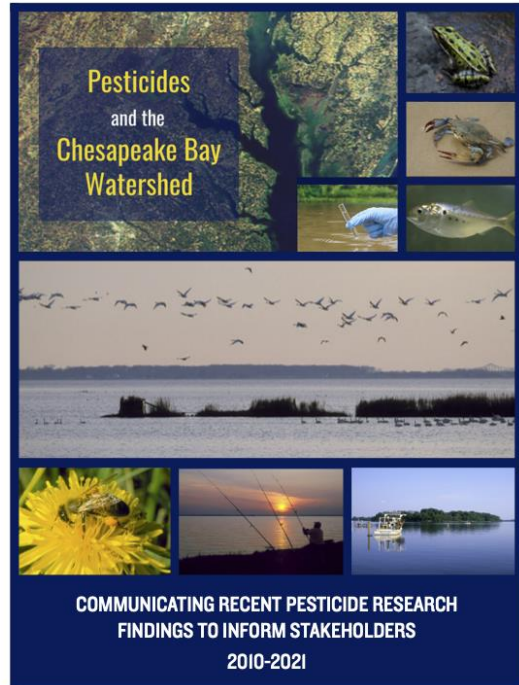




Project Research & Data Gaps Working Group

Communicating Recent Pesticide Research Findings to Inform Stakeholders

2025 Pesticide Research Update

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Working Group Co-facilitators



Communicating Recent Pesticide Research to Stakeholders

Update 2022 - 2025

Presented by Vicki Blazer, PhD

On behalf of Research & Data Gaps Working Group

A project of the Maryland Pesticide Education Network

Research & Data Gaps
Working Group
of the Pesticides & the
Chesapeake Bay
Watershed Project

November 5, 2025

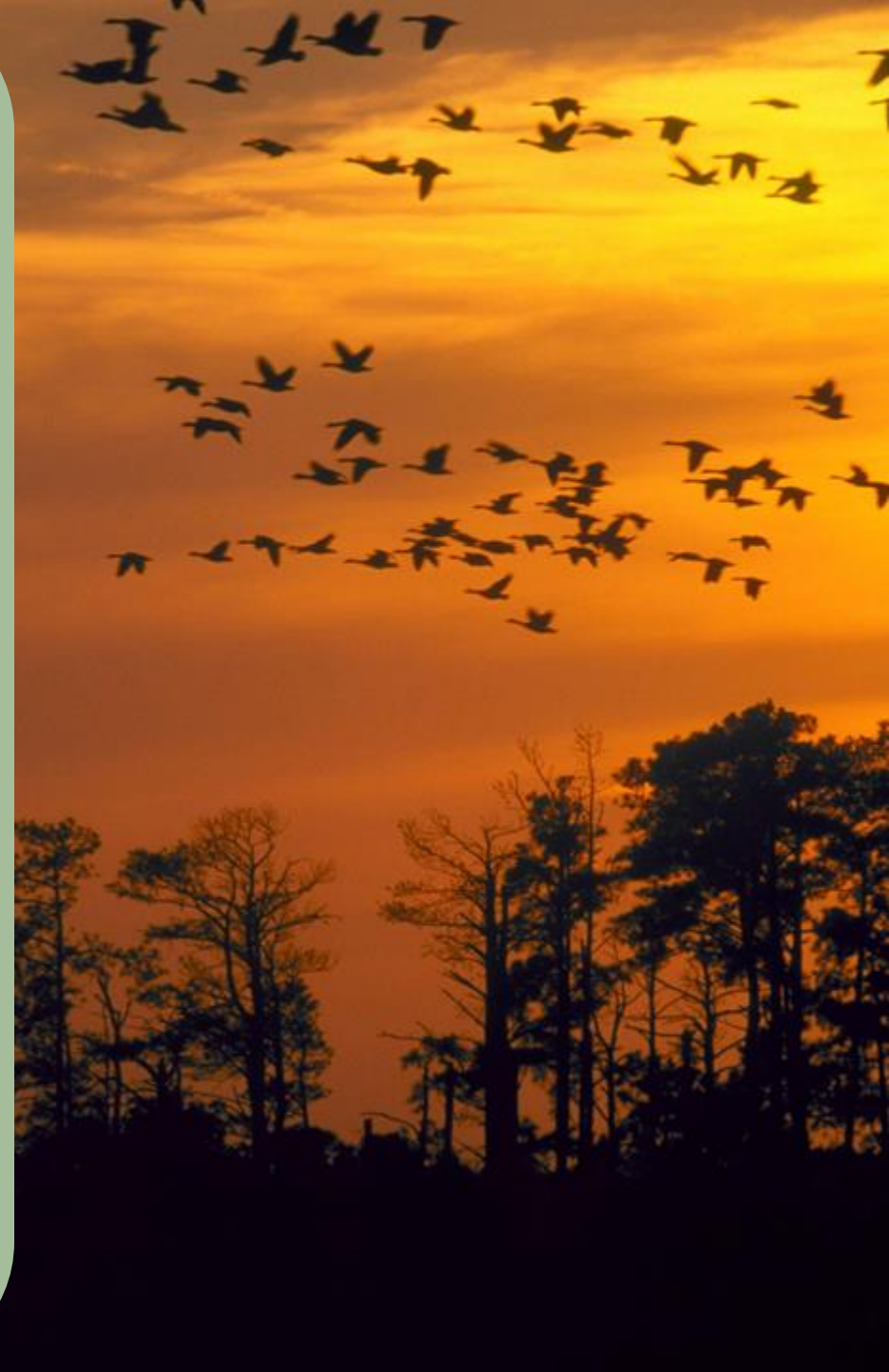
The Report completed in 2024 – decided we would update every year

