California's Surface Water Ambient Monitoring Program

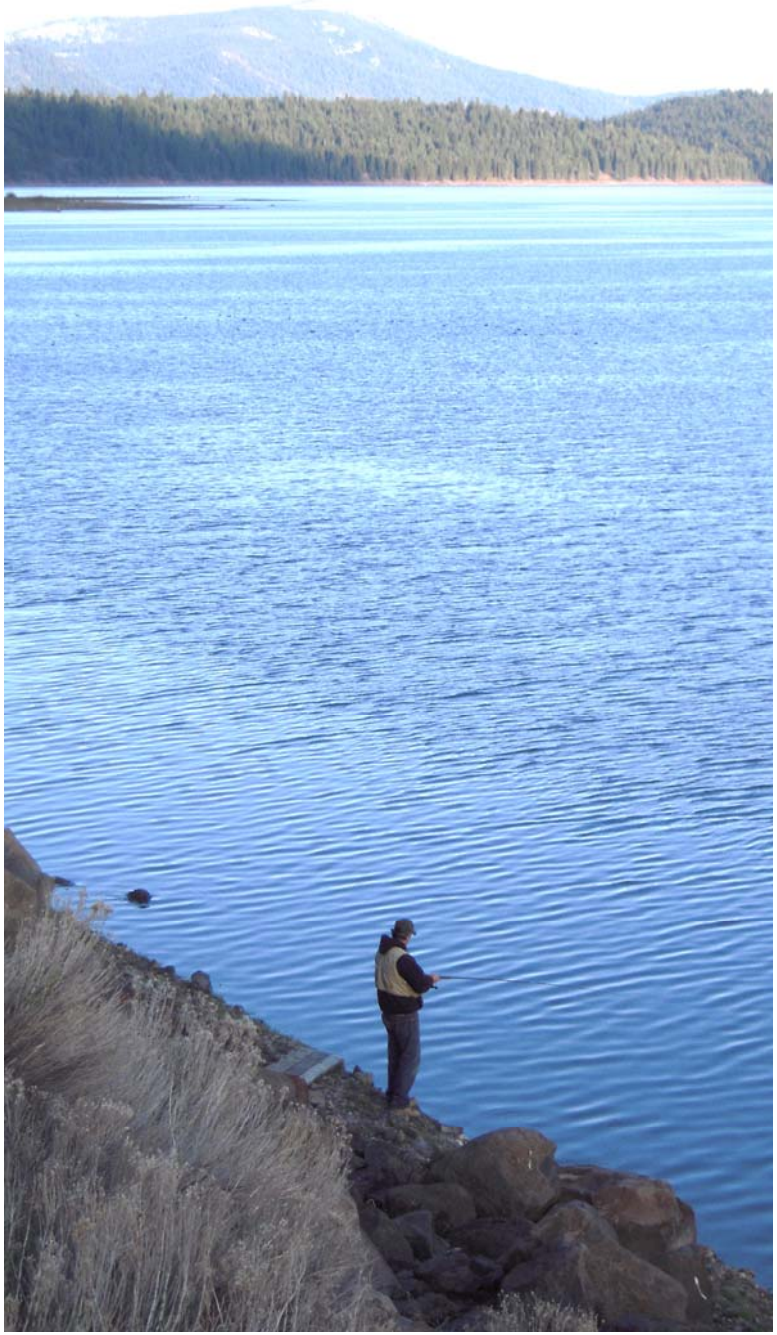
# Contaminants in Fish from California Lakes and Reservoirs

California Water Boards

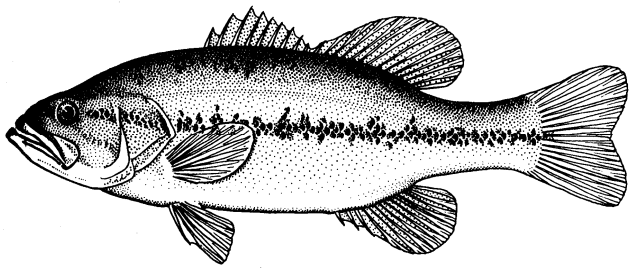
SWAMP
Surface Water Ambient Monitoring Program

