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Title: Habitat Use and Trophic Position Effects on Contaminant Bioaccumulation in St. Louis River Estuary Fishes

Authors: Joel Hoffman, Bruce Monson\*, Lawrence Burkhard, Michael Sierszen, Gregory Peterson, Anne Cotter

\* Minnesota Pollution Control Agency, (651) 296-7607, [Bruce.Monson@state.mn.us](mailto:Bruce.Monson@state.mn.us).

Abstract: The objective of our study was to determine the relationship between fish tissue stable isotope composition and total mercury or polychlorinated biphenyl (PCB) concentrations in the St. Louis River estuary food web. We sampled two resident fishes, Yellow Perch (*Perca flavescens*) and Black Crappie (*Pomoxis nigromaculatus*), and two migratory fishes, Northern Pike (*Esox lucius*) and Walleye (*Sander vitreus*) of varying size and from locations spread across the estuary. At all locations, mercury concentration increased with size, whereas PCB concentration did not. We found robust habitat-based differences in contaminant concentration and stable isotope composition, though results varied by species. For both mercury and PCBs in Walleye, increasing diet from Lake Superior was associated with decreasing contaminant concentrations. For other fishes, PCB concentrations were highest in the industrial portion of the river and Hg highest in the upper estuary. Within a species, we found poor relationships between stable isotope composition and contaminant concentration, owing to the river's complex biogeochemistry. We conclude that spatial-patterns in both isotopic composition and contaminant concentration across a mosaic of coastal habitats can be complex and vary among isotopes, contaminants and species. Undertaking careful measurements of isotopic baselines is critical for data interpretation, and can be used to reveal spatial patterns in contaminants that would otherwise be difficult to detect