# *ONE Health: A Case Study with PFAS*

**Qualtrics Survey Results**

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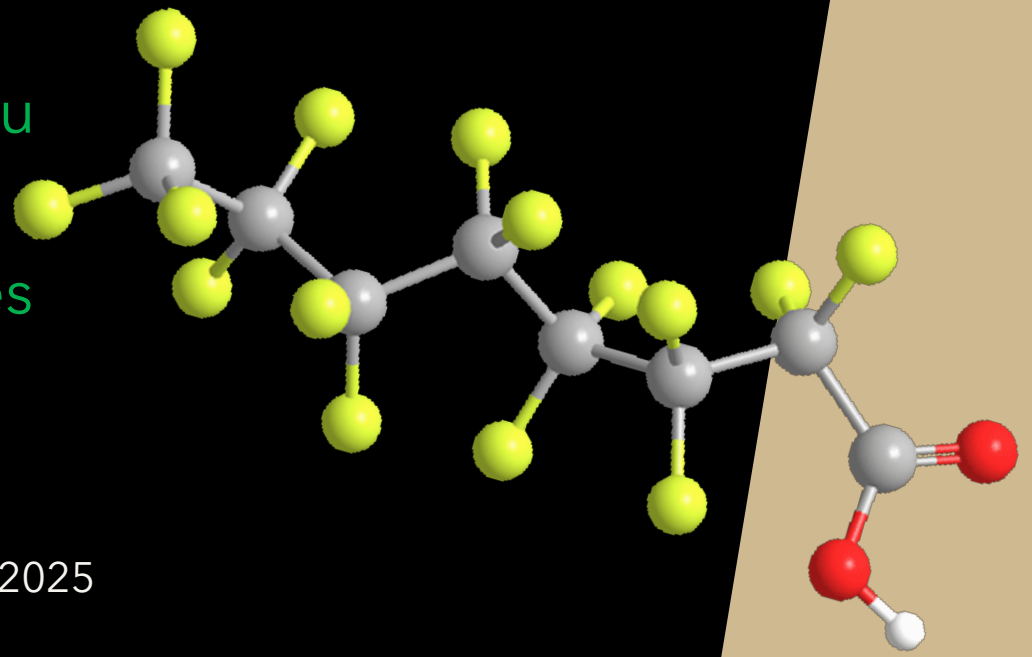

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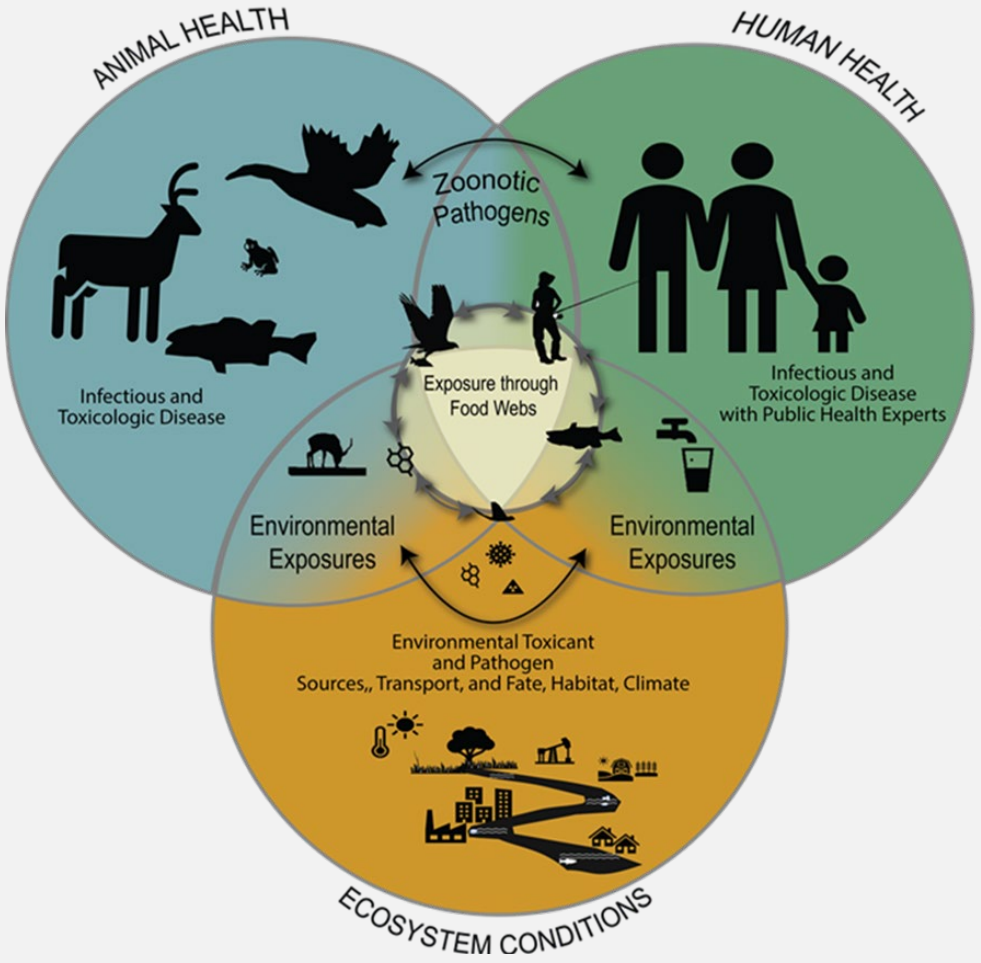
11/21/2025

