

20 years of PFAS data in the Delaware River Basin: Just scratching the surfactant

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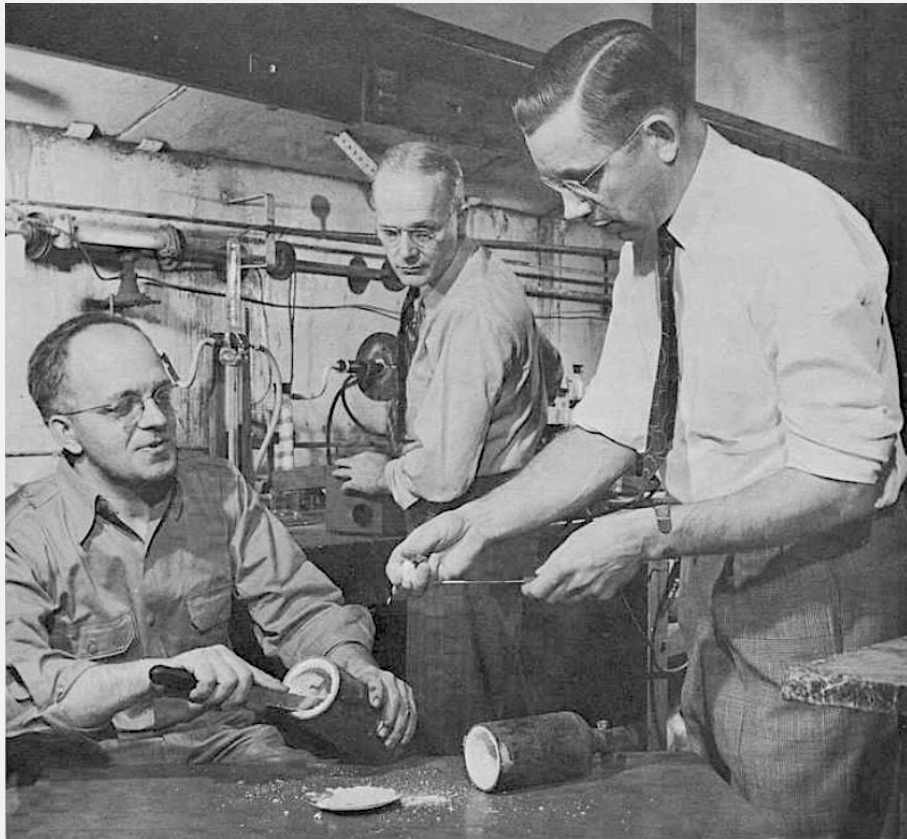
Delaware River Basin Commission

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PFAS Got Their Start in the Delaware River Basin

THE DISCOVERY

An “Accident” Derived from Solid Research



DISCOVERY of fluorocarbon polymers in 1938 was made by Dr. Roy Plunkett (*right*), who holds the original patent. Technician Jack Rebok (*left*) helped. Chemist Robert McHarness did early fluorocarbon research. In photograph, Plunkett and Rebok re-enact the discovery at the Jackson Laboratory.

“The Wide World of Teflon”

E.I. du Pont de Nemours & Company, 1963



Hagley Museum & Library
Digital Archives

Longterm Goal: Reduce PFAS Loading to the Delaware River Basin



- Step 1: Consolidate and look at the existing data
 - Examine trends
 - Find hotspots
 - Determine data needs
- Step 2: Source Identification
 - Collect data to fill gaps (multiple sampling events)
 - Examine data and use existing tools (models) to determine sources
- Step 3: Work with state and federal partners to reduce loading from point and non-point sources.

Where Did We Get the PFAS Data?

