

South River Science Team Meeting

April 6, 2016

April 5, 2016 ROPs Meeting Summary

SRST 2016 ROPs Activities

1. Phase 1 Interim Measures AOC4 (Anchor QEA / AECOM)
2. Phase 1 (post-2016) Design
3. XRF Field Validation (Robert Brent, JMU)
4. Enhanced Adaptive Management Model Training (Christy Foran, USACE)
5. Reactive Capping Simulations and Pore Water Monitoring (Danny Reible, Texas Tech University)
6. Characterization / Treatment of Sediment / Soil (Carol Ptacek, Waterloo)
7. Stable Mercury Isotope Analysis (Joel Blum, U Michigan)
8. Dynamic Mercury Cycling Model (Reed Harris)
9. Floodplain Soil Amendment Pilot (Bill Reese, AECOM)
10. Tentative: Verification of Aquanty HydroGeoSphere Model (Steve Berg, Aquanty / AECOM)

Waterloo Biochar Characterization

- Objective: Evaluate alternate biochars for application to the South River.
 - Specifically, characterize new biochars following same protocols used in previous biochar studies (e.g. leaching). Evaluate long-term potential for production of MeHg. Alternate Biochars: Distiller's Grain, Anaerobically digested manure, fine and coarse biochars.
- Preliminary Results:
 - Leaching of biochars results show some biochars are preferable over others (organic acid leaching) – Distiller's Grain and Digestate.
 - Mercury removal from water: Digestate seems to work as well as cowboy charcoal (>95% removal).
 - Distiller's Grains biochar similar to wood-based biochars in terms of sorption
- Next Steps: evaluate mixtures of Distiller's Grain and Digestate

Benthic Community Effects of Biochars Proposal (Clements)

- Objectives: Continue 2014 pilot study in-stream.
- Proposal:
 - 40 day field colonization study 3 Treatments
 - Control
 - Biochar
 - Washed biochar
 - Increase replication and greater statistical power
- Timing:
 - Late Summer 2016

Dynamic Mercury Cycling Model Update (Harris)

- Objectives: Develop a mechanistic model that can aid in predicting river recovery in response to remedial actions
- Status
 - Calibration has improved by using daily average flows rather than 5-day average flows
 - Definition of sediment vs. soils (at ordinary high water elevation)
 - TSS modeled and observed agree well
 - Hg and MeHg predictions in surface water may require another process in addition to desorption from TSS particles (e.g. flux from the sediments, bank leaching, increased erosion)
- Next Steps: complete calibration by the end of April and begin scenario testing

Phase 1 BMA Bank Soil Sampling (Collins)

- Objectives: Refine delineation and loading estimates at BMAs slated for construction in 2017+
- Approach: Horizontal and vertical delineation within potential removal areas and data gaps addressed at Secondary BMAs
- Status:
 - Data collection completed.
 - Chemical analysis completed this week.
 - Apparently similar trends as at other Phase 1 BMAs.
 - THg ranges from ND to >1,400 mg/kg and max THg concentrations generally found at depth
- Next Steps: Refine BMA boundaries.

JMU XRF Field Validation Study (Brent)

- Objectives: Extend preliminary field work conducted in 2015 to a validate previous results
- Status
 - Field measurements complete (~37% BMDL of 7.4 ppm)
 - Commercial Laboratory analysis complete
 - JMU XRF laboratory analysis (of commercial lab samples) pending
 - Sample variability is greater than measurement variability
- Next Steps
 - Spike lab samples and measure
 - Incorporate soil types into evaluation / variability
 - Complete evaluation of data (dry weight vs. wet weight)
 - Prepare report
 - Finalize field protocols

Floodplain Amendment Pilot Update (Reese)

- Objectives: Validate the effectiveness of *in situ* biochar amendments in reducing the bioavailability of Hg to terrestrial invertebrates
- Status: Phase 2 worm cages completed. Biochar may reduce Hg bioavailability in worms. Very low sample (worm) yield and study design variables partly mask results
- Next Steps: Develop plan for field application in non-forested and forested soils. Field application techniques to be tested prior to implementation. Anticipated application in 2016, sampling in 2017.