

U.S. Geological Survey Strategy for sampling PFAS in groundwater, surface water, and tap water

Bruce Lindsey

Webinar Series on Enterprise Services

PFAS TSCA Workshop

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Overview

- Background and study design
- Sampling progress
- Future sampling plans
- Initial results
- Integrated science in USGS

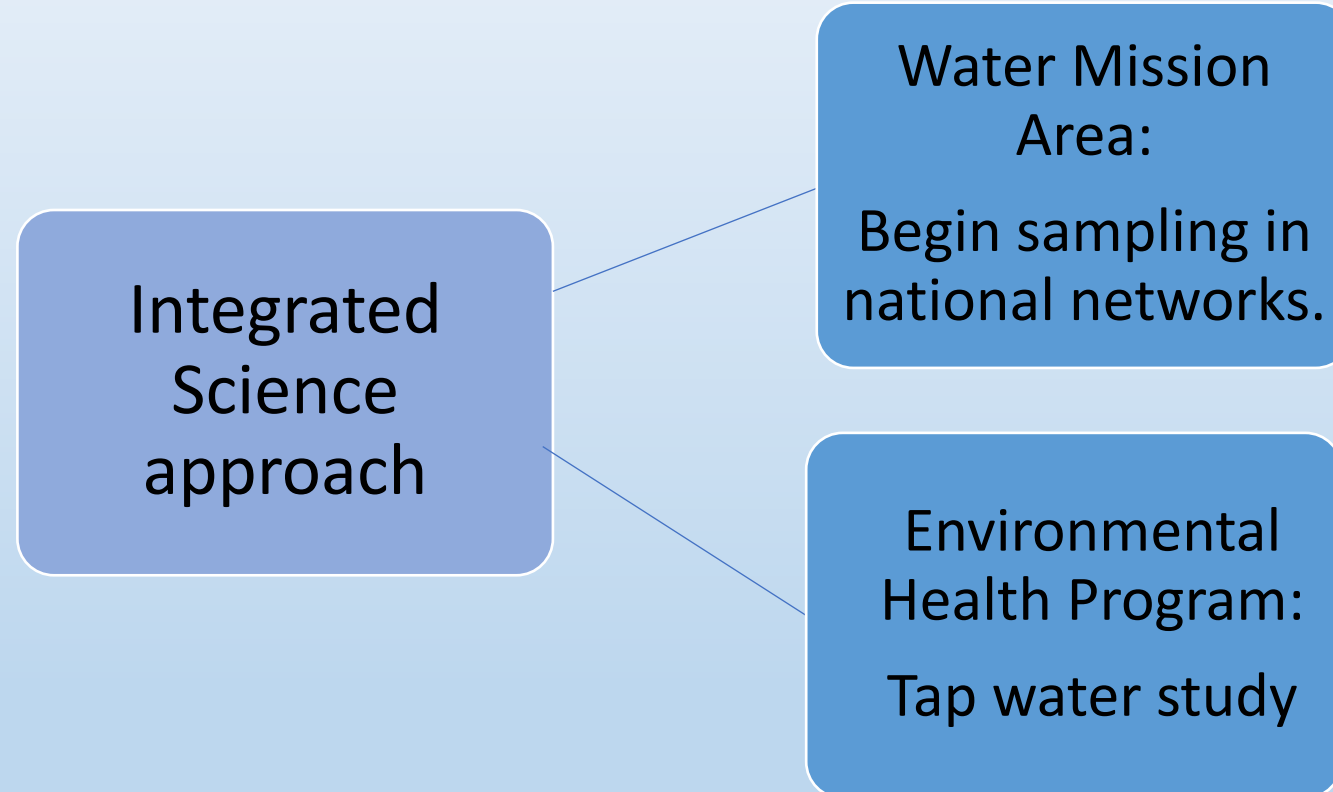
USGS mandate to sample

- National Defense Authorization Act for Fiscal Year 2020
- The U.S. Geological Survey shall carry out a nationwide sampling to determine the concentration of highly fluorinated compounds in estuaries, lakes, streams, springs, wells, wetlands, rivers, aquifers, and soil.

