



Technical and Practical Challenges for Regulating PFAS

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Battelle Memorial Institute

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Environment & Agriculture

- Environmental chemistry
- Site management
- Data management
- Climate solutions
- PFAS solutions
- Emerging contaminant solutions

Research Infrastructure

- DOE U.S. National Laboratory operations management
- NSF National Ecological Observatory Network (NEON)
- NSF Arctic Research Science and Logistics Support

Practical Challenges to Regulating PFAS



Emerging Risks Versus
Fixed Standards



Which Environmental
Media to Prioritize?

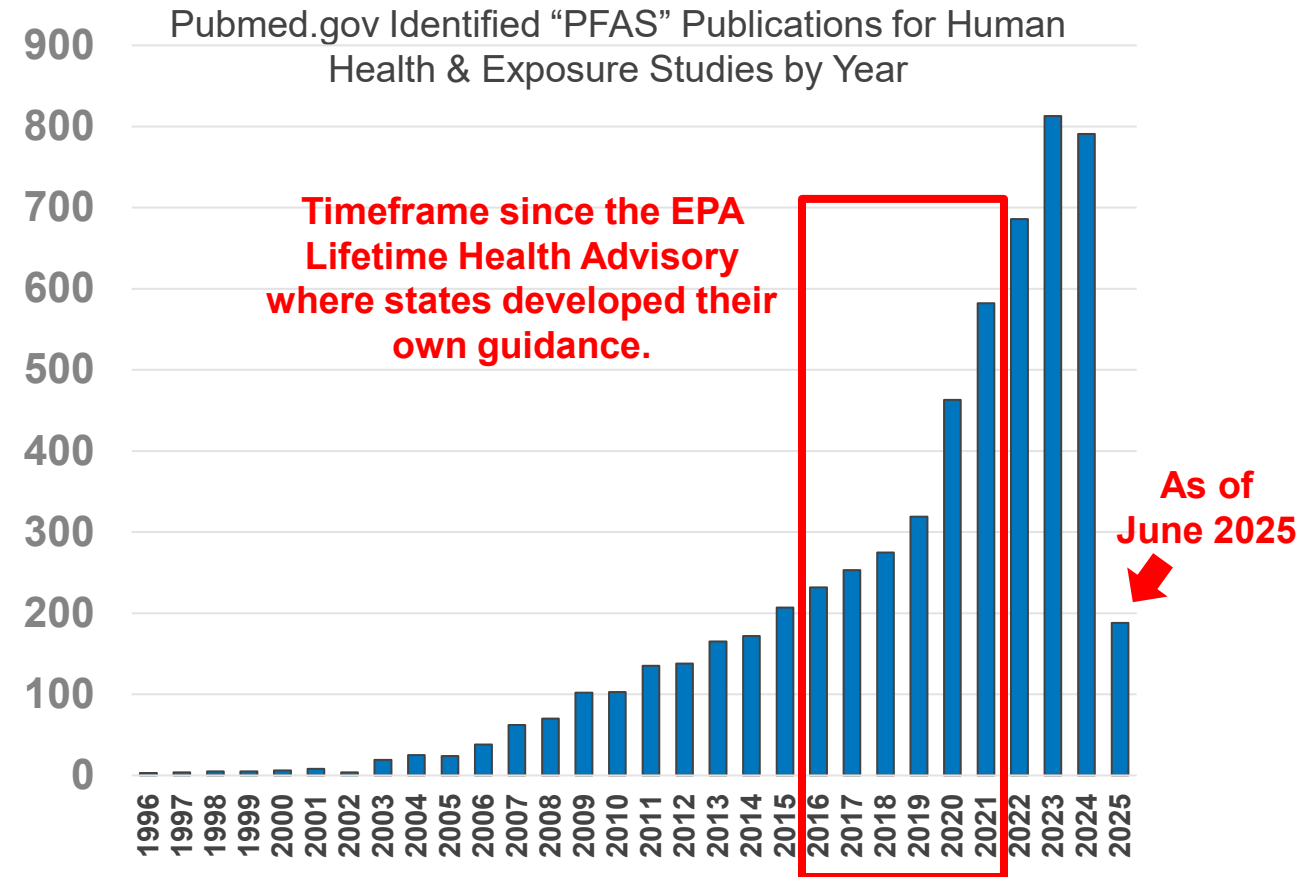


Feasibility of Monitoring
and Treatment

Evolving Science = Moving Goal Posts

- Science and policies inform the risk assessment outcome.
- Risk assessments inform recommended regulatory standards.
 - Based on best available science at the time the standards are proposed.
 - *Science is a process, not an outcome.*
- Uncertainty invokes risk management decisions over science-based decisions.
- Likely novel methods or management strategies will be applied for risk assessment and clean-up goals.
 - PFAS as a class
 - New Approach Methods (NAMs)
 - A.I. and In silico tools for risk assessment

The Available Literature for Health Hazards of PFAS is Rapidly Changing



Emerging Risks Versus Fixed Standards

- *Drinking water standards are not default for surface water protection.*
- In 2024 EPA recommended various criteria for surface water protection, namely freshwater:
 - [Technical Fact Sheet: Draft National Recommended Human Health Ambient Water Quality Criteria for PFOA, PFOS, and PFBS](#)
