Localized Mercury Bioaccumulation Study

WEF Water Quality Monitoring Conference

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May 2008

Project Team

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- Applied Marine Science
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Outline

1. Monitoring Overview
2. Results
3. Conclusions

Report available at www.bemercuryfree.net

1. Monitoring Overview

Study Purpose

- Understand the nature and extent of **mercury** in the District's effluent discharges and effects on **localized bioaccumulation** in the Sacramento River
- Understand angler activity & fish consumption, communicate with local community
- Use that understanding to guide District and regulatory policy (TMDL, trading)

Study Design

Null Hypothesis:

Methylmercury in bioindicator organisms (**clams & fish**) does not vary according to space (**upstream vs. downstream**) or time (**month to month**).

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Image NASA
Map data © 2007 DMapas/El Mercurio
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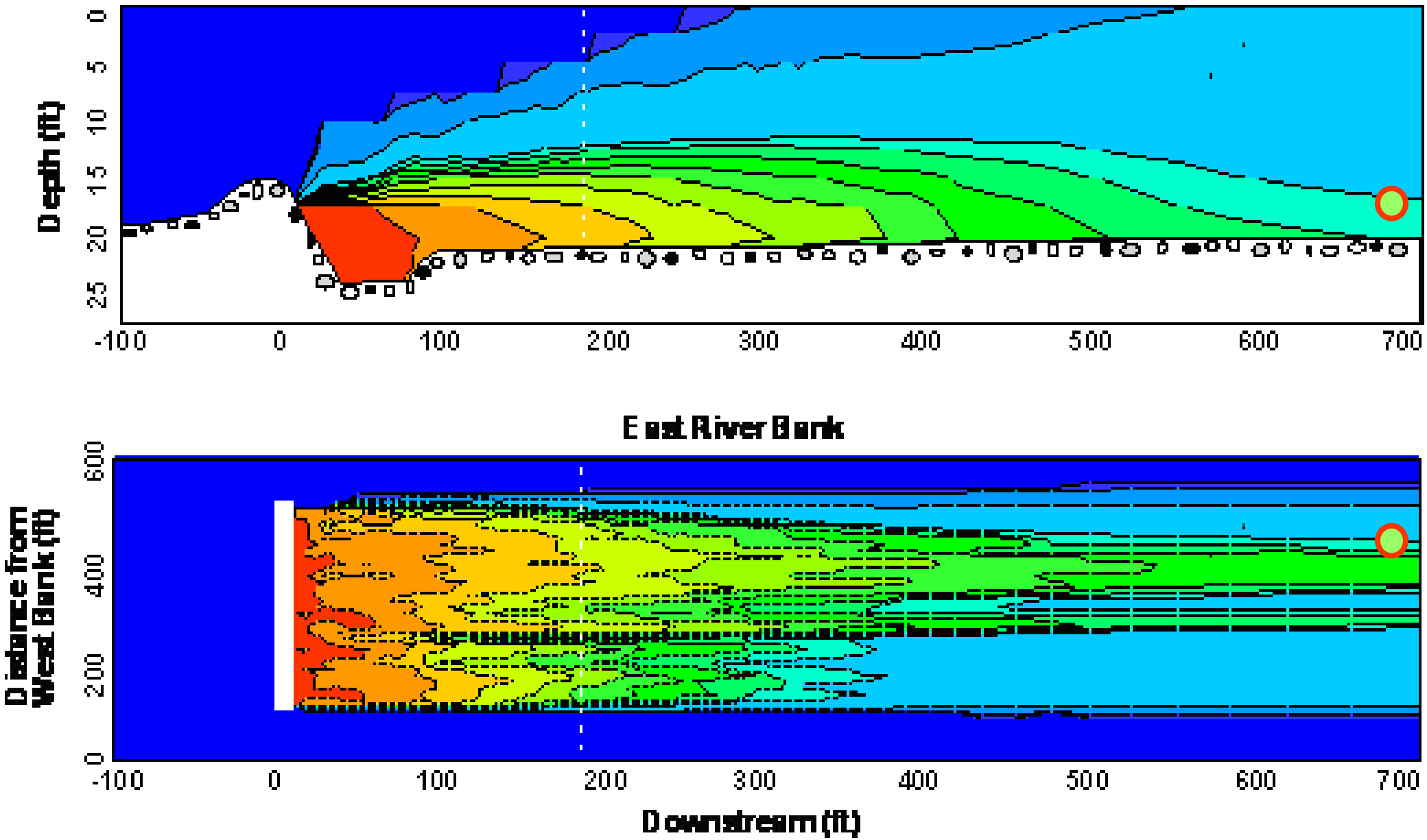
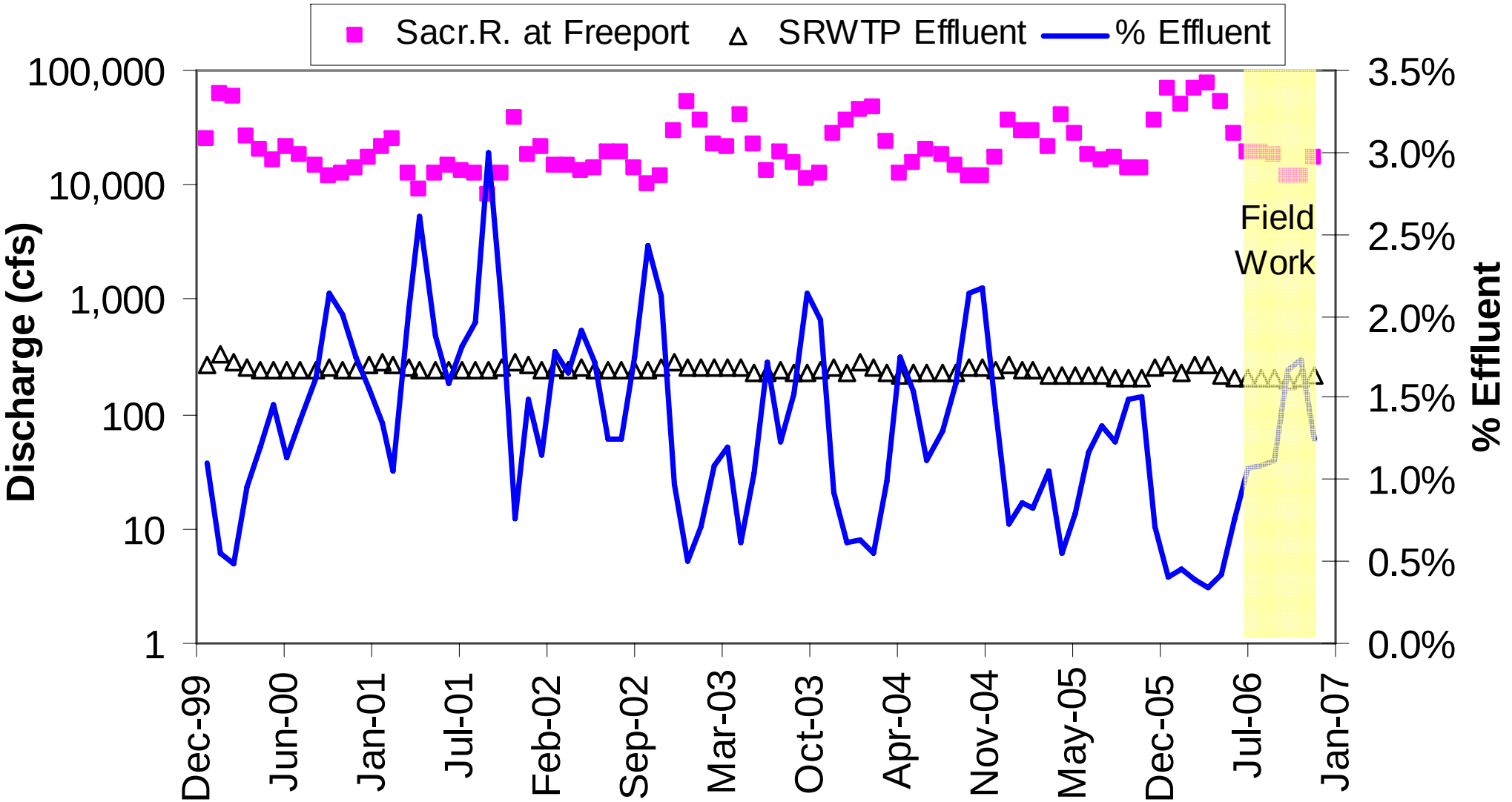
Approximate location of SRWTP outfall diffuser

