

PhD Dissertation
Department of Environmental Science and Policy
College of Science
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Defense Date and Time: April 10, 2025, at 10:30 AM

Defense Location: Potomac Science Center (PSC) Room 3102 & virtually on Zoom

Title: Of tides and skins: Using dragonfly exuviae as a non-lethal approach to monitor mercury along the nontidal and tidal freshwater Potomac River from Monocacy to Mount Vernon

Dissertation Director: Dr. Dann Sklarew

Committee: Dr. Greg Foster, Dr. Amy Fowler, Dr. Richard Groover

ABSTRACT

Dragonfly nymphs live from months to years in rivers where they may be exposed to mercury through prey ingestion, respiration, and physical contact with contaminated water and sediment. Analyses of exuviae (shed skins of nymphs) collected from nontidal and tidal freshwater reaches of the Potomac River showed that abundance, species richness, and diversity of dragonflies were consistently higher at nontidal sites, but evenness was higher at tidal freshwater sites. Mercury concentrations detected in exuviae positively correlated with concentrations in sediment and porewater. Exuviae offer a novel, non-lethal means to identify resident species and monitor mercury concentrations along the Potomac River.