

## Early Assessment of the Overall Effectiveness of the Upper Hudson River Remedy

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**Background/Objectives.** The Upper Hudson River Polychlorinated Biphenyls (PCBs) Superfund Site is a 40-mile stretch of river from Fort Edward to Troy, New York. The 2002 Record of Decision called for dredging followed by cap/backfill for 500 acres and natural recovery for the remaining sediments. Dredging and cap/backfill placement occurred in 2009 and 2011 through 2015, with habitat restoration complete in 2016. The long-term monitoring program calls for sampling in the water column, sediment, and fish at varying temporal and spatial scales. The first year with post-construction monitoring data available was 2017. Besides the data collected by General Electric, data collected in 2017 by New York State provide additional insight to river conditions post-dredging.

**Approach/Activities.** Fish PCB concentrations are too variable to be an early indicator of remedy effectiveness. To evaluate recovery, multiple years of data are needed to overcome factors driving fish PCB concentrations that are unrelated to water and sediment PCB exposure concentrations, such as variations in bioenergetics, availability of habitat and prey, river flow, and temperature. The best early assessment is made using the water and sediment data collected before and after dredging.

This talk will compare changes in surface sediment concentrations from the levels measured in pre-design sampling to levels measured after active remediation to the changes expected to be achieved. We will also present analyses of water column fluxes during low flow and high flow periods and compare them to expectations. Analyses will include the 2016, 2017, and 2018 water data (to the extent the 2018 data are available). Total PCB and Tri+ PCB trends would be evaluated and the compositional changes in the PCBs in the water column pre- and post-dredging would be reviewed.

**Results/Lessons Learned.** Active remediation achieved substantial reductions in average PCB concentrations in surface sediments and drove large drops in PCB transport. Because dredging targeted the higher PCB concentrations that tended to have a dechlorinated composition, there has been a shift in the composition of PCBs being transported, with a greater Tri+ PCB fraction post-active remediation. These large-scale trends set an expectation for significant reductions in fish PCB levels. Several more years of data are likely needed to confidently assess those reductions.