

Remedial Options Program Update

South River Science Team

10-12-11



Mercury Management

- Remedial Action Objectives (2008)
 - Reduce fish tissue Hg levels to concentrations that would allow consumption
 - Ensure protection of aquatic and terrestrial ecology with respect to Hg exposure

Mercury Management – Proposed Short-term and Long-term Actions

- Aquatic Environment Approach – Short term
 - Control significant ongoing sources from banks
 - Refine Hg Loading model estimates and validate with field program (RRM 0 to 10)
 - Prioritize Actions for bank stabilization
 - Conceptually design stabilization options on reach by reach basis (range of technologies)
 - Establish Stakeholder Group and refine designs
 - Test proposed actions using Relative Risk Model for potential unintended consequences
 - Implement on selected reach and monitor



Mercury Management – Proposed Short-term and Long-term Actions

- Aquatic Environment Approach – Long term
 - Continue to explore innovative approaches to control / reduce methyl mercury in the system
 - Employ adaptive management to test
 - Test the transport zone bed turnover model (90% of the bed in 20 years; 50% of the bed in 5 years)
 - Integrate possible actions with Overall Watershed Vision*
 - Test proposed actions using Relative Risk Model for potential unintended consequences

*Desired future conditions and clearly defined and achievable goals for the watershed are TBD



Mercury Management – Proposed Short-term and Long-term Actions

- Floodplain
 - Test sorbent amendment in floodplain pond (underway 2011)
 - Design and implement floodplain amendment study
 - Track terrestrial / avian food web studies and identify potential options for reducing Hg in biota.
 - Integrate with overall Watershed Vision
 - Test proposed actions using Relative Risk Model for potential unintended consequences
 - Implement feasible management options

Ongoing SR Activities Overview

- Bank Stabilization Pilot
- Bank Loading Verification Program
- FP Pond Amendment Pilot
- Proposed FP Soil Amendment Study Plan
- Role of SAV in MeHg Production in the River

- University Studies
 - Ongoing *Smithsonian / U MD BC* work
 - Ongoing *UT Austin* DGT Probe De
 - Ongoing *U Waterloo* work



Phase 2 – Carbon Amendments (*SediMite*)

Primary Objective:

- Test carbon based amendment effectiveness in reducing biological uptake of Hg within the South River



Phase II Study:

- a) Test PAC (previous study) and Cowboy charcoal
- b) Study length 14 weeks vs 2 weeks (previous study)
- c) Effectiveness for sediments from Wertman pond and RRM 4.0 (previous study)
- d) Begin to investigate mechanistics using stable Hg isotope

Status:

- a) Mesocosms are at week 13 of a 14 week study
- b) Lumbriculus have be added at week 12 of study
- b) Data is expected latter portion of November

Cindy Gilmour – Smithsonian Environmental Research Center
Upal Ghosh – UMd at Baltimore County
Charlie Menzie – Exponent
Cindy Henry - Exponent

09/20/2011



Diffusive Gradient Probe University of TX Austin

Overall Objective:

Develop a tool to passively measure total Hg and MeHg gradient with depth in sediment porewater

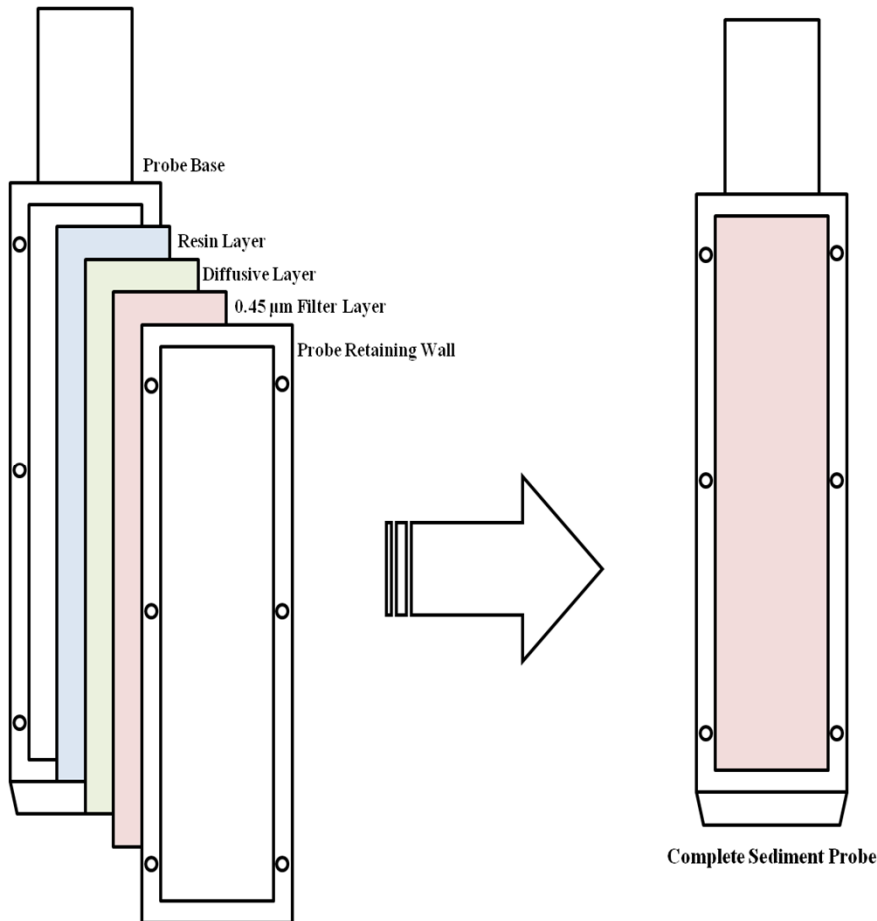
2011 DGT deployment at Pond Amendment Pilot

