

Over 20 years of data show that the Delaware River Basin is a hotspot for PFAS pollution

Chemistry & Environmental Science Seminar
NJIT

September 9th, 2026

Jeremy Conkle, Ph.D., Senior Chemist/Toxicologist
Delaware River Basin Commission



Delaware River Basin Commission

DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

What is the Delaware River Basin Commission?



DRBC Formed 1961



- Delaware River Basin Compact: Federal Law & State Law
 - First of its kind
 - 5 Equal Members
- Governors are the Commissioners; USACE NAD Commanding General is Federal Commissioner; NYC & Phila. are advisors
- Public Meetings
- Full-time Staff of Engineers, Scientists, Planners



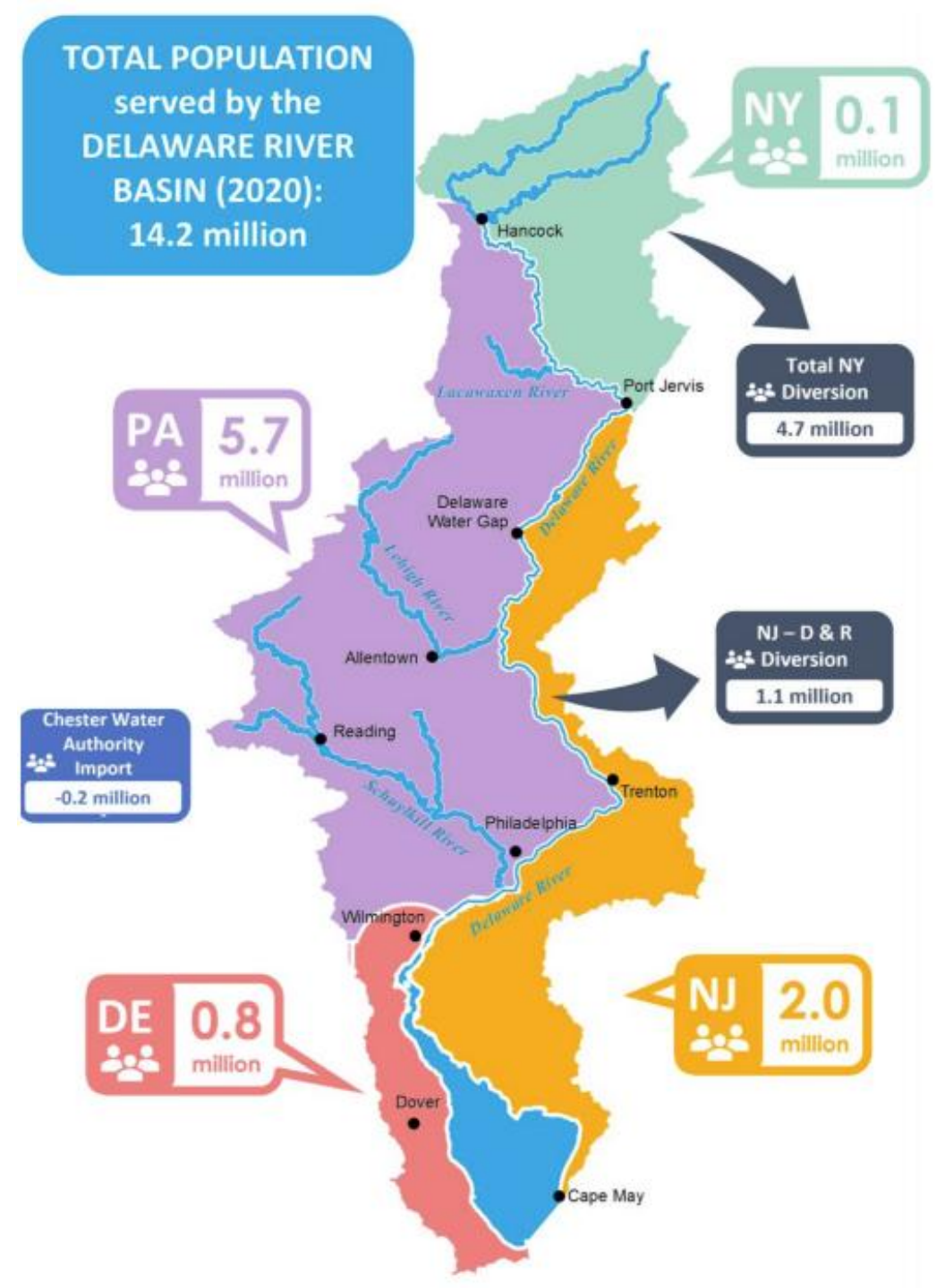
The Delaware River

- 330 miles
- 13,500 mi² watershed
- Free-flowing mainstem
- Tidal from ocean to Trenton
- Unique habitats & communities



The Delaware River Basin meets our needs.

- 14+ million people in four states
- Half of NYC drinking water
- \$21+ billion in economic value
- Interstate boundary





DRBC is a federal-interstate government agency

Our Mission

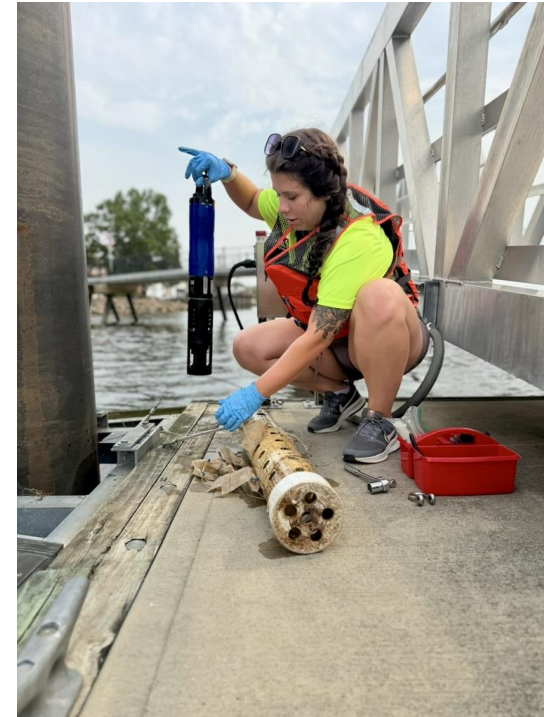
Manage, protect, and improve the water resources of the Delaware River Basin.

Our Vision

Provide trusted, effective, and coordinated management of the Basin's shared water resources.

Water Quality Mission

- Emerging contaminants
- Chlorides
- Bacteria
- Dissolved oxygen
- Cyanotoxins
- Macroinvertebrates



PFAS is a *CENTURIAL* Problem





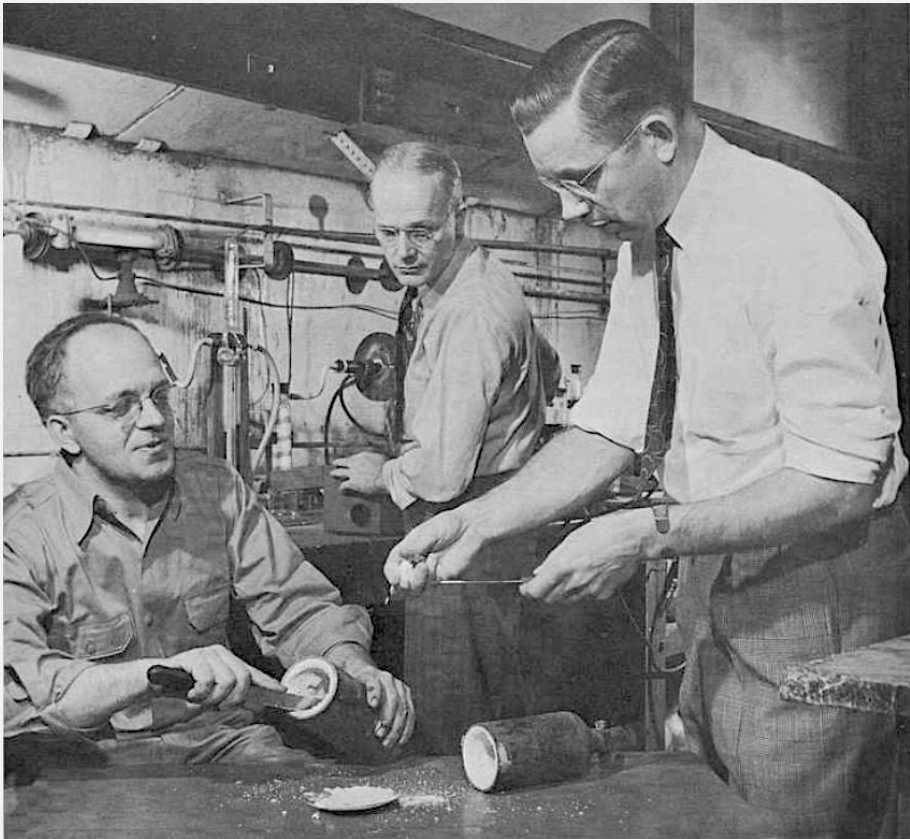
Delaware River Basin Commission

DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

PFAS Started 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

PFAS: >13,000 Diverse Chemicals



Pros

- ⊕ Extremely durable
- ⊕ Water/stain repellent
- ⊕ Non-stick/low friction
- ⊕ Smothering fires
- ⊕ Surfactants
- ⊕ Other industrial applications

Cons

- ⊖ Extremely durable
- ⊖ Ubiquitous
- ⊖ Mobile in water, but also sticky
- ⊖ Found in every human
- ⊖ Numerous health effects
- ⊖ Difficult/expensive to treat/remove

Long-term Goal: Reduce PFAS Loading to the Delaware River Basin



Step 1: Consolidate and look at the existing data

Step 2: Source Identification

Step 3: Work with state and federal partners to reduce loading from point and non-point sources.

