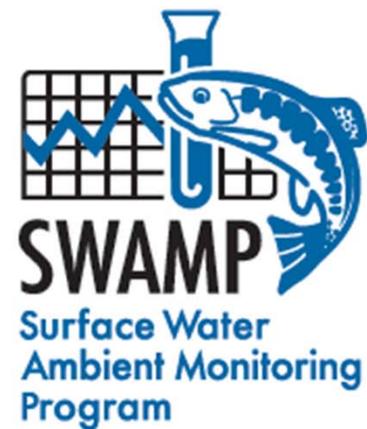
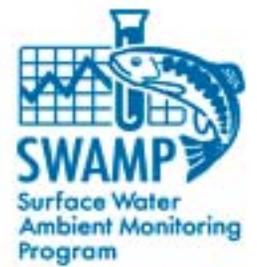




# Bioaccumulation Oversight Group

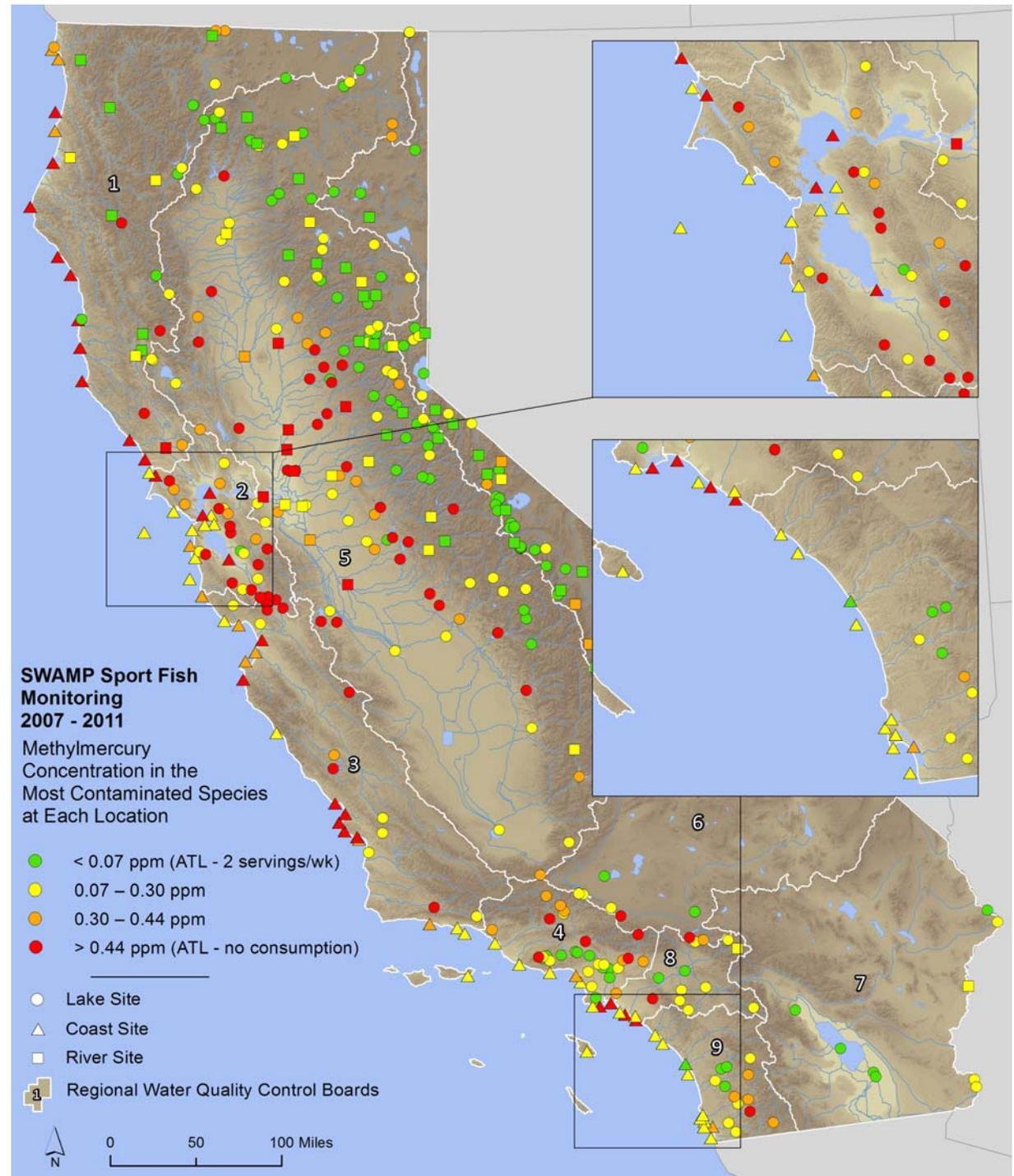


# Background



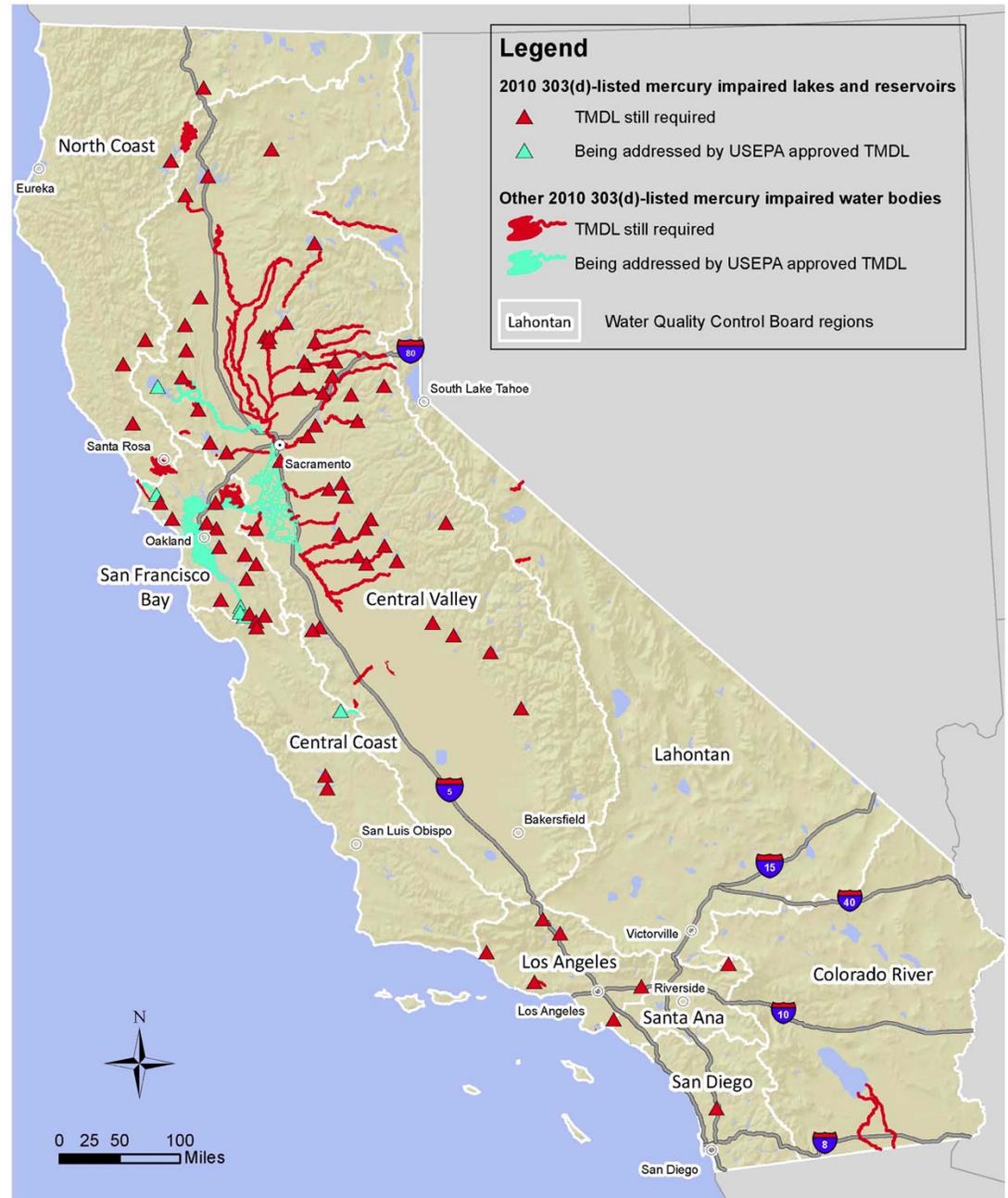
# BOG Accomplishments

- Statewide sport fish surveys (2007-2011)
  - Annual reports
  - Fact sheets
  - Media coverage
- Centralized database
- “Safe to Eat?” web portal
- First statewide study on aquatic life impacts (2012-2013)
- Bioaccumulation Strategy