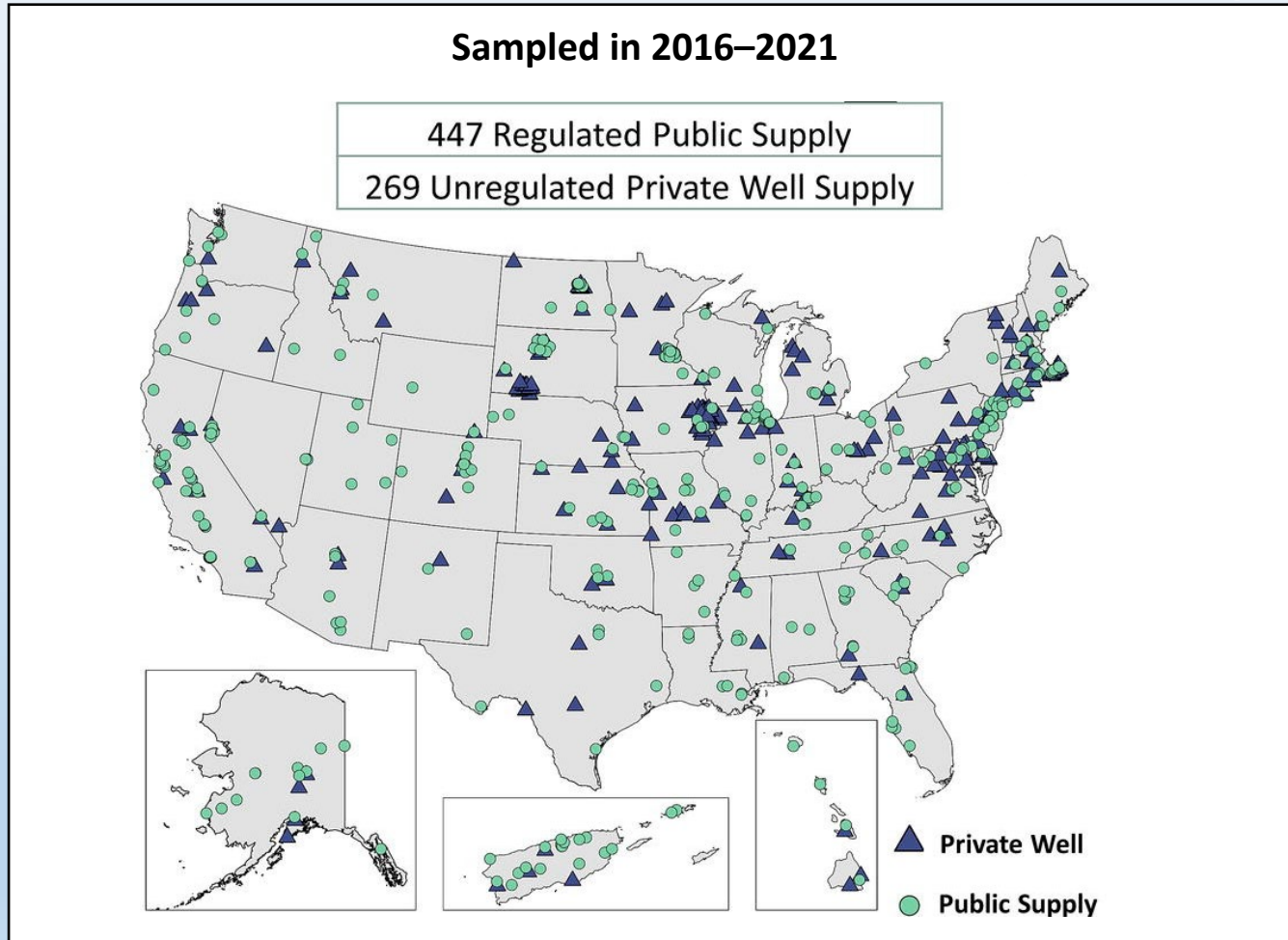
(NDAA; Public Law 116–92, 133 Stat. 1198)

Sampling approach

Sampling implemented to date:



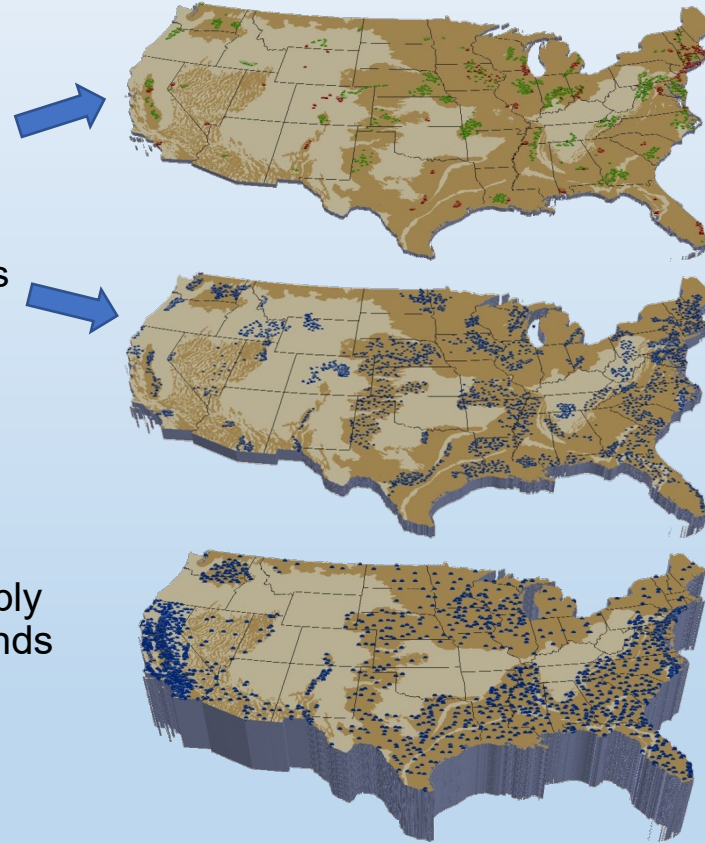
Locations of wells sampled for PFAS for the Tap Water Study



