

SRST 2017 ROPs Activities

- Characterization / Treatment of Sediment / Soil – Biochars (Carol Ptacek, Waterloo)
- Stable Mercury Isotope Analysis (Joel Blum, U Michigan)
- Floodplain Soil Amendment Pilot (Bill Reese, AECOM)
- Field Verification of Aquanty HydroGeoSphere Model - Advancing the Science (Steve Berg, Aquanty / Kevin Mudrick, AECOM)
- Dynamic Mercury Cycling Model (Reed Harris)
- Pore Water Monitoring / CapSim (Danny Reible, TTU)



CapSim Modeling Results (April 11 Update): Bank Stabilization Treatment: How Effective is the biochar layer in controlling dissolved mercury flux from bank drainage?

- Bank stabilization, in addition to preventing erosion, is also effective at reducing non-particle related Hg leaching
- Bank stabilization acts as a cap
 - Helps isolate contaminated sediments from inundation/drainage cycles
 - Biochar further delays and reduces Hg flux – depends upon effective K_d of the biochar
 - ✓ 91% reduction with $K_d=1000$ L/kg after 10 years
 - ✓ 97% reduction with $K_d=10000$ L/kg after 10 years

Dynamic Mercury Cycling Model - Goals

- A tool that will help to:
 - predict and assess the benefits of bank stabilization and timing
 - interpret monitoring data
 - integrate multi-disciplinary studies into a consistent CSM
 - characterize uncertainty and provide another line of evidence for decision-making



