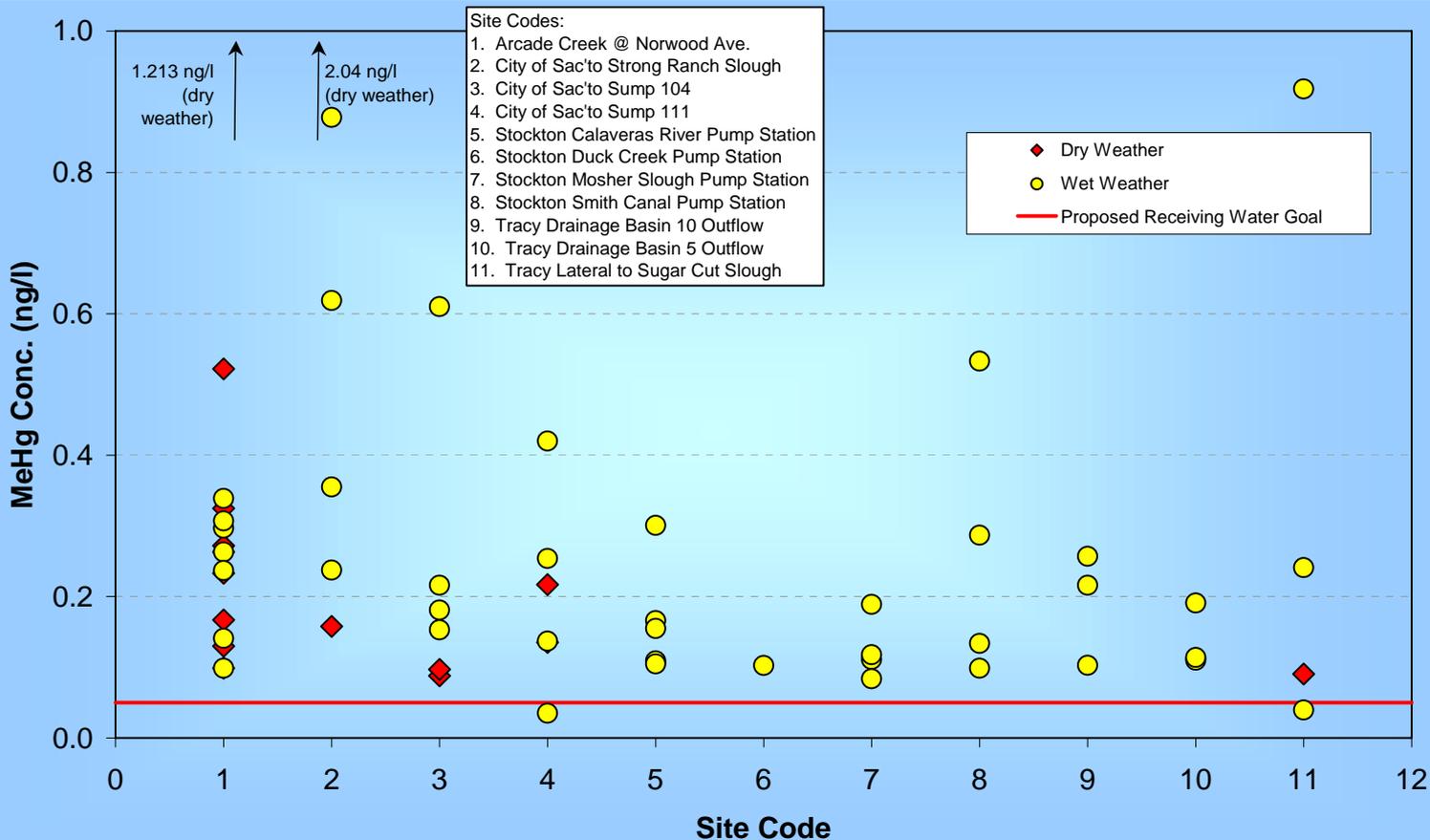


MeHg Loading from Wetlands

- Methylmercury production evaluated at two Twitchell Island experimental ponds.
 - ◆ 10:1 difference in summer production rate between shallow pond with submerged aquatic vegetation and deeper pond with more open water



Urban Runoff MeHg Concentrations



Proposed Control Strategy

- Reduce methylmercury loads to impaired areas of the Delta from sources in the Delta.
- Cap inorganic Hg loads from point sources in the Delta and downstream of major dams
 - Focus on nonpoint sources (e.g., mines) and tributaries that contribute high levels of inorganic Hg.

