

Questions for SRST Expert Panel

1. What information requires clarification?

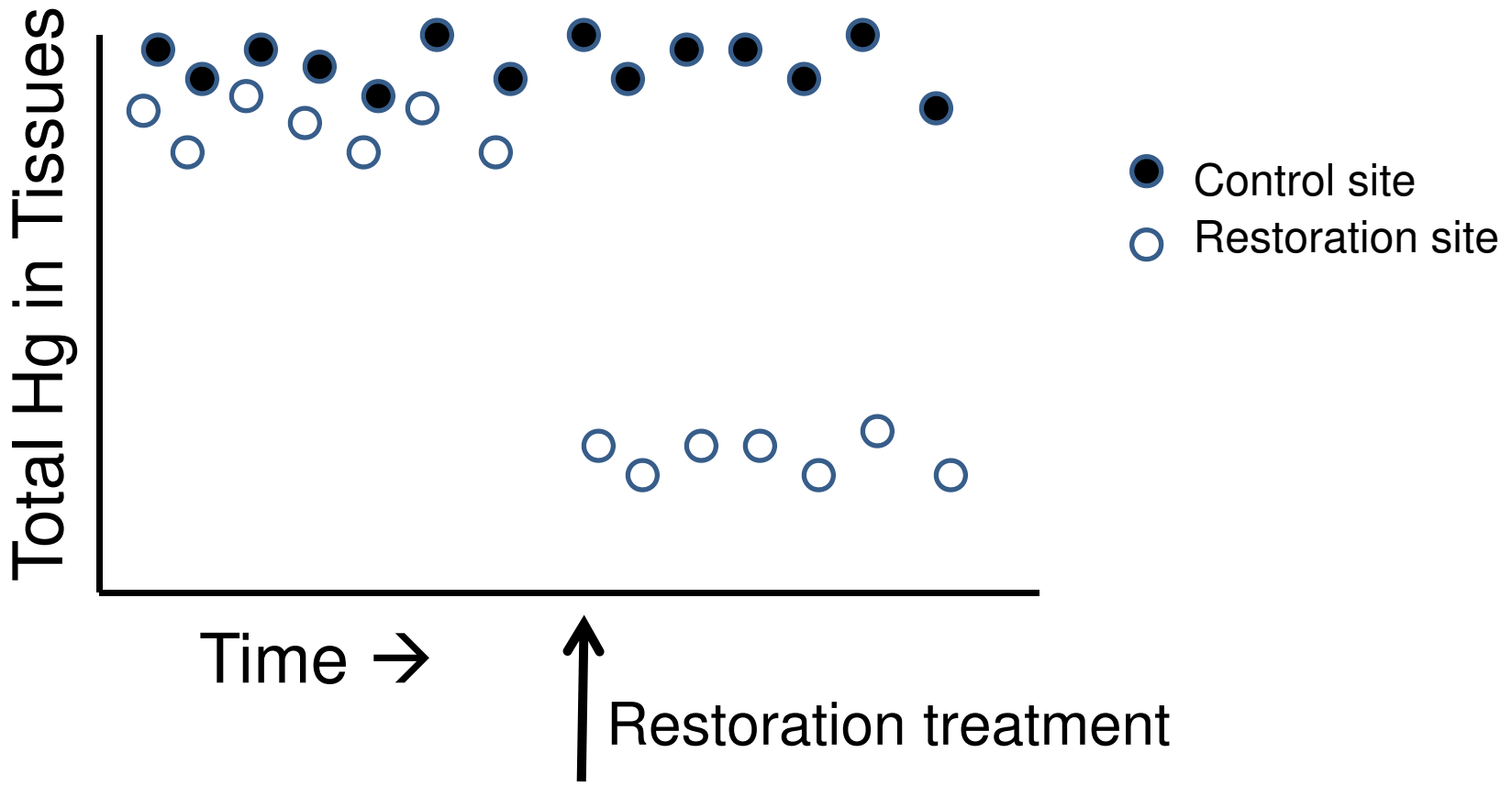
- A plan for integration of restoration monitoring, adaptive management and regional risk models
- Provide a hypothetical example describing how relative risk assessment will be integrated into the monitoring plans and be used to improve adaptive management
- Will risk reduction targets be set for each region?