SACRAMENTO RIVER DOWNSTREAM OF FREEPORT BRIDGE
AVERAGE DILUTION IN IMPACTED AREA - 14:1 FLOW RATIO (ROUGH BOTTOM)



DIFFUSER FLOWRATE = 181 MGD
RIVER FLOWRATE = 3920 CFS

Relative Discharge

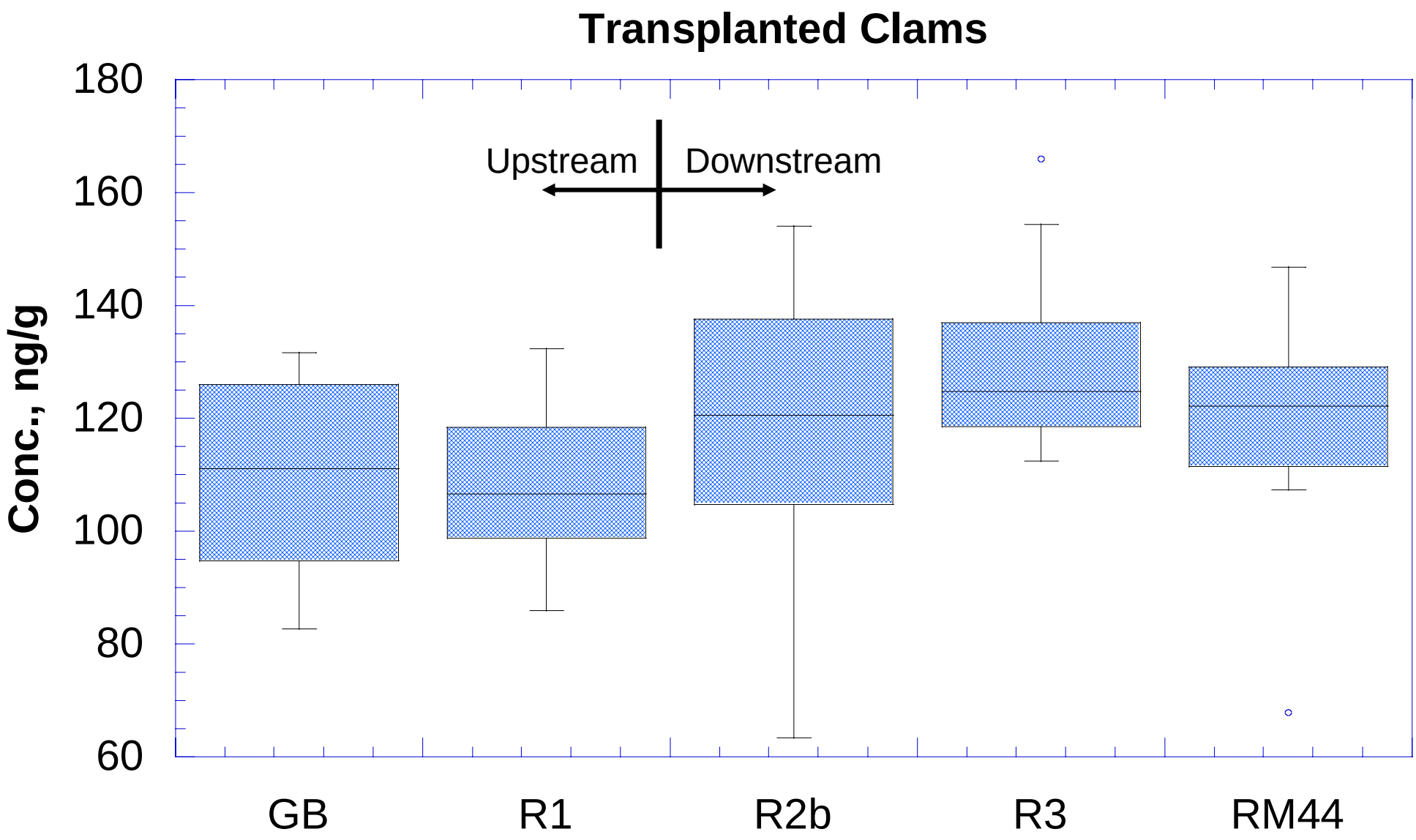


Major Design Points