 - [Fact Sheet: Final Recommended Aquatic Life Criteria and Benchmarks for Select PFAS](#)
- Helpful resources for Tracking these state-by-state or their differences are: [ITRC PFAS Technical Guidance Document](#) and [ECOS Compendium of State Actions \(2025\)](#).

Specific PFAS	Drinking Water (Human Health Only)			Proposed Surface Water Criteria (2024)		
	USEPA MCLs (ng/L or ppt)	USEPA RSLs (ng/L or ppt)	DoD Guidance (ng/L or ppt)	Drinking Water & Fishing	Fishing Only	Freshwater Aquatic Life (Chronic)
PFOS	4	0.2	12	0.06	0.07	250
PFOA	4	0.00027	12	0.0009	0.0036	100,000
PFHxS*	10	39	30	-	-	-
PFNA*	10	5.9	30	-	-	-
PFBS*	2,000	600	-	400	500	-
GenX*	10	1.5	30	-	-	-

MCL = Maximum Contaminant Level; RSL = Regional Screening Level; DoD = Dept. of Defense

*Hazard Index (HI) for the combination of PFHxS, PFNA, PFBS and GenX. USEPA exclude PFOS and PFOA from the HI.

Which Environmental Media to Prioritize?

States tend to prioritize regulations based on:

1. *Where is there meaningful potential for exposure reduction?*
2. *Where to they have authority?*

Examples from New Hampshire:

- New Hampshire started with drinking water and groundwater ([2019/2020, HB 1264](#))
 - Maximum contaminant levels (MCLs) and Ambient Groundwater Quality Standards (AGQS)
- Proposed A Plan for Regulating PFAS in Surface Water ([2019, Surface Water Plan](#))
- Aqueous Film Forming Foam (AFFF) Take Back Program ([2019, SB 257](#))
- PFAS Response Fund for Statewide Sampling ([2020; NH 1264](#))
- PFAS Blood Testing and Insurance ([2020; NH 1264](#))
- PFAS in Products Ban ([2024, HB 1649](#))