# One Health: A Systems Approach




*"A transdisciplinary scientific approach to build capacity, foster trust among stakeholders, and promote good stewardship of natural and trust resources with the goal of optimizing human, animal, and ecosystem health". (WHO 2024).*

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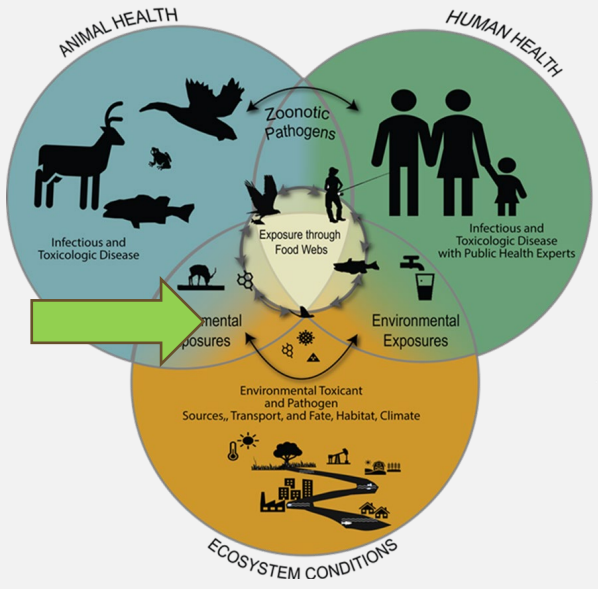
# PFAS: Environment ⟷ Animal Health

## *How environmental PFAS contamination impacts animals*

## *How contaminated animals contribute back to environmental cycling*




- PFAS bioaccumulate and are excreted by fish, wildlife, and domestic animals
- Predator-prey PFAS transfer
- Livestock are exposed to PFAS from contaminated water and feed
  1. Immunotoxicity
  2. Altered lipid metabolism
  3. Reduced reproductive success
  4. Endocrine disruption