Methylmercury

5-Year Study Period

- Conduct studies to characterize & control existing MeHg concentrations and loads
- **GOALS:**
 - ◆ Refine load estimates
 - ◆ Develop technically & economically feasible controls to reduce methyl mercury production if >0.06 ng/L and will discharge to impaired section of Delta.

Methylmercury

Characterization and Control Studies

- Collaborative approach encouraged (versus individual studies by every entity)
 - ◆ Source & return water
 - ◆ Representative source types (e.g., crop, management, and soil types)
- Control studies: focus on sources that discharge the most MeHg to develop effective MeHg management practices

Methylmercury

In the Delta & within 30 Miles*

*1-day travel time by water

- Agricultural discharges and managed wetlands
- NPDES wastewater treatment facilities discharging greater than 1 mgd
- Urban runoff (Phase 1 MS4s)

Allocations to guide studies.

Methylmercury

Water storage, flood and salinity management

- Federal and State agencies
- Projects that change pore water sulfate or salinity levels (South Delta Improvement Project, X2 Standards)
- Flood conveyances (Fremont Weir/Yolo Bypass)
- New/expanded reservoirs (Sites, Shasta)

Conditional Prohibition

MeHg discharge into the Delta is conditionally prohibited, unless:

1. The fish tissue MeHg WQOs for the Delta are being met,
2. MeHg allocations have been met,
3. MeHg discharge concentration < source water MeHg, or
4. Responsible parties conduct MeHg control studies by December 2012 & implement Board-approved control actions

Total Mercury

Municipal WWTPs downstream of major dams through Delta

- WWTPs that discharge > 1 mgd
 - ◆ Cap TotHg discharges at 2008 annual loads
- All WWTPs:
 - ◆ Implement Pollution Prevention Plans

GOAL: Make certain Delta impairment does not worsen

Total Mercury

Compliance with TotHg Limits Facilities > 1 mgd

- Between adoption of this BPA and future Offset Program:
 - ◆ Do not exceed 2006 annual average TotHg effluent concentration
- If exceed 2008 load limit, reduce or offset load
- In absence of offset program, 2008 load limit continues to be in effect & new inputs must be approved individually by EO

Total Mercury

Phase 1 MS4s downstream of major dams through Delta

- Total Hg limit in 2014
 - ◆ Based on 10-year average concentration for 2002-2011

Total Mercury Cache Ck Settling Basin

- Propose and implement a control program to (1) periodically clean basin out and (2) increase the mercury trapping efficiency by about 50 kg/yr.

Methyl and Total Mercury Dredging

- Ensure new surface sediment has an average mercury concentration less than existing surface
- Protect dredge spoils with THg > 0.2 mg/kg from erosion due to 100-yr precip or flow conditions
- Ensure return flows < methyl mercury than receiving water
- Report methyl and THg loads removed

New MeHg Sources (2007-2014)

New MeHg inputs from existing or new projects initiated between the effective date of this amendment and 2014 are allowed but:

- Discharge MeHg concentrations must be less than source water or
- The project proponent must conduct MeHg control study and increases in MeHg must be approved by the Regional Board EO.

Why Are New Projects a Concern?

Wetlands are effective at methylation...

And increases are expected:

- 39,000 to 54,000 acres planned for restoration, doubling existing wetland acreage
- Downstream from Hg-enriched watersheds:
 - Yolo Bypass (Cache Ck)
 - Dutch Slough (Marsh Ck)
 - Staten Island (Cosumnes R.)

Wetland drainages: 1-10 ng/l MeHg →
Predict increases in Delta H₂O &  MeHg

More characterization studies...

Delta:

- Big Break
- Browns Island
- Cosumnes River
- Dutch Slough
- Franks Tract
- Twitchell Island
- Yolo Bypass

San Francisco Bay:

- Petaluma River (tidal)
- Suisun Marsh
- San Pablo Bay
- Sonoma Headlands
- South Bay Salt Ponds
- SFB Tidal Wetlands

Watershed:

- Mud & Salt Slough
- Merced River

But must ensure that management practices are developed...

Proposed Schedule

- 2007: Submit study plans
- 2009: Submit progress report
- 2012: Submit final results, proposed management practices and an implementation schedule

Proposed Schedule

2014:

Board evaluates results and management practices and considers a Basin Plan amendment for an updated control program

2015-2029: *Implementation actions to comply with MeHg load allocations*

Next Steps

- Public workshops (Sept. 2006)
- Release draft BPA staff report for public review after receive & address scientific peer review comments (Oct. 2006)
- Release final draft BPA staff report (Nov. 2006)
- Board Hearing (Winter 2006/07)

Questions & Discussion