# Background

- Problem
  - lack of statewide information on contaminant impacts on the fishing beneficial use
  - lack of safe eating guidelines
  - especially for lakes
- New SWAMP monitoring began in 2007
- $750,000 to $1 million per year
- Five-year cycle to cover all water body types, beginning with lakes
- Initial focus on sport fish



# Lakes Survey



- Questions
  1. Condition of California lakes?
  2. Candidates for 303(d) listing?
  3. Candidates for additional sampling?
- Focus on screening of indicator species
- 2007 – 2008

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# Summary of Results

- California now has one of the best datasets and is making substantial progress in defining the problem
- As in many other states, the problem is widespread
- Mercury poses the greatest concern
- There is significant variation among lakes and among species
- Data from this screening will be valuable in setting priorities for developing TMDLs and for OEHHA in developing safe eating guidelines

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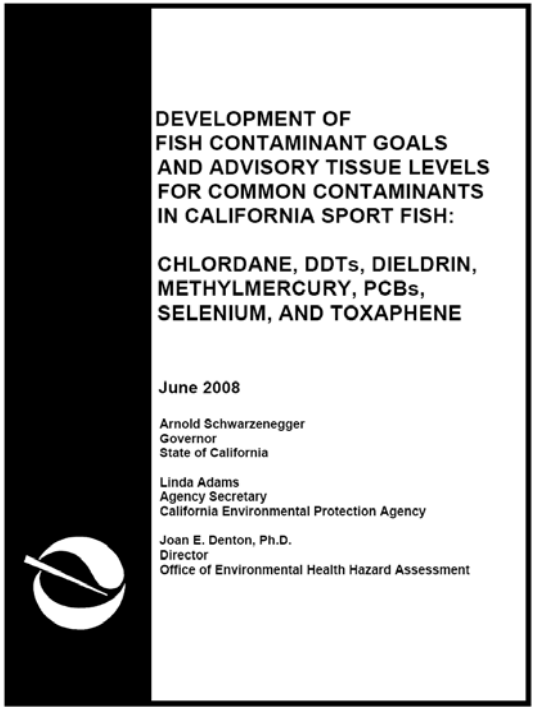
# Assessment Thresholds

- New OEHHA thresholds
- Fish Contaminant Goals (FCGs)
  - Purely risk-based
  - 1 serving/wk
  - 1 in 1,000,000 additional cancer risks
  - Useful goals for risk minimization or elimination
- Advisory Tissue Levels (ATLs)
  - Take benefits into account
  - 1 in 10,000 additional cancer risks
  - 0, 1, 2, 3 servings per week categories
  - For OEHHA use in advisories/safe eating guidelines


DEVELOPMENT OF
FISH CONTAMINANT GOALS
AND ADVISORY TISSUE LEVELS
FOR COMMON CONTAMINANTS
IN CALIFORNIA SPORT FISH:

CHLORDANE, DDTs, DIELDRIN,
METHYLMERCURY, PCBs,
SELENIUM, AND TOXAPHENE

June 2008

Arnold Schwarzenegger
Governor
State of California

Linda Adams
Agency Secretary
California Environmental Protection Agency

Joan E. Denton, Ph.D.
Director
Office of Environmental Health Hazard Assessment

**Klasing and Brodberg, 2008**

http://www.oehha.ca.gov/fish/gtlsv/index.html

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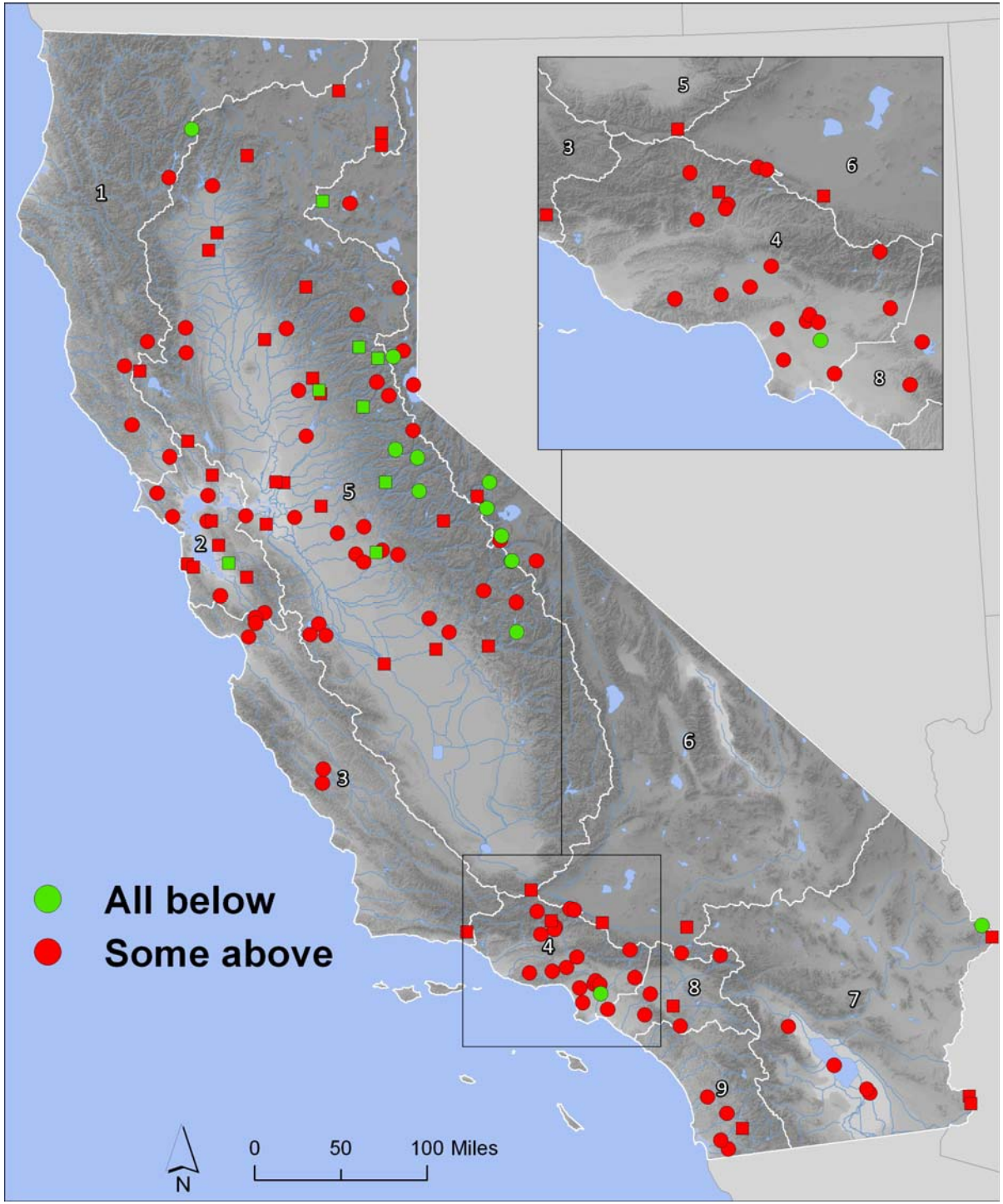
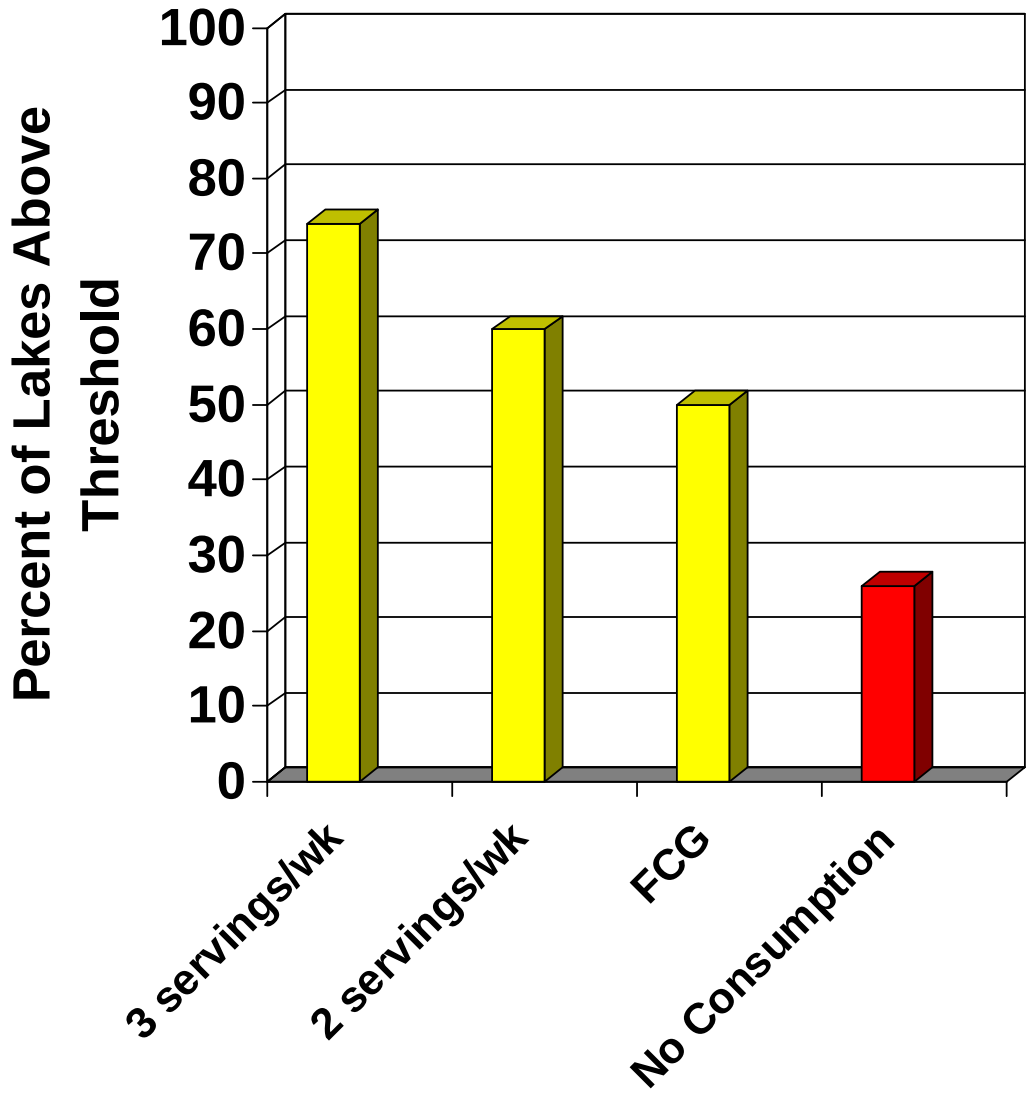
# "Clean" Lakes (Based on This Survey)