Existing PFAS Data in the Delaware River Basin



	Samples (%)				Below Detection (%)	
	All	Estuary	>2019		All	Estuary
Surface Water	1,393	931 (67)	1,353 (97)		95 (7)	19 (1)
Groundwater	296	186 (63)	233 (79)		108 (36)	68 (29)
Sediment	131	101 (77)	115 (88)		38 (29)	26 (23)
Tissues	221	194 (88)	150 (68)		20 (9)	8 (5)
Total	2,041	1,412 (69)	1,851 (91)		261 (13)	121 (7)

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:

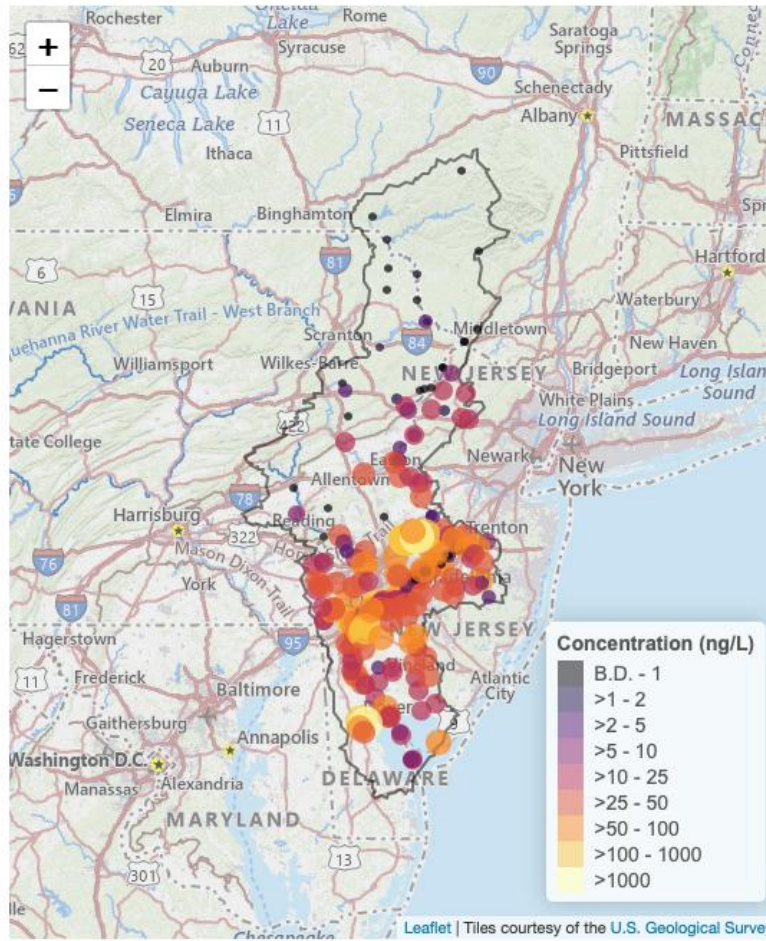
Most Recent Sample

- ☐ HUC12 Averages (based on values displayed at each sampling location)
☐ River Miles
☐ Hide Map Legend
☐ Samples with known Quality Assurance Project Plans

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



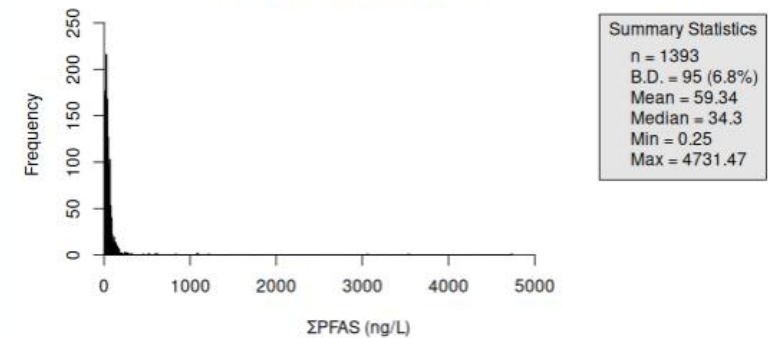
Estuary Analyzer

Criteria

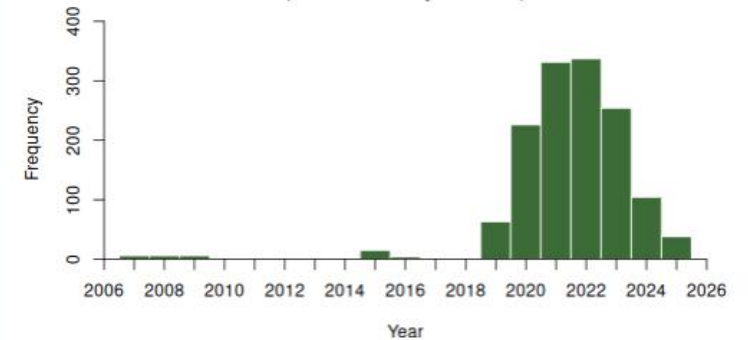
History

About

Concentration Distribution (in current map window)

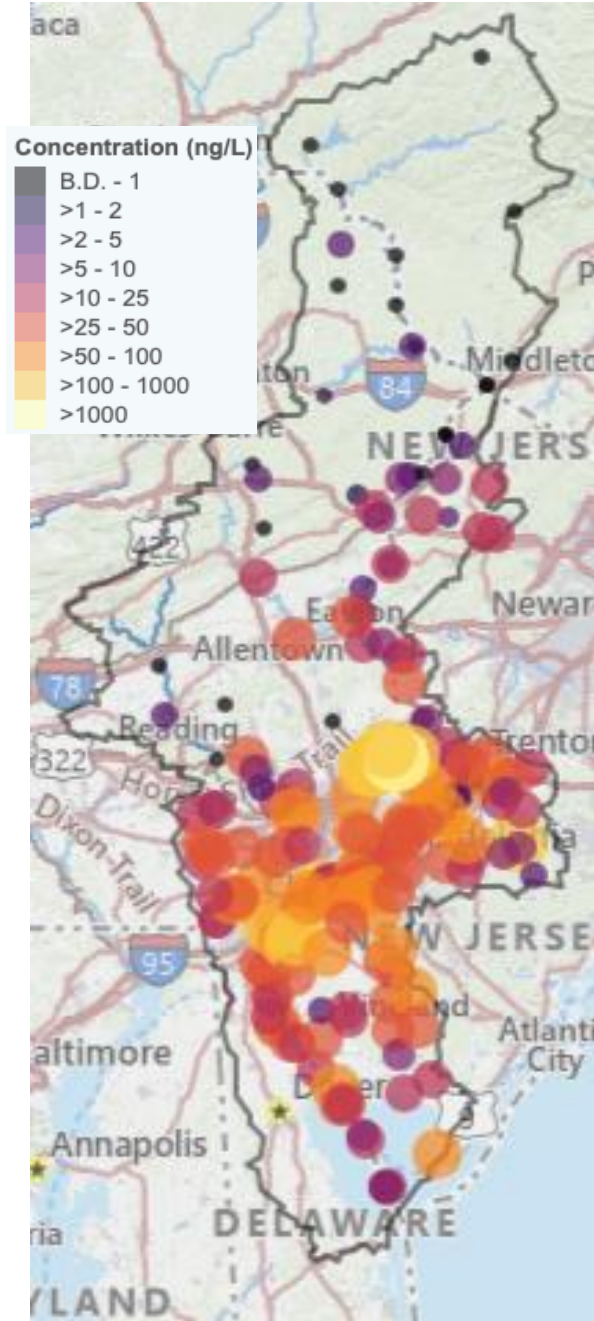


Sampling Years (in current map window)

