Indiana Statewide PFAS Assessment: Some Key Takeaways

Indiana Water Summit

8/28/2025

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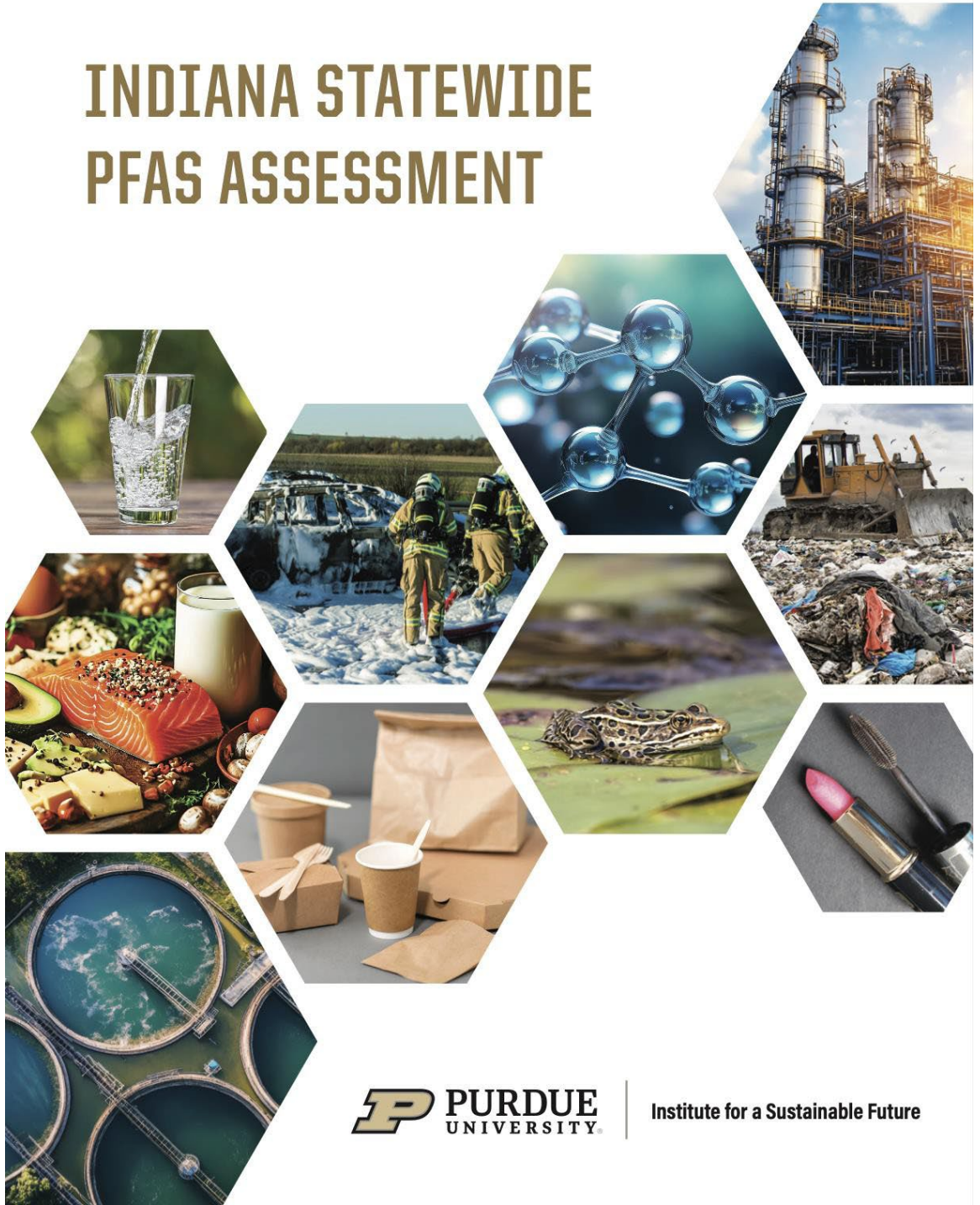


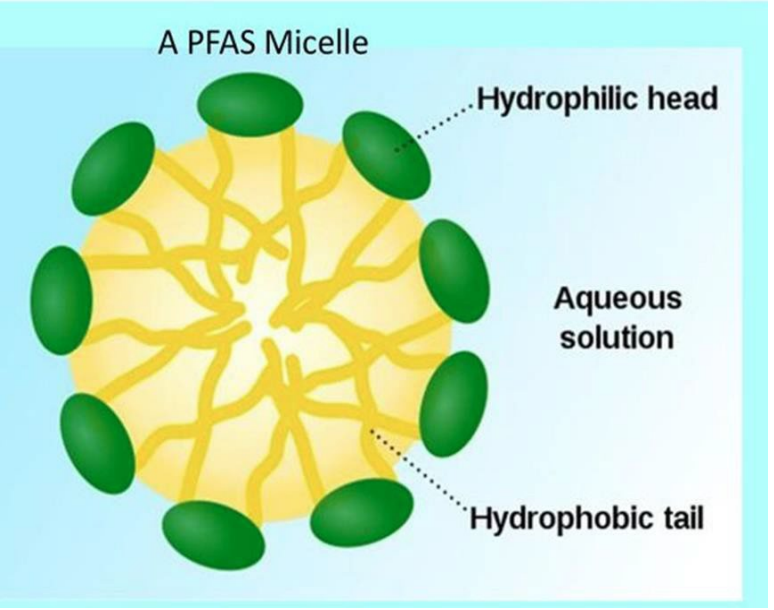
WHAT ARE PFAS?