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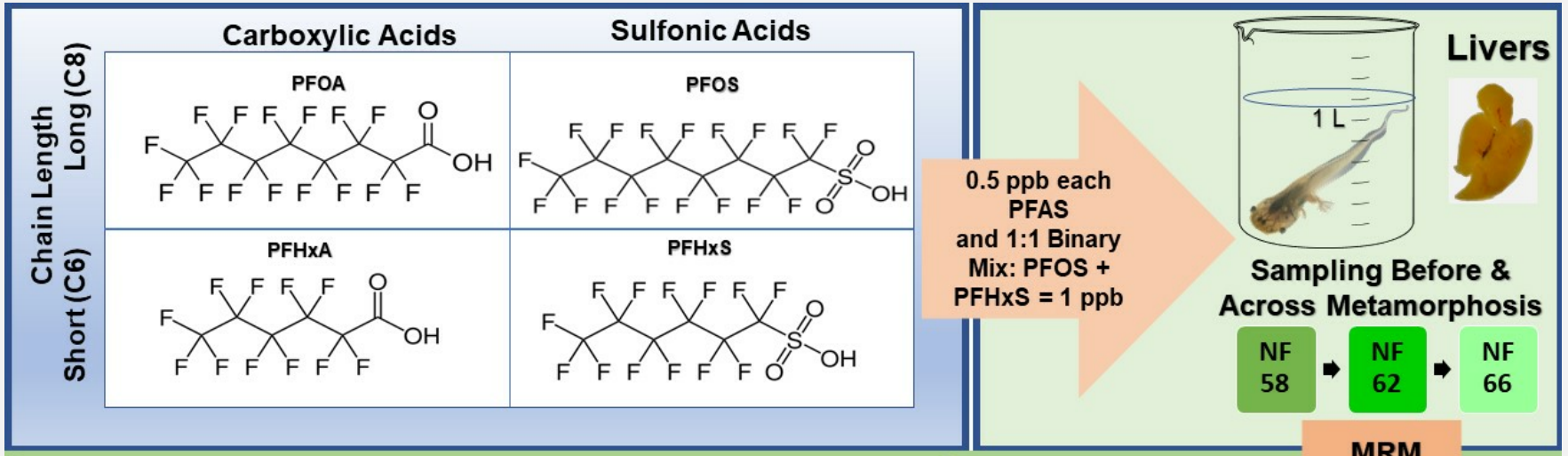
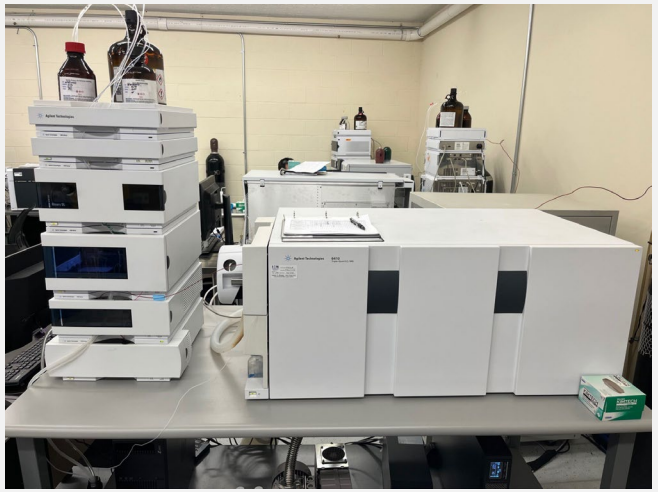
# PFAS: Environment ⟷ Animal Health

## Lipidomics in *Xenopus* exposed to PFAS

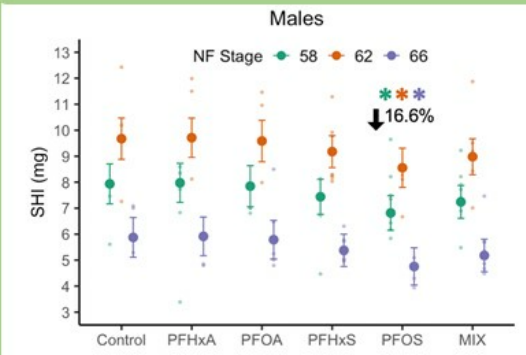
Anna Bushong




*Multiple Reaction Monitoring (MRM) Profiling*



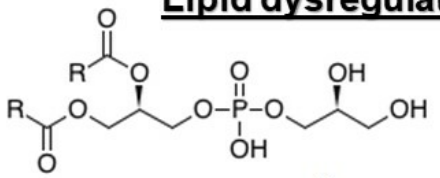
**PFAS Induce Stage and Sex-Specific Changes in Hepatic Lipid Profiles During Development in *Xenopus laevis***

