

American River Watershed Mercury Total Maximum Daily Load

Stakeholder Meeting
Auburn – January 11, 2011



Outline

- TMDL background
- Existing and new data
- Source analysis
- Fish tissue targets



Environmental Protection Agencies

- CA EPA
 - Air, water, toxic substances, pesticides, human health
- State Water Resources Control Board
 - 9 Regional Water Quality Control Boards
 - Protect surface and ground water quality
 - Implement state and federal water quality laws

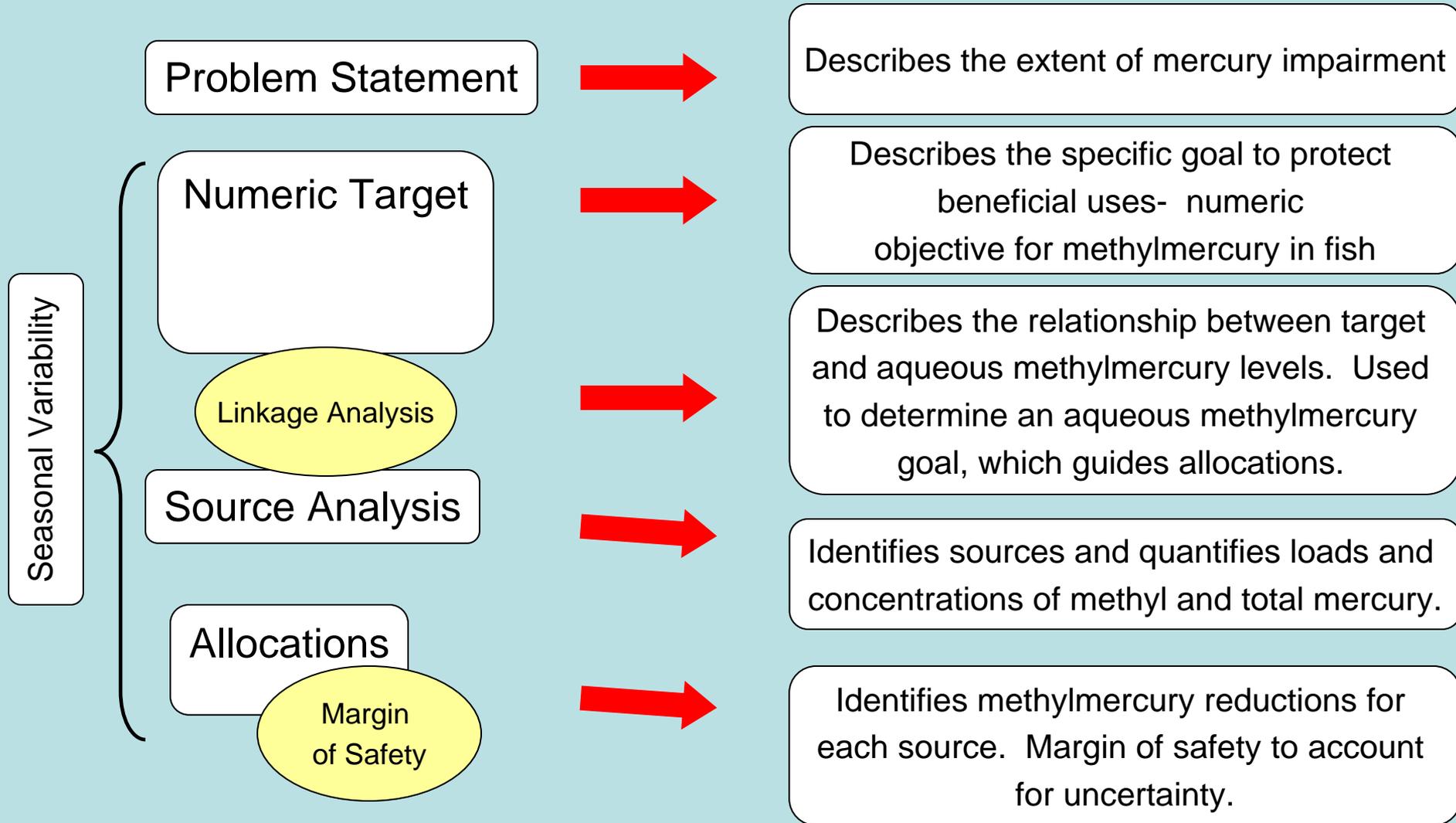
Federal Law

- Federal Clean Water Act
 - CWA Section 303(d):
 - Identify waters that do not meet standards.
 - Establish Total Maximum Daily Loads designed to attain standards.
 - TMDL is the amount of pollutant a water body can receive and still attain water quality standards.