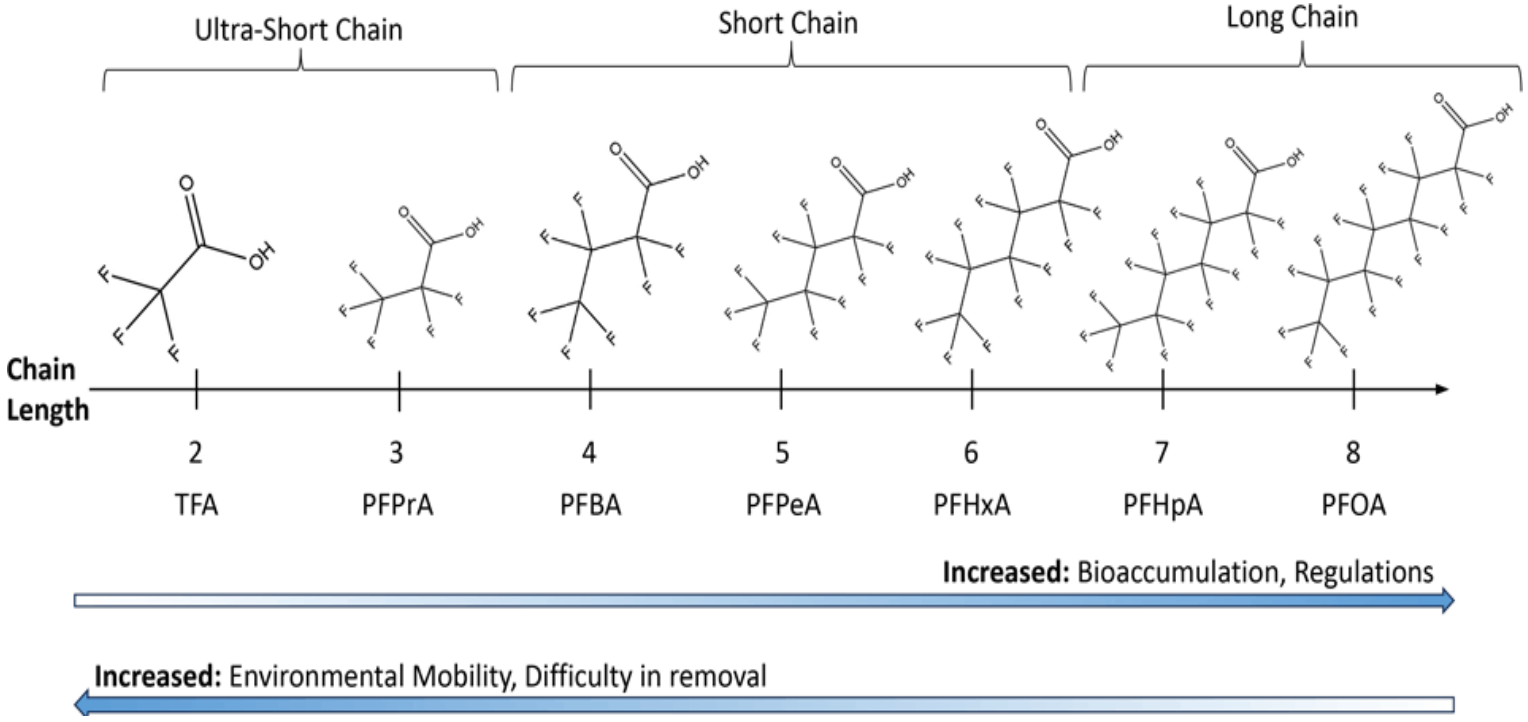
Per- and polyfluoroalkyl substances (PFAS), sometimes referred to as fluorinated chemicals or PFCs, are used in many consumer products and industrial applications because the add the following properties to products:

- **Oil resistance**
- **Stain resistance**
- **Water repellency**

PFAS chemical properties

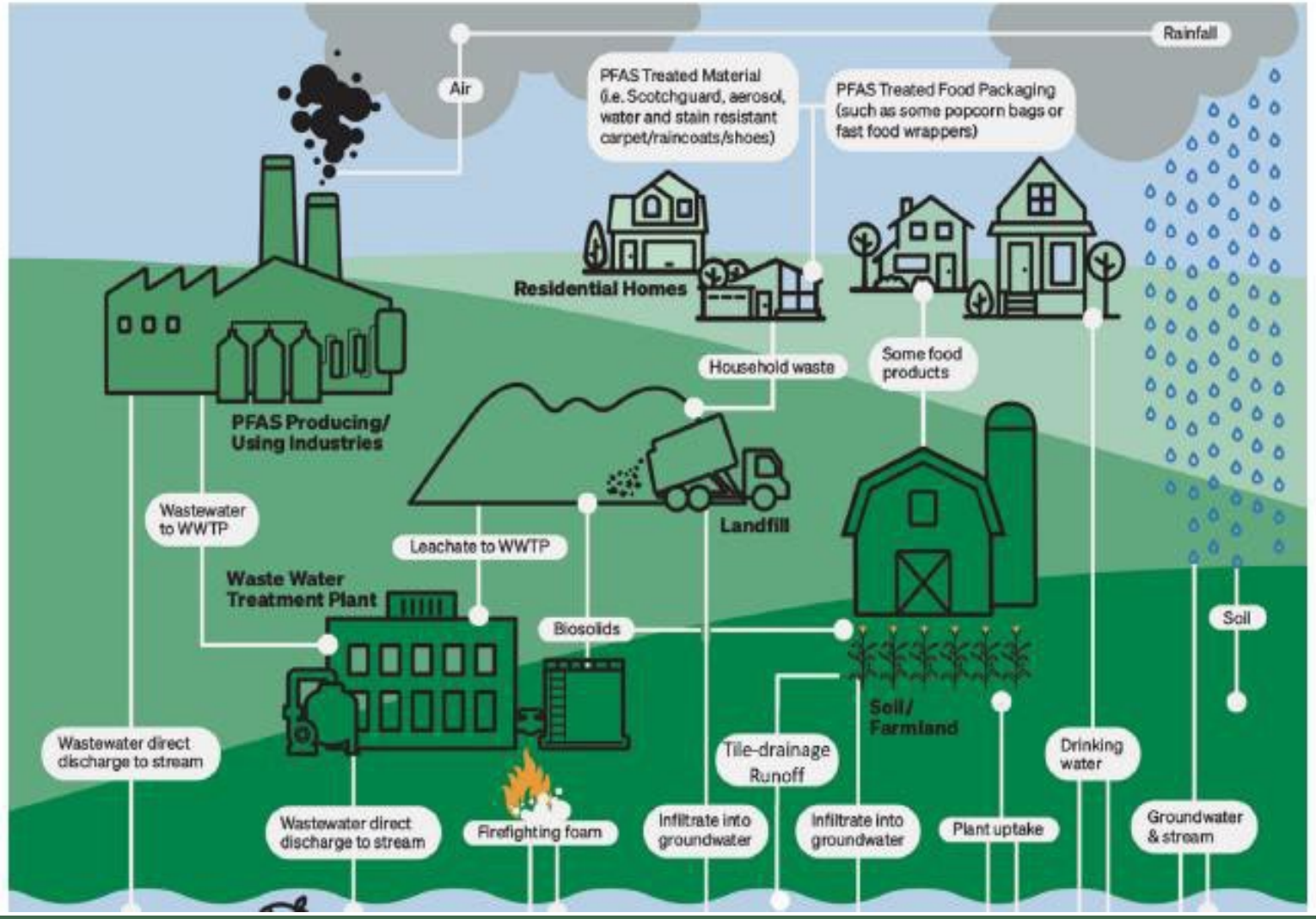
- C-F strong bond
- Chemically and thermally stable
- Water soluble and mobile in ground water
- Surfactant properties