2. Strengths, weaknesses & suggestions for the ROPs program

- Excellent connection among conceptual model, ROPs and individual projects
- Engage SRST in the design, implementation and assessment of monitoring plans
- Identify endpoints that have the greatest potential to respond to restoration
 - Low variability & high sensitivity
 - Sufficient background data
- Can you “pilot” a remedy such as bank stabilization for eventual whole river application? Do responses in a few linear segments reveal probable whole river response?
- Tie SR monitoring protocols to Chesapeake Bay Program for crediting watershed restoration practices

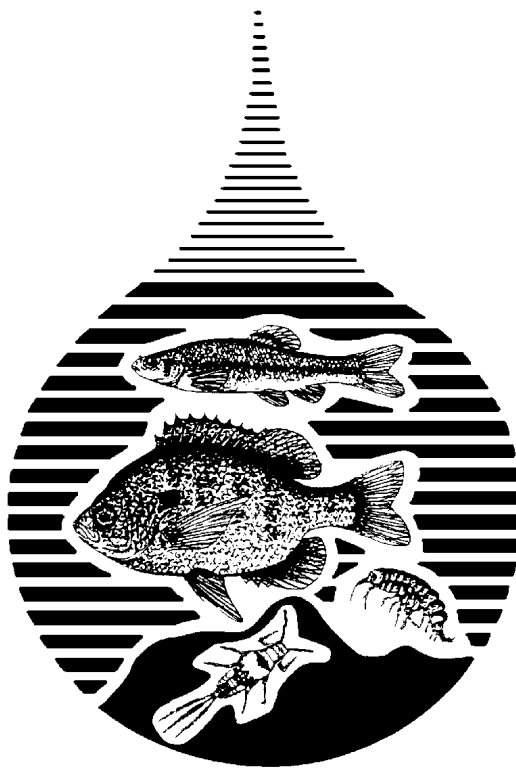
Sample control & restoration sites multiple times before and after treatment

“Ideal” BACI Design



Quantitative assessment of habitat quality

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish Second Edition



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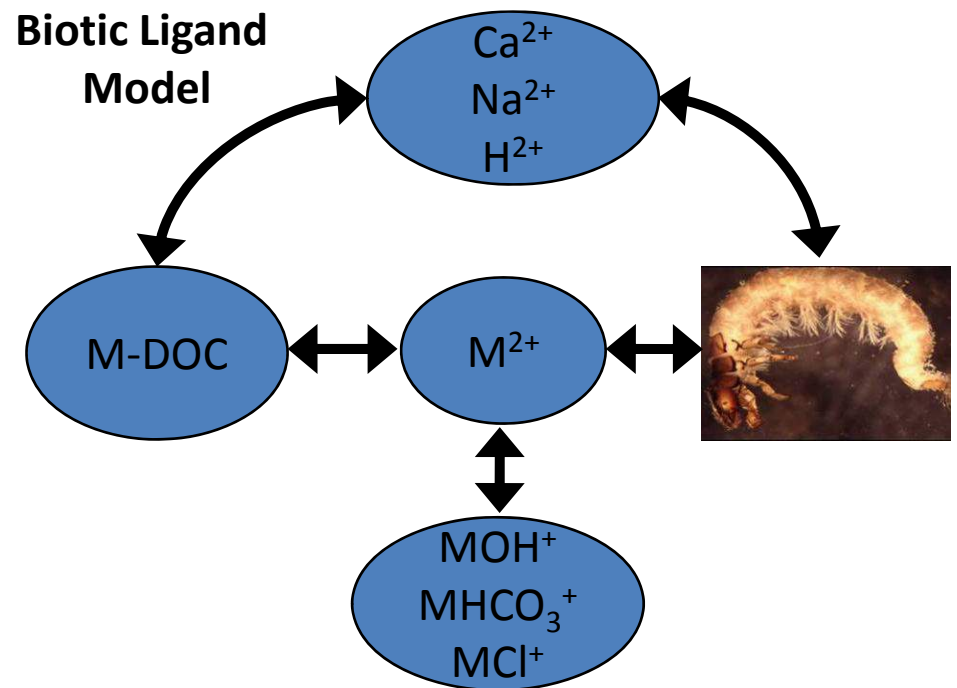
3. What critical research required for remedy selection