State Law

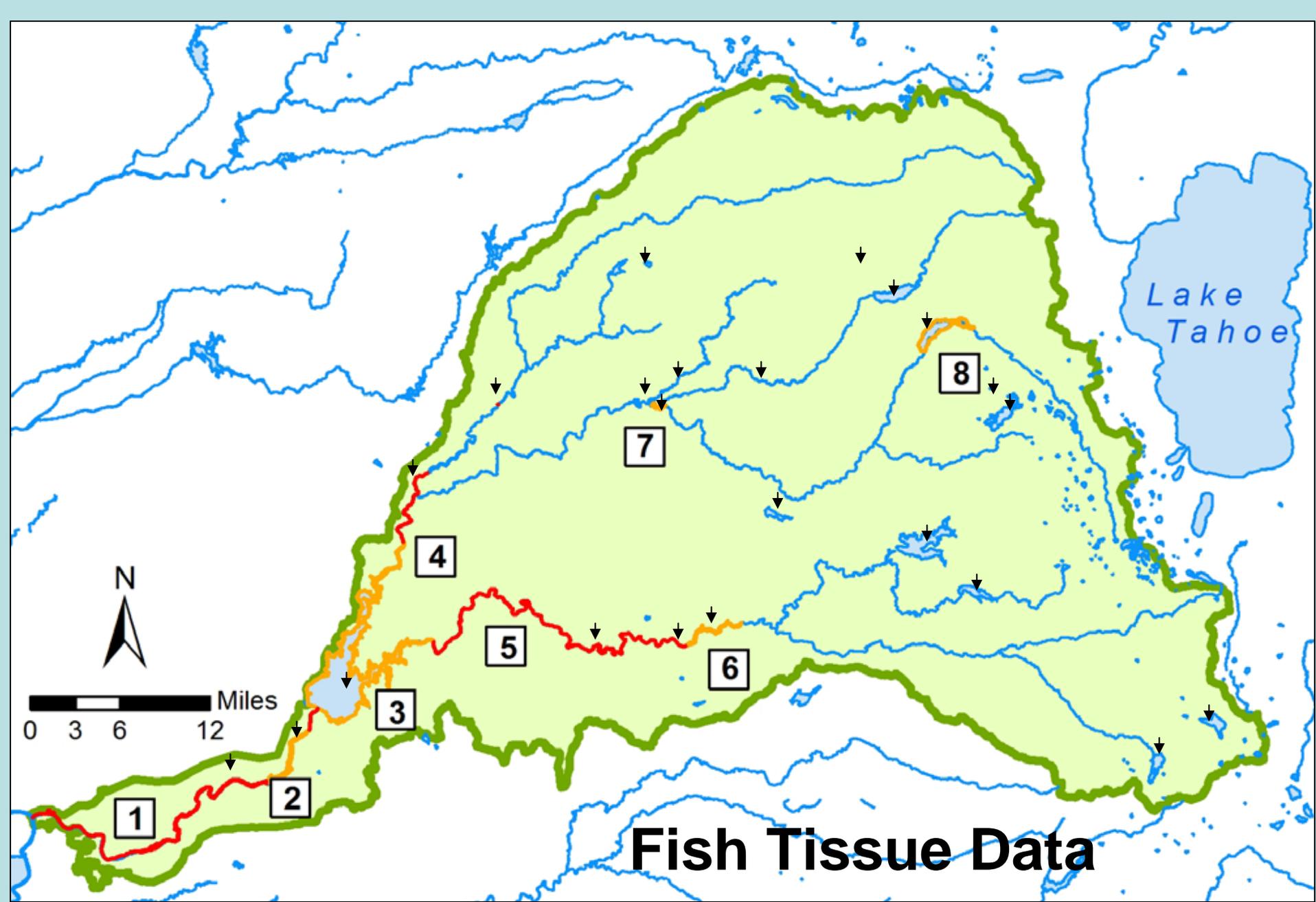
- Porter-Cologne Water Quality Control Act
 - Regional Boards establish Water Quality Control Plans- Basin Plans
 - Beneficial Uses (e.g., municipal, power, cold)
 - Water Quality Objectives- criteria to protect the beneficial uses
 - Implementation Plan- plans and regulations to achieve the Water Quality Objectives