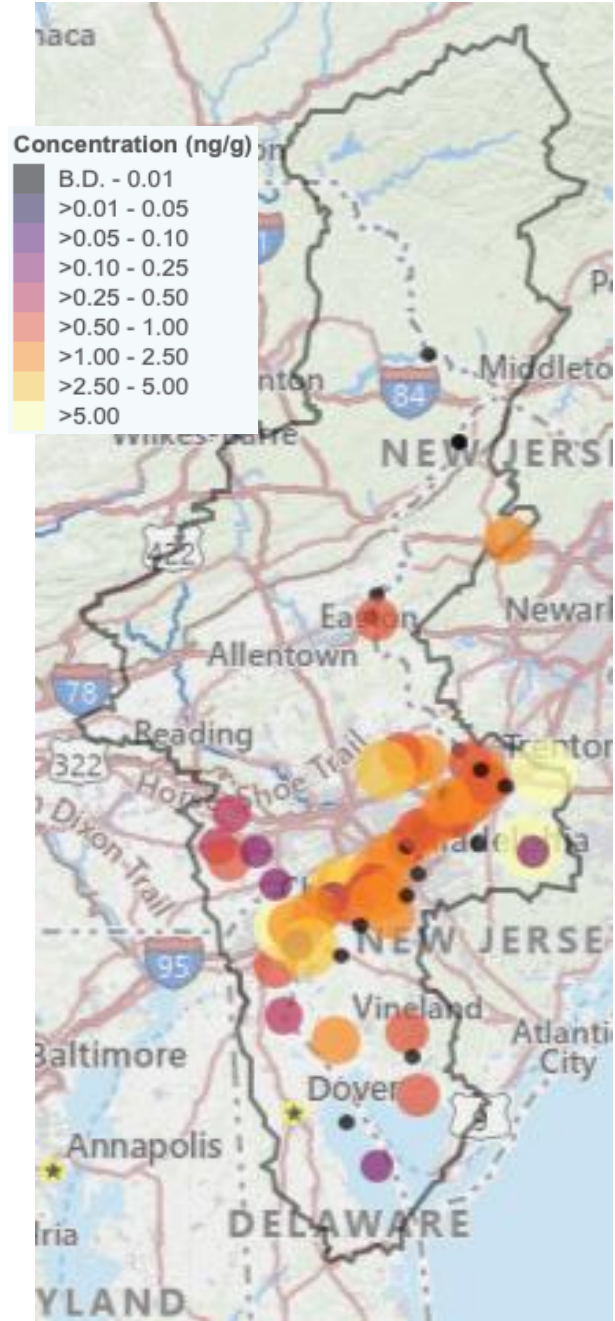


The Estuary is a Hot Spot

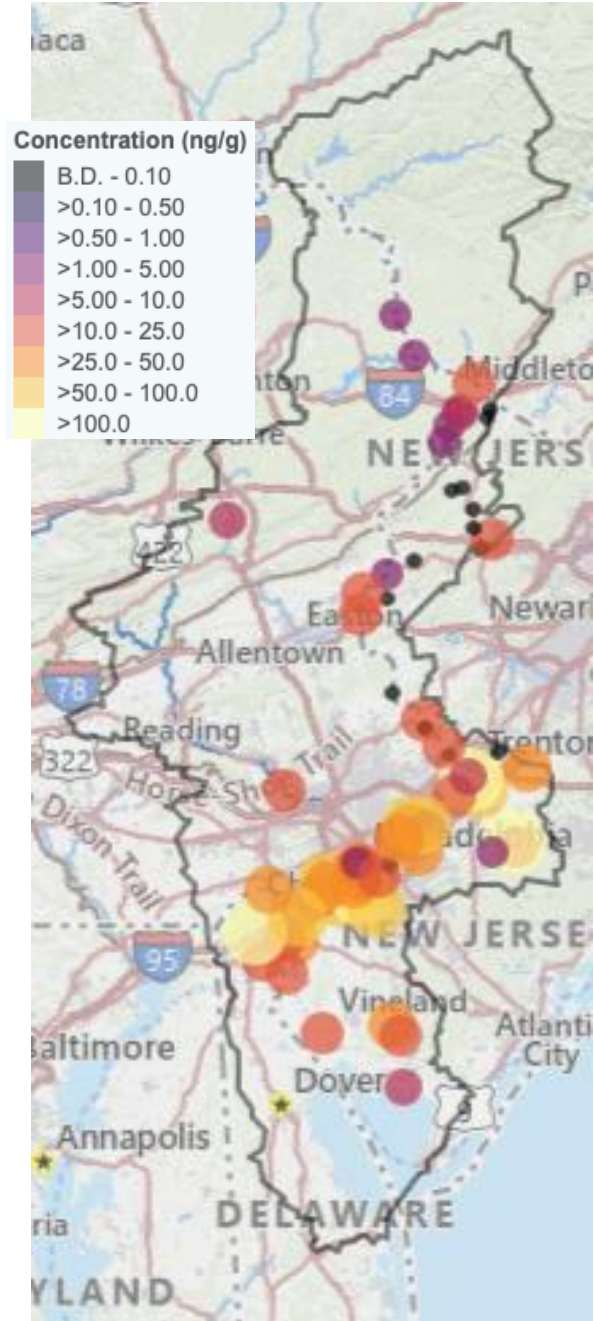
Surface Water



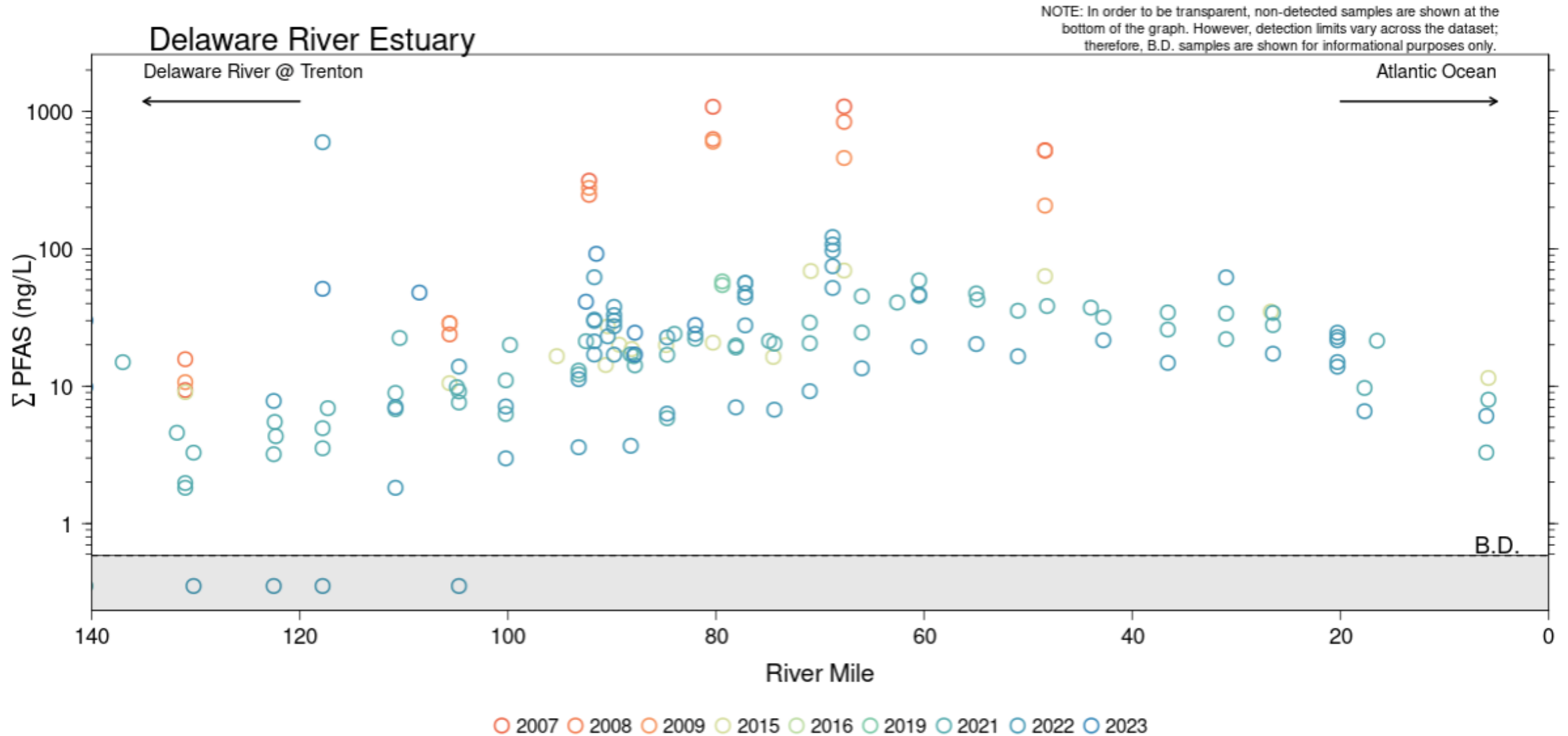
Sediment