- The National Water Quality Data Portal, and the USGS's Water Data API
 - DRBC uploads all data to the National Water Quality Portal (WQP)
- More data out there, but not yet in these locations – dataset will continue to grow for years past and into the future
- This effort is only possible because our state (DE, NJ, PA and NY) and federal (USGS, EPA ORD) partners have also been generating PFAS data from the Delaware River Basin

PFAS Sampling Numbers

Current Dataset Sample Counts

n = 2,139	Count	Below Detection (%)	Mean	Max
Surface Water	1,380	95 (6.9%)	53.96	4731.47
Groundwater	328	108 (33.4%)	52.55	534.00
Sediment	131	38 (24%)	2.06	31.74
Tissue	295	20 (6.8%)	29.75	421.96

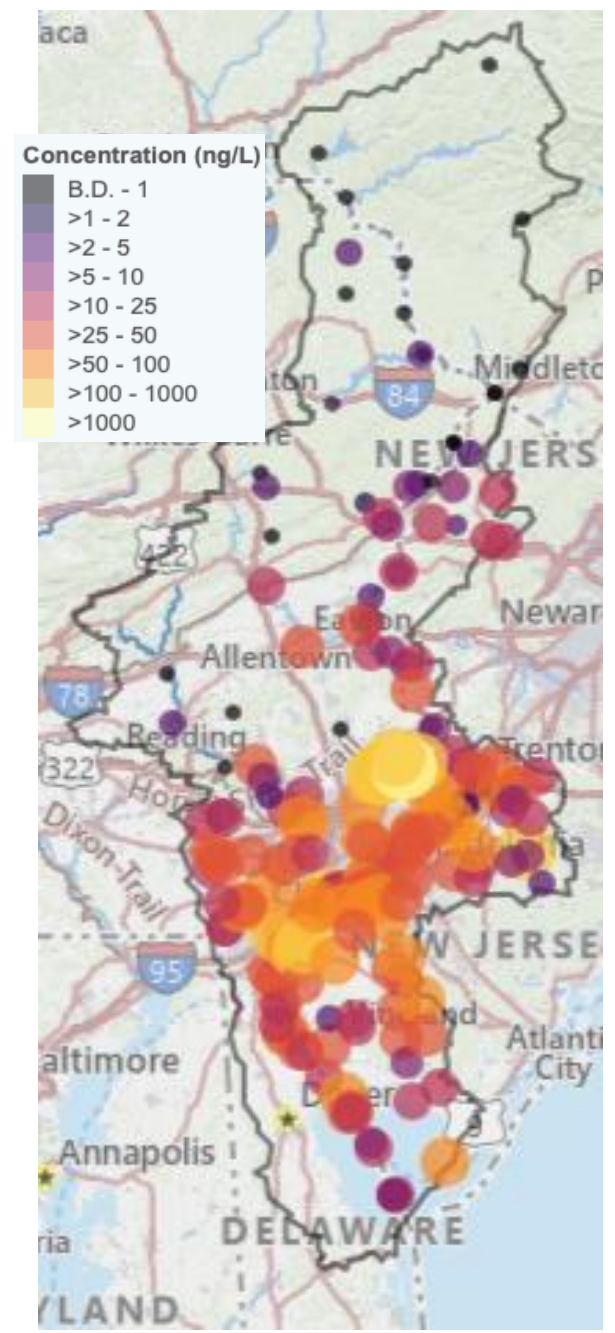
Surface water and Groundwater units are ng/L