Status:

Baseline and week 4 samples have been collected
DGT gels have been digested.
Technical issues with the analytical instrument
Next deployment in week 12

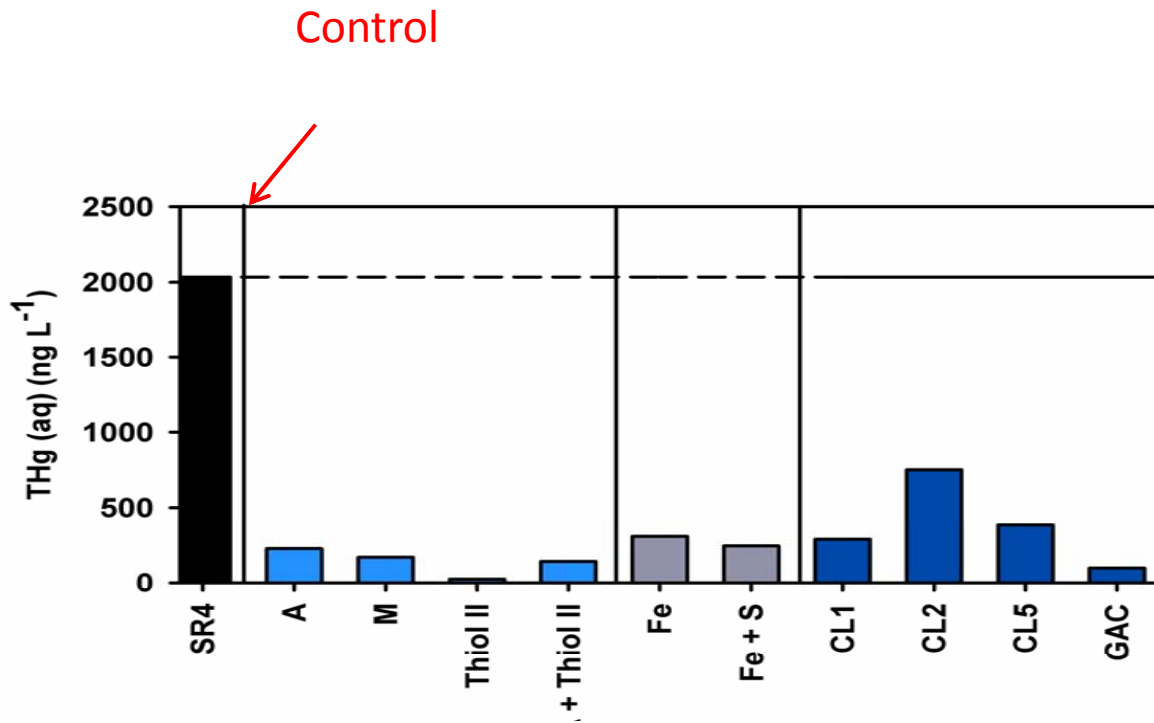
Tasks: Compare DGT PW data to:

Henry probe method
Benthic Hg burden data



Danny Reible - UT
Paul Bireta - UT
Rich Landis

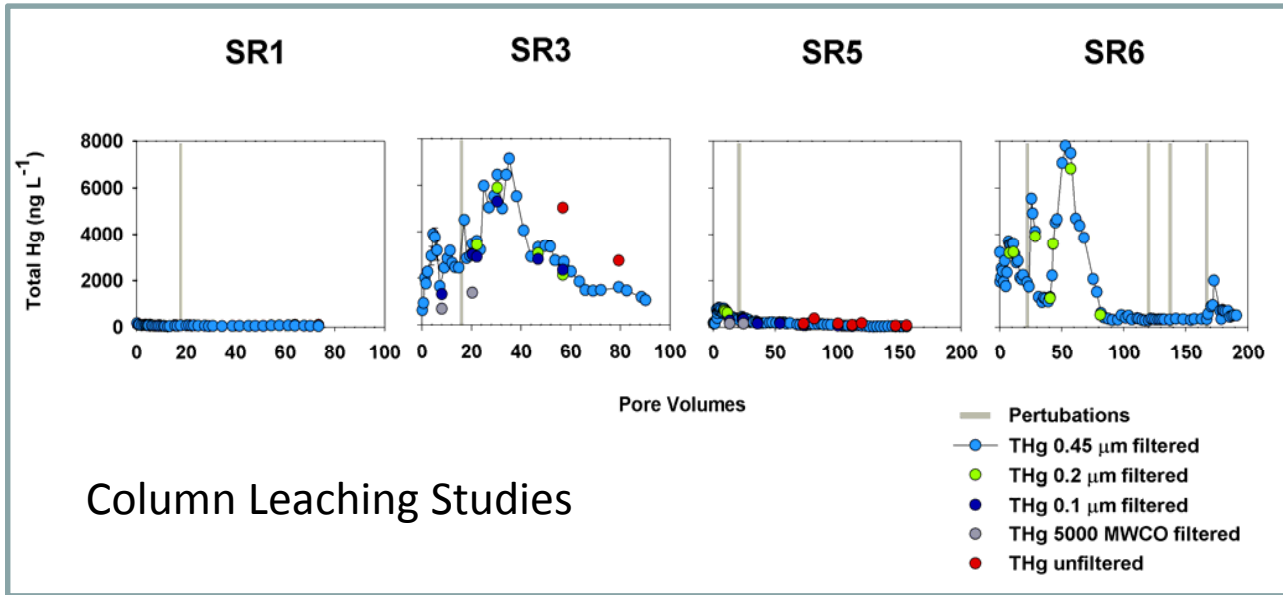
University of Waterloo South River Studies: Mercury Release from Sediments and Strategies for Remediation



