PCBs in Fish Tissues at the Hudson River PCBs Superfund Site: Update on Results of Remedial Action and Early Post-Construction Monitoring

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Background/Objectives. Extensive and ongoing monitoring of PCBs in fish from the Hudson River is important for understanding the status of risks to humans and wildlife that may consume contaminated fish and establishing a useful database for use in future remedy effectiveness evaluations. The fish monitoring program includes collection of resident adult sport fish (black bass, bullhead, and yellow perch; as fillets) in the spring of each year, and pumpkinseed (targeted as yearlings; whole body individuals) and forage fish (whole body composites) that are collected each fall. Data to be discussed in this presentation include the 2004-2008 Hudson River Baseline Monitoring Program (BMP; 2004-2008), Remedial Action Monitoring Program (RAMP; 2009-2015), and early post-construction years (2016-spring 2018), supplemented by data from the New York State Department of Environmental Conservation (NYSDEC) resident fish annual monitoring program (1997-2003) and NYSDEC 2017 fall fish. Temporal trends were evaluated using a regression modeling approach that accounted for the factors of lipid, size (length), and sex, for species-station combinations.

Approach/Activities. The potential effects of episodic dredging on fish lipid-normalized PCB (LPCB) concentrations in the Upper Hudson River were evaluated by comparing the BMP average concentrations with the results from samples collected in species annually under the RAMP from multiple stations that were dredged between 2009 and 2015. This statistical evaluation was conducted on both river section (e.g., Thompson Island, Northumberland/Ft. Miller, and Stillwater pools) and individual monitoring station bases. Station locations and the timing of dredging that occurred upstream, proximal to, and downstream of each station afforded EPA an opportunity to examine fish tissue PCB levels at both large and small spatial scales within the project area and at varying levels of local (station-level) dredging intensity over time and into early post-dredging conditions at these same stations between 2016 and 2018.

Results/Lessons Learned. We observed localized increases in fish tissue concentrations for several species as dredging approached and was implemented at or near stations compared to baseline data (2004-2008). Sport and forage fish tissue concentrations appeared to indicate varying responses to proximal dredging activities in all river sections. Most species-station combinations indicated responses to the downstream progression of dredging (2009-2015); and data from the immediate post-dredging periods (fall 2015-2017; spring 2016-2018) show variable trends suggesting that some species-station combinations may still be exhibiting steeply declining fish tissue concentrations. Overall, the results since 2009 generally indicate that fish tissue LPCB levels decreased following dredging activities and the magnitude and timing of dredging impacts did not appear to be consistent across stations, river sections, or species. EPA continues to anticipate that dredging-related, localized body burden increases of PCBs in fish will return to baseline levels, and will continue to decline post-construction. However, it is too early to determine the rates at which fish tissue PCB concentrations are declining in the post-construction period as a result of the combined effects of upstream source control and the benefits of remedy implementation (i.e., contaminated sediment removal).