TMDL Elements- Scientific basis

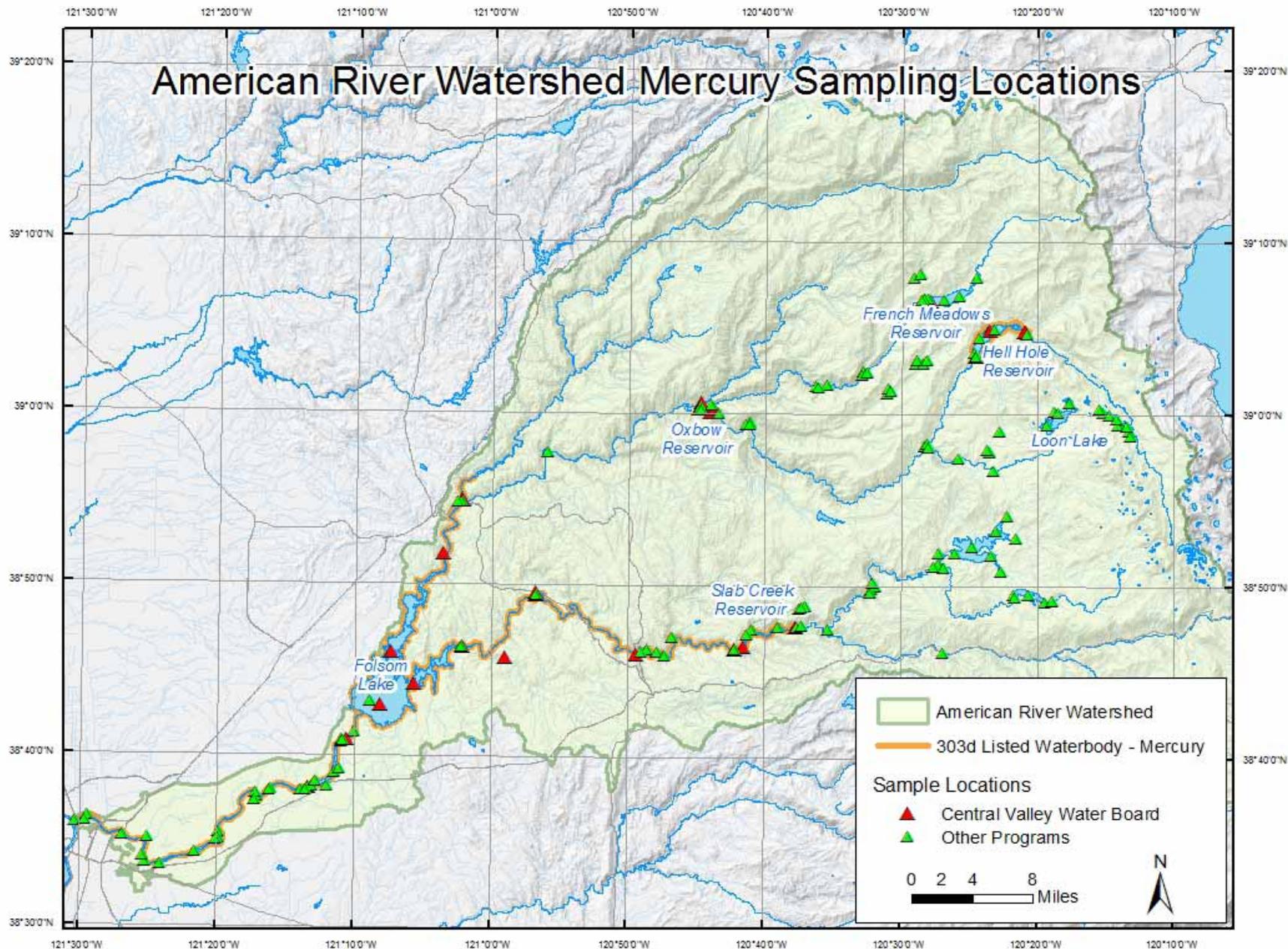


Basin Plan Amendment

- New regulations
- Establish the American River Watershed Mercury Control Program (aka TMDL)
 - Numeric objectives for methylmercury in fish tissue
 - An implementation plan for controlling methyl- and total mercury sources