PFAS Cycle

Modified with permission from SOUTHERN ENVIRONMENTAL LAW CENTER



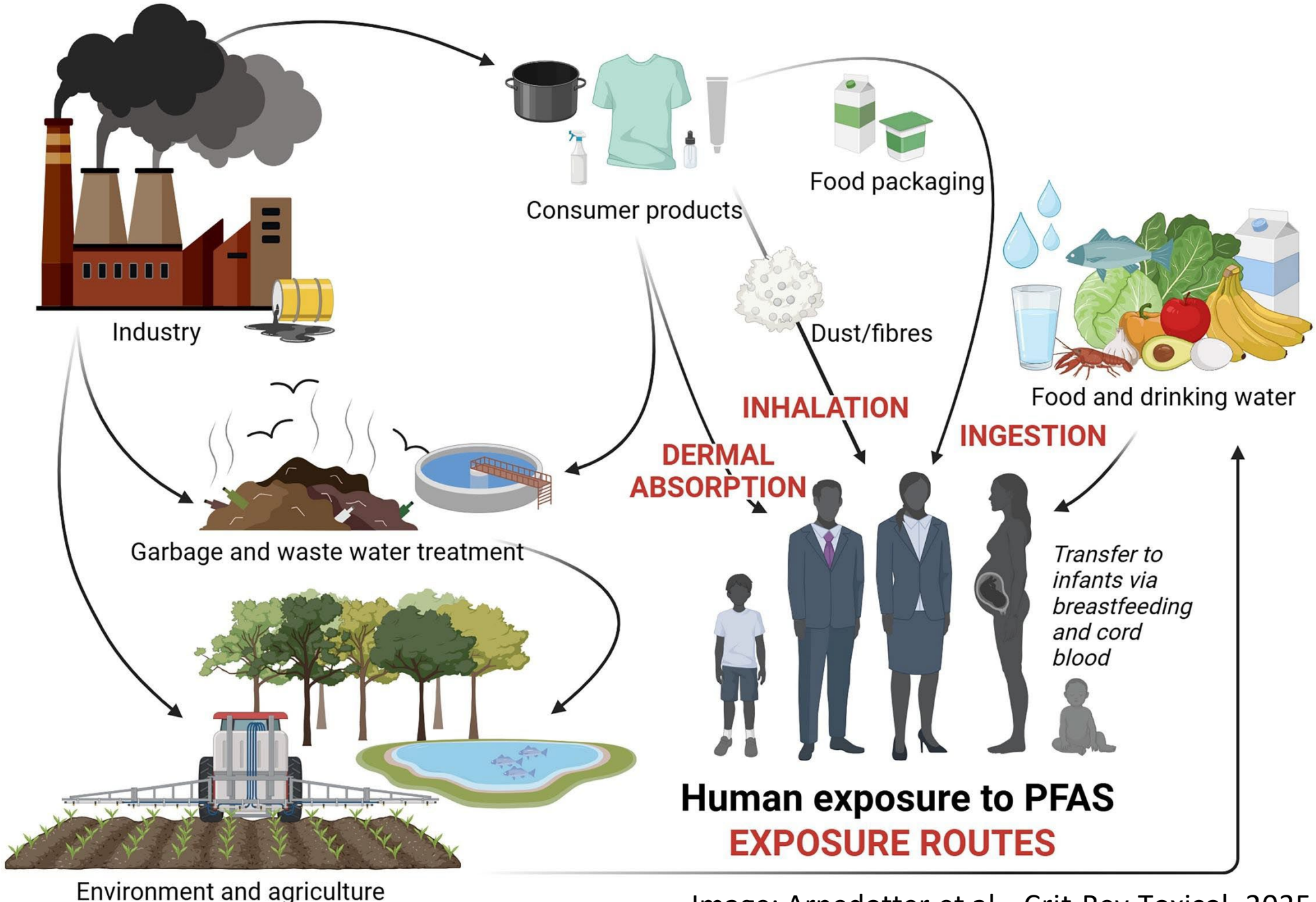