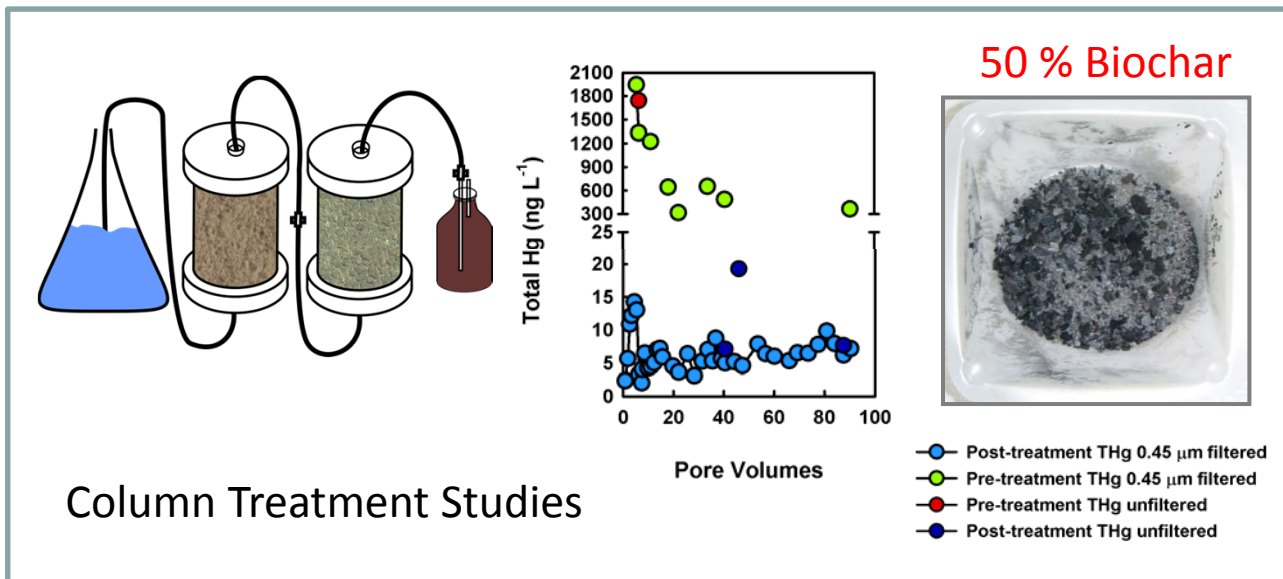
Sediment
Stabilization Studies



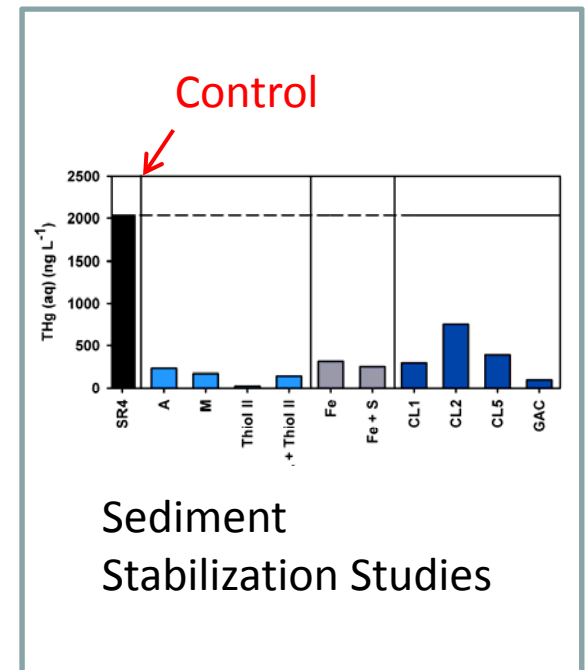
University of Waterloo South River Studies: Mercury Release from Sediments and Strategies for Remediation



Column Leaching Studies



Column Treatment Studies



Sediment Stabilization Studies