Sediment and tissue units are ng/g

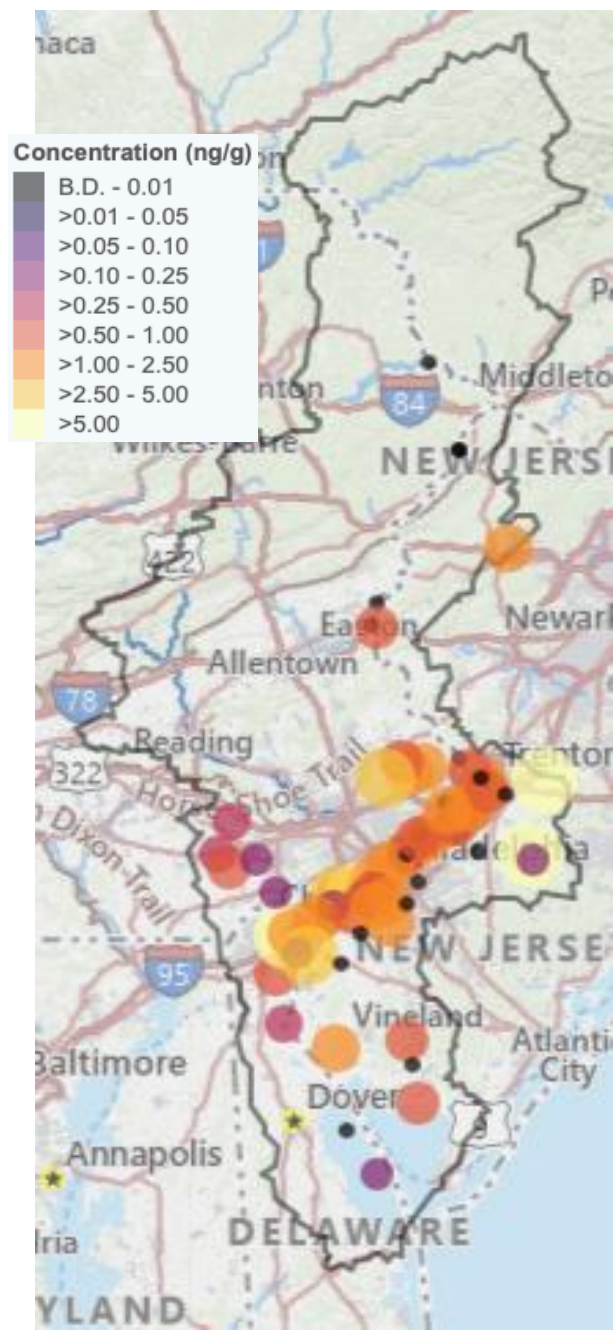
- Water samples dominate dataset (65%)
- Sediment data lacking, especially in tributaries
- Need more multi-matrix sampling