- 15% of the lakes tested "clean" – all samples below all thresholds
- These lakes are low priorities for further sampling
- 85% were "red"
- Mercury is the main problem at most of these lakes



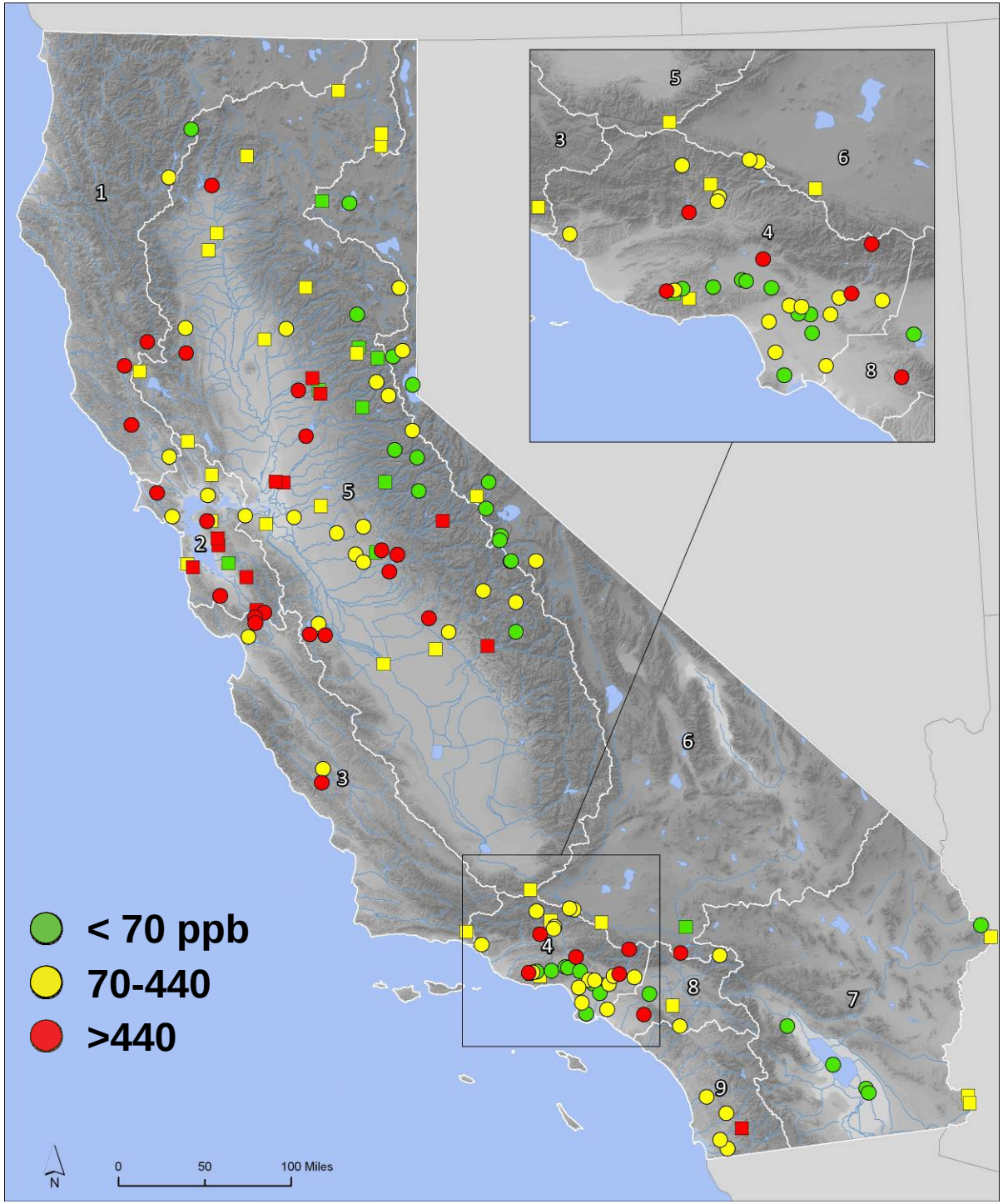
# Mercury: Severity of the Problem

- Based on highest species average at each lake
- 26% in no consumption range (> 440 ppb)
- 50% above Fish Contaminant Goal (220 ppb)
- 61% above 2 serving/wk ATL (150 ppb)
- 74% above 3 serving/wk ATL (70 ppb)