PURPOSE OF THE REPORT

To inform stakeholders, regulators, policymakers and the public about the current data and data gaps regarding the impact of pesticides and emerging contaminants on the watershed and to provide proposed actions to address this salient issue.



Overview of of Relevant Literature 2022-2025



Chesapeake Bay Focused

- Contributing factors to pesticide contamination – Potomac example
 - Evaluted sources/landuse associations with pesticide presence – WWTP, urban runoff, agricultural, mixed landuse
- Two studies on the health of smallmouth bass and associations with surface water contaminants and landuse
 - Monthly/bimonthly water samples analyzed for 105 pesticides
 - Variability in sites - monthly and annually
 - Sampling period is important in assessing sublethal effects



Glyphosate Reviews

- Earlier studies had indicated glyphosate was the most commonly used herbicide in the Chesapeake Bay watershed
- Been used not only for terrestrial weeds but also to control invasive Phragmites in wetlands
- Not measured in many studies – analytical
- Reviews on terrestrial ecotoxicology (2023), aquatic ecotoxicology (2024) and overview (2025) includes human health concerns
- One of the recognized data gap is there are numerous formulations and other ingredients alter absorption, distribution, metabolism, excretion and toxicity – rarely considered in risk assessments



Use has been restricted or banned in a number of Maryland counties and Charlottesville, VA, still widely used in other states/counties in Chesapeake watershed

Effects on Pollinators/Insects

- Declines of wild and managed populations have been documented – reviews on sublethal effects, synthesis of data
- Insecticides can directly kill pollinators, while herbicides can reduce food availability
- Flower plantings can mitigate some effects but is species dependent

Effects - Farmland Birds

- Farmland birds have been decreasing worldwide – review of pesticide effects.
- Interspecies variability in sensitivity is important
- Delayed nonlethal effects can have major consequences on bird populations and communities



Data Gaps – Emerging Issues

- **Pesticides and PFAS (Per- and Polyfluoroalkyl Substances)**

- Pesticide sources of PFAS - active ingredients and their degradates (major source) and fluorination of plastic containers and leaching
- Fluorination of adjuvants and inert ingredients - identified as a major data/knowledge gap. A number of PFAS inert ingredients are approved for food use.
- PFAS, One Health concept, circular and sustainable agriculture – use of biosolids, contaminated irrigation water, uptake by plants and food animals – to humans

- **Pesticides and Microplastics**

- Study in Patuxent River reported on contaminants, including chemicals used in pesticides, detected on hydrophobic surfaces of microplastics extracted from jellyfish
- Laboratory study investigated the sorption of DDT, 2,4-D, atrazine and glyphosate onto microplastics. >50% of the DDT and 32-36% of glyphosate, depending on solution.