Smalling et al., 2023 <https://doi.org/10.1016/j.envint.2023.108033>

National Water Quality Network: Groundwater is a three-dimensional resource

The 82 groundwater trend networks in the National Water Quality Network are Land Use studies or Major Aquifer Studies and each is sampled once per decade



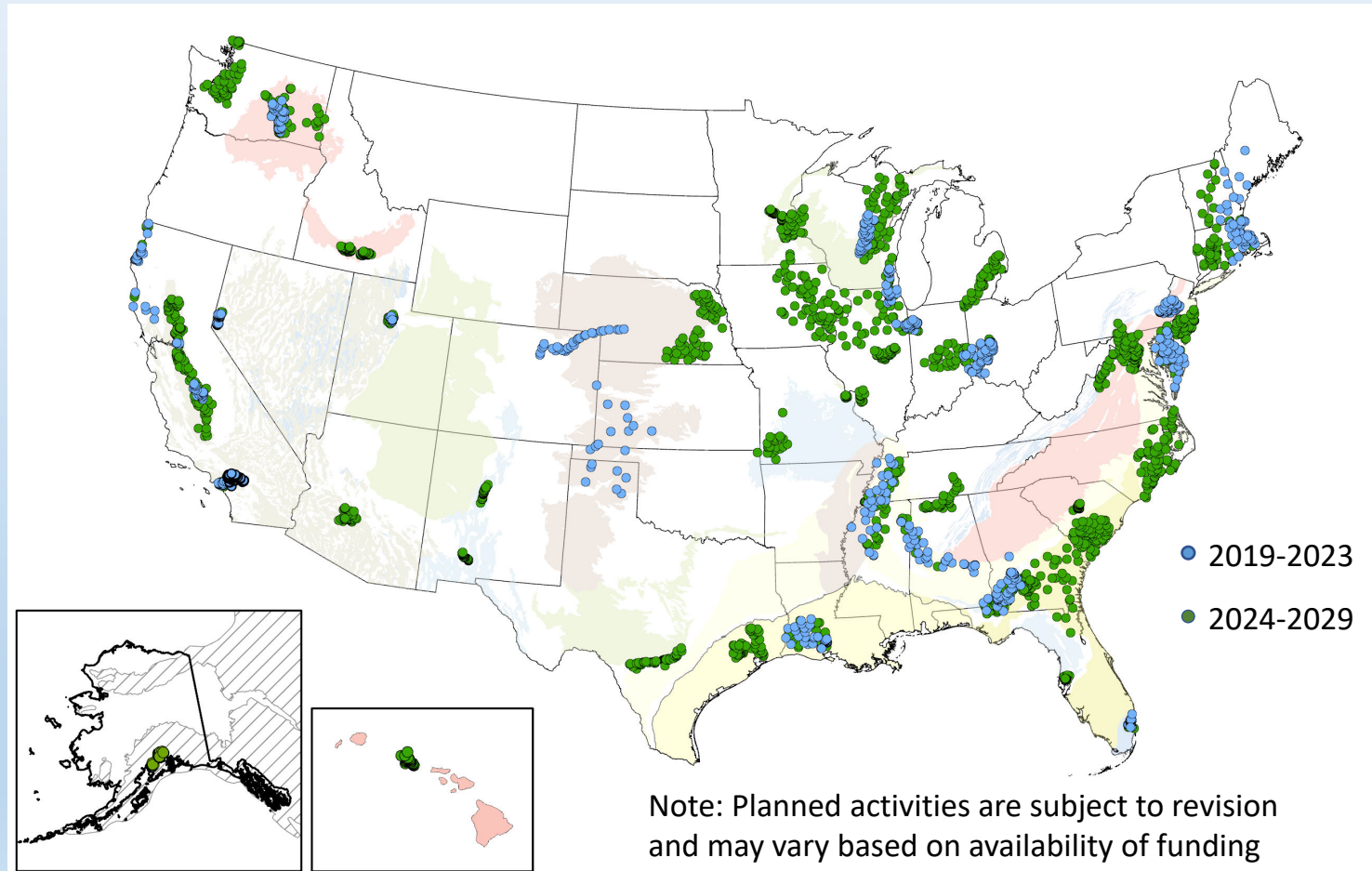
Land Use Studies
typically observation wells
~ 20 to 50 feet