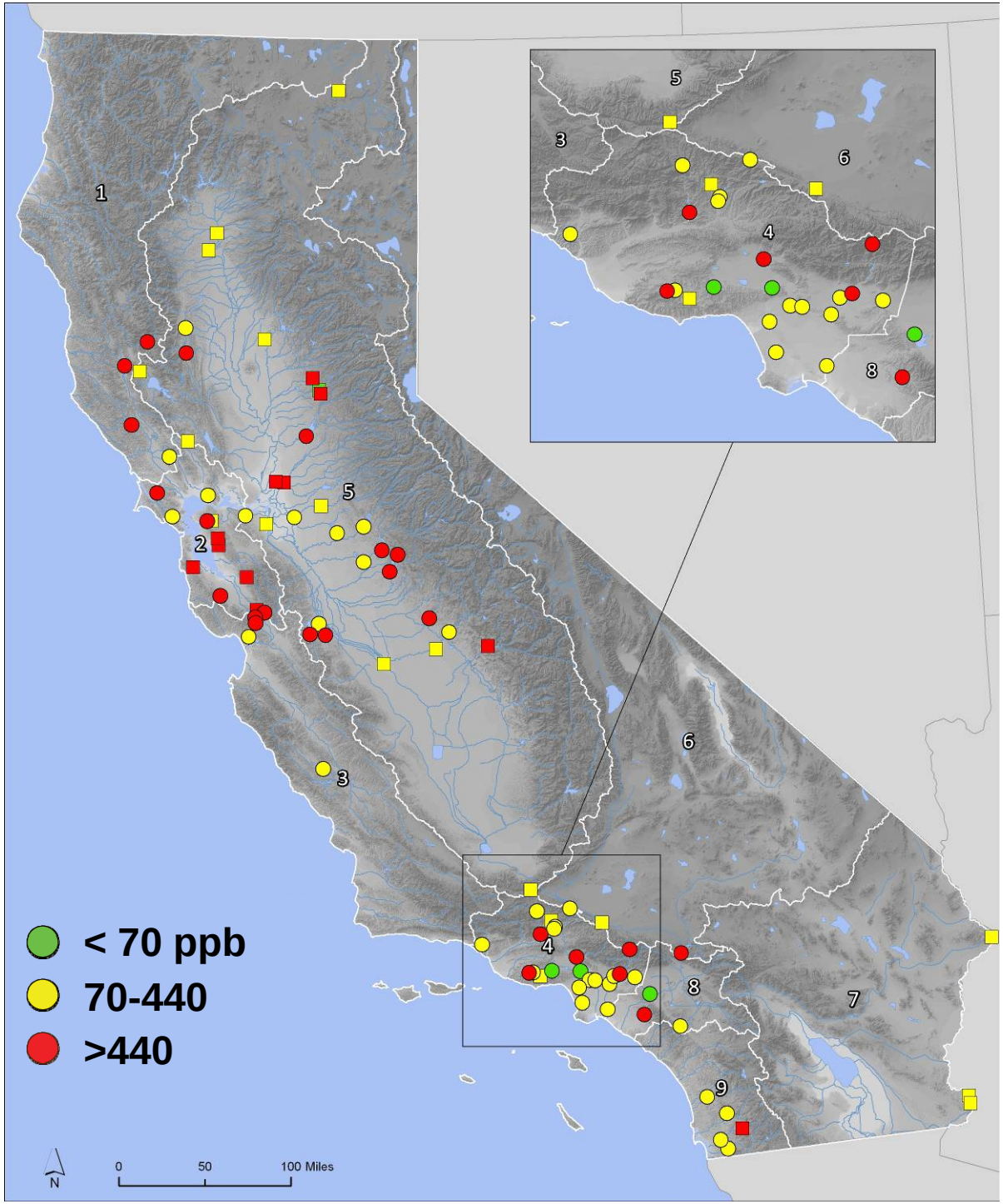
# Mercury: Spatial Distribution

- Based on highest species average at each lake
- Low concentrations in some Sierra Nevada and southern CA lakes
- Not just a northern CA problem
- Red lakes a high priority for followup
- Species distribution has a big influence