Data Gaps Identified in Many Studies

- Pesticides are generally regulated as single compounds – need to better understand the synergistic effects of pesticide mixtures as well as the “inert” or co-formulation compounds
- Manufacturers are not required to list “inert” or adjuvant ingredients. There is a need to understand cumulative risks of active ingredients as well as formulation cocktails
- Necessary to understand species differences, sublethal and potentially long-term effects
- Need better integrated pest management, balanced with environmental and public health concerns

Enhancing spray retention using droplets cloaked with an ultra-thin food and environmentally safe oil layer - could greatly reduce pesticide and surfactant use

Emerging Technology: Robotic equipment trained by AI to weed fields

Questions?

In the interest of time
Vicki will answer in writing
in the Q&A module.



“Communicating Recent Pesticide Research to Stakeholders”

Download:

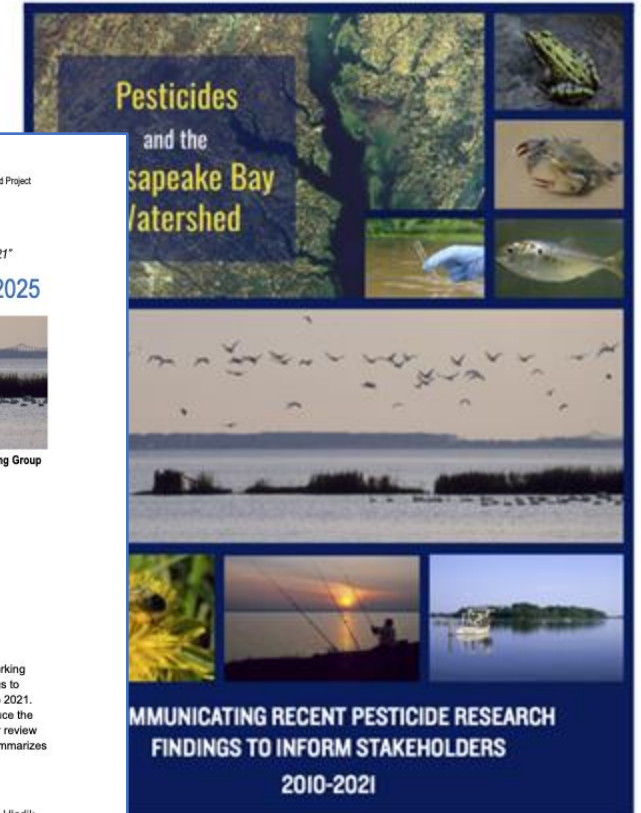
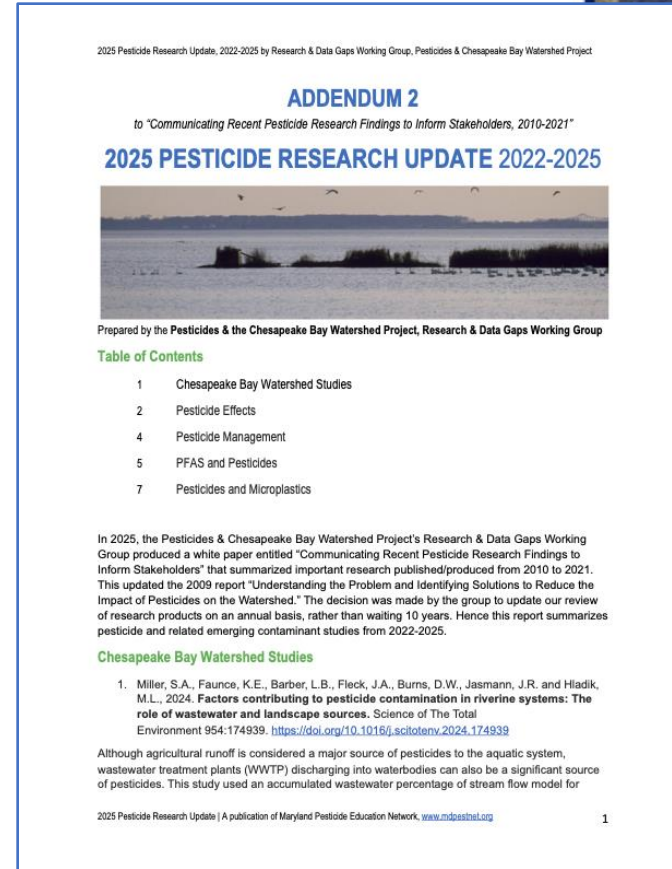
- 2010-2021 Report
 - 2022-2025 Update
- at bit.ly/pesticides-bay-report

For more information on
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