The Estuary is a Hot Spot

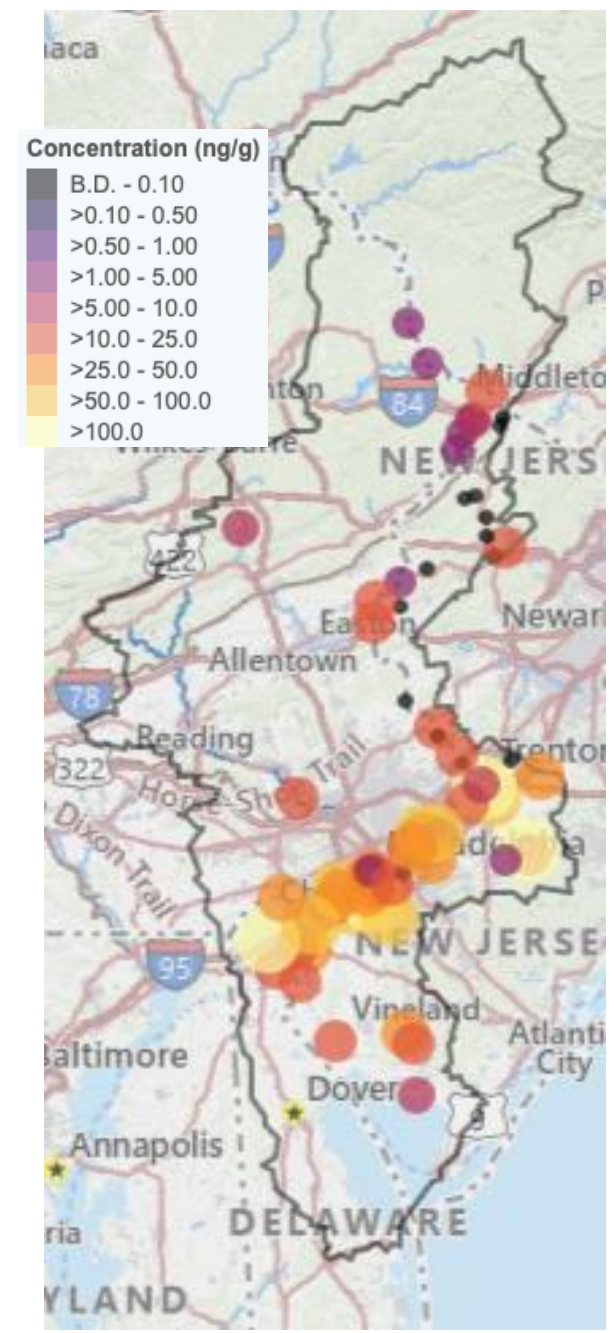
Surface Water



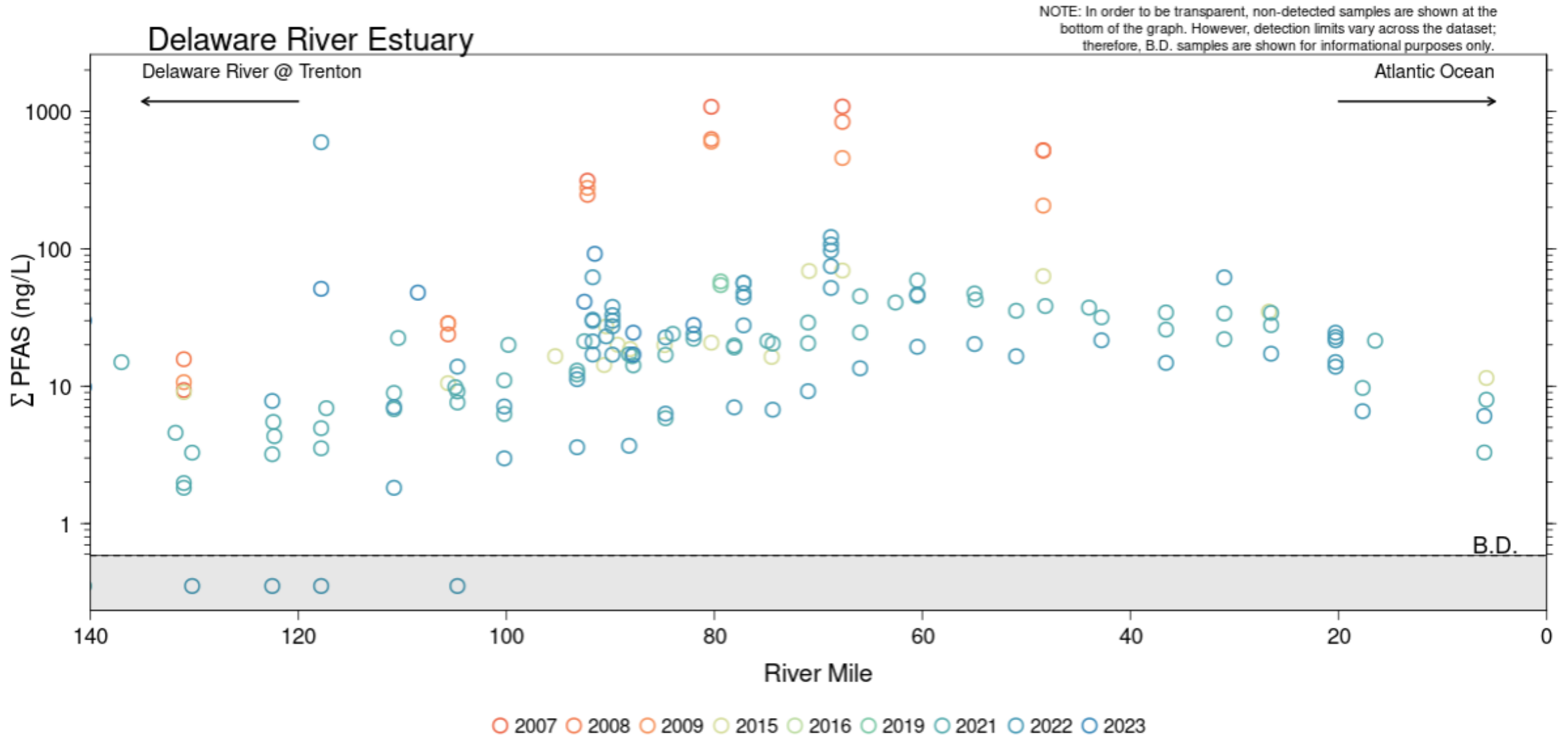
Sediment



Tissue



Surface Water Σ_{PFAS} Peaks near River Mile 65



WATER CRITERIA: PFOS, PFOA

Draft EPA Human Health Water Quality Criteria		
	Water + Organism (ng L ⁻¹ ; ppt)	Organism Only (ng L ⁻¹ ; ppt)
PFOA	0.0009	0.0036
PFOS	0.06	0.07