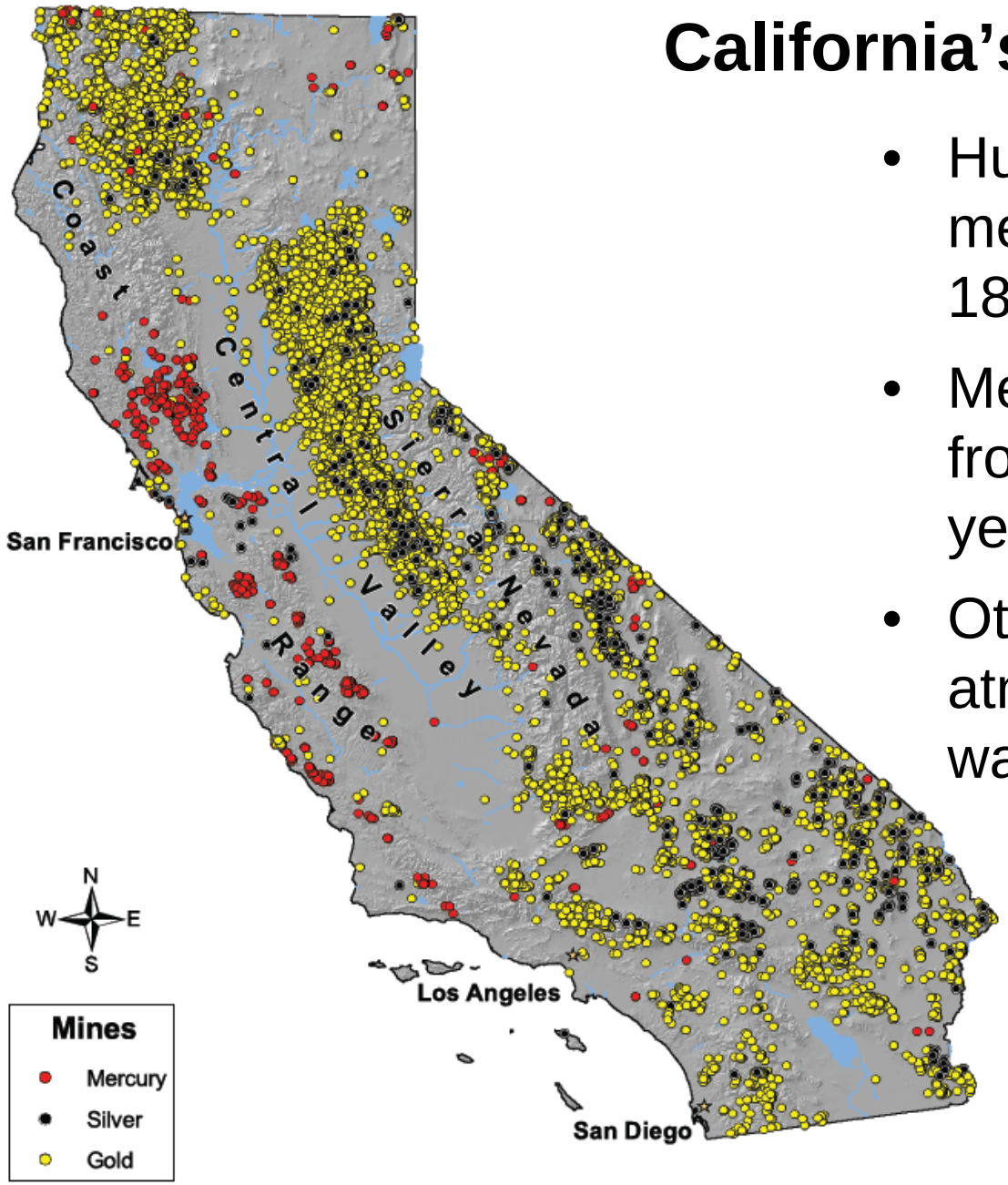


# Mercury: Spatial Distribution

- Standard size largemouth bass: apples vs. apples
- One “clean” lake in northern California
- Three clean lakes in southern California
- Sources: mining may not be the only driver