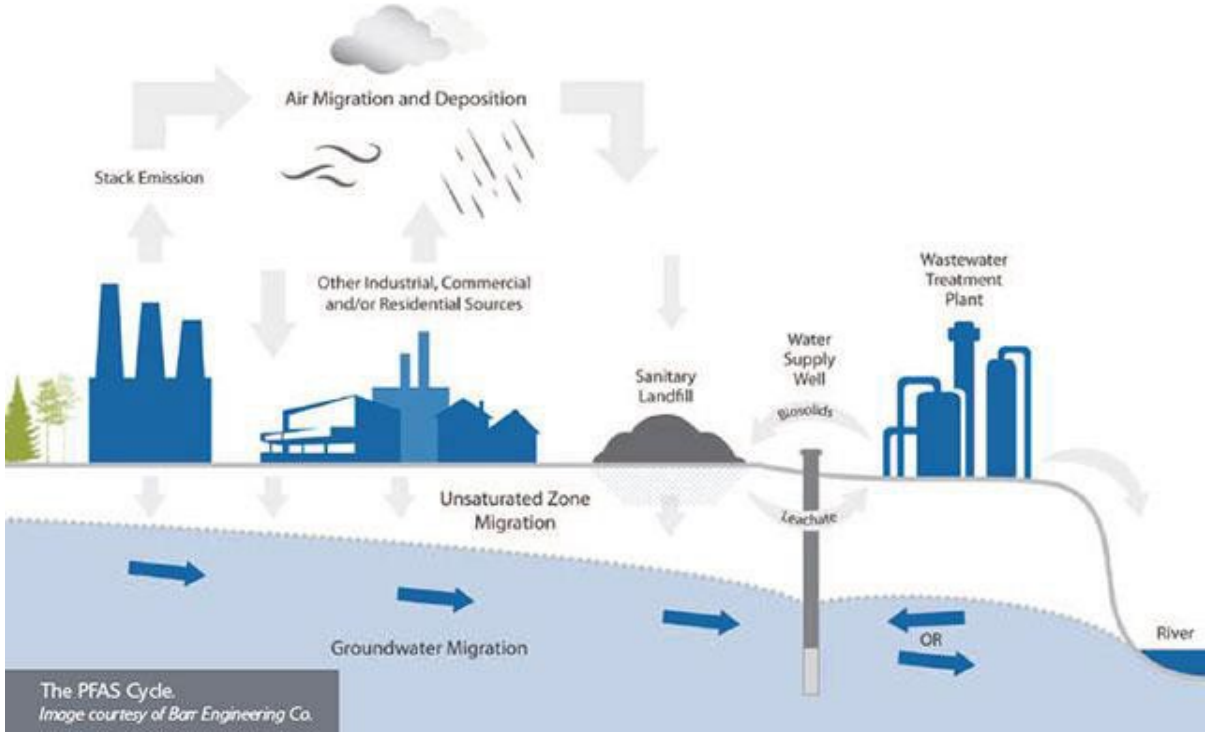
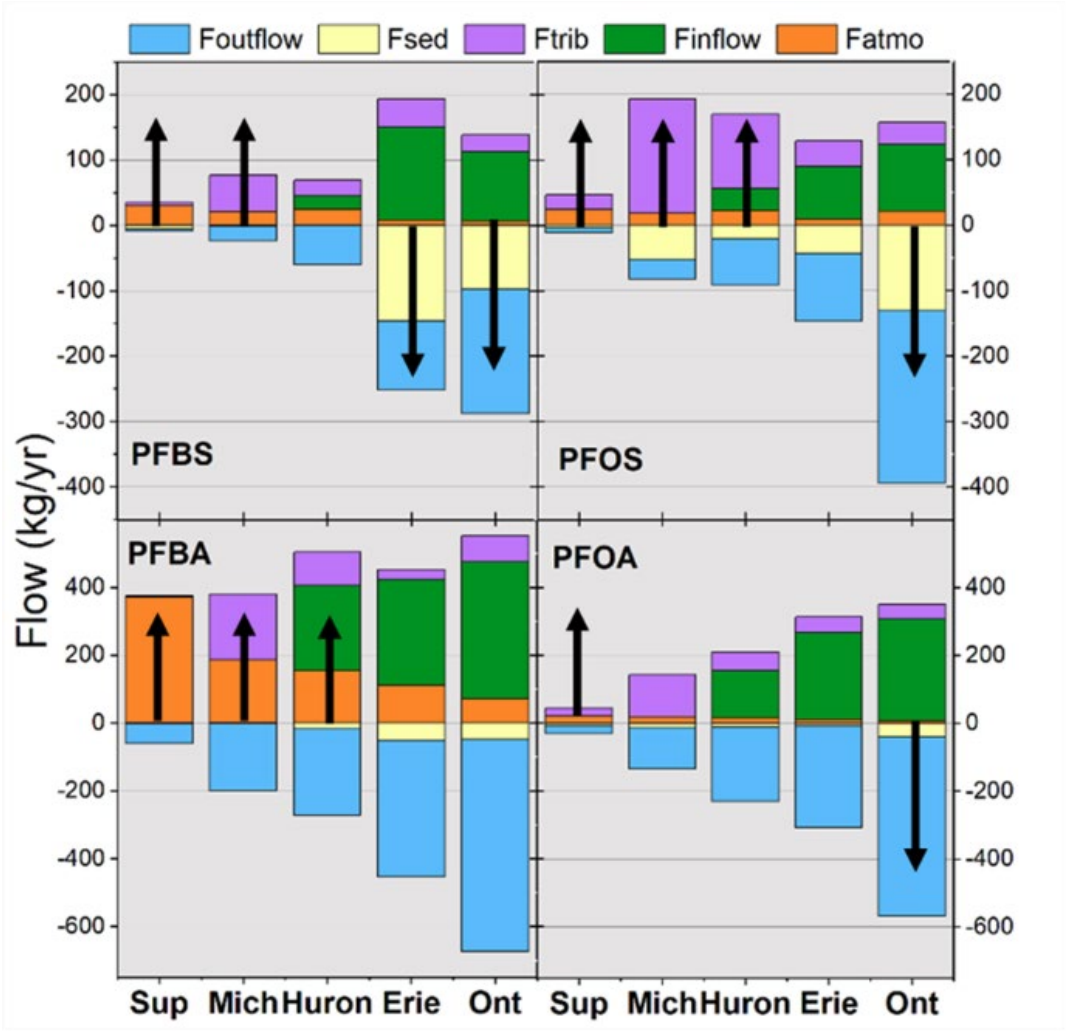