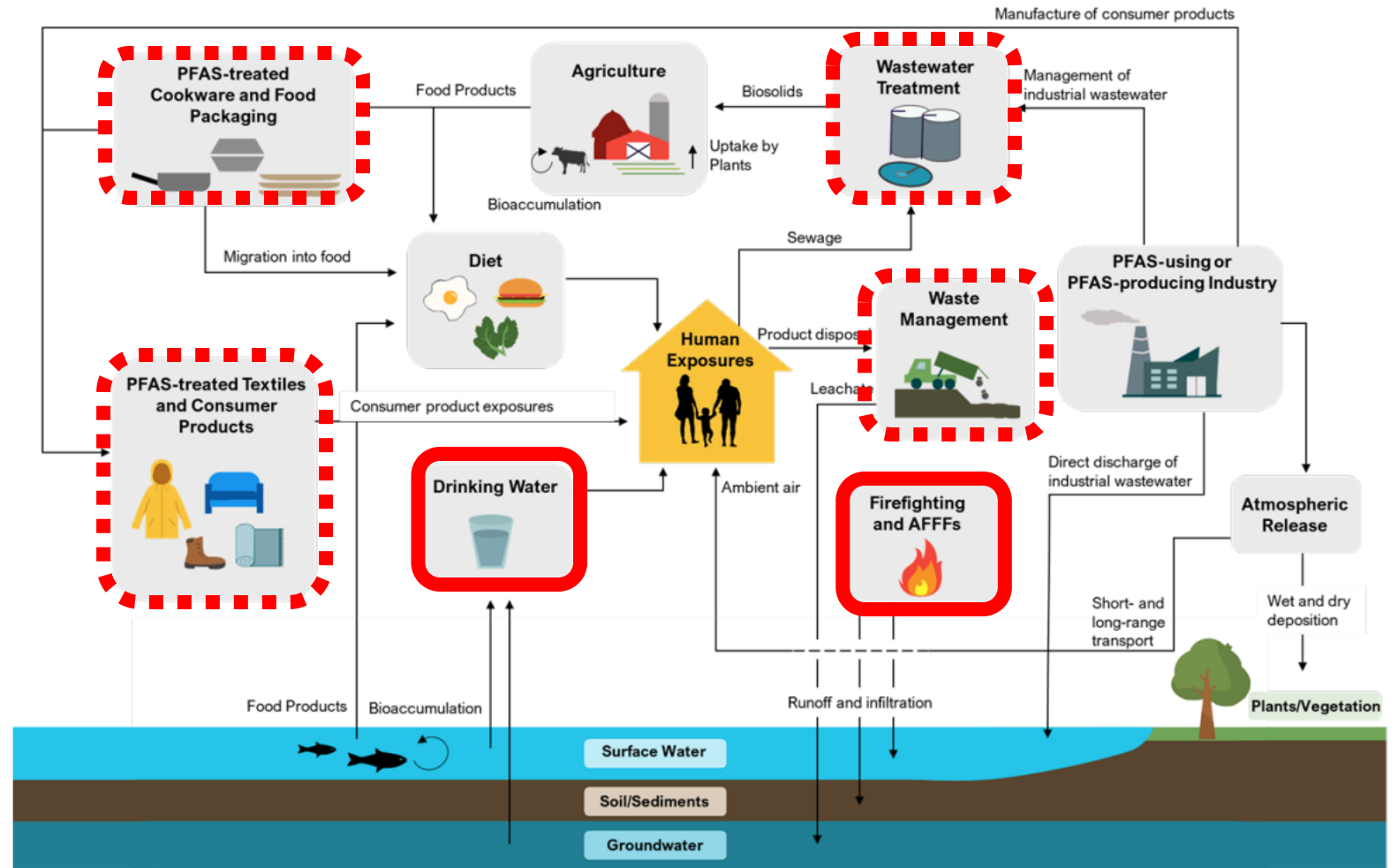


Figure Source: Consumer Product Safety Commission (prepared by RTI, 2023). [Characterizing PFAS Chemistries, Sources, Uses, and Regulatory Trends in U.S. and International Markets](#). CPSC RFP No. CPS-2115-22-0009

Feasibility of Monitoring and Treatment

The complexity of surface water systems makes PFAS management difficult for monitoring, attribution and treatment.

- New Hampshire is a non-delegated state, so US EPA has final say on permits such as National Pollutant Discharge Elimination System (NPDES).
- New Hampshire regulates surface waters based on:
 - designated uses, such as fishing or swimming;
 - numerical or narrative criteria to protect the designated uses;
 - and an antidegradation policy, which maintains existing high-quality water that exceeds the criteria.
- Without **monitoring capabilities**, any regulation is a declaration.
- Monitoring without treatment options creates tensions.