Consider effect of upstream flood controls on erosion →
e.g., will dam removal influence bank erosion?

4. Critical data gaps to address unintended consequences associated with the Phase 1

- Results of the 2 pilot studies are very promising
But, somewhat equivocal due to initial variation, seasonal/annual effects, other actions in the watershed
- **Less concerned about unintended consequences than possible failure to achieve fish tissue reductions**
- Bank stabilization- many other positive benefits
- Biochar studies- continue to address indirect effects

- Uncertainties in our understanding of the dynamics of Hg uptake by benthic organisms
- Hg uptake and depuration studies with *Corbicula*
Long-term monitoring studies w/ *Corbicula*
- Advantages of assessing resident macroinvertebrates
- Initiate a long-term monitoring program with an indigenous species (hydrpsychid caddisflies)



5. How can we improve the adaptive management (AM) approach for the river remedy?

- Transparent and well defined link between specific monitoring endpoints and AM
- Performance of restoration alternatives influenced by: 1) objectives; 2) cost; and 3) uncertainty of the contaminant loading model
 - Identify major these sources of uncertainty
- Weight interim/early measures that implement one action more than combined measures (don't combine bank stabilization and with biochar)
- Account for possible increases due to disturbance (e.g., bank grading) that may be short-lived

6. What does remediation success look like based on your experience at other sites?

Not simply removal of contaminated sediment

- Often achieve reductions in water, sediment but not fish/biota

Consider multiple parameters that are weighted:

- Hg in fish, other receptors (highest weight)
- TMDL water quality: TN, TP, TSS, others
- TMDL land use changes: buffers
- Habitat/fishery
- Regulatory
- Community: recreation, health
- Partnerships: City, research, local groups, etc.
- Risk scores to certain # per region?

7. In what areas is stakeholder acceptance at risk and how do we gain the necessary buy in?

Getting private landowners on board
demonstrate success in the upper 2-3 miles!

- Get early involvement; establish citizen's working group; review experiences with these groups at other sites
- Farmers are riled up about Chesapeake Bay TMDL (hazard of being associated with broader restoration)
- Big challenge for farmers will be overcoming desired "clean" look to stream banks. Insisting on maintenance agreements may be a "deal killer"
- In order for Waynesboro to account for pollutant removal credits for its MS4 permit (stream restoration, BMPs, retrofits, etc.), certain protocols must be followed

8. How can we reduce the potential for unintended adverse effects to ecosystem?

- Few unintended consequences of bank stabilization
- Continue with Biochar studies conducted under realistic conditions
 - functional measures (detrital processing)
 - field and microcosm experiments
- Consider conducting a “failure analysis”, i.e., identify assumptions that if wrong will lead to inability to achieve targets.
- Consider “test” for not disturbing banks or instream areas that are currently stable or for which disturbance will likely not lead to net gain

Additional Questions for the SRST

- What are the remaining sources of uncertainty with respect to our understanding of the system?
- Are the proposed short- and long-term monitoring plans adequate to assess restoration success?
- How well do we understand the effects of long-term changes in climate on stream hydrology, temperature, etc.
 - how will these relate to Hg dynamics
- Is there a downside to trying multiple remedies (e.g., stabilization w/ and w/out biochar) in Phase 1?
 - Yes, possible loss of learning opportunity with mixed remedies