# BOG Impact

- 303(d) Listings
- Statewide TMDL
- Statewide consumption advisory
- Site-specific advisories



# Future Aspirations of BOG

- Continued success - providing high value information in a cost-effective manner
- Ensure that California has the monitoring needed to manage (minimize exposure) to bioaccumulative pollutants
- Ensure that the monitoring is coordinated and cost-effective
- Do the monitoring that's needed and not being done by others
- Ensure that information is generated and used by decision-makers (including the public)



## Safe for Fishing

<b>Tier I</b> <i>High Concern</i>	Methylmercury Saxitoxin Domoic Acid
<b>Tier II</b> <i>Moderate Concern</i>	PCBs Microcystin
<b>Tier III</b> <i>Low Concern</i>	PBDEs DDTs Dieldrin Chlordanes Selenium Many others
<b>Tier IV</b> <i>Unknown Concern</i>	PFCs Dioxins CECs

## Safe for Aquatic Life

<b>Tier I</b> <i>High Concern</i>	Methylmercury Microcystin Domoic Acid Other biotoxins
<b>Tier II</b> <i>Moderate Concern</i>	DDTs PCBs Selenium PBDEs PFOS
<b>Tier III</b> <i>Low Concern</i>	Dieldrin Chlordanes Dioxins Many others
<b>Tier IV</b> <i>Unknown Concern</i>	CECs

# SWAMP Objectives

For the high priority pollutants, we should be looking at:

- Status
- Trends
- Sources and pathways
- Effectiveness of management actions



# Methylmercury

Objective	% Completed (approximate)	Remaining gaps
Status	67%	<ul style="list-style-type: none"> <li>• Safe lakes</li> <li>• Additional 303(d) lakes</li> <li>• Wetlands</li> </ul>
Trends	15% (statewide baseline established, RMP)	<ul style="list-style-type: none"> <li>• Lakes</li> <li>• Coast</li> <li>• Rivers</li> </ul>
Sources and Pathways	30% (sediment Hg, mining)	<ul style="list-style-type: none"> <li>• Controllable factors</li> <li>• Role of air dep</li> </ul>
Effectiveness of Management	5%	



# Methylmercury Monitoring Needs Appropriate for BOG

## High Priority

- Coordination, guidance, synthesis, communication of work funded by others
- Long-term statewide trends
- Identifying safe locations

## Other

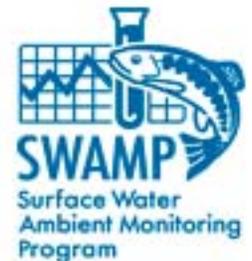
- Intensive sites (multiple species, trends)
- Additional lakes for 303(d) listing
- Assessment of atmospheric deposition contribution to impairment

**Other Players:**  
State TMDL  
Bay RMP  
Delta RMP



## Origin and Charge for This Group

- BOG and Roundtable discussions
- Discussion with Carrie and Patrick
- Outcome of last BOG meeting – form subgroup and begin design discussions
- Prepare draft sampling plan
- Discuss with Review Panel (late March)
- Prepare QAPP
- Sampling this summer



# Designing a Clean Lakes Study



## Objectives (draft)

1. Promote exposure reduction by identifying lakes that the state can recommend to the public as places where fish are “safe to eat”
2. Support management by gathering supplemental data that can help explain why these lakes have low methylmercury concentrations in the food web



# Addressing Objective 1: Data Needs

- Need to go beyond screening level of effort to avoid misdirecting the public
  - Repeated observation of low concentrations
  - Multiple species
    - Make sure we get the popular species that might have high concentrations
  - Adequate sample size
  - Include indicators with greatest statistical power: black bass



## Addressing Objective 2: Data Needs

- More than just the sport fish data. Possibilities:
  - Hg in multiple sport fish species
  - Hg or MeHg in lower trophic levels – prey fish, inverts
  - MeHg, THg in water and sediment
  - Community and food web structure: fish, phytoplankton
  - Trophic status, stratification
  - Standard water quality parameters



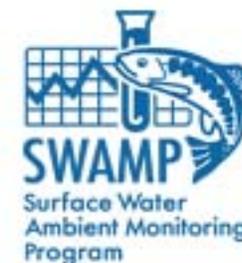
# Funding

- BOG funds available: ~ \$240,000
- Potential partners
  - Reservoir TMDL?
  - WB regions?
  - Others?