Image: Arnedotter et al., Crit Rev Toxicol, 2025

Is atmospheric deposition the missing piece?





Ecological Impacts of PFAS

- Aquatic systems as final sinks for PFAS accumulation.
- Respiration and diet exposure are the main routes for fish and other aquatic life.
- Animals with permeable skin can also be exposed through dermal contact.

Source: istockphoto

Northern Indiana: Diverse in Ecology, Economy & Demographics

Tributaries to Lake Michigan
60 sites across 5 watersheds
Water samples in Fall 2023
- N = 60 were analyzed for total fluorine
- N = 31 were analyzed for targeted analysis

Water and sediment in Spring 2024
- N = 31 were sites analyzed for target PFAS

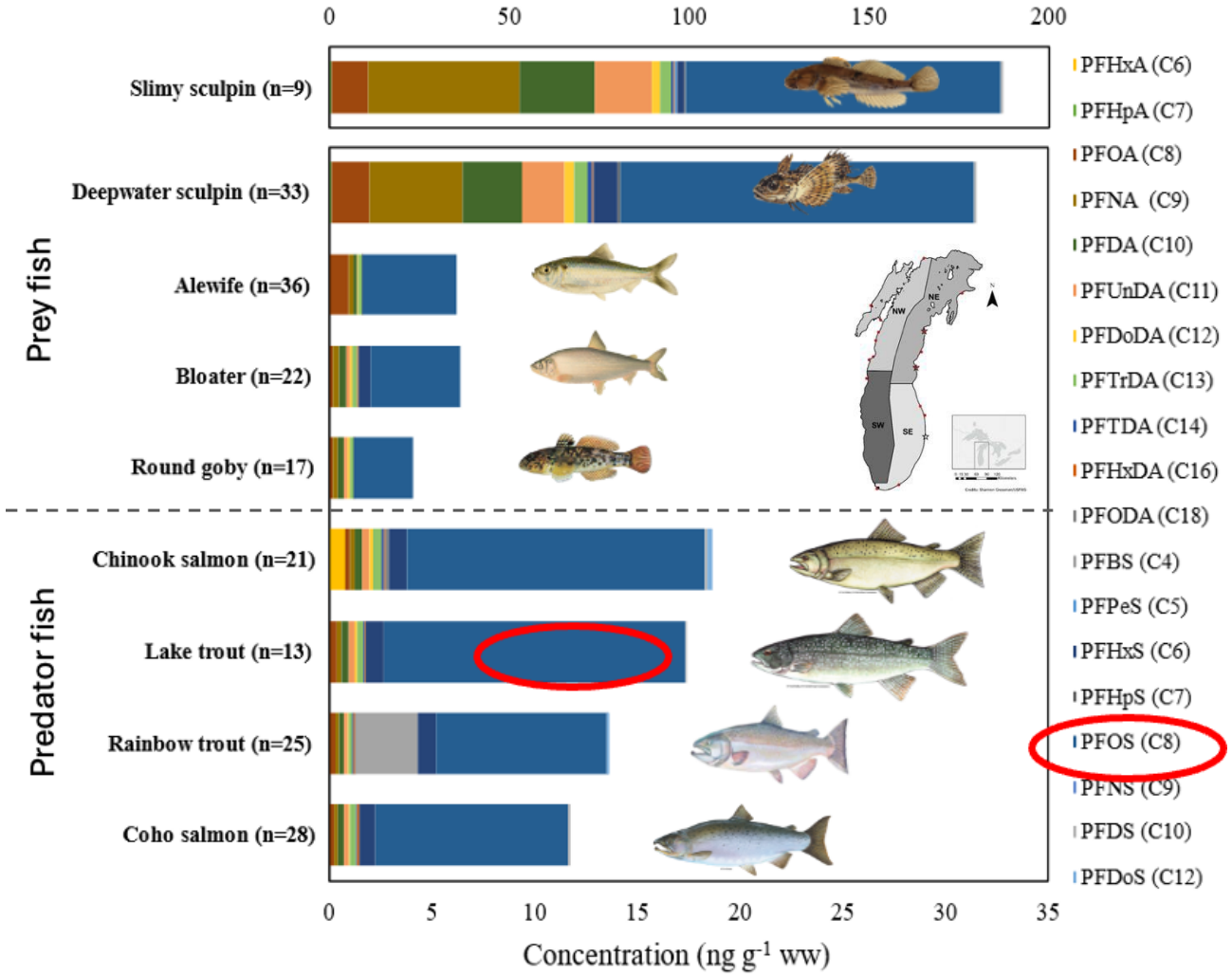
Results:
- No water samples in either season exceeded EPA's Ambient Water Quality Criteria (AWQC) for Protection of Aquatic Life
- Some sites exceeded the EPA National Drinking Water Regulations Maximum Contaminant Levels in Fall and Spring

Biosolids-Impacted Ponds

- Runoff of PFAS contaminated biosolids in IN can reach ponds and be a source of PFAS to fish.
- Preliminary results showed largemouth bass mean with PFOS concentration in fillet = **97 ng/g ww (ppb)**
- There are roughly 60,000 similar ponds in the state, where around 1,000 are within 100m of a biosolids application site
- Ponds are not routinely studied or monitored for contaminants

PFAS were observed in all fish species

- PFAS were detected in all, but three fish samples at varying concentrations.
- PFOS was the most frequently detected compound (98% of samples).
- Generally, predator fish have higher concentrations of PFAS than prey fish, indicating potential for biomagnification of specific compounds.
  - Interestingly, Slimy Sculpin and Deepwater Sculpin have higher PFAS concentrations than those in predator fish.
- Contaminated drinking water and food are the main exposure pathways to humans