Major Aquifer Studies
typically domestic wells
~ 50 to 150 feet

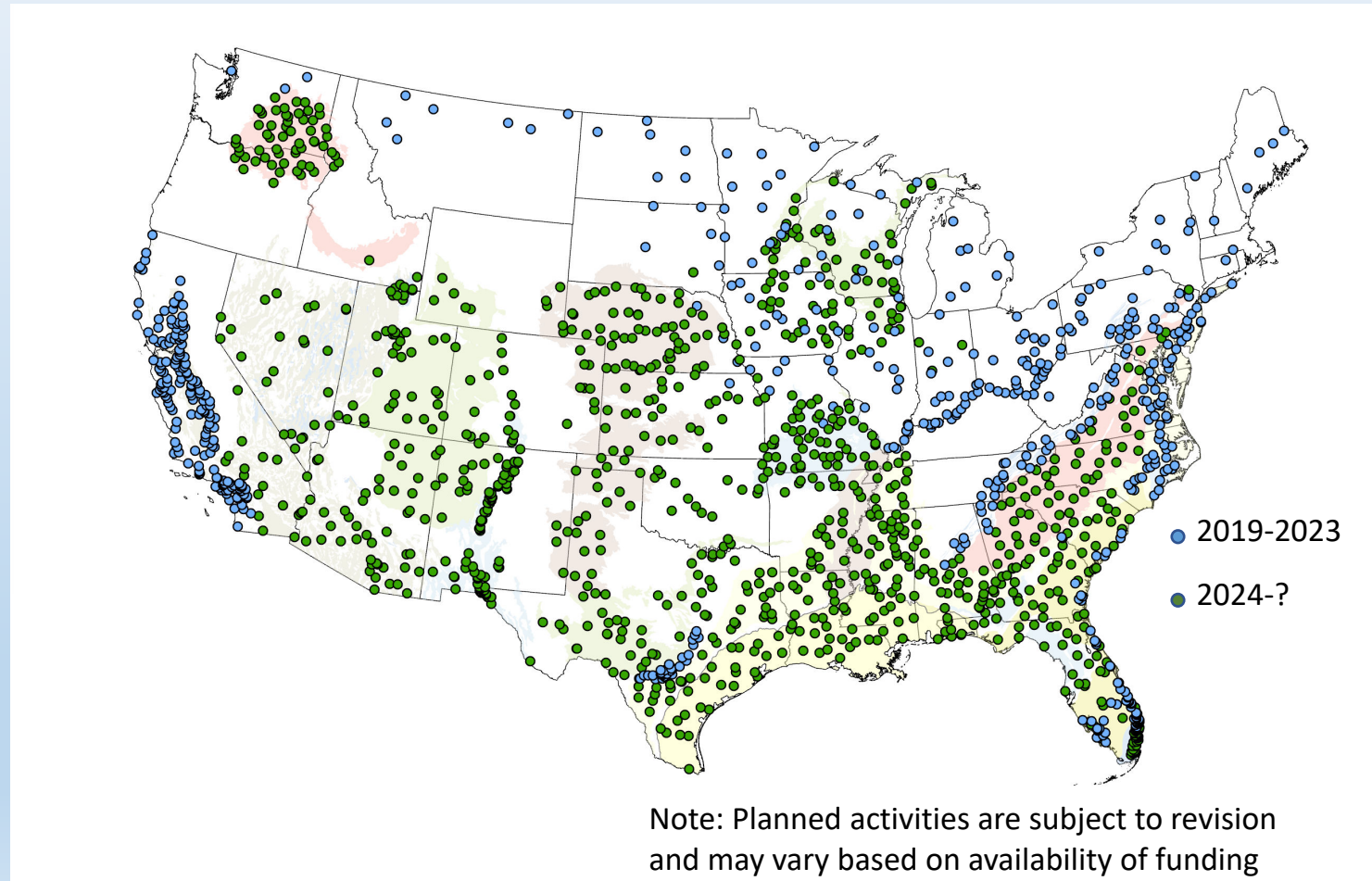
Principal Aquifer Studies
typically Public Supply wells
~ 150 to 750 feet deep