American River Watershed Mercury Sampling Locations

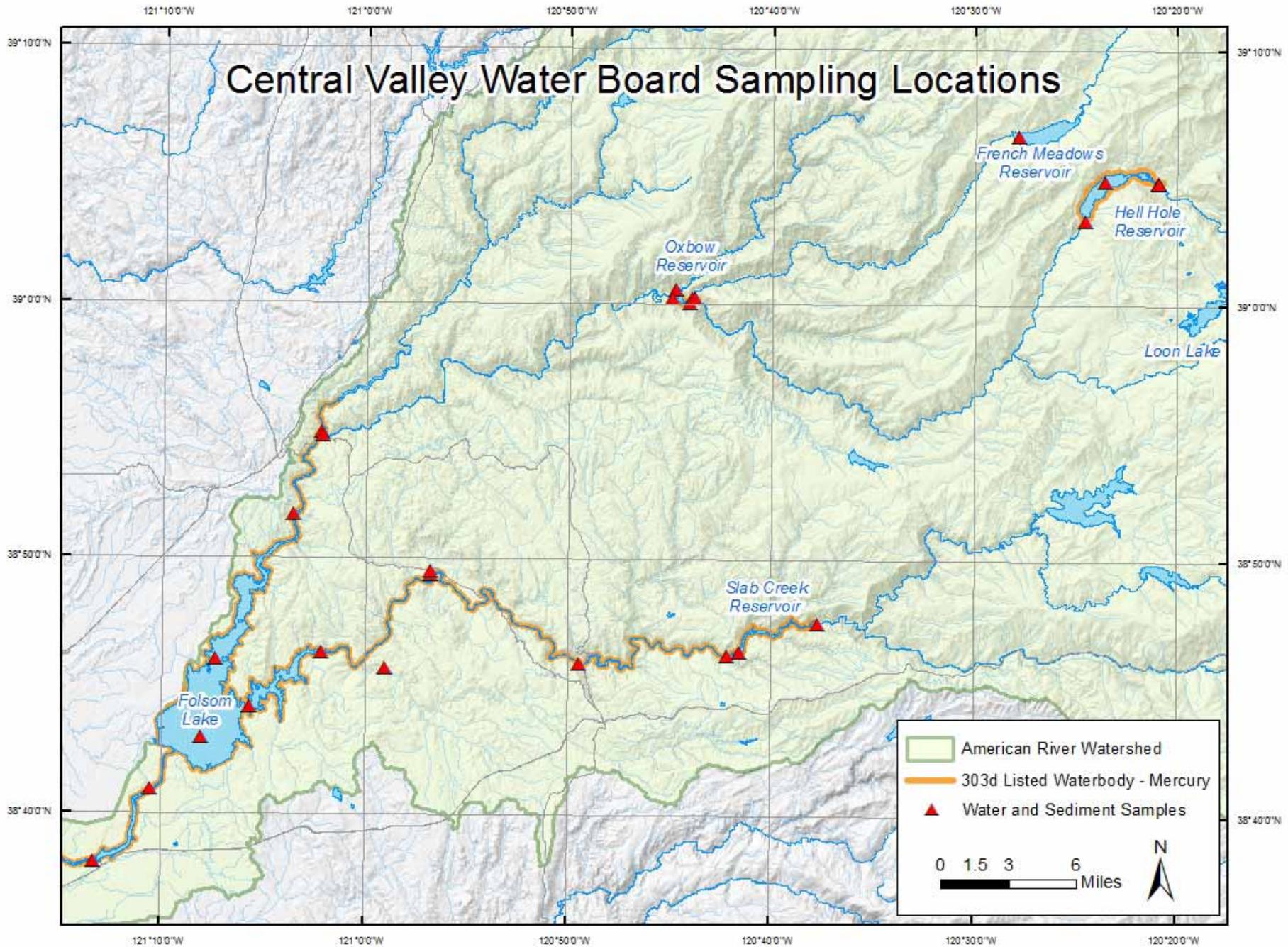


RB5 Water Data



- Methylmercury, total mercury, & suspended sediment
- Unfiltered thus far; will collect some filtered (to measure dissolved fraction)
- Winter has been collected
- Plan to collect spring and summer
- 2 storm events at Folsom inputs have also been sampled.

Central Valley Water Board Sampling Locations



RB5 Sediment Data

- Collecting river bank and lake bed sediments
- Total mercury
- More samples are needed!



How can stakeholders help w/ monitoring and identifying sources?

- Mining history- where was Hg most likely used?
- Anecdotal: map where you have observed elemental Hg
- Identify mine sites eroding into creeks
- Survey watershed for visible Hg
 - Hg panning
- Sediment/soil samples
- Water samples - hi flow



How the data will be used in the TMDL

- Extent and magnitude of impairment
- Identify Hg and MeHg sources
- Estimate loads and relative contributions
- Develop allocations
- Implementation goals and cleanup targets
- Identify priority sources and hot spots

Source analysis approach

- GIS for land types
- Loading rates by source type or land use
- Local data, published data, and/or extrapolation
- Load = area x loading rate per area

Source analysis

- By source type rather than individual sources
 - mines, streambeds, lakebeds, runoff from forests, urban areas, open space
 - Land usage

Estimate mercury loads

- Erosion
 - mines, dredge piles (*local?, regional*)
 - In channel sediments, gravel bars (*local*)
 - Native soil (*local & regional*)
- Atmospheric deposition