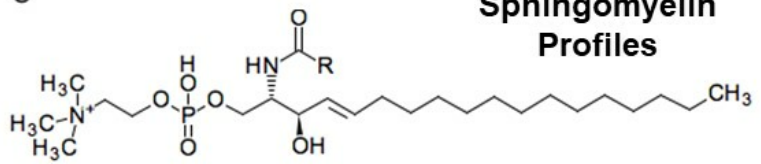



**Decreased** scaled hepatic index in males exposed to PFOS

**No changes** in PPAR-related gene expression

**Lipid dysregulation**





Altered Glycerophospholipid & Sphingomyelin Profiles



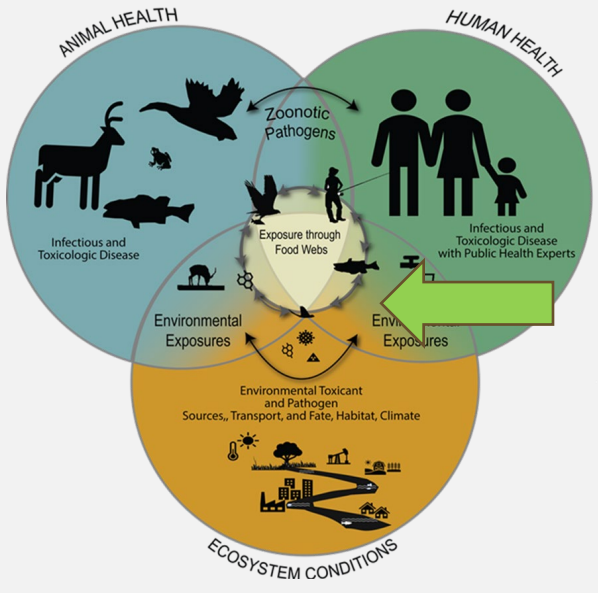


Bushong et al. 2024. https://www.mdpi.com/2305-6304/12/10/732

# PFAS: Environment ⟷ Human Health

## *How human activities introduce PFAS to ecosystems*

## *How PFAS contamination of ecosystems leads to human health risks*




- PFAS are released by humans: Wastewater and biosolids, consumer products, AFFF firefighting foams
- Human exposure occurs through: Drinking of PFAS-contaminated water, eating contaminated food
  1. Immunotoxicity
  2. Altered lipid metabolism
  3. Reduced reproductive success
  4. Endocrine disruption

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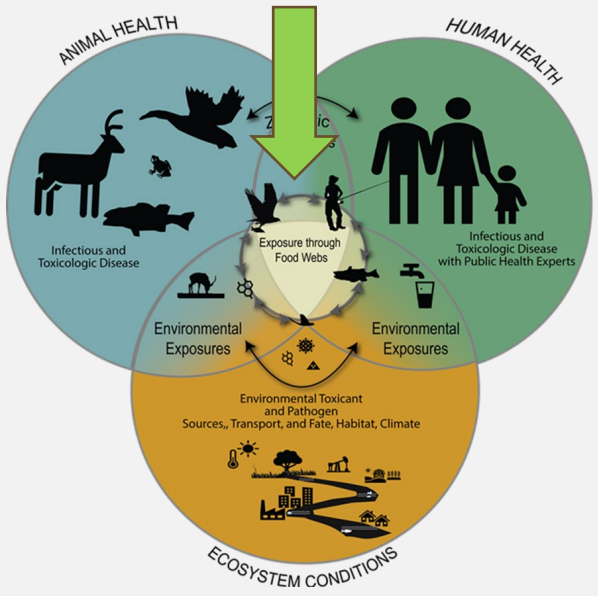
# PFAS: Animal Health ⟷ Human Health