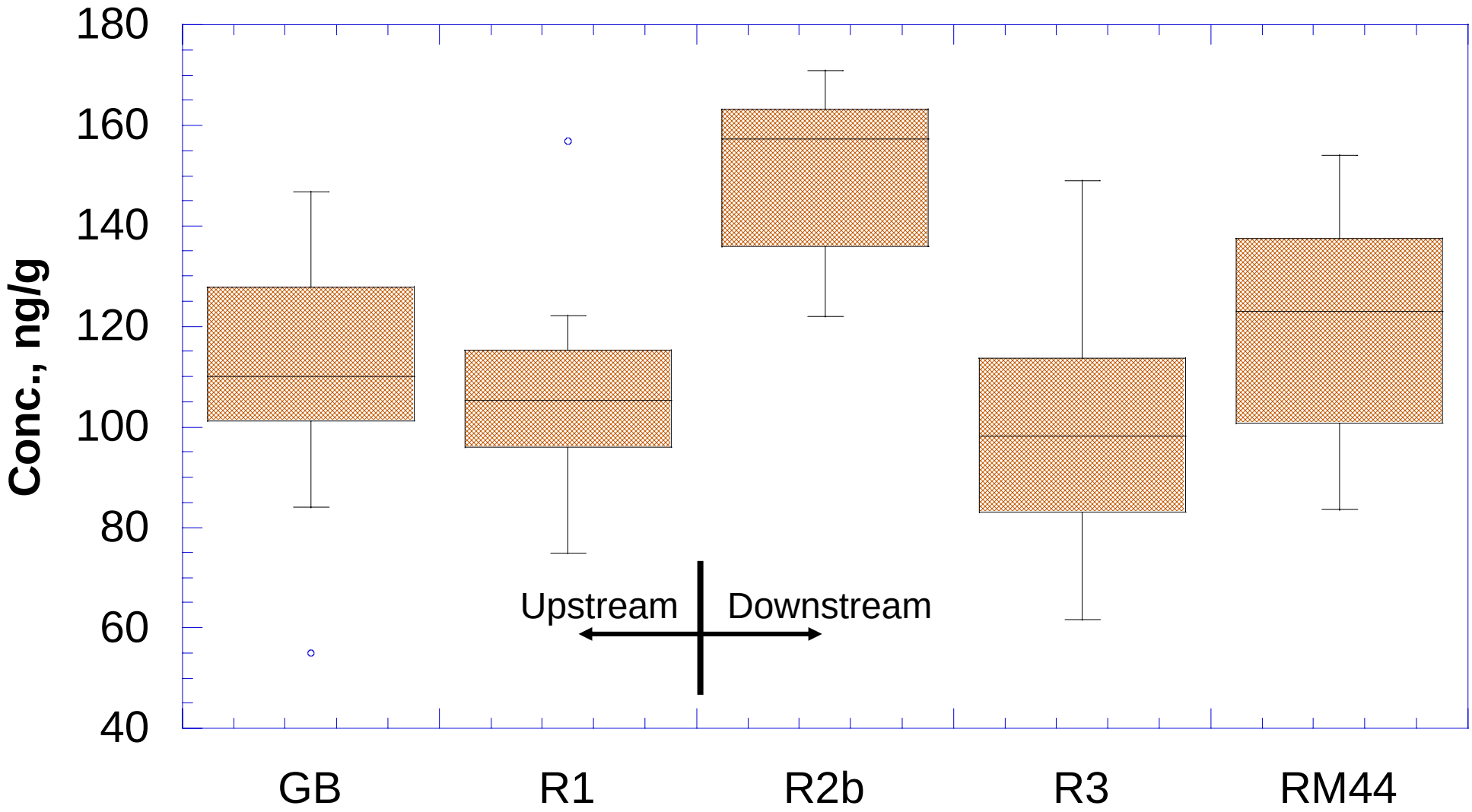
1. Monthly sampling during dry season (July – November, 2006)
2. Focus on resident & transplanted clams, and “biosentinel” fish
3. Multiple compartments
   - Riverbed
   - Water column
   - Fish
   - Microseston