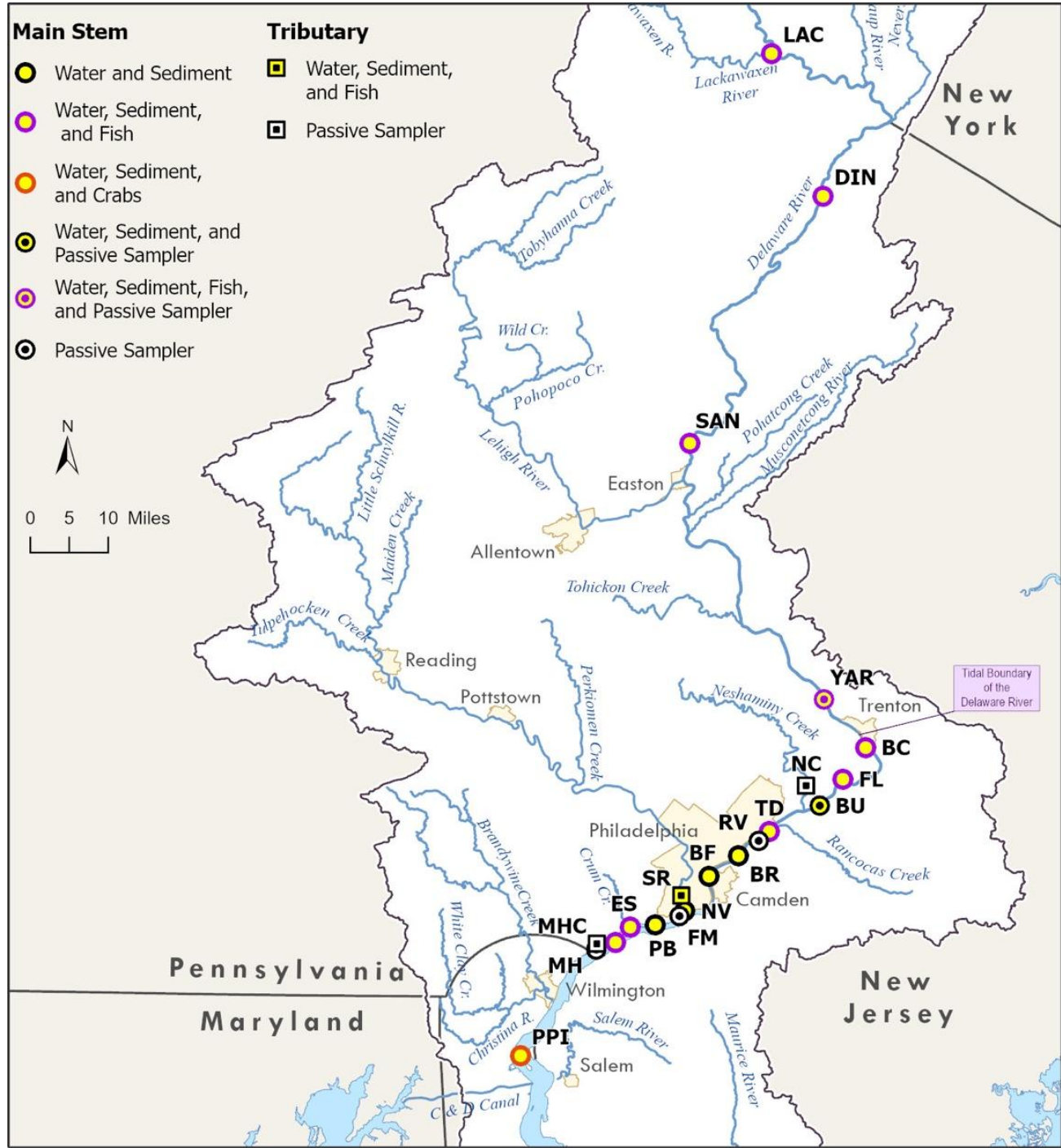
Tissue



Surface Water Σ_{PFAS} Peaks near River Mile 65

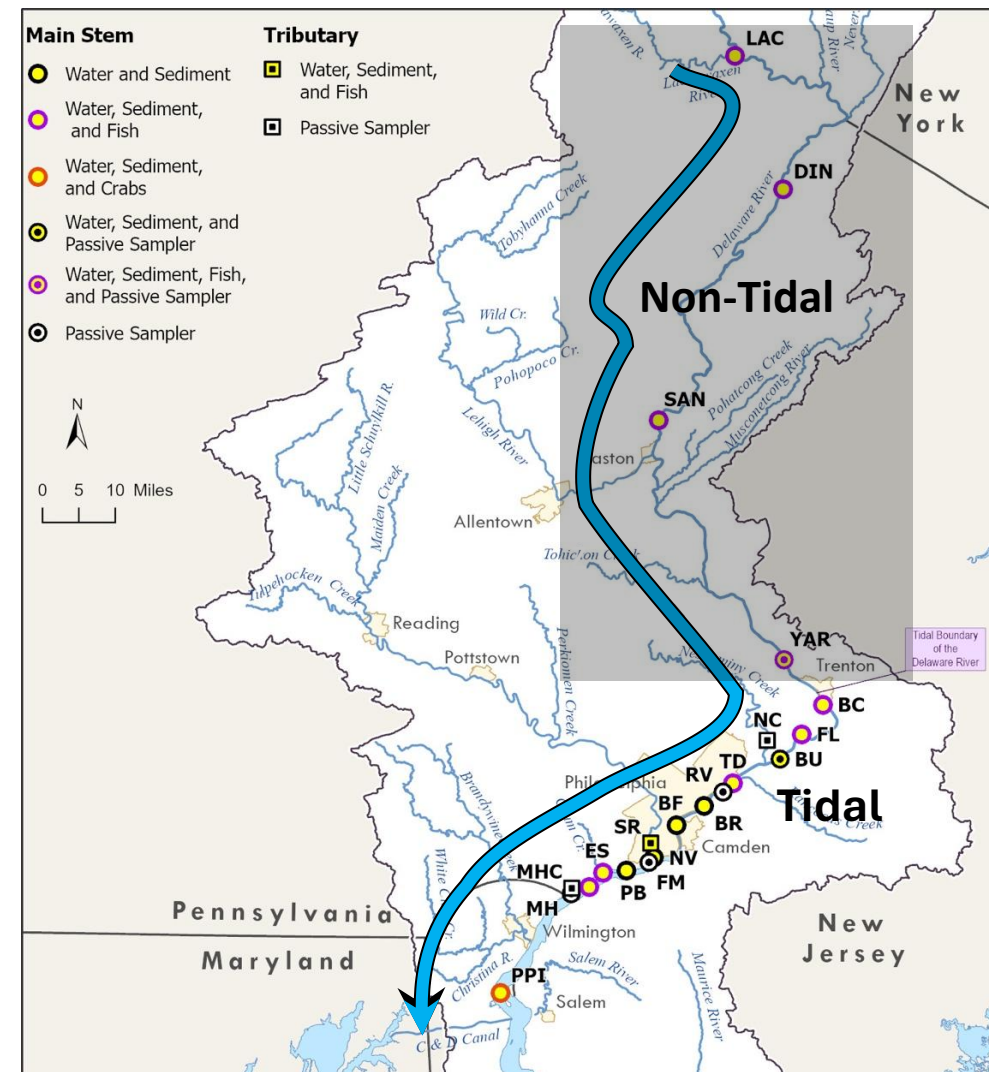
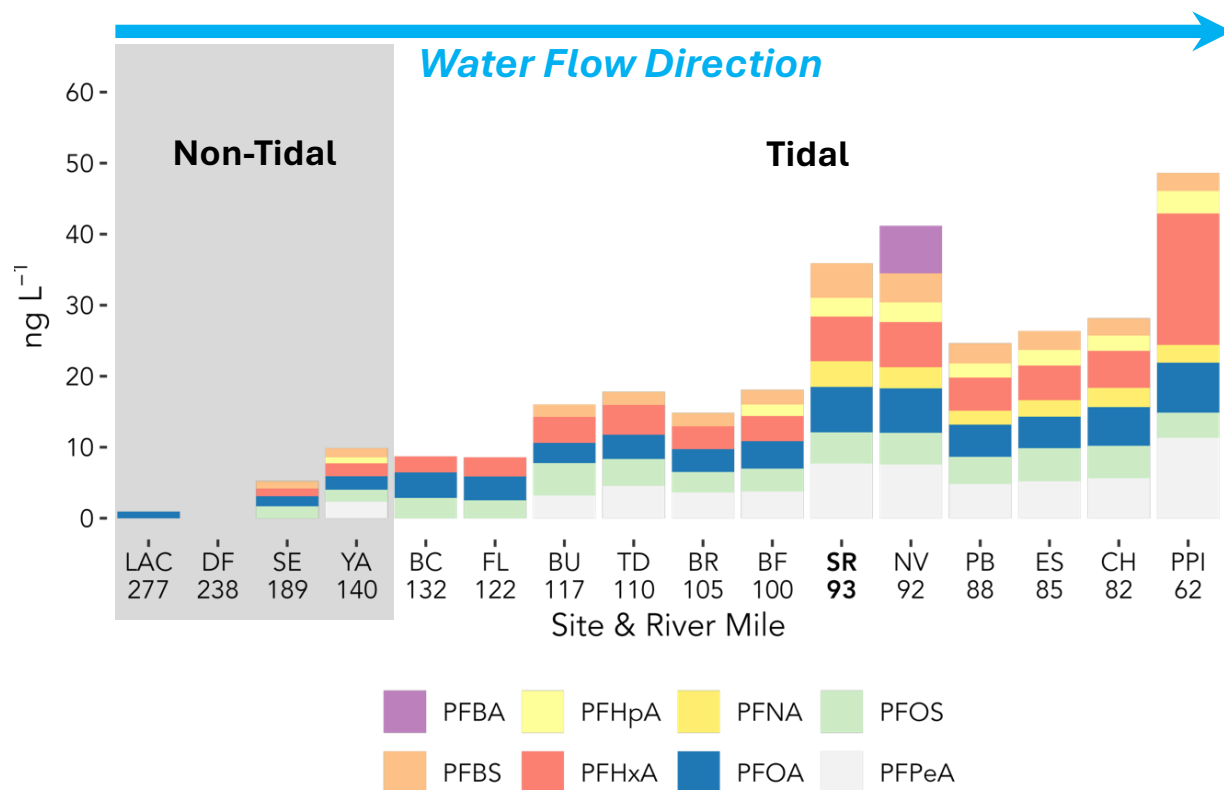