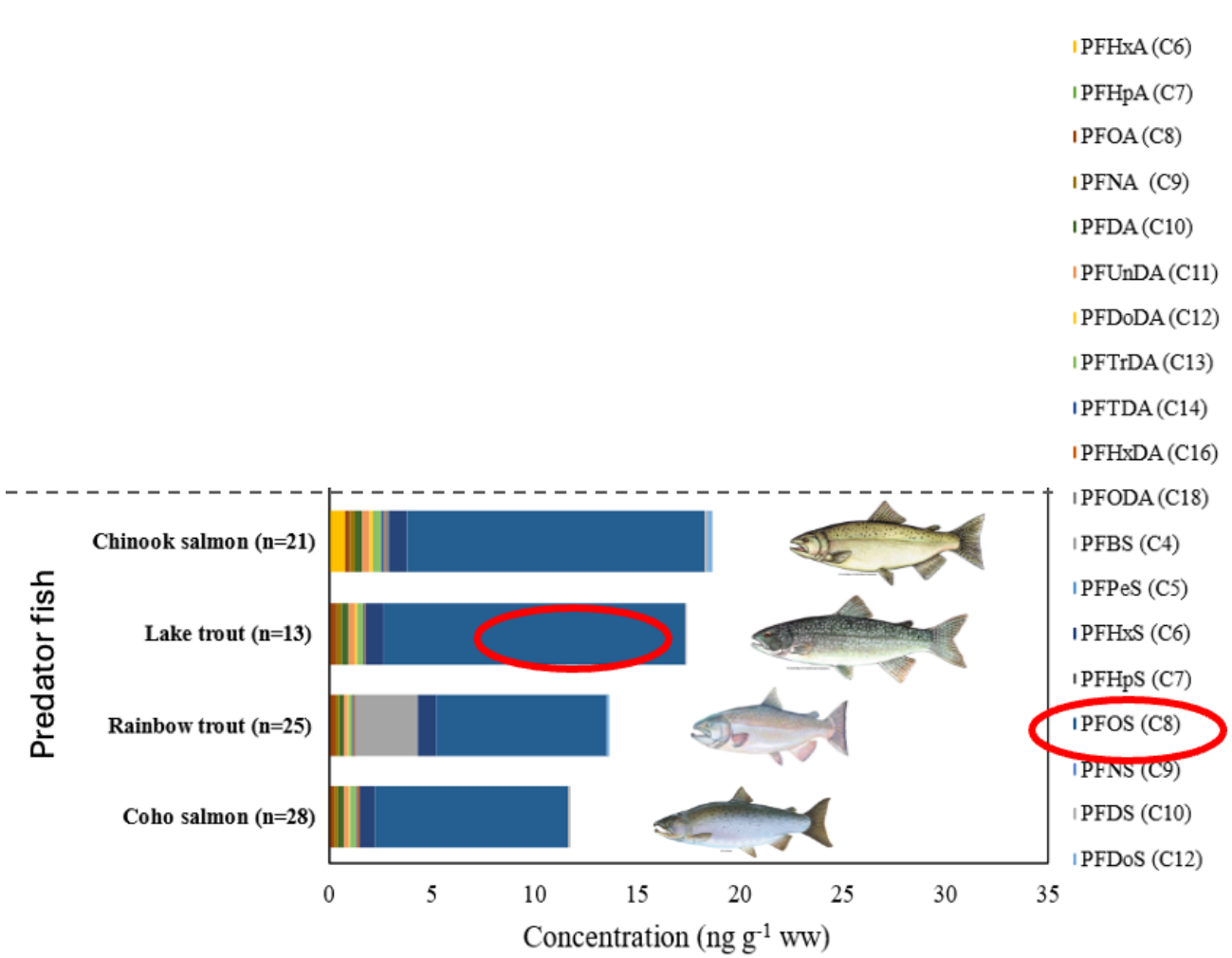
Miranda et al. (2023) STOTEN

Comparison to Consumption Guidelines

- PFOS levels in all 87 salmonids we tested were below the current consumption guidelines recommended by the State of Michigan and the Great Lakes Consortium

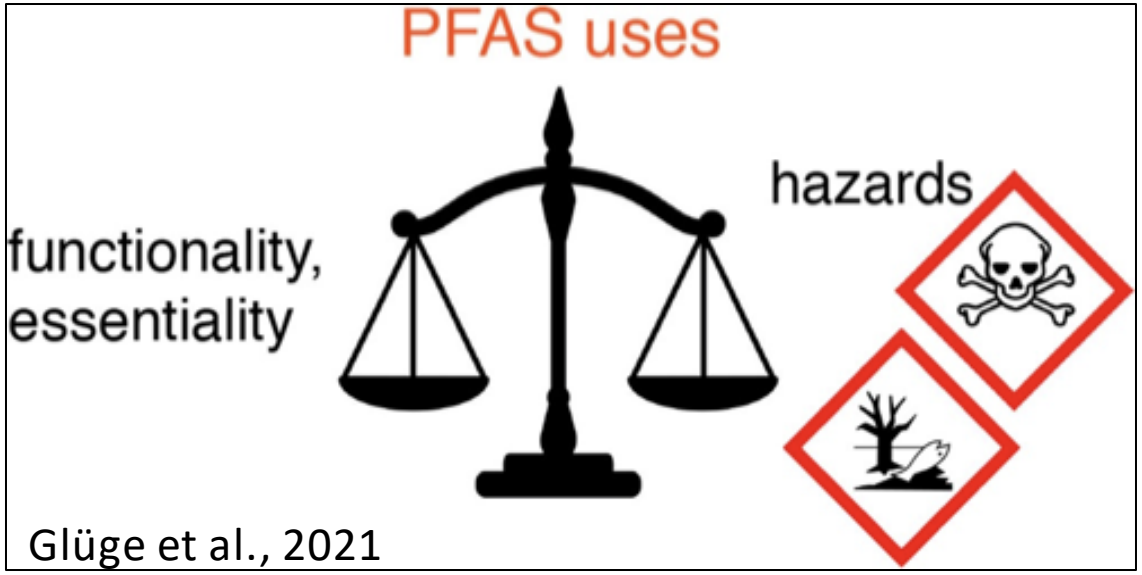
- Currently, only PFOS is considered in these regional guidelines but represents a varying proportion of total PFAS

- PFAS guidance on safety is an active area of research and policy-making and guidelines are likely to evolve



Miranda et al. (2023) STOTEN

PFAS Solutions: Big Picture



- "Solution" to PFAS must include reduction in manufacture/use/release
- We have a roadmap that considers economic/practical necessity against harm: **Essential Use Paradigm**
- Instead of regulating individual PFAS (thousands) or classes of PFAS: regulate the uses!
- Paradigm used to phase out ozone depleting CFCs in the 1980s/1990s (Montreal Protocol)
  - Case study for how to effectively solve a global environmental problem!