EPA Draft
Human Health
Water Quality
Criteria
December 2024



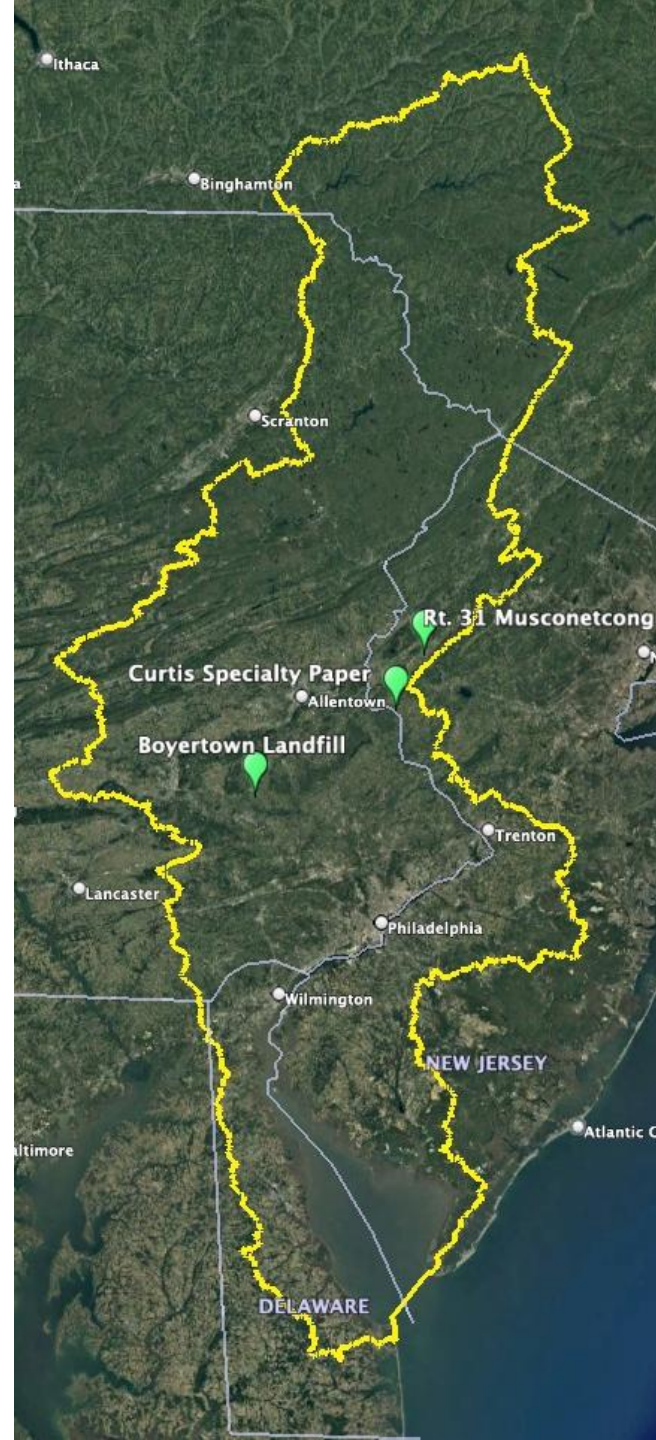
WATER CRITERIA: PFOS, PFOA

	Draft EPA Human Health Water Quality Criteria		Presence in Delaware River Watershed Surface Water Samples	
	Water + Organism (ng L ⁻¹ ; ppt)	Organism Only (ng L ⁻¹ ; ppt)	% Detection	Concentration (Avg; ng L ⁻¹)
PFOA	0.0009	0.0036	92.6 (n=1,367)	7.83
PFOS	0.06	0.07	89.6 (n=1,333)	12.88

EPA Draft
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Recent “Surprises”



Route 31 on the
Musconetcong River



Boyertown Landfill



Curtis Specialty Papers

Needs:

- More multi-matrix sampling to get a more complete picture at a site
 - More sediment samples
- Existing data to be uploaded to the Water Quality Data Portal
- Trifluoroacetic acid (TFA) monitoring



Be Prepared for:

- PFAS pollution at not yet known sites
- Growth in use of PFAS compounds not in Method 1633
- More surprises...