Multi-Matrix Sampling from Lackawaxen to Pea Patch Island



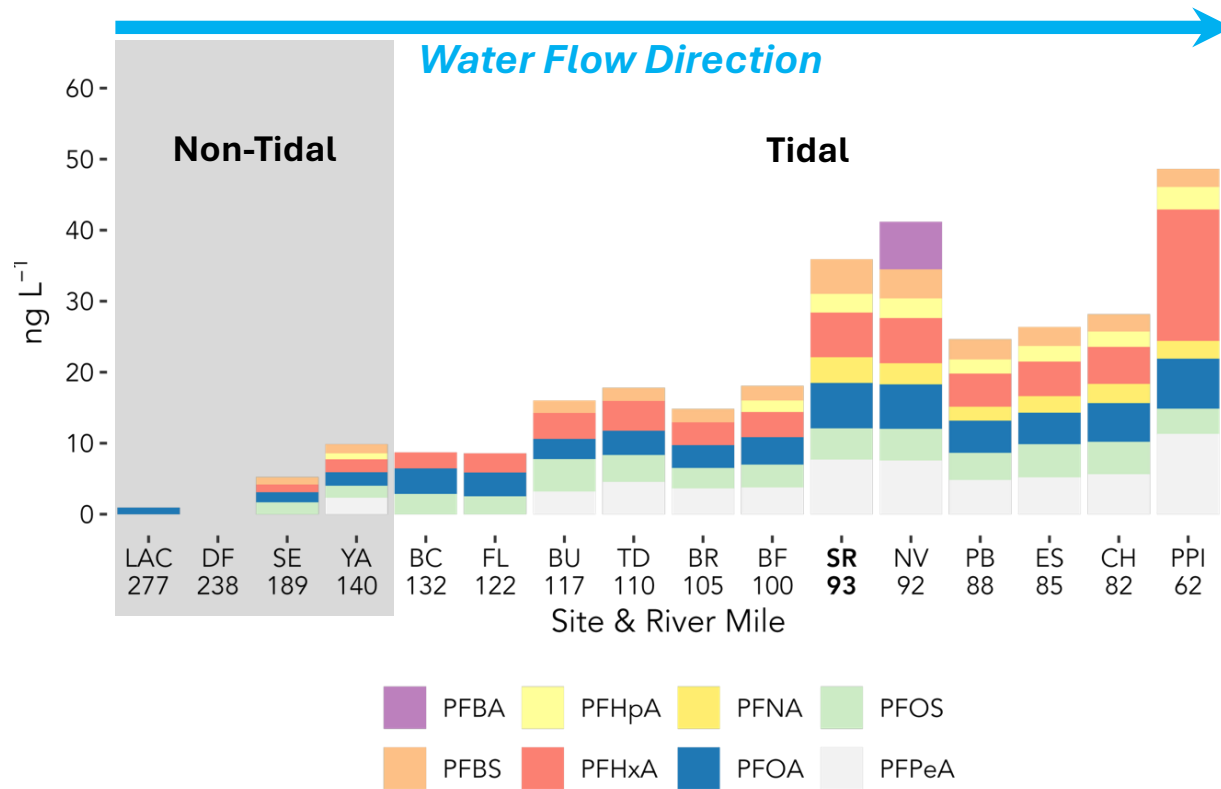
PFAS Increase Downstream

PFAS Concentration

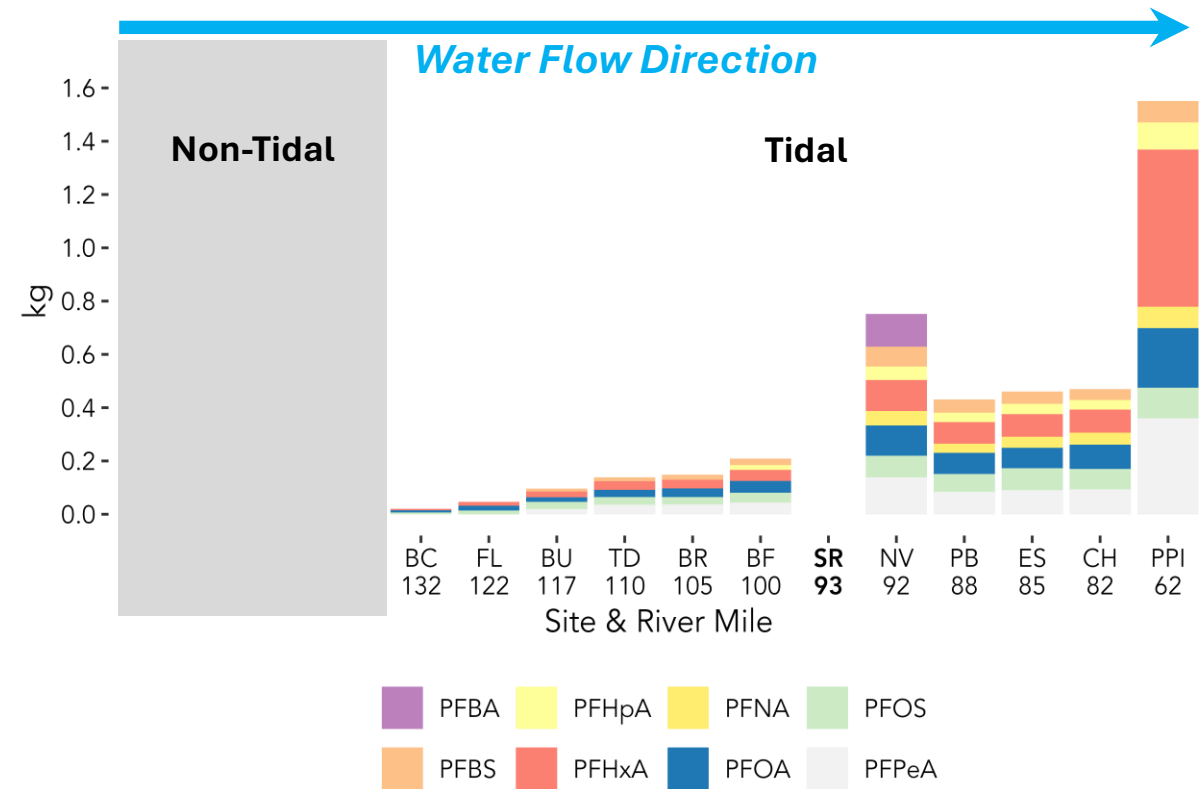


PFAS Mass Downstream

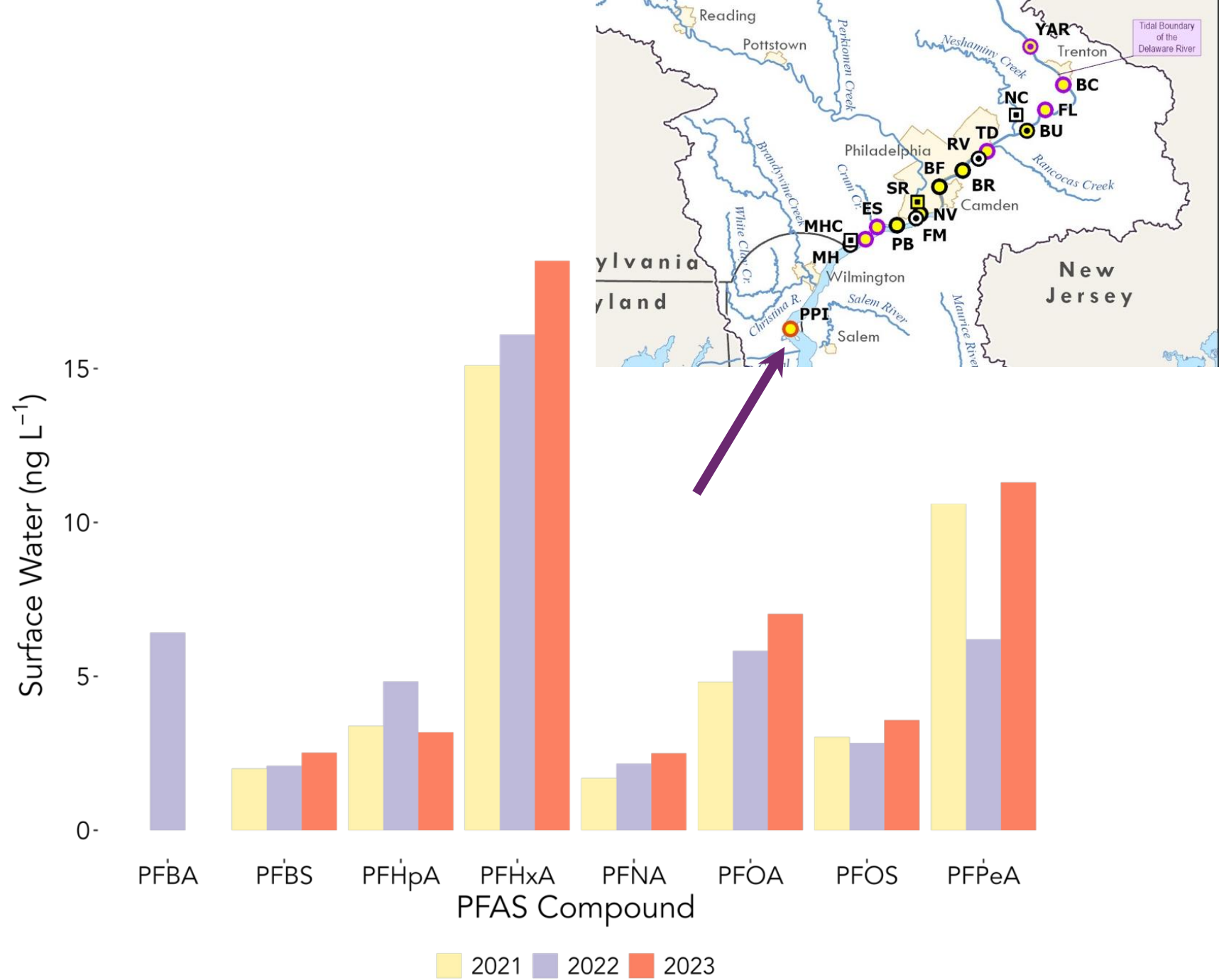
PFAS Concentration



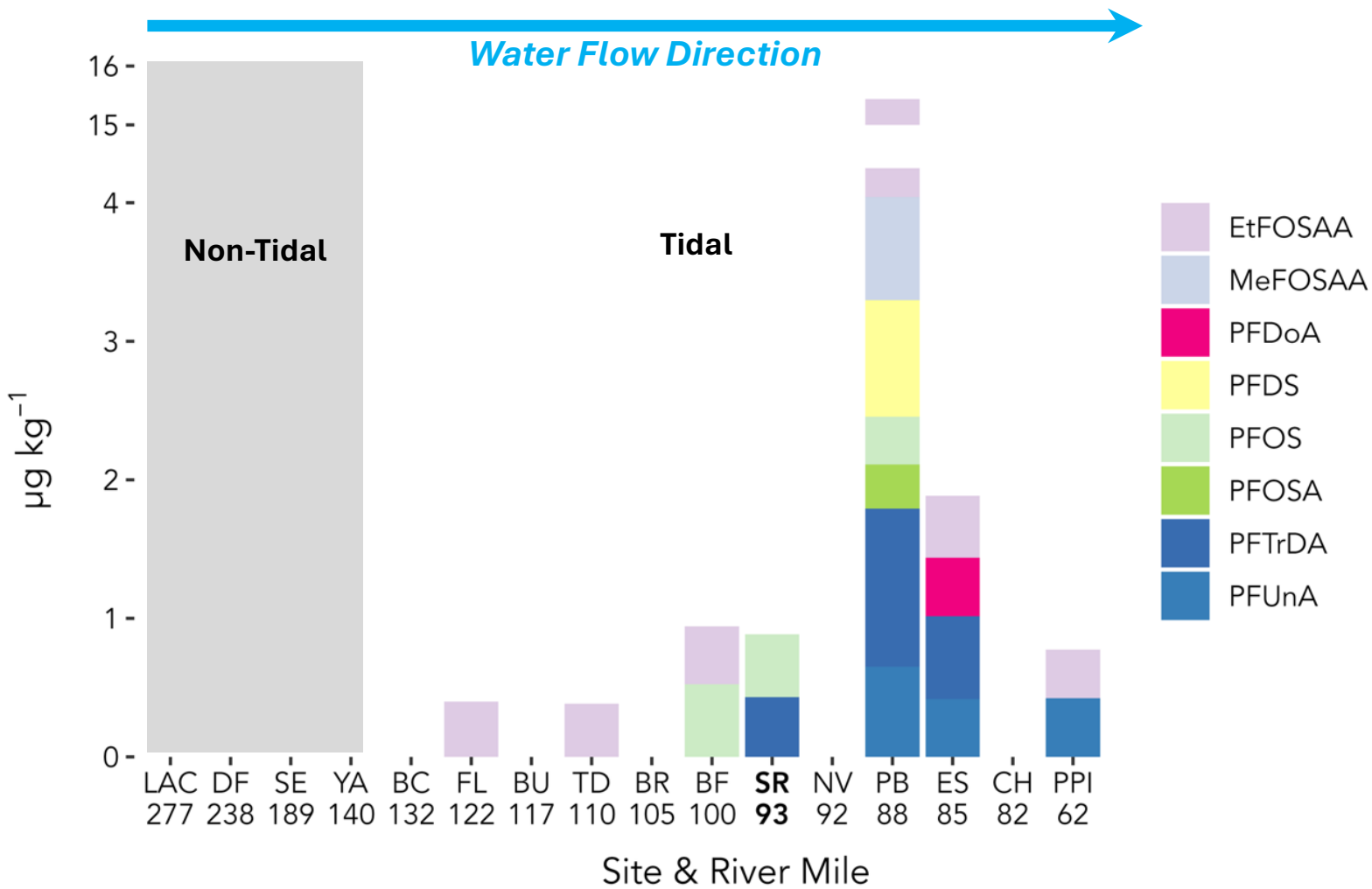
PFAS Mass



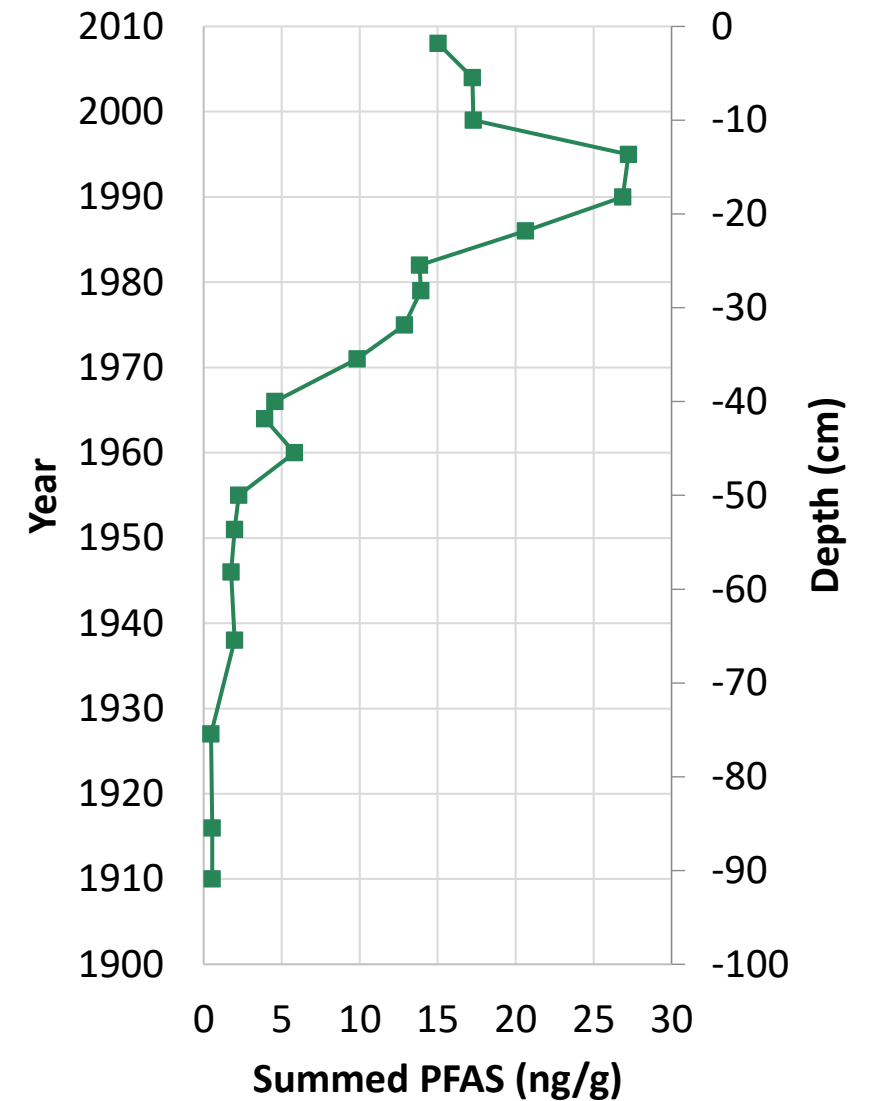
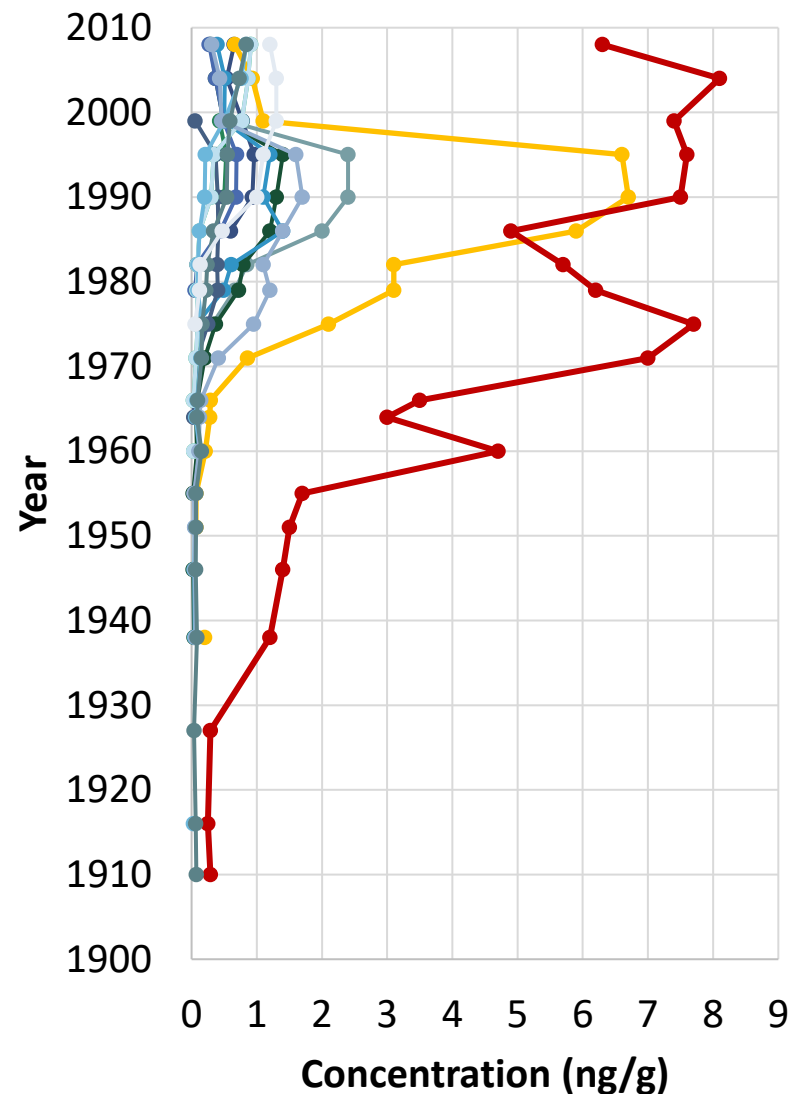