Networks used as a source of public supply are resampled as funds become available

Locations of trend networks sampled or scheduled for sampling by 2029



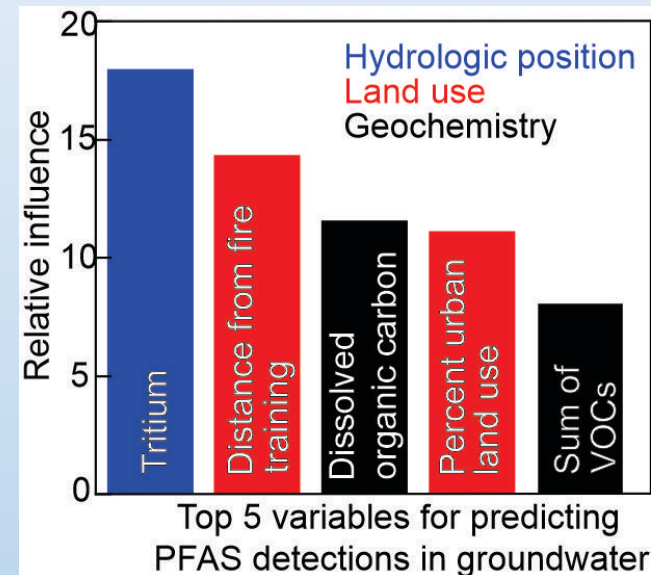
Locations of public-supply well networks sampled or scheduled for sampling



Initial findings: Important variables for predicting PFAS

Top variables for predicting PFAS detection based on initial report (using data from 2019):

- Tritium
- Fire training areas
- DOC
- Urban Land use
- Sum of VOCs



From McMahon and others, 2022
<https://doi.org/10.1021/acs.est.1c04795>

PFAS Concentrations Exceeding Proposed EPA Maximum Contaminant Levels(MCLs) and Hazard Index (HI)

Constituent and benchmark	Network type and Rate of exceedance of benchmark		
	Public-Supply (n=115)	Domestic-Supply (n=107)	Urban (n=28)
PFOA (4 ng/L)	32%	8%	50%
PFOS (4 ng/L)	34%	12%	54%
PFBS/GENX/ PFHxS/PFNA Hazard Index*	9%	3%	10%

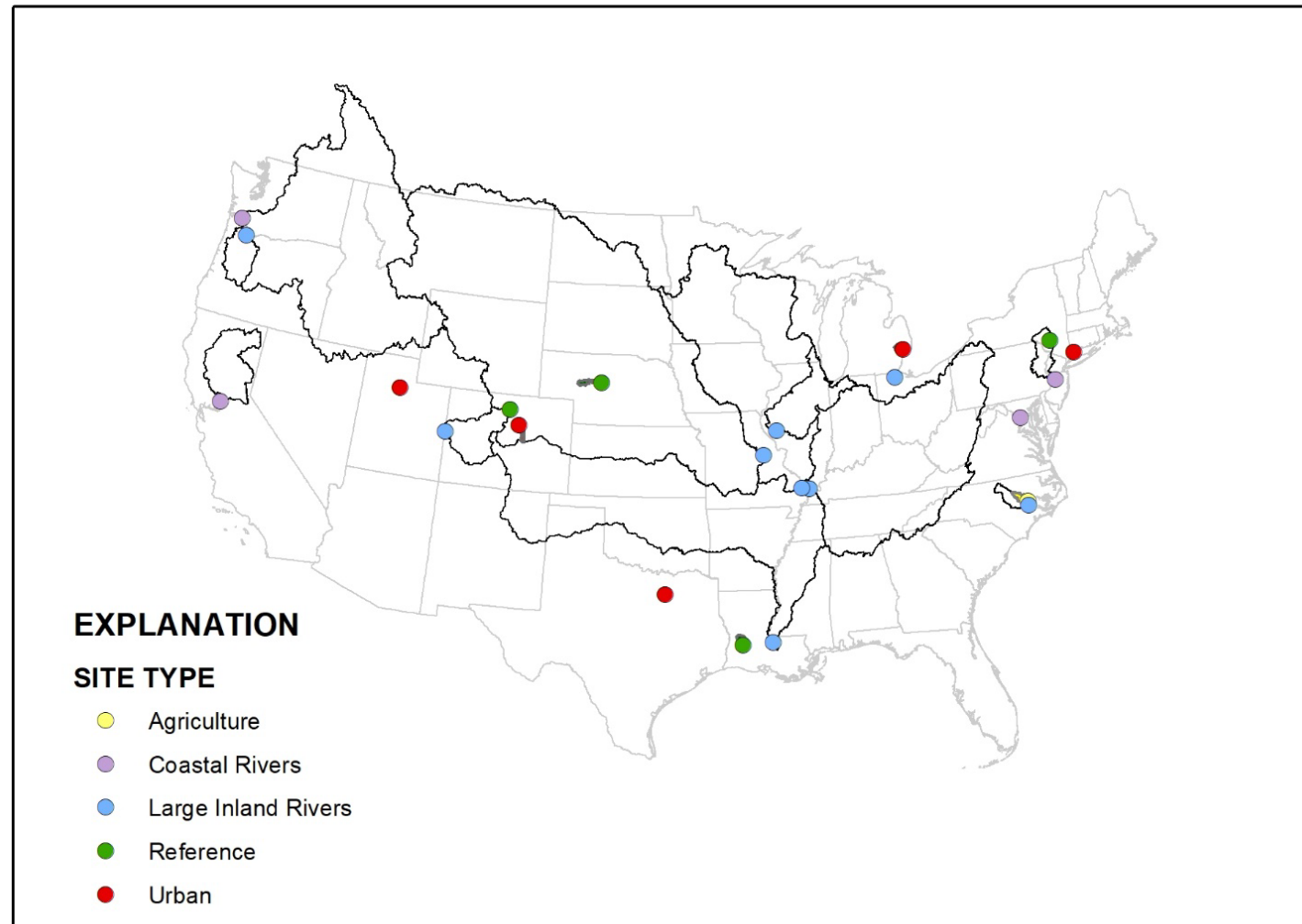
Data from 2019 only.