# Costs and Scope

<b>One Location per Lake</b>		
Item	Cost	Notes
Biota sampling	\$6,000	3 sport fish species (LMB and 2 others)
Tissue sample compositing and archiving	\$240	
Mercury in individual bass	\$825	11 fish per lake, \$75 per analysis
Mercury in composite samples	\$150	2 composites per lake
Water Sampling		including ancillary field measurements
Sediment Sampling		
MeHg, THg in water		xx samples, \$xx per sample
MeHg, THg in sediment		xx samples, \$xx per sample
Hg in prey fish	\$225	3 composites
MeHg in inverts		
<b>Total Cost per Lake</b>	<b>\$7,440</b>	
<b># of Lakes That Can Be Covered</b>	<b>32</b>	



## Selecting Lakes

- Revisit lakes with prior data
- Focus on lakes with high fishing pressure to achieve maximal exposure reduction
- Defining “safe”
- Distribution among regions
- Availability of supporting limnology data

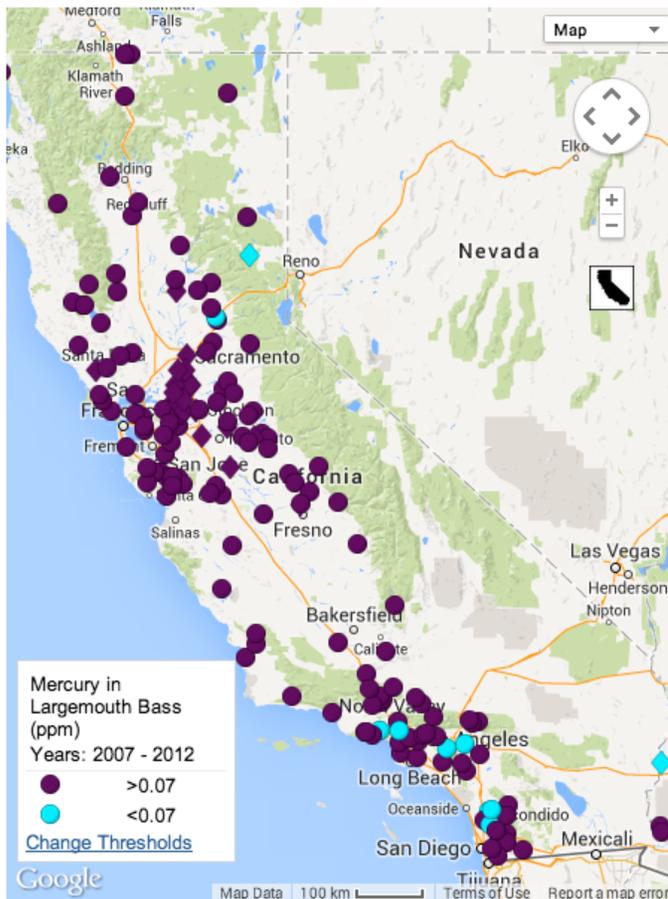


About the California Water Quality Monitoring Council

SAFE TO EAT FISH LINKS

- » Pollution Sources & Health Risks
- » Laws, Regulations, Standards & Guidelines
- » Assessment Thresholds
- » Regulatory Activities
- » Enforcement Actions
- » Research
- » Monitoring Programs, Data Sources & Reports
- » Statewide Perspective
- » National Perspective

Show counties



This interactive map allows you to explore fish contaminant data for your fishing locations. Data are available from extensive monitoring by SWAMP of lakes and reservoirs in 2007 and 2008, of the coast in 2009 and 2010, of rivers and streams in 2011, and from other studies. Data from 2007-2011 are shown by default. [Map Instructions](#)

Select Species:

Largemouth Bass

Select Contaminant:

Mercury

Select Start Date:

2007

Select End Date:

2012

Go

Reset

[Download Map Data](#)

More Information

- » [Monitoring programs and reports](#)
- » [Access Complete Datasets from CEDEN](#)
- » [Assessment thresholds](#)

This map shows data generated by:



SWAMP

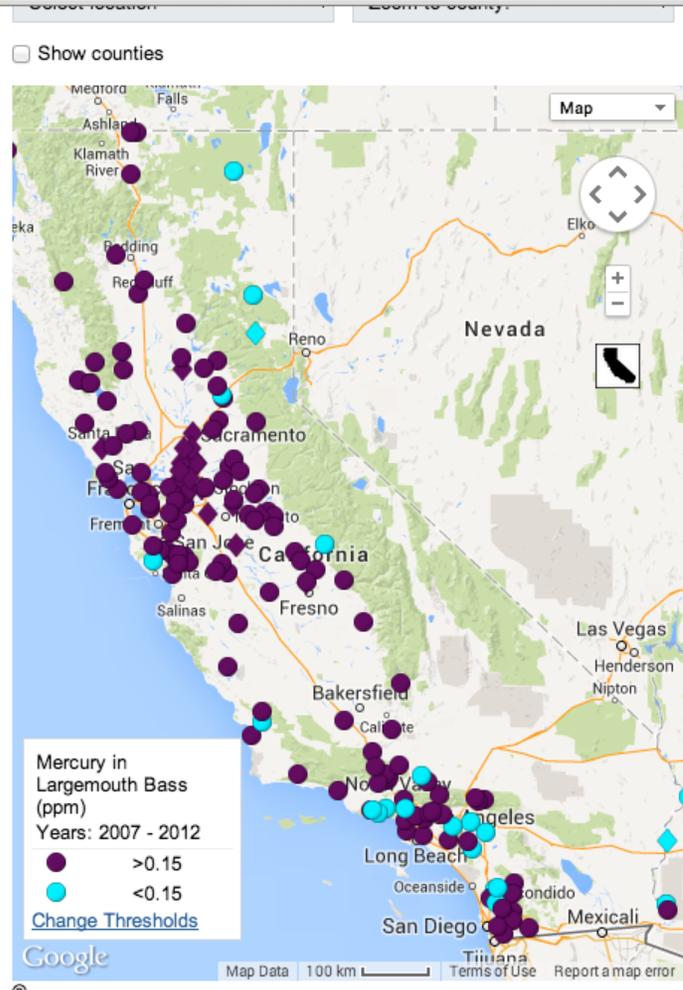
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Select Start Date: 2007 Select End Date: 2012

Go Reset [Download Map Data](#)

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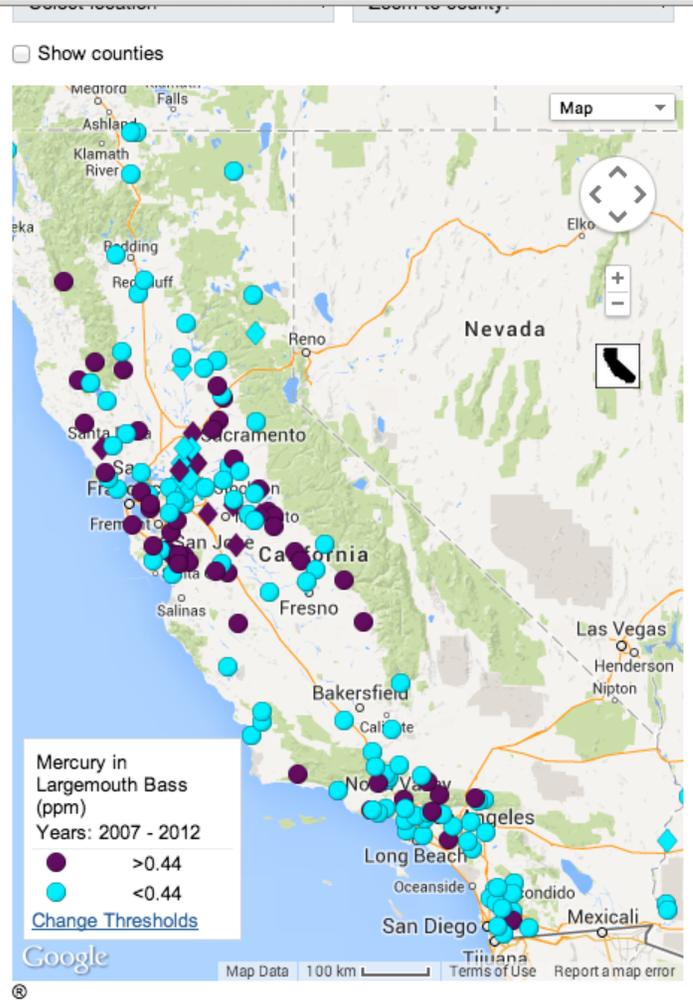
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# Influence of Atmospheric Deposition

- Lakes with expected air dep decreases (there are only 3 of these)
  - Indian Valley Reservoir (Lake County)
  - El Dorado Park Lakes (LA County, LMB 0.36 in 2007)
  - Puddingstone Reservoir (LA County, LMB 0.44 in 2007)



## Design Within Each Lake

- Need different designs for different lake sizes