 - Direct to water surface (*regional*)
 - Indirect - stormwater runoff (*local for deposition rate; literature for runoff rates*)
- Tributary inputs (*local RB & others' sampling*)
- Reservoir exports (*local RB sampling*)

Estimate mercury loads

- Mine portal discharges (*local, regional*)
 - In channel sediments, gravel bars (*local*)
 - Native soil (*local & regional*)
- Urban sources
 - WWTPs (*local if facilities collected data or regional*)
 - Stormwater (*same as WWTPs*)

Estimate MeHg loads

- Tributary inputs (*RB sampling*)
- Reservoir exports (*RB sampling*)
- MeHg flux from open water sediment (*literature & local sediment mercury concentrations*)
- Wetland inputs (*regional & literature*)
- Runoff from forest, ag, & other land uses (*literature*)
- Urban sources (*local & regional*)
- Atmospheric deposition (*regional*)

THg Loss Processes

- Sediment deposition and burial (*local & regional*)
- Water diversions (*local*)
- Reservoir and channel dredging (*local-where is this happening?*)
- Evasion from water surface (*literature*)

MeHg Loss Processes

- Particle settling (*local & literature*)
- Photodegradation (*regional & literature*)
- Water diversions (*local*)

Preliminary ideas for fish tissue objectives (FTO)

- Determine values protective of wildlife
- Evaluate corresponding safe level for humans consuming local fish (#meals/week)
- Evaluate range of consumption rates
- Single objective for high elevation lakes
 - Applies to large fish, available species
- TL3 & TL4 FTO for Folsom & downstream
 - Specific species and size range

Mercury in Fish > 6 in.