***How PFAS contamination in animals becomes a human health exposure pathway or warning signal***

***How human actions affects animals directly***




- Fish and wildlife as sentinel species
- Food chain transfer
- Pets as sentinels

- PFAS in biosolids applied to farmland
- Fish advisories limiting tribal subsistence diets
- Industrial emission impacting local fish and wildlife

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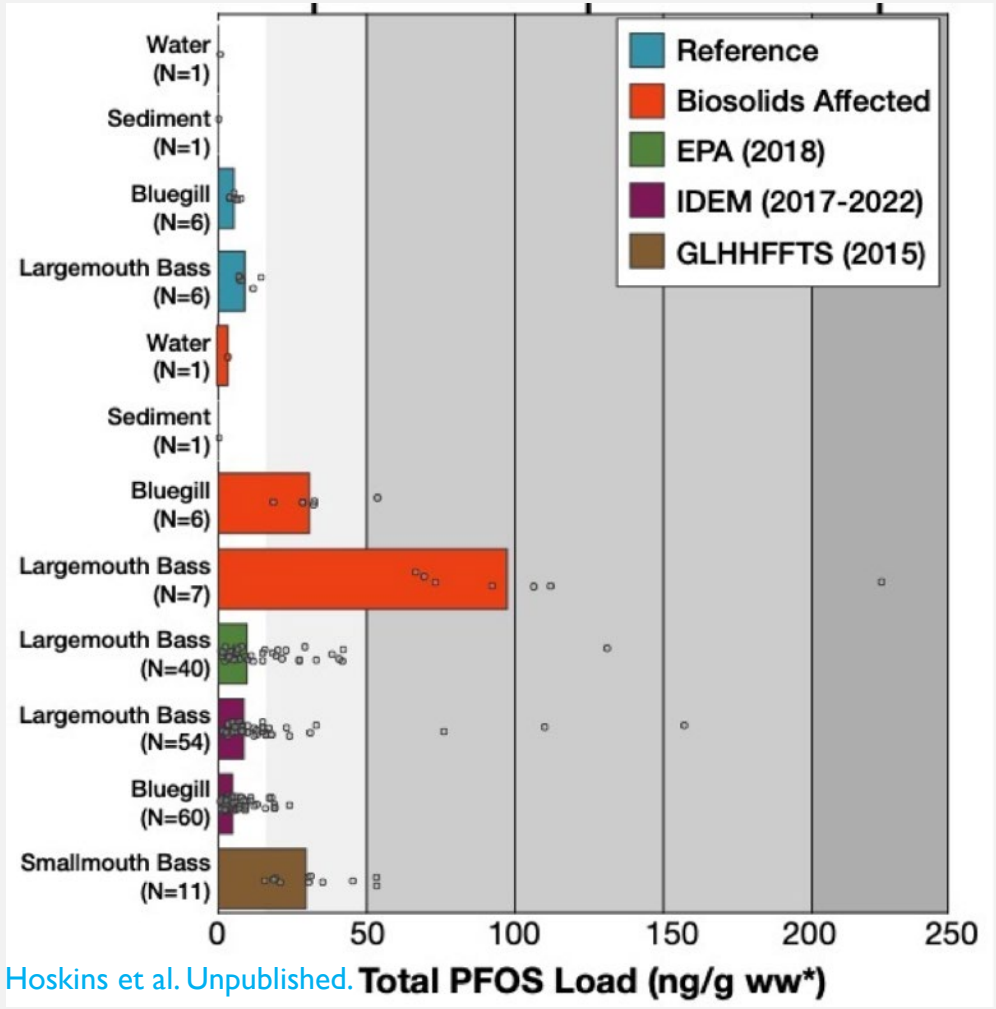
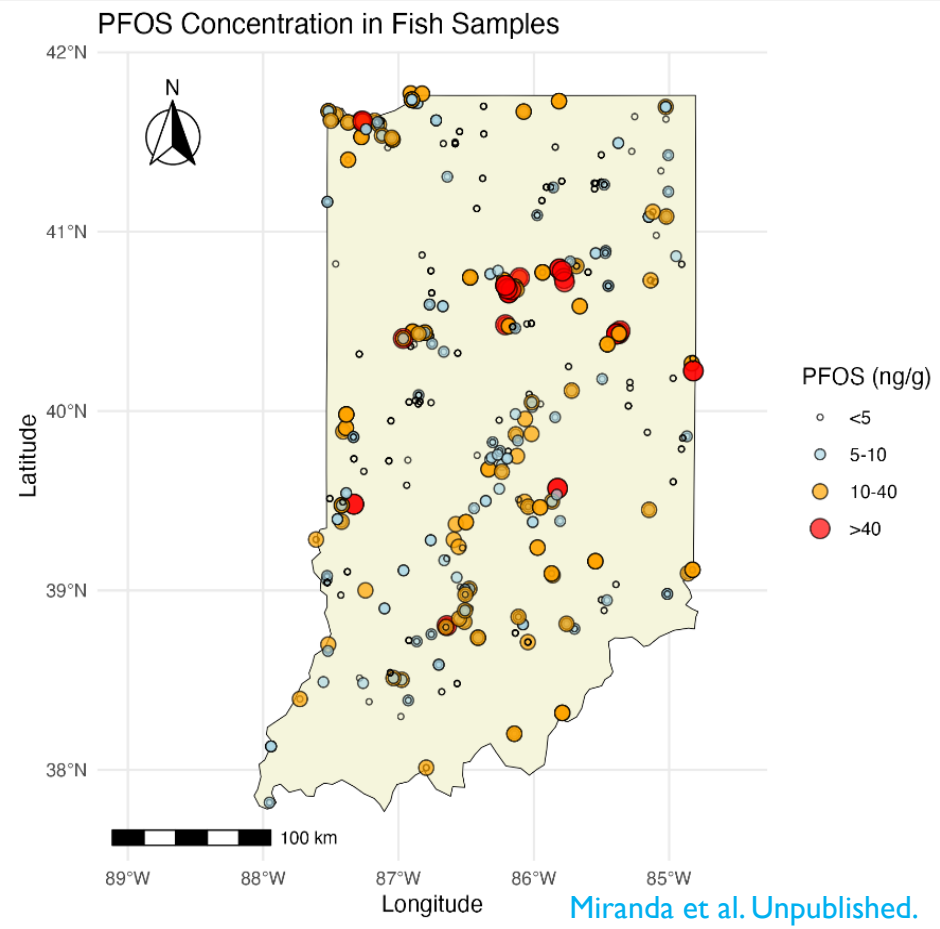
# PFAS: Animal Health ⟷ Human Health




