

MS Thesis
Department of Environmental Science and Policy
College of Science
George Mason University

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Defense Date and Time: March 28, 2025 @ 8:00am

Defense Location: Virtual (on Zoom)

Title: Evaluating High-Throughput Assays for Pesticide Ecological Risk Assessment

Thesis Director: Dr. Esther Peters

Committee: Dr. Younsung Kim, Dr. Scott Glaberman

ABSTRACT

Evaluating the ecological risk of pesticides is crucial for regulatory decision-making, yet traditional vertebrate-based approaches are time-consuming, costly, and ethically challenging. New approach methodologies (NAMs), such as high-throughput assays (HTAs), offer faster, cost-effective alternatives which reduce animal testing. Our study considers the effectiveness of HTAs for pesticide risk assessment. While HTA data generally underestimated risks, certain assays demonstrated strong alignment. Our findings underscore HTAs' utility in ecological risk assessment while emphasizing the need for assay development. By integrating HTA data into regulatory risk metrics, this study provides a foundation for advancing NAMs and promoting resource-efficient, ethical approaches to environmental protection.