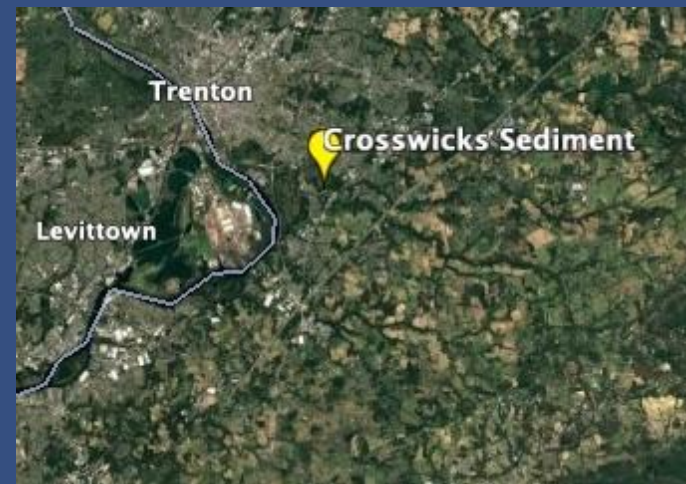
Surface Water PFAS Concentrations Were Consistent at Pea Patch Island



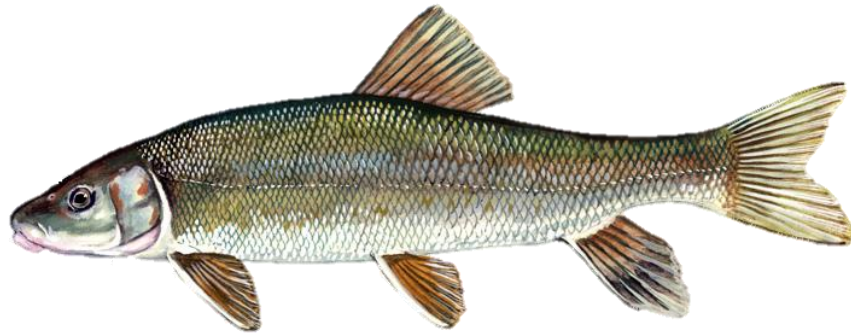
Sediment Concentrations Were Highly Variable and Inconsistent



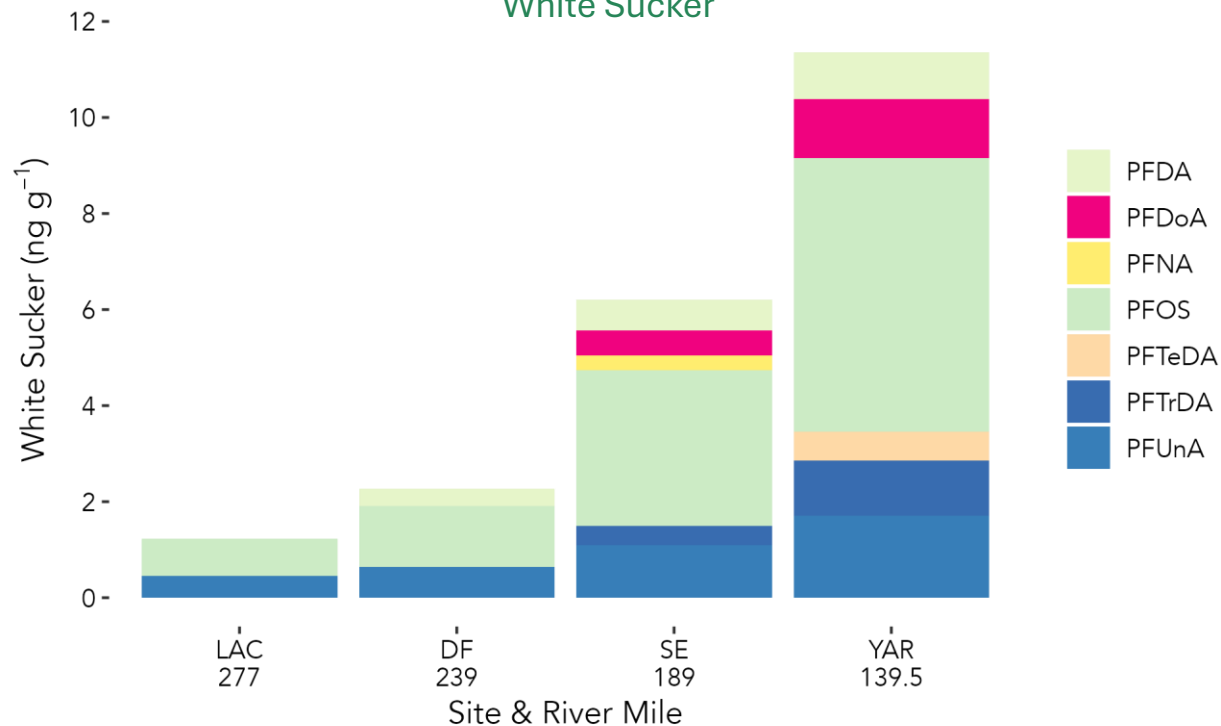
Crosswicks Creek: Sediment Core from 2008



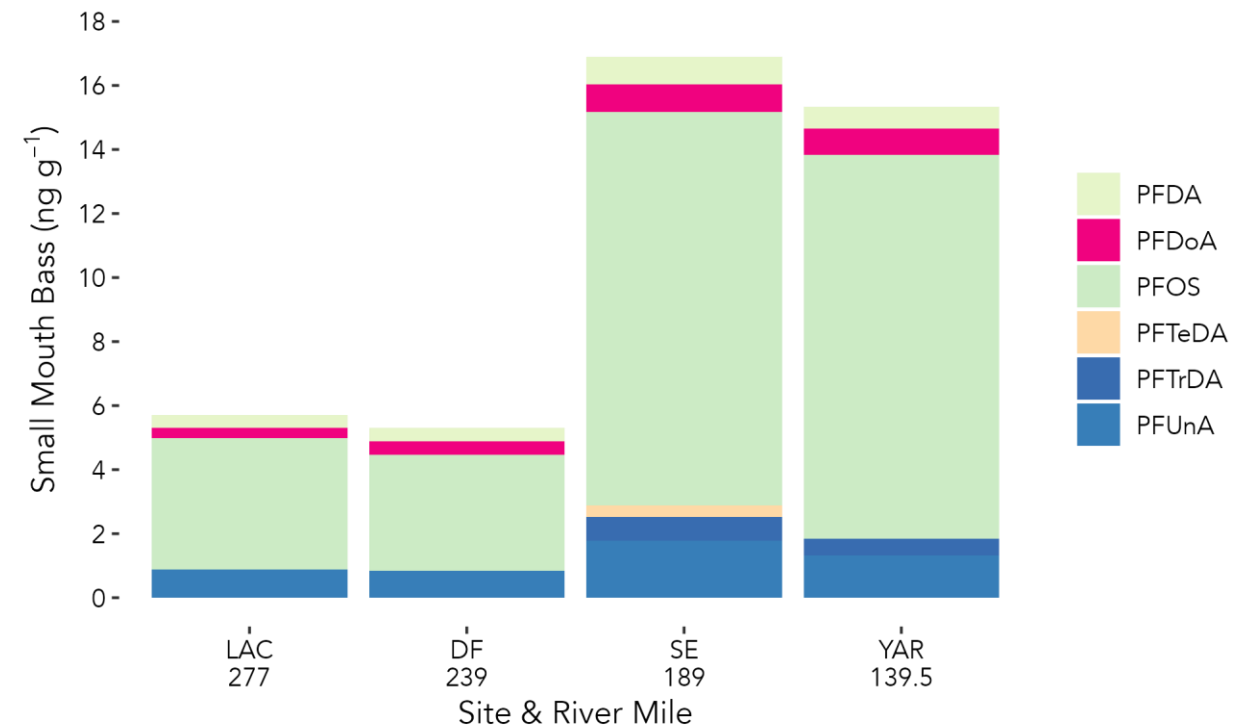
PFOS Dominates Freshwater Fish Fillet Samples