Benchmarks by 2023 proposed EPA MCL and HI

Data from McMahon and others, 2022
<https://doi.org/10.1021/acs.est.1c04795>

Benchmarks from: Proposed PFAS National Primary Drinking Water Regulation
[Per- and Polyfluoroalkyl Substances \(PFAS\) | US EPA](#)

PFAS sampling for the National Water Quality Network – surface water started in 2023



Ongoing work

- Analysis of results of samples collected from 2019 to 2022 is ongoing.
- More than groundwater 1,200 samples are available nationally.
- Product will include a national map predicting PFAS occurrence in groundwater.

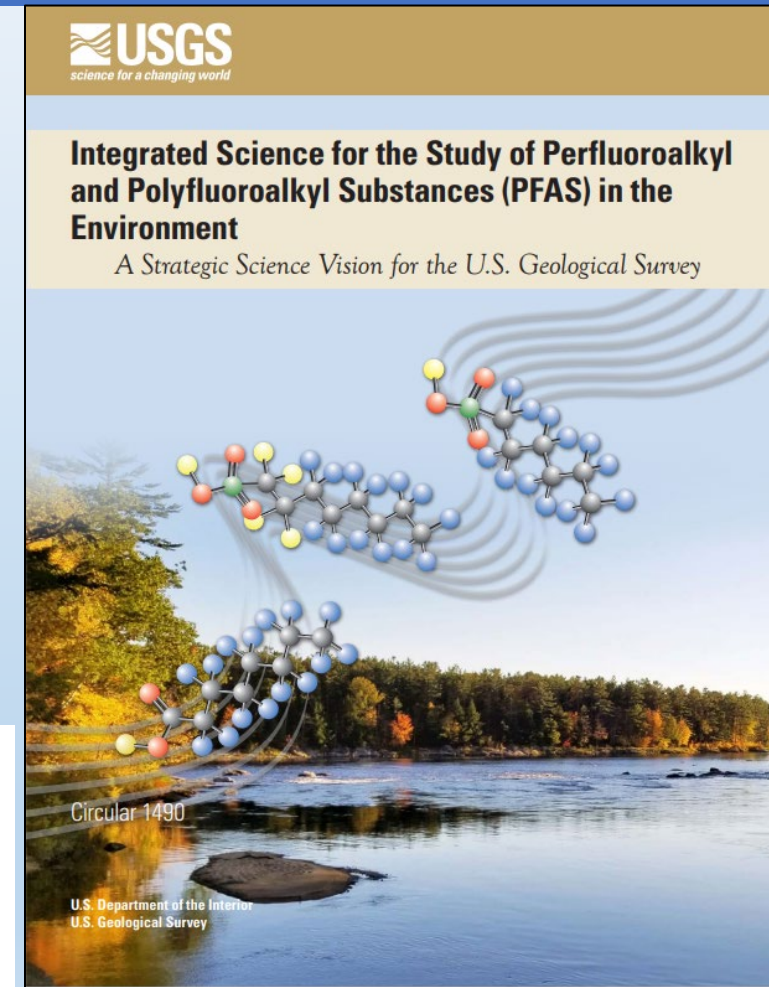
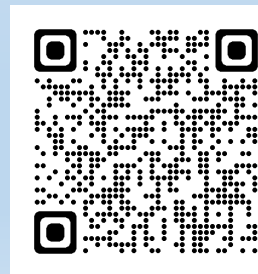
Note: Planned activities are subject to revision and may vary based on availability of funding

