

Actionable Science for Communities

Contaminated Sediments/Remedy Effectiveness SHC – 3.61.3

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Purpose/Utility of Research

The main objective of this research effort is to provide stakeholders with biological, chemical, and physical tools, indicators and approaches to more effectively assess and manage contaminated sites, under the Great Lakes Legacy Act (GLLA), Great Lakes Restoration Initiative (GLRI), and other EPA programs.

ORD with its partners at the Great Lakes National Program Office (GLNPO), Superfund (SF), Regions (2,4, 5 and 10), States (OH, MI, IN, NY and WA), and other federal agencies, such as USGS, USFWS, NOAA, has provided critical information and generalizable best practices derived from demonstration projects at multiple sites: 5 Areas of Concern (AOCs) and 2 Superfund.

The methods and tools being developed are used for:

- (1) identifying and tracking contaminant sources to sediments,
- (2) assessing risk management and remediation strategies at contaminated sediment sites by project managers, and
- (3) delisting of Beneficial Use Impairments (BUIs).

Highlights

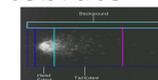
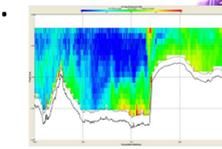
In this task, we apply a “Weight of Evidence Approach (WOE) using Multiple Lines of Evidence (LOE)”

Chemical – measures that relate to contaminant concentrations (e.g., post-remedial surface weighted concentrations, reductions in fish, macroinvertebrate and spider tissue levels). Use of innovative devices like passive samplers.

Physical – volume and mass removed (e.g. pounds of PCBs dredged). Innovative approaches – Sediment particle size and tracking, and plume monitoring

Biological – assesses biological endpoints (e.g., fish assemblage, macroinvertebrate diversity of species, sediment toxicity, DNA damage)

Modeling - physical and hydrodynamic modeling, performance modeling, food web modeling.



Application & Translation

Superfund

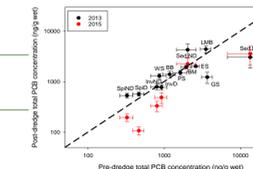
Lake Hartwell Craig Zeller, RPM used ORD sediment, water and macroinvertebrate data, and recommendation to assess source controls for updating the 5 year ROD on Monitored Natural Recovery. Because of ORD’s recommendations – Source controls were increased which resulted in a 50% reduction in clam tissue concentrations

Provided Screening Level Risk Calculations for Mink (*Mustela vison*), Belted Kingfishers (*Ceryle alcyon*), Short-Tailed Shrew (*Blarina brevicauda*), and Red-Tailed Hawk (*Buteo jamaicensis*) for Lake Hartwell to assist RPM with addressing local citizen scientist concerns over dam removal

Great Lakes AOCs

Data generated and technical advice provided by ORD being used by the GLNPO to assess remedy effectiveness, develop guidelines for BUI delisting and R2R2R*. Data being shared with Federal and State partners working on BUI delisting and National Resource Damage Assessments (NRDA).

* see poster R2R2R Contaminated Sediment 3.61.3



Intended End users

GLNPO Site Managers

Federal Partner Agencies – USFWS, USACE, USGS

State Environmental, Public Health & Wildlife partners – OH, NY, MI, MN, IN, WA

Citizen AOC Councils

Superfund Remediation Project Managers

All have requested this information and have participated in the design, collection and publication of the findings.

Lessons Learned

- Applications on various AOC sites for some of the biological methods have resulted in improvements and modifications that have resulted in more sensitive information and reduced logistical complications.
- It takes team work!