Hoskins et al. Unpublished.

**Biosolids lead to high PFAS burdens in fish, potentially major human exposure route**




Miranda et al. Unpublished.

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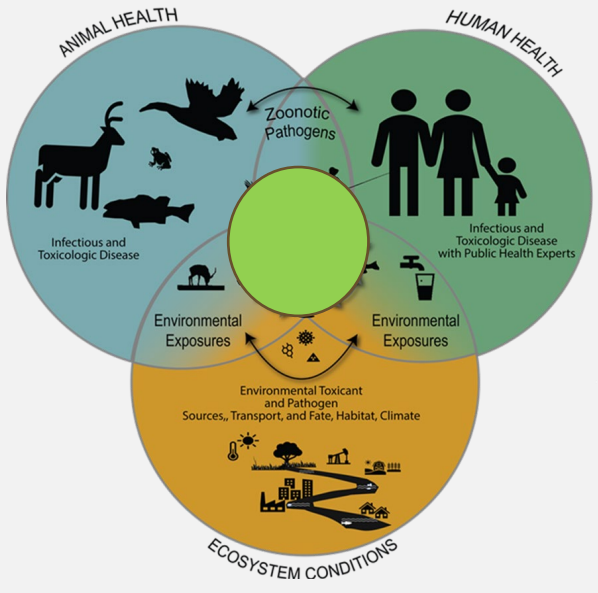
# PFAS: Animals ⟷ Humans ⟷ Environment