Integrated Science for the Study of PFAS in the Environment: A USGS Strategic Science Vision

<https://pubs.er.usgs.gov/publication/cir1490>

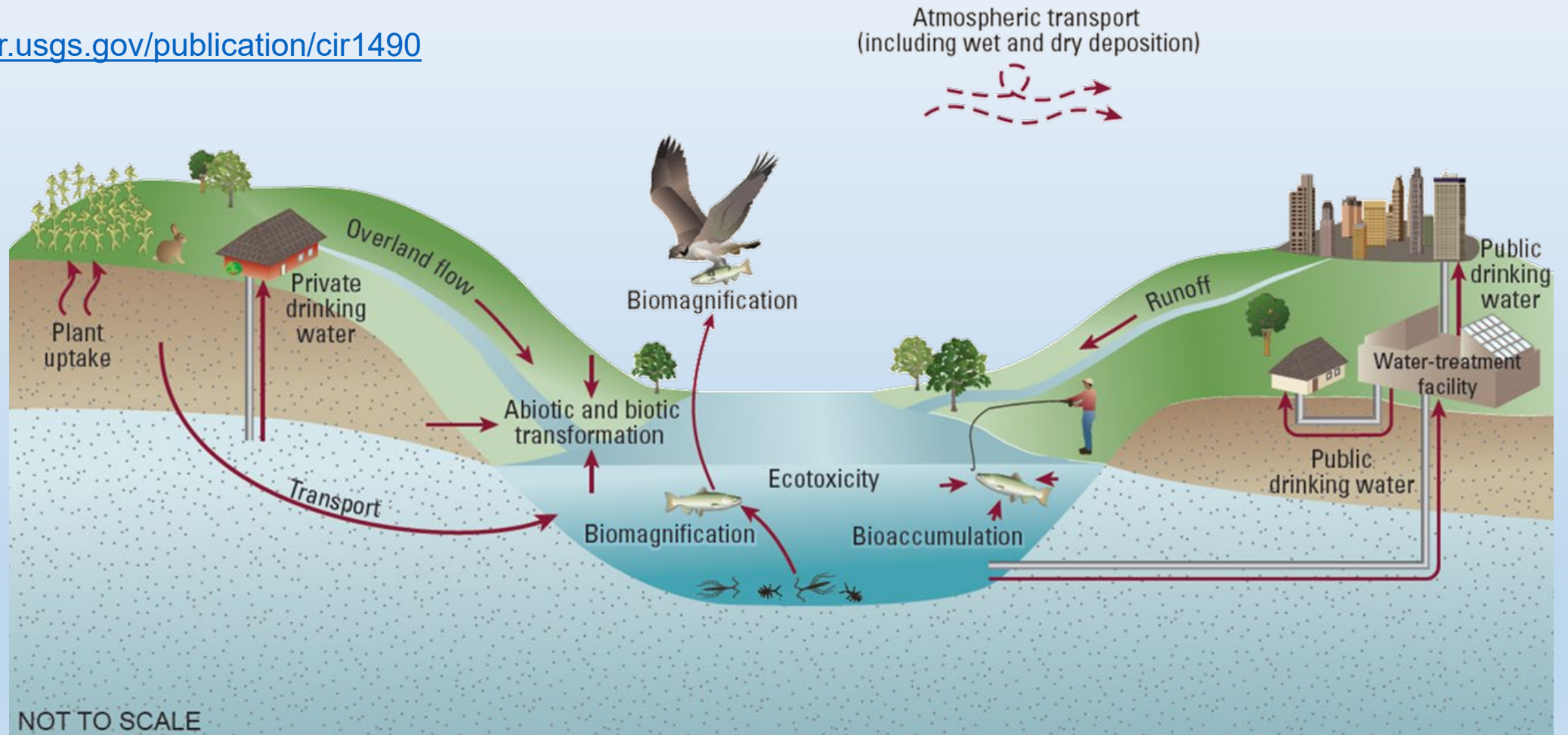
1. Briefly summarize the current state of PFAS science
2. Identify science gaps through reviews of the scientific literature and input from internal and external stakeholders
3. Determine USGS capabilities and expertise that could be leveraged to address the science gaps identified above
4. Identify scalable science opportunities for the USGS with an emphasis on integrated science that cross-cuts disciplines