White Sucker



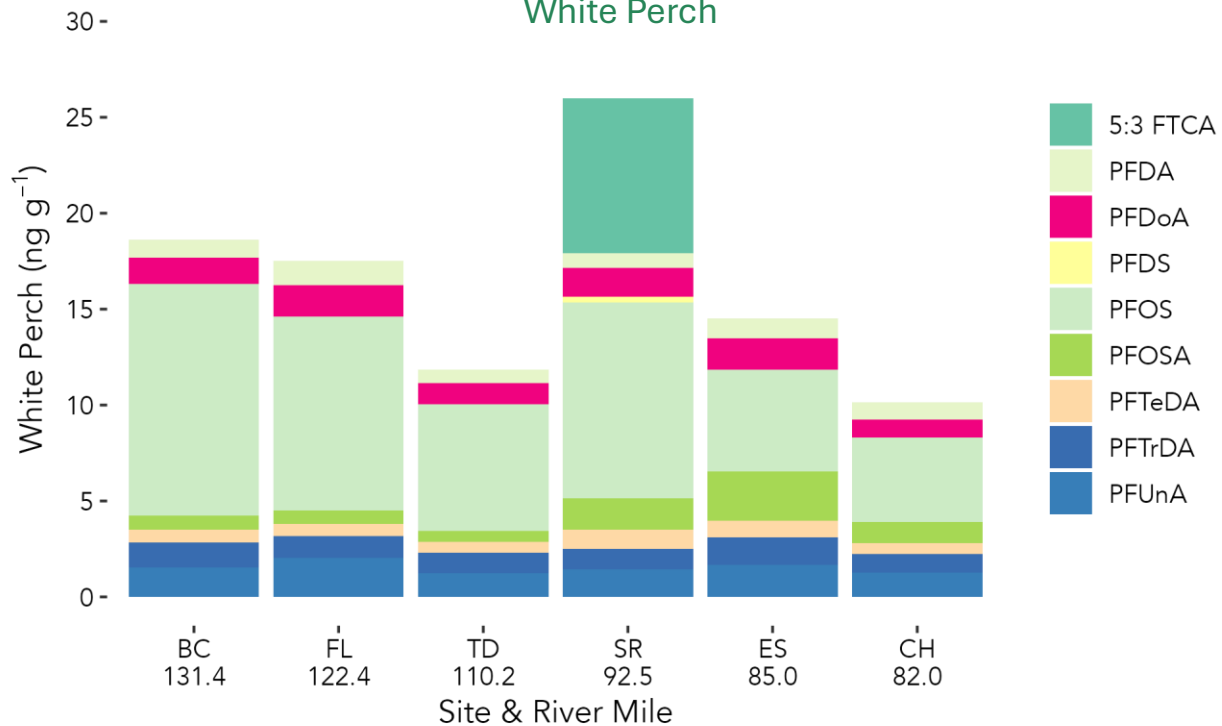
Small Mouth Bass



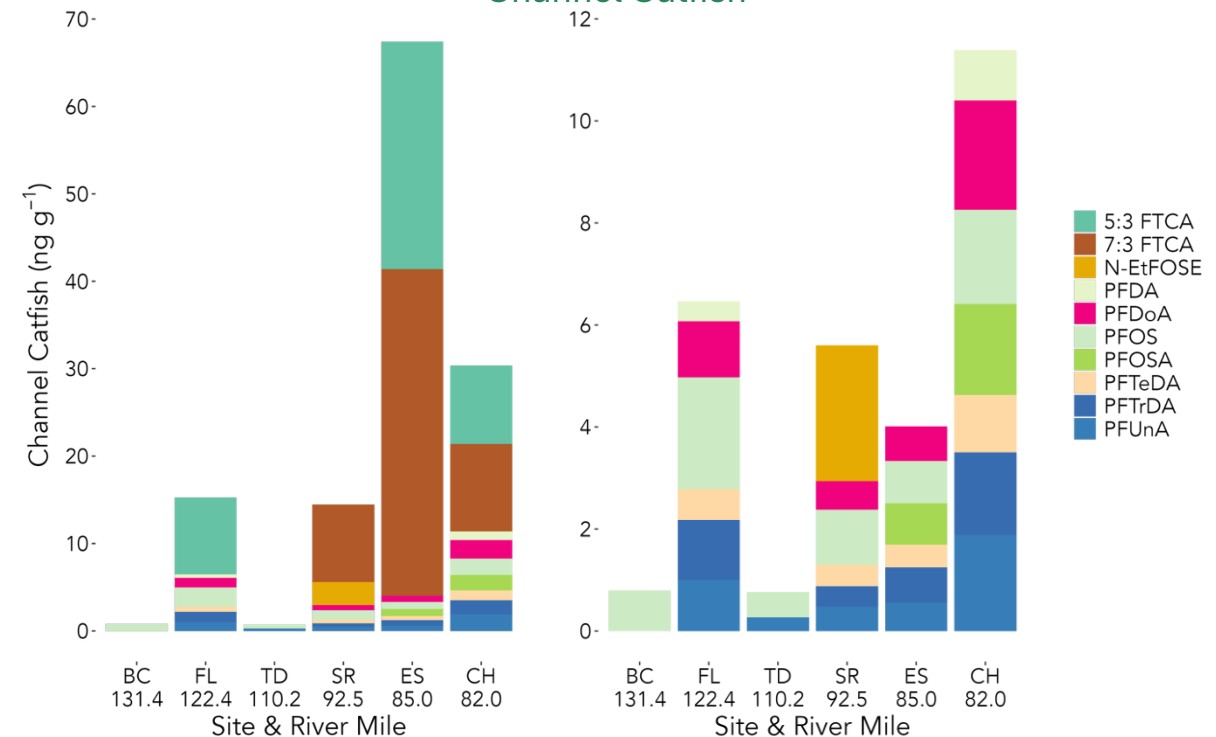
Delaware River Basin Commission
 DELAWARE • NEW JERSEY
 PENNSYLVANIA • NEW YORK
 UNITED STATES OF AMERICA



White Perch



Channel Catfish





PFAS concentrations and mass increase as water flows downstream



Surface sediment concentrations reflect nearby sources, while cores show historical accumulation



PFAS is found in all tissues sampled, with PFOS generally being the dominant compound

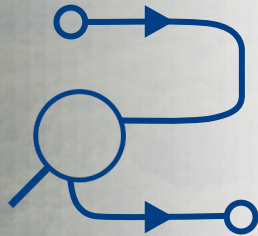
PFAS is pervasive in the Delaware River Basin – more monitoring and source Identification are needed



DRBC's Plans for PFAS



Continue collecting and assessing publicly available PFAS data for the Delaware River Basin



Begin tracking sources of PFAS



When sources are identified, work with state and federal partners to find ways to reduce loading

What can you do?





Delaware River Basin Commission

DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

DRBC knows that PFAS is a significant problem in the Delaware River Basin. While still assessing data, we are starting to look for ways to identify sources and reduce this pollution in our basin.

Jeremy L. Conkle, Ph.D.
jeremy.conkle@drbc.gov



Thanks to the National Fish and Wildlife Foundation Delaware Watershed Conservation Fund for 3 consecutive years of funding to study PFAS in the Delaware River Basin and to the USEPA 106 Grants for funding our web app development.

DRBC PFAS Web App



OR search: “DRBC PFAS Web app”

DRBC PFAS Website

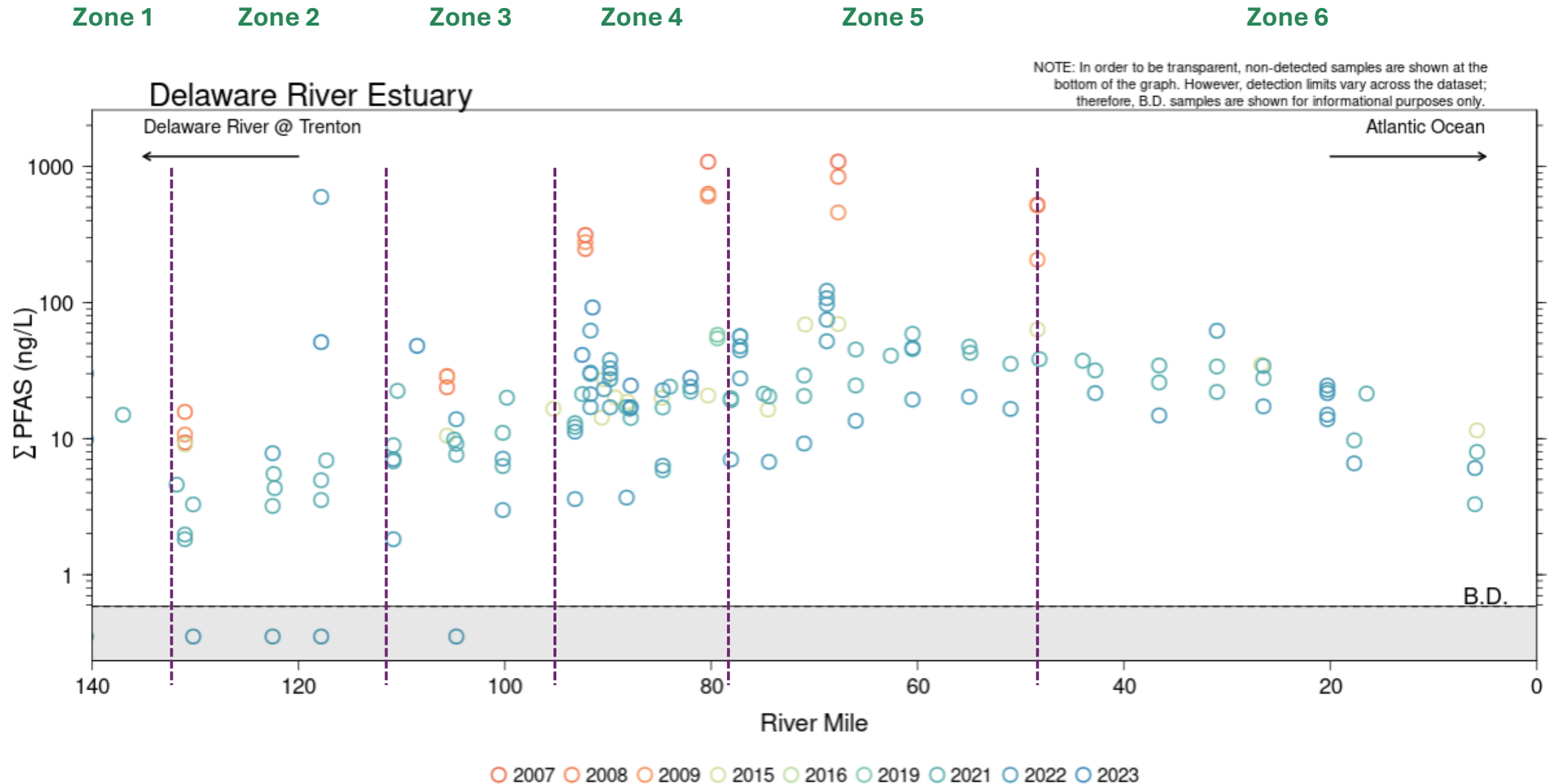


OR search: “DRBC PFAS”