2. Results

Clam Cages


Transplanted Clams
Conc., ng/g
180
160
140
120
100
80
60
Upstream
Downstream
GB
R1
R2b
R3
RM44

Resident Clams



Biosentinel Sampling Techniques

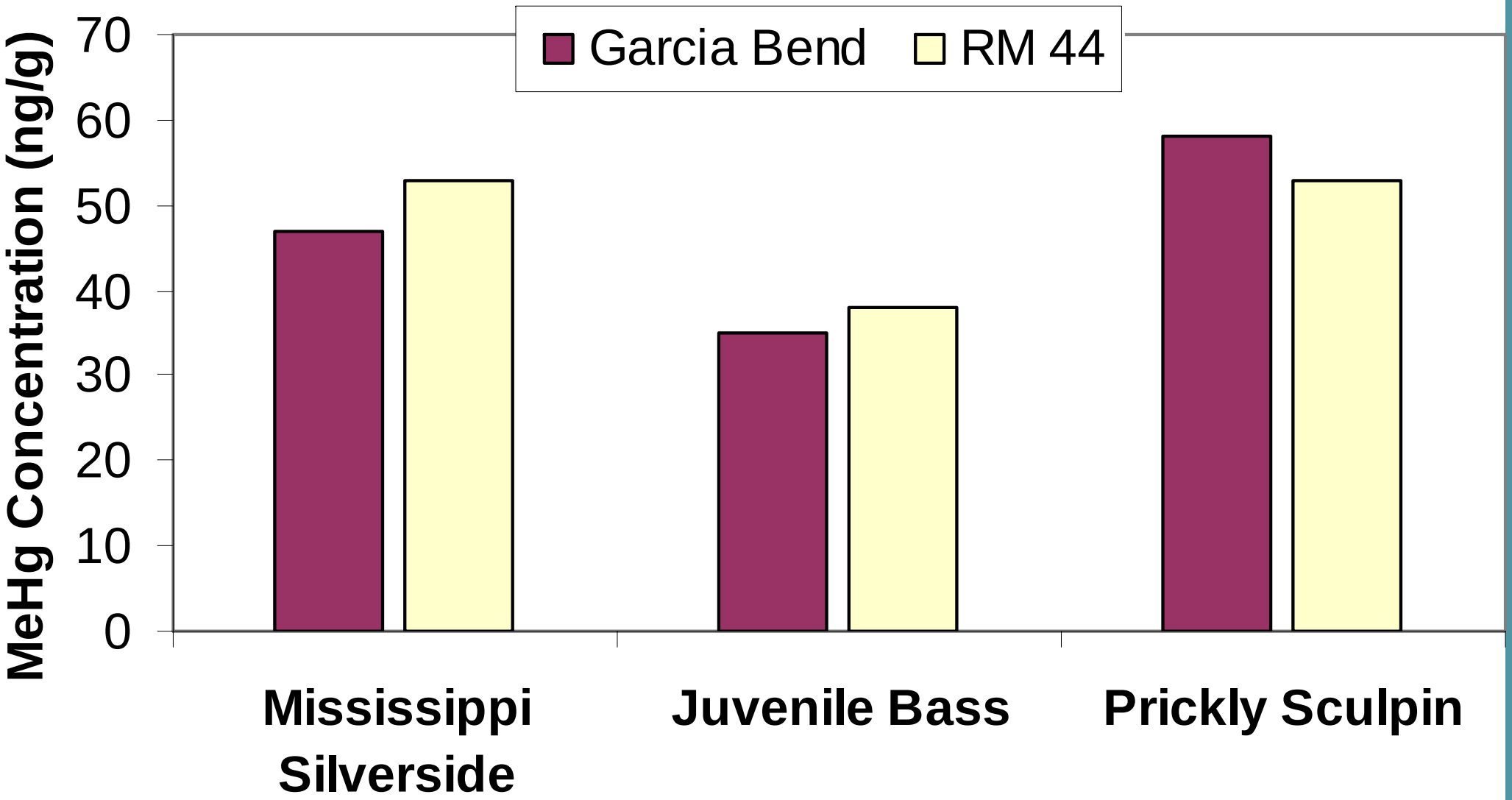
Boat Electroshocking

MS Silverside

Field cleaning, sorting, packing

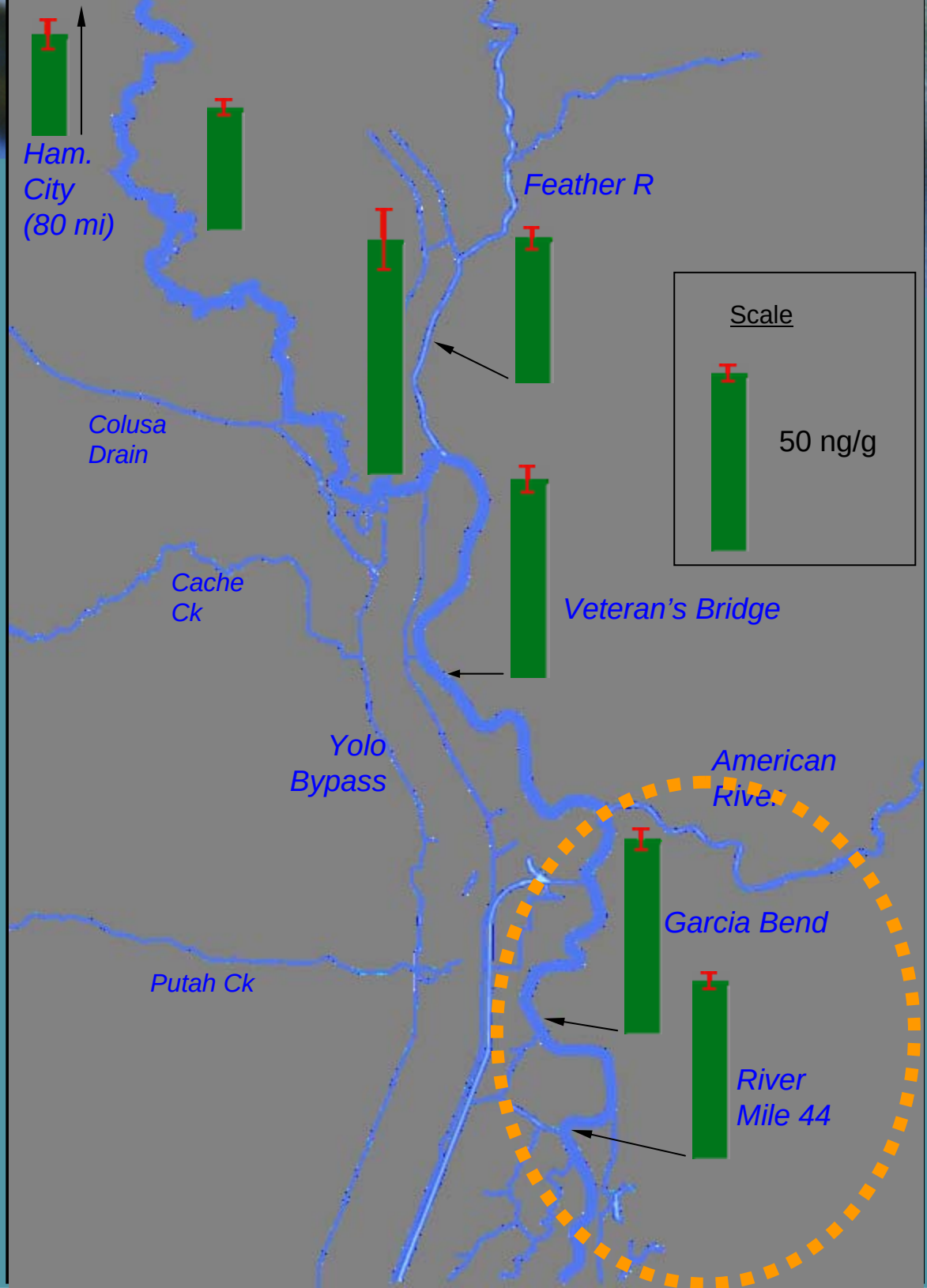