***Contaminated Surface Water → Fish & Wildlife exposure → Human Consumption***




- Environment: PFAS from industrial discharge or firefighting foam accumulates in rivers and lakes.
- Animal Health: Fish, frogs, and birds accumulate PFAS, leading to liver toxicity, reduced hatching success in birds, and immune suppression.
- Human Health: People eating contaminated fish (especially subsistence fishers) experience elevated PFAS levels linked to thyroid disruption, cancer, and high cholesterol.

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# Poor Public Awareness of PFAS?

- A recent US survey indicated that 45% of the respondents had never heard of PFAS
- 31.6% responded that they had heard of PFAS but do not know what it is
- 97.4% responded that they did not believe their drinking water had been impacted by PFAS

*An important percentage of the public does not perceive PFAS contamination as a risk to themselves*

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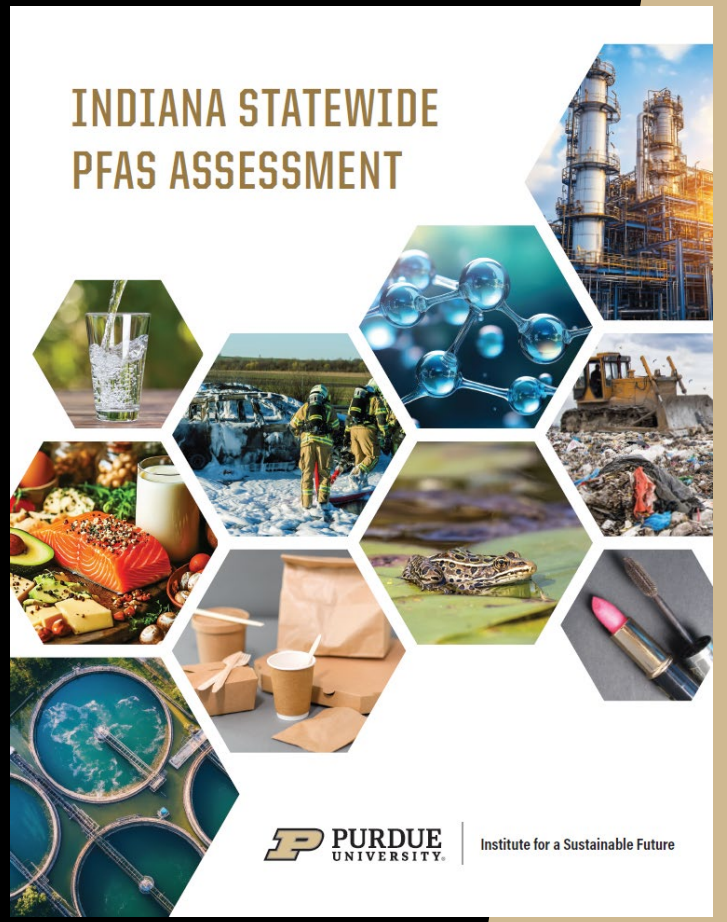
Berthold et al. 2023. PLoS One 18: e0294134.

# *Main Takeaways*

- ***PFAS don't stay where we put them***—they move through water, soil, air, wildlife, crops, and people.
- ***Animals and humans are exposed through the same pathways***, making wildlife and livestock powerful warning systems.
- ***Environmental contamination becomes a public health issue*** through food webs, drinking water, and occupational exposure.
- Solutions must combine ***policy***, ***monitoring***, ***safe alternatives***, ***community engagement***, and ***cross-sector collaboration***.
- A One Health perspective helps ensure that PFAS actions protect ***ecosystems***, ***animals***, and ***people*** together.

# Thank You

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