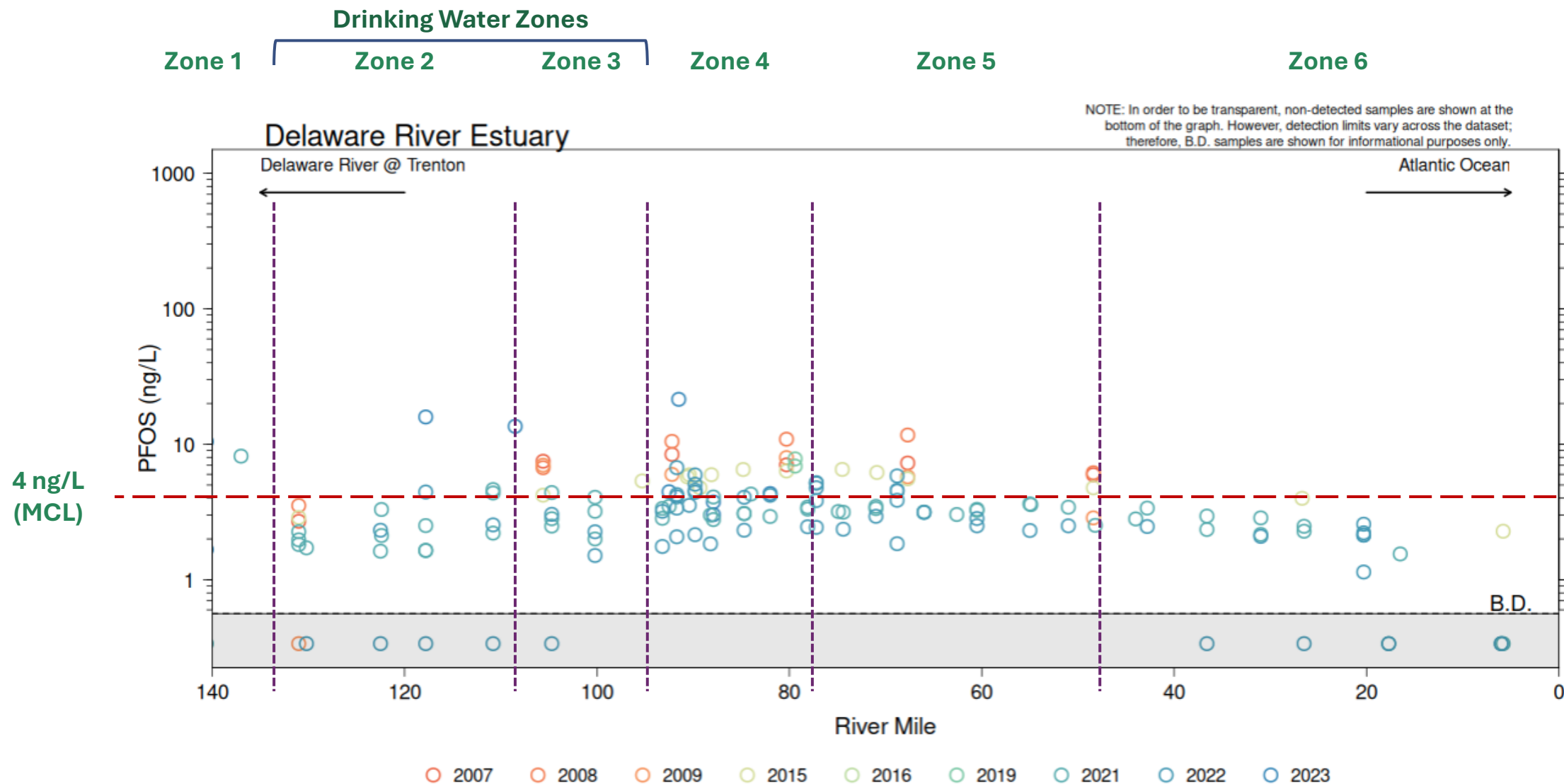
Thank you for the support:
DRBC Staff: Ron MacGillivray, Elaine Panuccio, Jake Bransky, Bailey Adams, Kyle McAllister



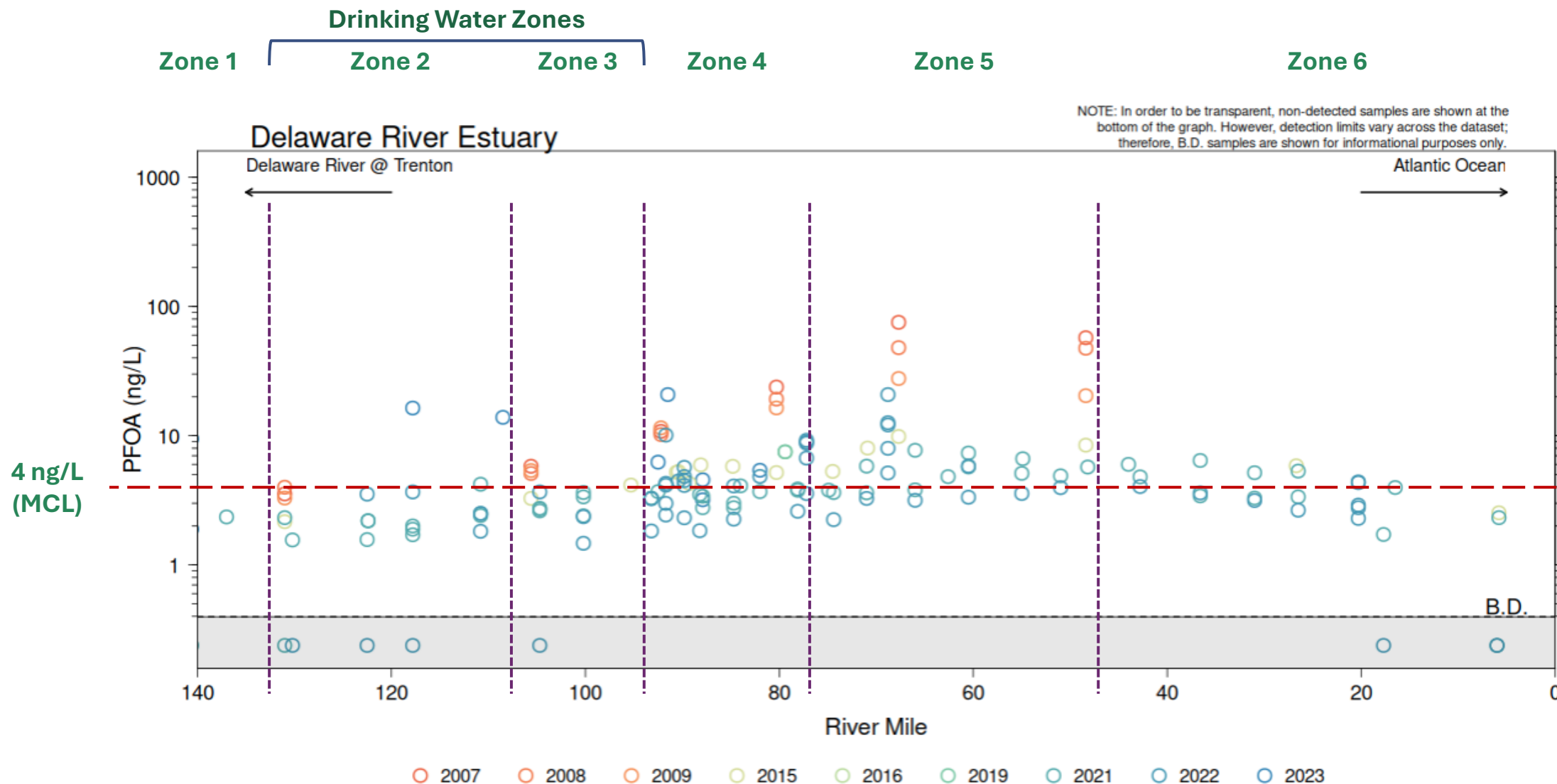
Surface Water Σ_{PFAS} Peaks near River Mile 65



PFOS in Mainstem Surface Water



PFOA in Mainstem Surface Water



DRBC's Next Steps for PFAS

Jeremy L. Conkle, Ph.D., Sr. Chemist/Toxicologist





Continue collecting and assessing publicly available PFAS data for the Delaware River Basin

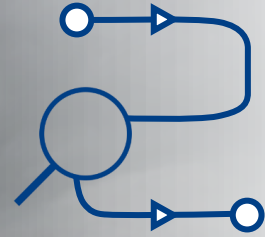
DRBC's Plans for PFAS



PFAS Web App for assessment



Samples of opportunity



Begin tracking sources of PFAS

DRBC's Plans for PFAS



Start with smaller-scale efforts
in tributaries



Pursue funding

DRBC's Plans for PFAS



When sources are identified, work with state and federal partners to find ways to reduce loading



Stay Engaged with DRBC's PFAS work

- **Explore DRBC's PFAS resources**
 - PFAS report and resources:
<https://www.nj.gov/drbc/programs/quality/pfas.html>
 - Web app: <https://wq.drbc.net/pfas/>
- **Attend a DRBC meeting**
 - Next advisory committee meeting:
<https://www.nj.gov/drbc/meetings/advisory/index.html>
 - Next public input opportunity:
<https://www.nj.gov/drbc/meetings/upcoming/>
- **Apply to serve on a DRBC advisory committee**
 - Committee openings
<https://www.nj.gov/drbc/about/advisory/committee-openings.html>
- **Sign up for news from DRBC**
 - <https://www.nj.gov/drbc/contact/interest/>
- **Share DRBC's PFAS social media toolkit**
 - Toolkit will be sent via email to webinar attendees

Question & Answer session

The Delaware River Basin Commission ensures water security for over 14 million people in 4 states.

contact@drbc.gov

www.drbc.gov

