

# Can trees be used to monitor mercury dynamics in a riparian system?



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# Objectives:

- Create a historical timeline of the mercury pollution incident
  - Using dendrochemical analysis, determine the mercury concentration in a tree's annual rings
  - Identify the year in which Hg was introduced to a particular site in/along the stream
- Locate mercury “hotspots” along the stream bank
  - Correlate results to fish and clam studies...is tree monitoring a viable and useful monitoring tool?



# Feasibility

- Numerous ongoing and past studies regarding heavy metal uptake via trees
  - Lead, zinc, copper, nickel, uranium, mercury, etc.
- “Mercury in Tree Rings” EPA study
  - Initiated in FY2003; expected to reach completion later this year

# Proposed Methodology



# Potential trees to be sampled:

- Eastern Sycamore
- Eastern Cottonwood
- American Basswood





## Proposed Sites:

- Sample trees along stream bank, 25 ft, 50 ft, and 100 ft from stream bank
- Control
  - Above DuPont plant? Distance?
- Experimental
  - Current DEQ mercury monitoring sites



# Standardized Procedures

- Tree coring technique
  - Constant size and diameter of increment borer
  - Sample at breast height
  - Wash borer after each sample taken
  - Etc...
  
- Sampling procedures
  - Similar sized (age) trees
  - Sample at least 2 trees at each site
  - 2 core samples taken from each tree
  - Etc...



## Potential Benefits

- Long-term monitoring tool
- Easily accessible organisms
- Less work effort
- A good way to assess the impact of future remediation efforts
- If mercury uptake is deemed significant, possible investment in phytoremediation clean-up??

# Potential Drawbacks

- Metals aren't necessarily restricted to tree-rings formed during the current year
- No consensus exists on which tree is best



## Next Step



- Visual survey of sycamore (cottonwood/basswood) density at control and experimental sites

Questions?