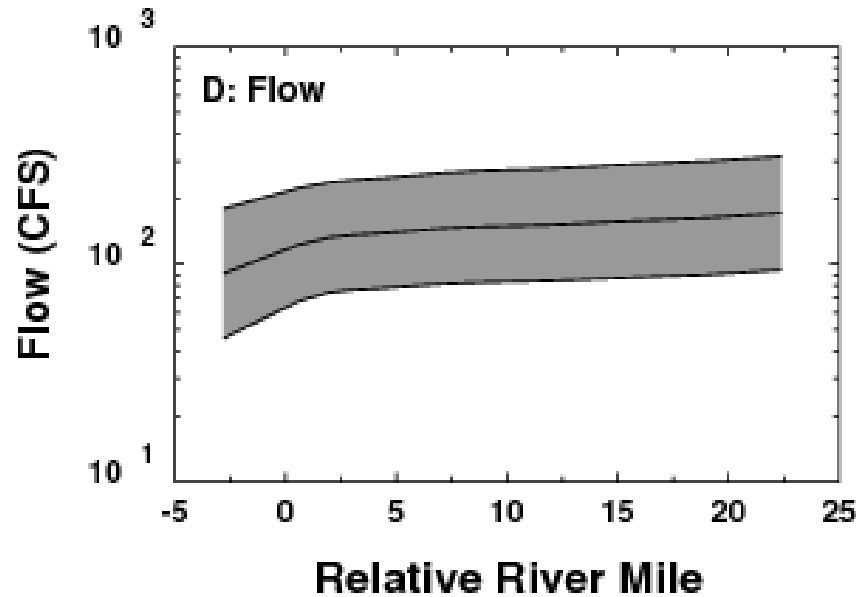
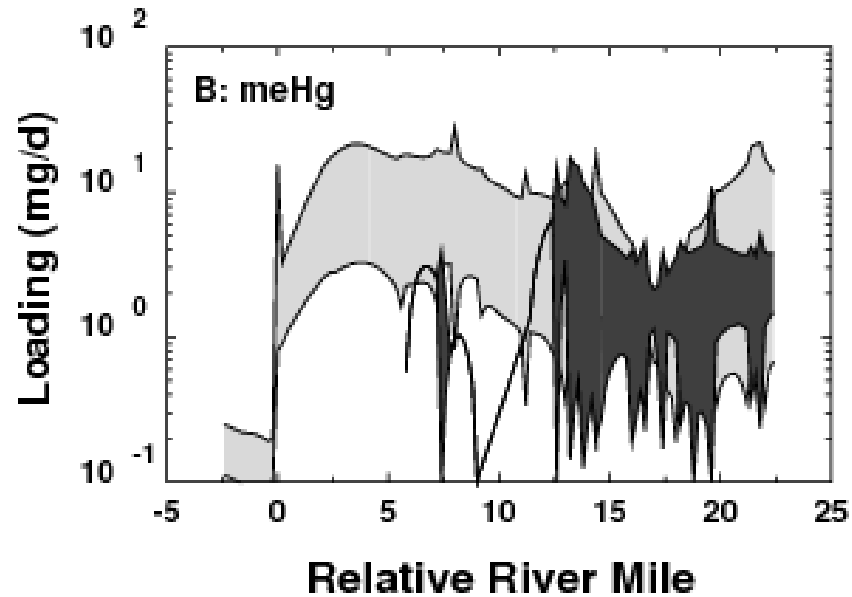
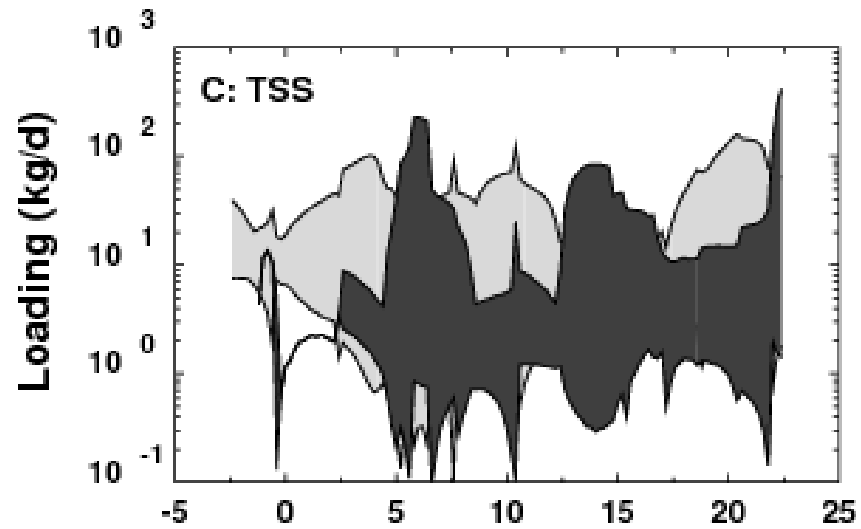
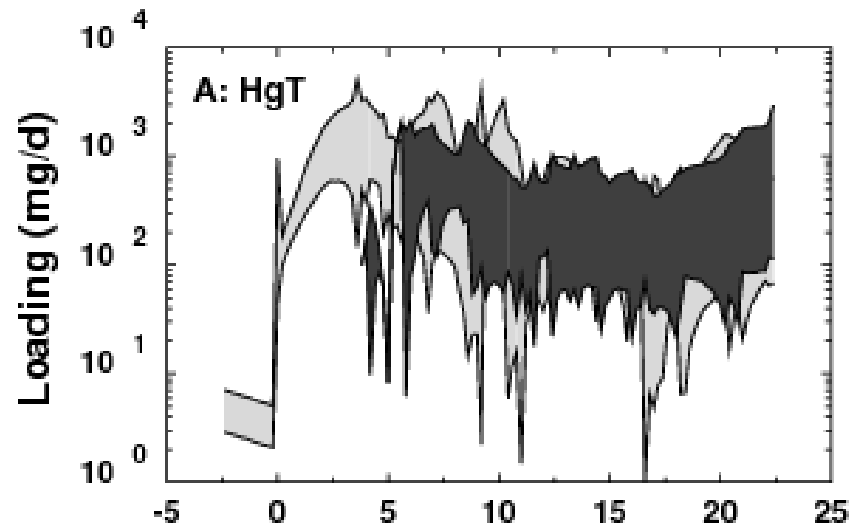
Progress on dMCM

- Results generally consistent with conceptual model
- Currently:
 - Trying to improve model fit to spatial rise and decline of Hg(II) and MeHg in water column.
 - Adjust model input to use most recent Hg loading estimates along river
 - Examine Hg partitioning along river.
 - Scenarios with bank stabilization and prediction
 - Consider non-linear Hg-MeHg relationship



QUESTIONS / COMMENTS?





HydroQual, 2007 (unpublished)

South River - Spatial profiles of incremental loads of HgT (A), meHg (B), and TSS (C) to the water column at low flow.

Light shaded polygons are positive incremental loads and dark shaded areas are negative loads.

The range of the polygon represents one standard deviation across all months that were evaluated in this study. The flow (D) is plotted as the median and one standard deviation for all months included in this analysis.