# California's Mining Legacy

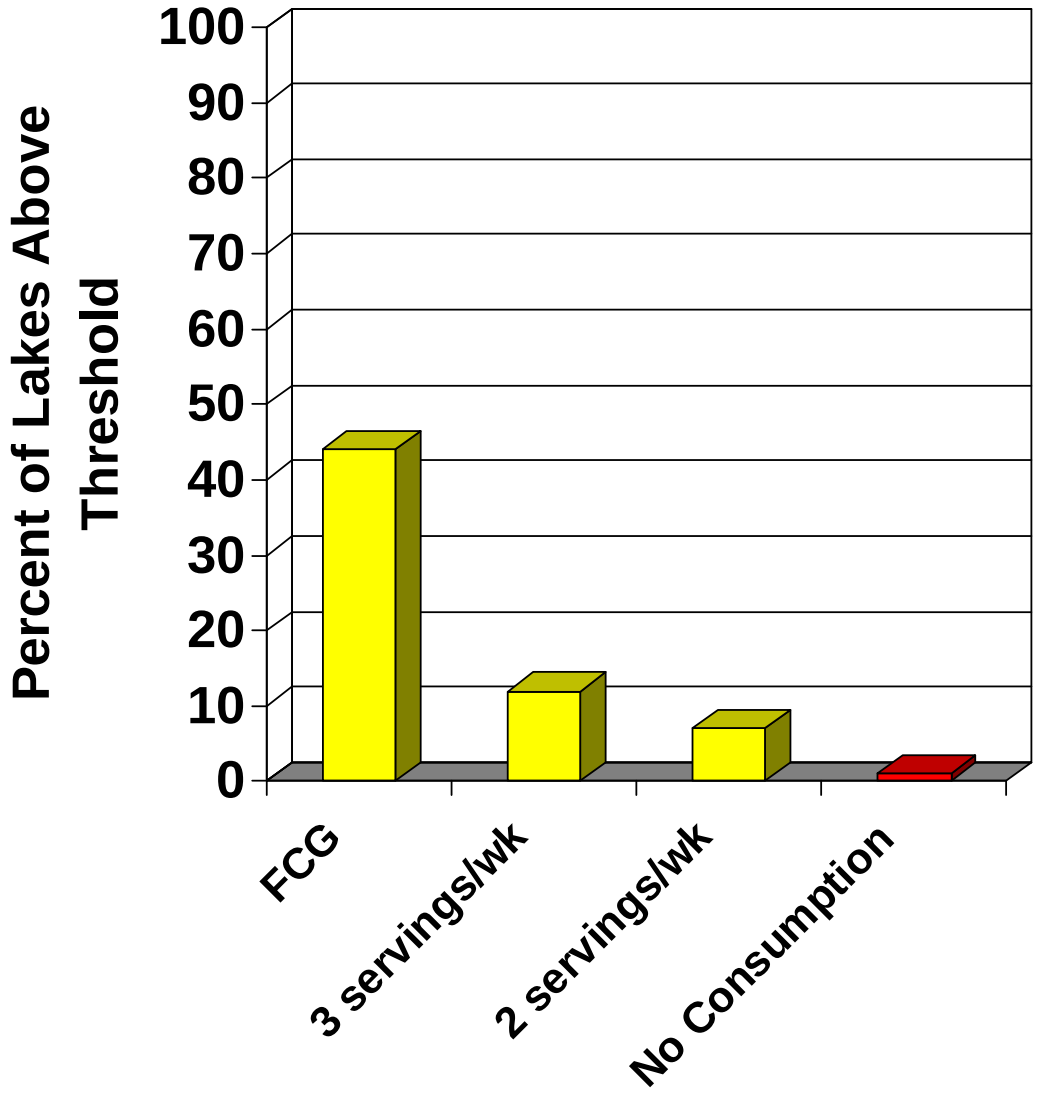



- Hundreds of gold and mercury mines from mid-1800s
- Mercury contamination from mining persists 150 years later
- Other sources: atmospheric deposition, wastewater, urban runoff

From Wiener and Suchanek (2009). Ecological Applications 18(8) Supplement: A3-A11.

# PCBs: Severity of the Problem

- Based on highest species at each lake
- 1% of lakes in no consumption range (>120 ppb)
- 8% above 2 serving/wk ATL (42 ppb)
- 13% above 3 serving/wk ATL (21 ppb)
- 37% above Fish Contaminant Goal (3.6 ppb)



# Other Contaminants: Severity of the Problem

- Dieldrin: 21% above Fish Contaminant Goal (0.46 ppb)
- DDT: <1% above 3 serving/wk ATL, 17% above FCG (21 ppb)
- Chlordane: 10% above FCG (5.6 ppb)
- Selenium: 2% above 3 serving/wk ATL (2500 ppb)