Field freezing on dry ice

Biosentinel Fish, Fall 2006

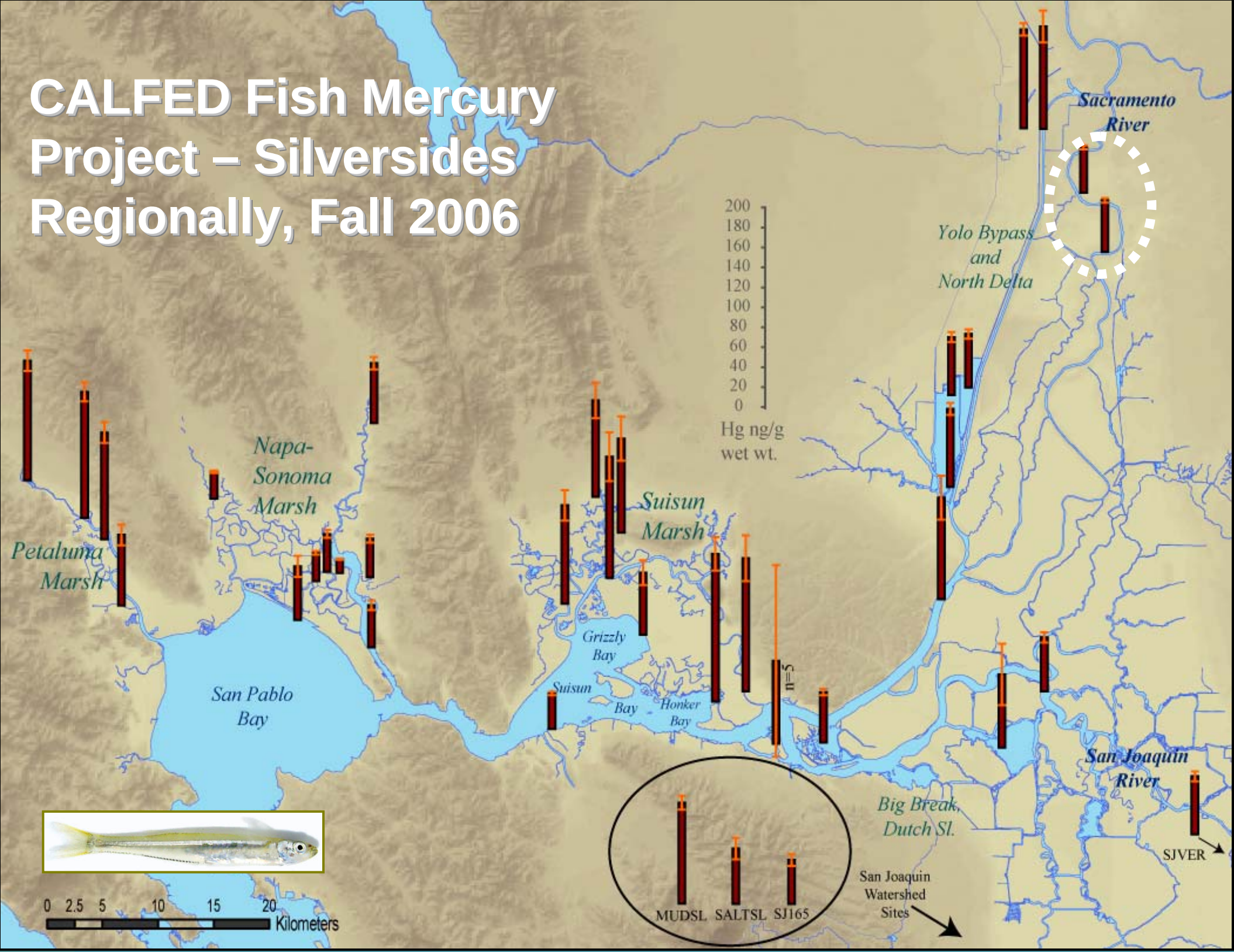


CALFED Fish Mercury Project – Sac. R. Watershed

Prickly Sculpin, Fall 2006



CALFED Fish Mercury Project – Silversides Regionally, Fall 2006



3. Conclusions

Conclusions

- SRCSD discharge is not causing a localized hot spot during critical low flow period
- Levels of mercury in sentinel fish downstream from SRCSD discharge are not elevated compared to other watershed or Delta locations
- Reductions in MeHg levels in SRCSD would not be expected to produce a significant benefit in Delta fish