- **Essential** = high priority for use and substitutes are not available

- **Substitutable** = high priority of use, but alternatives to PFAS are already available

- **Non-Essential** = low priority of use, effective alternatives already available

PFAS Solutions: Leveraging Indiana PFAS Resources

- Major Conclusion from IN PFAS Report: although PFAS present a major challenge, **we have a lot of smart people working on PFAS in our state, across multiple sectors**
  - Many of you are in the room now!
- Seems prudent to increase efficiency of how we use available resources/expertise to maximize benefit
- Establishing an **Indiana PFAS Research and Action Network** could be a step in this direction
- Currently in stakeholder engagement/visioning phase: **please provide your feedback and contact information!**

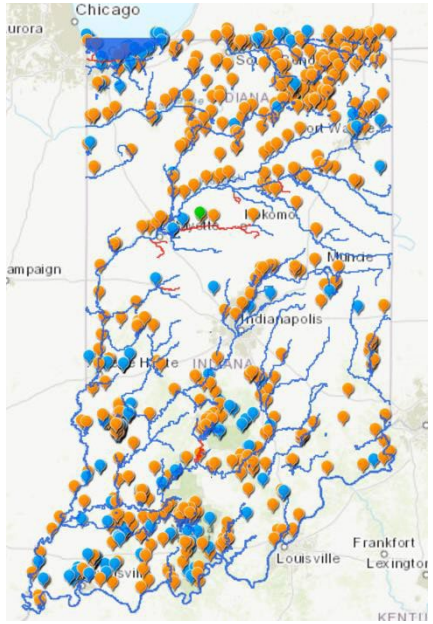
Take a short survey to survey to help us design the Indiana PFAS Network

IN PFAS Network: Increasing Communication and Cooperation

- Many of us working in this area, but we don't always know:
  - Who is working on what, or how to find each other
  - Where to find data
- Historically, limited cooperation among sectors. Academic/Public sector example:
    - To understand epidemiological/ecological impacts of PFAS, academics always need larger datasets
    - IDEM has extensive water and fish monitoring datasets: time, money, and statues understandably limit resources to apply them to problems outside their core objectives
    - Academic researchers/IDEM staff now working together to gain epidemiological/ecological insights
- An Indiana PFAS Network could provide a "one-stop-shop" for how to find data, or a person with the expertise to help solve a problem
  - Find data
  - Find an expert or collaborator
  - A forum for other PFAS-related communication
  - Initially, perhaps a website

Indiana Department of Environmental Management

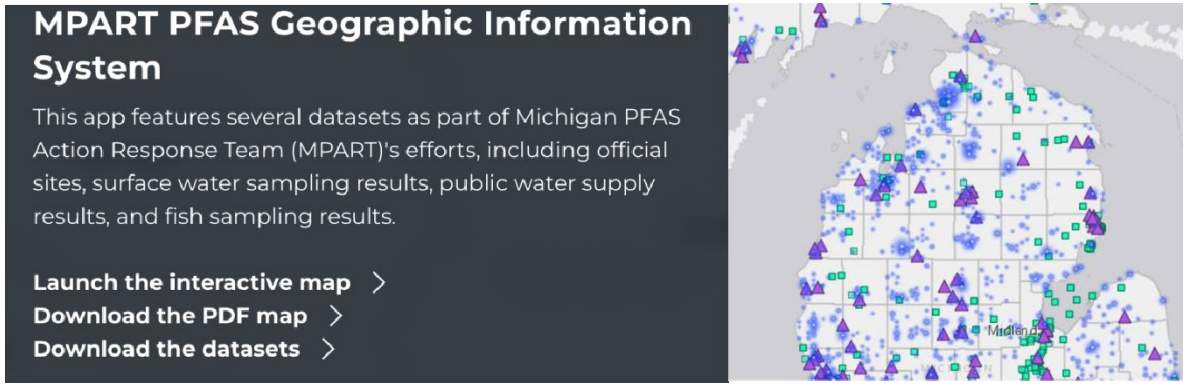
Phase	Population Served
Phase 1	3,300 to 10,000
Phase 2	<3,300
Phase 3	>10,000
Phase 4	Surface Water Bodies
Phase 5	NTNC Systems (schools and daycares)



IDEM has collected extensive data on PFAS drinking water (top), and in fish tissues (bottom)

IN PFAS Network: Building Toward an IN PFAS Strategic Plan and Response

- Ultimately, money will be required: the state legislature would likely need to step in
- States that have aggressively funded PFAS response show how beneficial this can be: see the Michigan PFAS Action and Response Team (MPART)
  - 7 state agencies: regularly collaborate with MI universities, federal agencies, local groups
  - In addition to supporting research:
    - Provide outreach/education and **actionable guidance for the public**, including easy access to testing (e.g., self-sampling for well water)
    - Find and administer funding to **implement mitigation strategies** at local level
    - Data hosting, with public facing apps to find and explore data
    - Strategic plans for long term solutions to complex problems
- Indiana deserves this type of response, too!



IN PFAS Network: Help Us Build It!

- Please consider providing your contact information and some feedback on what you'd find useful in an ideal IN PFAS Network
- Plan is to gather contact information/feedback from interested parties in fall 2025 and to begin to implement in 2026
- QR Code at right, also a table here at the conference with link to participate

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Thank you for listening!

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