DRBC's Plans

- Currently
 - Wrapping up ongoing PFAS studies
 - Assessing the 20-year dataset

- Goals
 - Determining hotspots and trends
 - Find and close gaps in the data that are needed to determine sources
 - Locate PFAS sources
 - Work with states to reduce loading and cleanup hotspots
 - Create a regularly updated web app to view PFAS data in the basin, including your local watershed



Coming Very Soon

PFAS in the Delaware River Basin

Media:

Surface Water

PFAS Data Type:

- ΣPFAS
- Compounds
- Groups

Agency:

All

Years:



Value displayed at sampling locations with multiple sampling years:

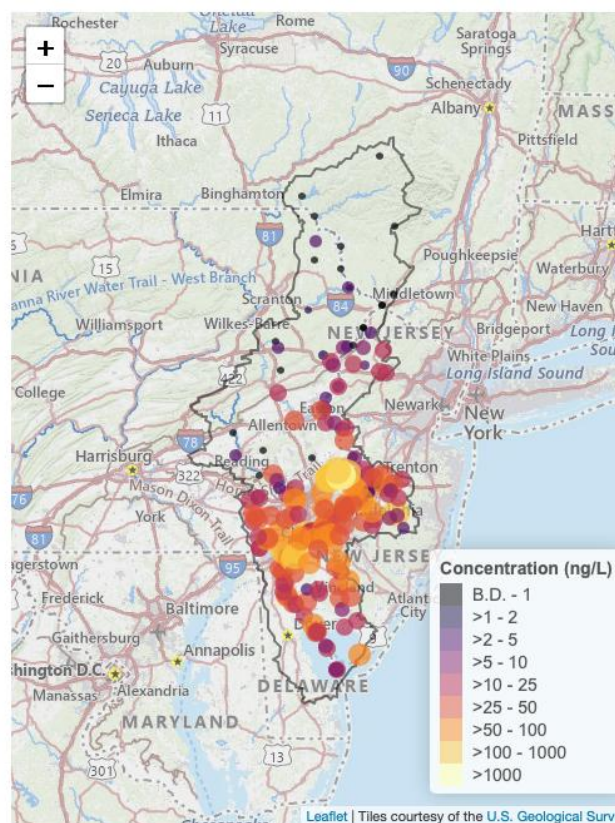
Most Recent Sample

- Show HUC12 Averages (based on value displayed at each sampling location)
- Show River Miles
- Hide Map Legend

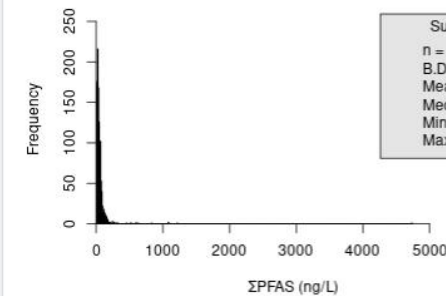
ΣPFAS = Sum of detected PFAS compounds in a sample; not all samples were analyzed for the same compounds.

B.D. = Below analytical detection limits; varies by sample.

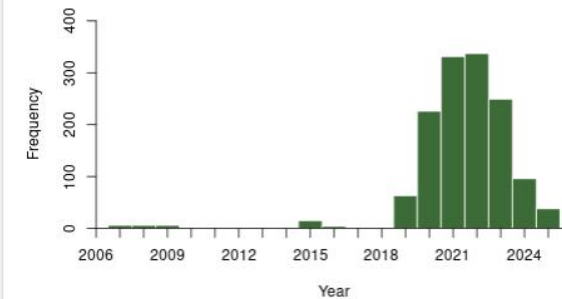
Map Estuary Analyzer Criteria History About



Concentration Distribution



Sampling Years





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PFAS is a persistent problem in the Delaware River Basin. DRBC is working to better understand PFAS trends and locate sources to reduce this pollution in our basin.

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DRBC PFAS Website



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Thank you for the support:

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