

Assessing the Hudson River Post-Remedy; An Overview of the Ongoing Recovery of PCB Levels in Fish, Sediment and Water in 150 Miles of River

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Background/Objectives. In part because of its sheer scope and size, the Hudson River PCBs site has been and continues to be one of the precedent-setting Superfund sites for investigative techniques, remedy performance and now, post-remedial monitoring. Monitoring of site conditions continues to involve the analysis of hundreds of samples of fish and water on an annual basis, with sediment monitoring conducted on a 3 to 5 year basis. With the completion of active remediation of the Upper Hudson River in 2016 and the extensive historical and post-remediation monitoring programs, including major sediment sampling events in 2016 and 2017, the site provides an opportunity to track PCB concentrations in all three media through time and to evaluate remedy effectiveness in a rigorous fashion. In total, about 2.7 Myd³ of sediment were removed over a 7 year period (2009-2015), immediately followed by backfilling (or capping in limited areas). Habitat restoration and replanting activities were ongoing during the remediation and were completed a year later, in October 2016. The 2002 ROD required that a period of monitored natural attenuation begin immediately upon completion of the dredging, tracking PCB levels in all three media across more than 150 river miles. While the remedy was quite extensive, there remains the concern that more remediation may be needed. The monitoring program provides the data to assess this concern.

Approach/Activities. EPA has been conducting five-year reviews to evaluate remedy protectiveness. The last five-year review was drafted in 2017. However, given the extensive monitoring, size and interest in the project, EPA continues to evaluate data as it is received. Relevant PCB records extend as far back as 1976 and include 4 long-term water column monitoring stations in the Upper Hudson and 2 in the Lower Hudson, 9 major fish monitoring stations in the Upper and Lower Hudson, and several extensive surveys of sediment contamination in the Upper Hudson, including 2 surveys post-dredging (2016 and 2017). Taken together, these monitoring elements track not only the remedial endpoint (PCB levels in fish) but also PCB levels in the matrices responsible for fish exposure across nearly all of the impacted areas post-remediation. Each of these records is sufficiently extensive to support its own detailed evaluation and is, in fact, the subject of at least one abstract to be presented at this conference. This presentation will provide an overview and integration of the various records regarding the Hudson River recovery.

Results/Lessons Learned. PCB levels in fish, water and sediment of the Upper Hudson have already recovered from dredging related impacts and are near pre-dredging conditions, with continuing downward trends. As might be expected, sediment concentrations have declined dramatically in response to the dredging remedy and are already below 1 mg/kg Tri+PCB (sum of PCB congeners with 3 or more chlorine atoms per molecule) in most areas of the river. Sediment areas outside the dredging footprint show no impact due to dredging and also indicate continued recovery. Lower Hudson conditions as tracked by fish and water levels do not appear to be recovering as rapidly and show little influence of dredging-related impacts.

EPA is planning further evaluation of the Upper Hudson remediation on Lower Hudson recovery. This presentation will examine the current status of the various data sets and EPA's five-year review.