Note: The document is not an implementation plan



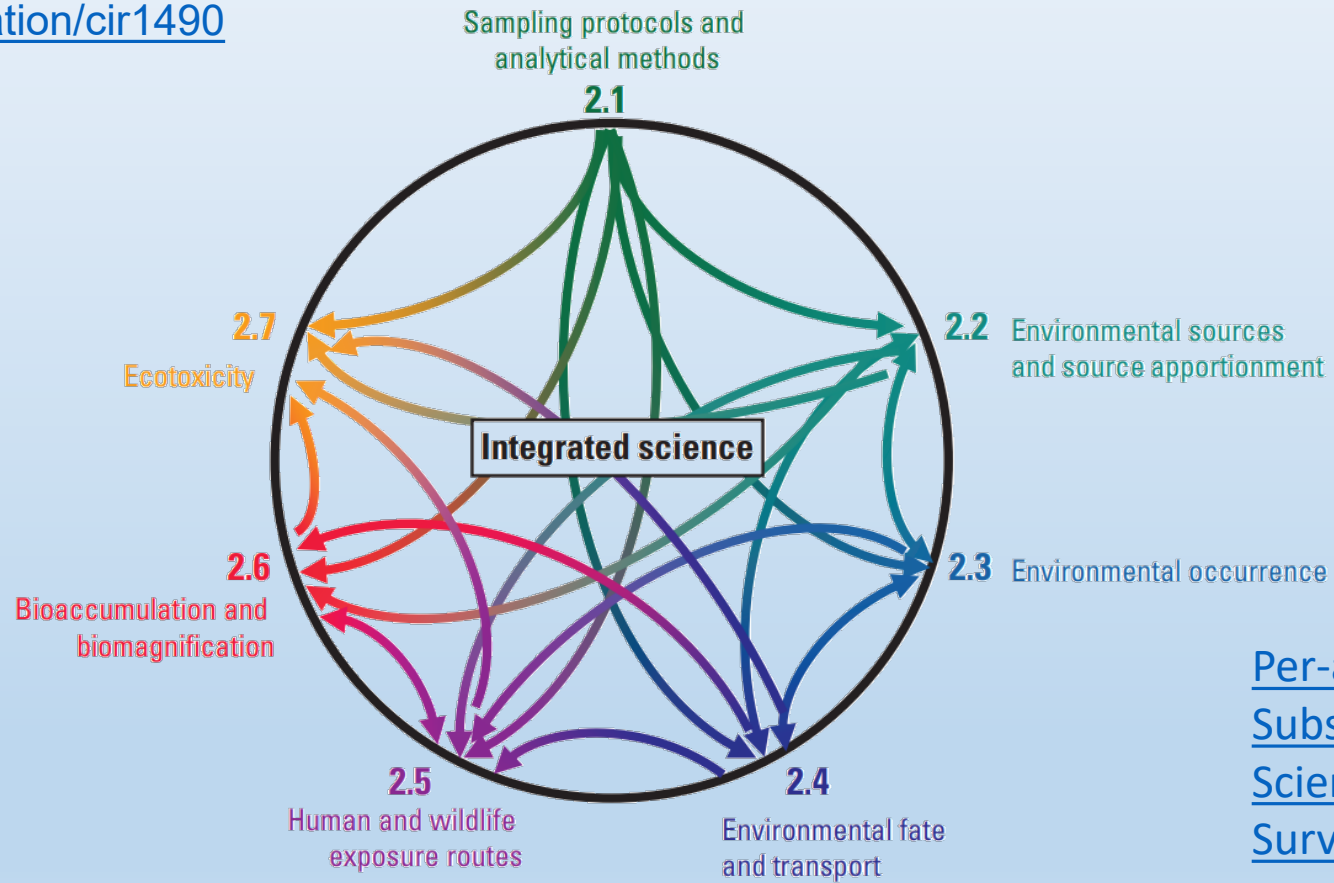
Mechanisms of Fate, Transport and Exposure

<https://pubs.er.usgs.gov/publication/cir1490>



Science Integration

<https://pubs.er.usgs.gov/publication/cir1490>



[Per- and Polyfluoroalkyl Substances \(PFAS\) Integrated Science Team | U.S. Geological Survey \(usgs.gov\)](#)

Summary

The USGS has implemented PFAS sampling in groundwater and surface water in national networks

Tap water sampling and groundwater and surface water resource assessments are ongoing

Sampling in other media is under development

Contact Bruce Lindsey, blindsey@usgs.gov for questions about USGS groundwater sampling.

Contact Michelle Lorah, mmlorah@usgs.gov for questions about the USGS PFAS integrated science team.