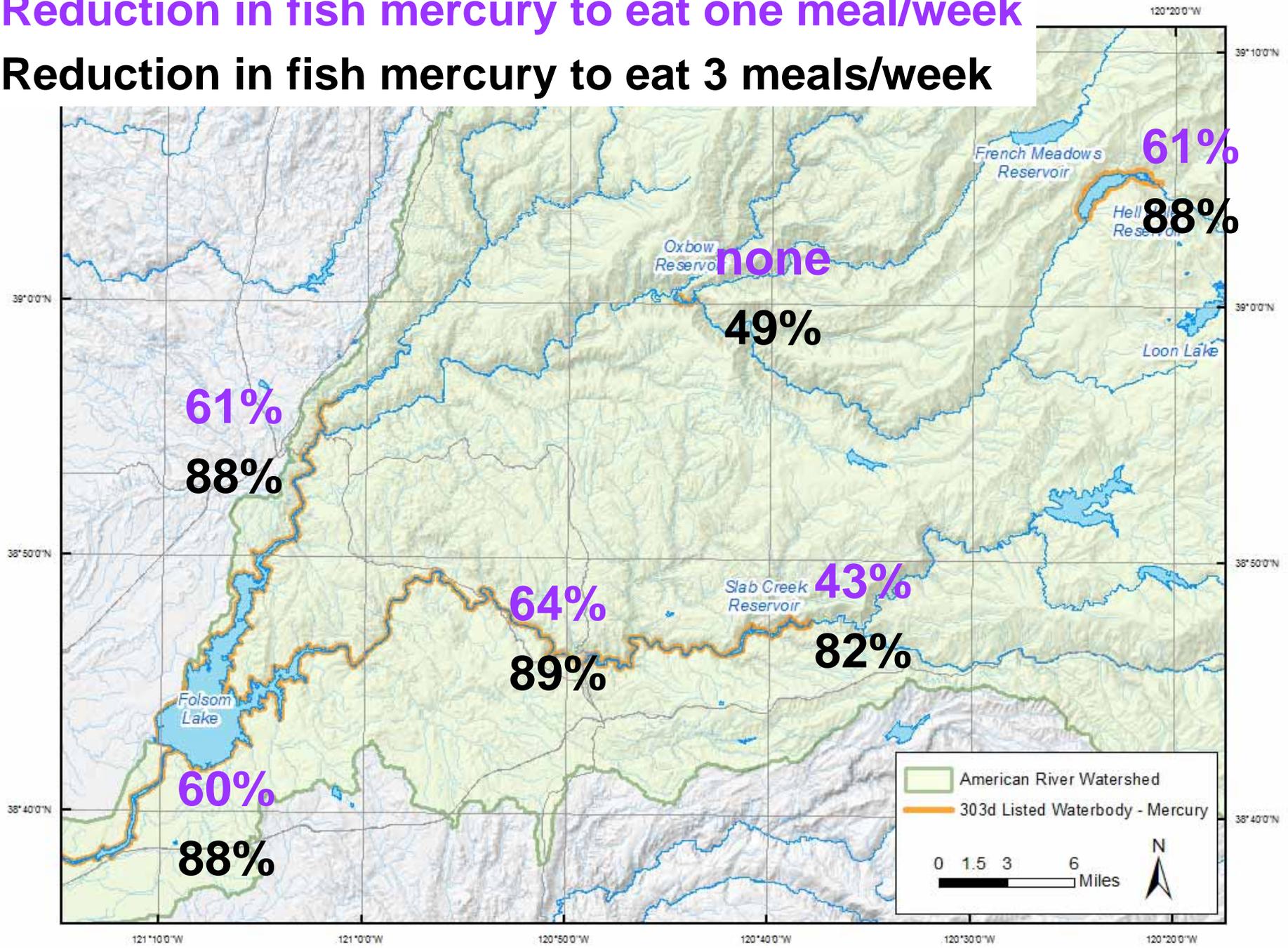
Avg TL3 & 4 fish Hg, mg/kg *

<i>Safe level, one meal/wk</i>	<i>0.16</i>
<i>safe level, 3 meal/wk</i>	<i>0.08</i>
French Meadows Res.	0.12
Hell Hole Res.	0.41
Loon Lake	0.31
Oxbow Res.	0.10
North Fork American	0.41
Middle Fork American	0.08
Slab Creek Res.	0.28
South Fork American	0.44
Folsom	0.53



Reduction in fish mercury to eat one meal/week

Reduction in fish mercury to eat 3 meals/week



Ideas for next meeting

- What do you want to hear?
- Introduce straw proposal?
- Loading estimates
- Show linkage between fish targets and mercury and MeHg reductions (sediment, water)



Contact Information

- American River Watershed TMDL/BPA Webpage:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/american_river_hg/index.shtml
- Questions or Comments:
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