Advocates challenge EPA approval of Manchester's wastewater permit

New Hampshire Public Radio | By Mara Hoplamazian
Published December 11, 2025 at 5:51 PM EST



Gaby Lazzola / NHPR

Detection and Surveillance Challenges

It's complicated and costly, but possible.

Methods for Different Media Vary

Most common methods include:

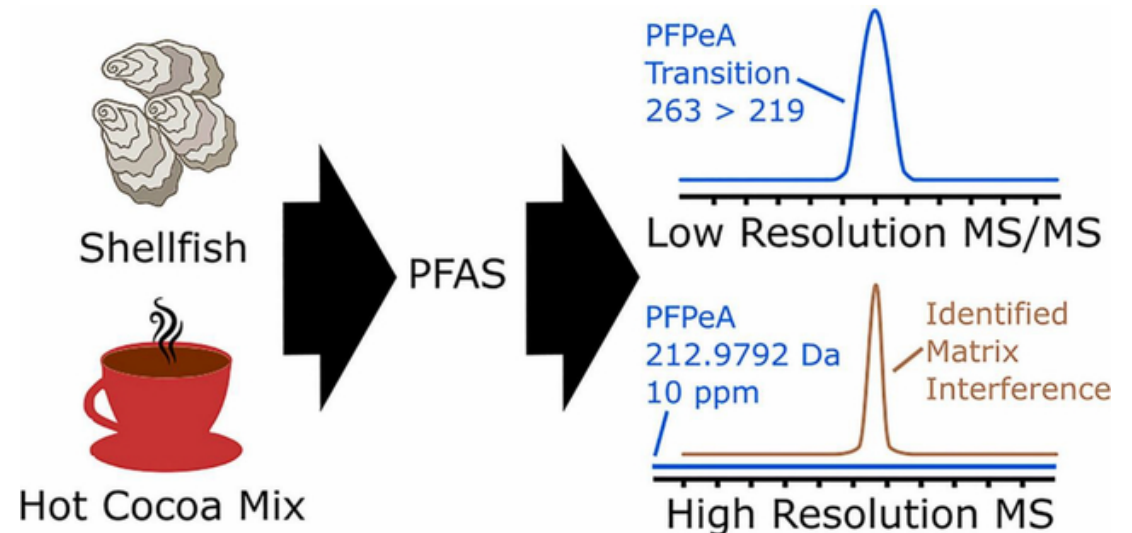
- Those developed by US EPA or US FDA.
- No method covers all possible PFAS or media.
- Relatively expensive for large scale monitoring.
 - EPA 1633 ~\$300-500 per sample

Method Name	#PFAS Analytes	Media	Usage
<i>Multiple Lab Validation</i>			
USEPA 1633	49	Water, Soil, Tissues	High
USEPA 537.1	18	Water	High
<i>Limited Lab Validation</i>			
FDA C-010.03	20	Food	Low
FDA C-010.03	30	Food	Low

Interpret Results with Caution

Past studies have been plagued by analytical issues.

- Example of PFPeA “interferent”¹



Treatment Challenges

- Drinking water is relatively straight forward.
 - carbon systems and/or maybe resins.
- Other media do not share a common remedial solution, yet.
 - Aqueous film forming foams (AFFF), landfill leachates, sludge and biosolids, soils, sediments, surface water
- Very few technologies adopted. Most are very energy intensive and costly.
- We want PFAS treatment, but not “here.”
- Significant research has been conducted by the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP)
 - Great podcasts about these projects: PFAS Podcast Series: SERDP and ESTCP Research and Demonstrations

Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances—2026 Version

INTERIM GUIDANCE FOR PUBLIC COMMENT
APRIL 20, 2026



EPA 600/R-25/172 | September 2025 | www.epa.gov/research

PFAS Destruction by a Hazardous Waste Incinerator: Testing Results



1. [Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances—2026 Version](#)
2. [PFAS Destruction by Hazardous Waste Incineration: Testing Results \(2025\). US EPA](#)
3. Aries Image source – Seacoast Online, 2026.

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