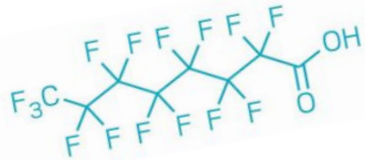
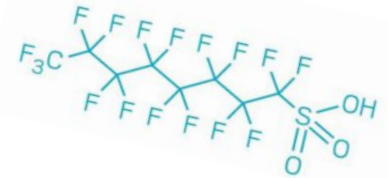


An Introduction to PFAS



Cumberland County Extension
Katy May
March 11, 2025



CHHE
Center for Human Health
and the Environment

Answering your PFAS questions:

During the presentations:

→ **One thing you learned.**

(were most surprised by, will stick with you, etc.)

During the Q&A:

→ **Raise your hand for more cards**

→ **One question per card 😊**

What are PFAS?

- **P**er- and poly**f**luoro**a**lky**s** substances
14,000+ manmade chemicals



What are PFAS?

- **P**er- and poly**f**luoro**a**lky**l** **s**ubstances
14,000+ manmade chemicals
- Unique chemical properties that make things water, stain, and grease resistant



What are PFAS?

- **P**er- and poly**f**luoro**a**lkyl **s**ubstances
14,000+ manmade chemicals
- Unique chemical properties that make things water, stain, and grease resistant
- Move through environment easily
Bioaccumulate in organisms



What are PFAS?

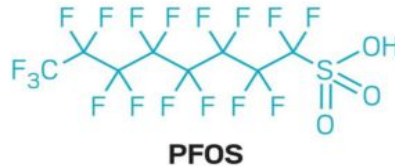
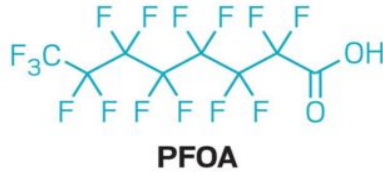
- **P**er- and poly**f**luoro**a**lky**s** substances
14,000+ manmade chemicals



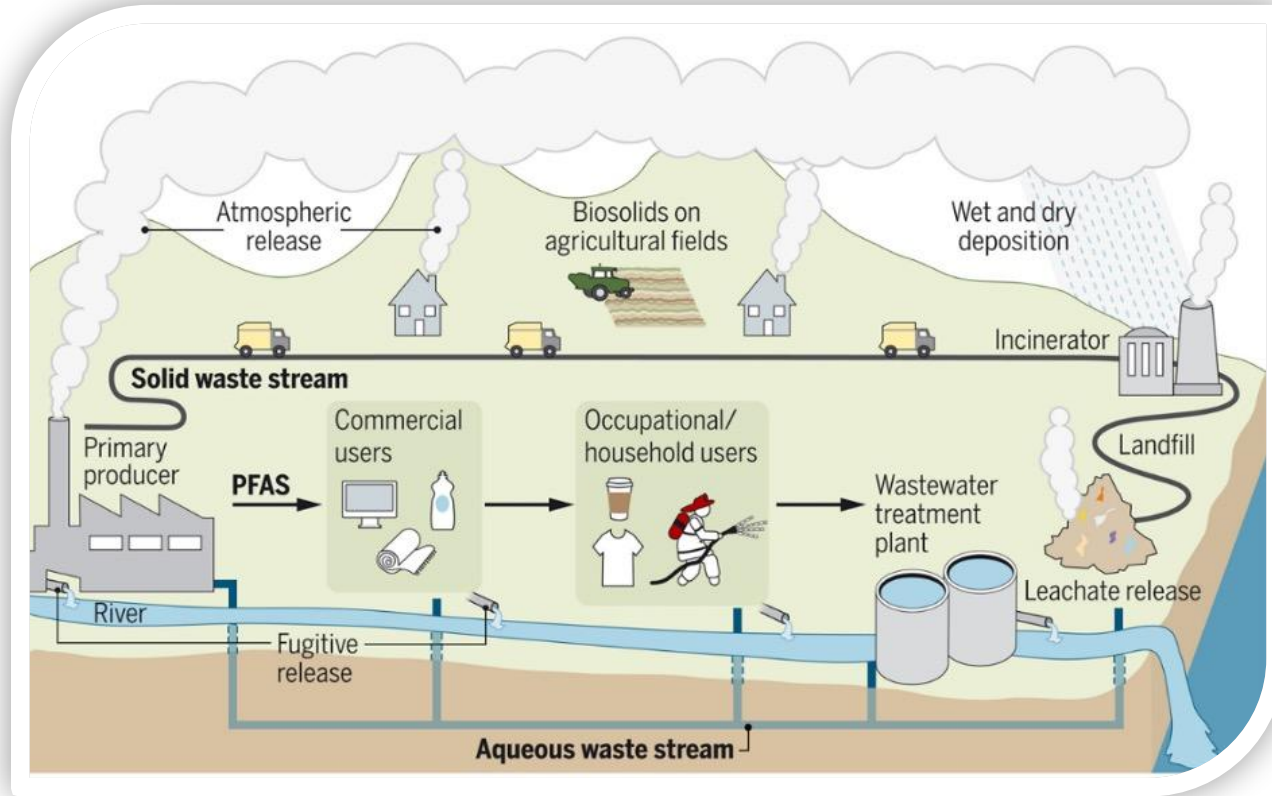
2 widely used and investigated:

Perfluorooctanoic acid (**PFOA**)

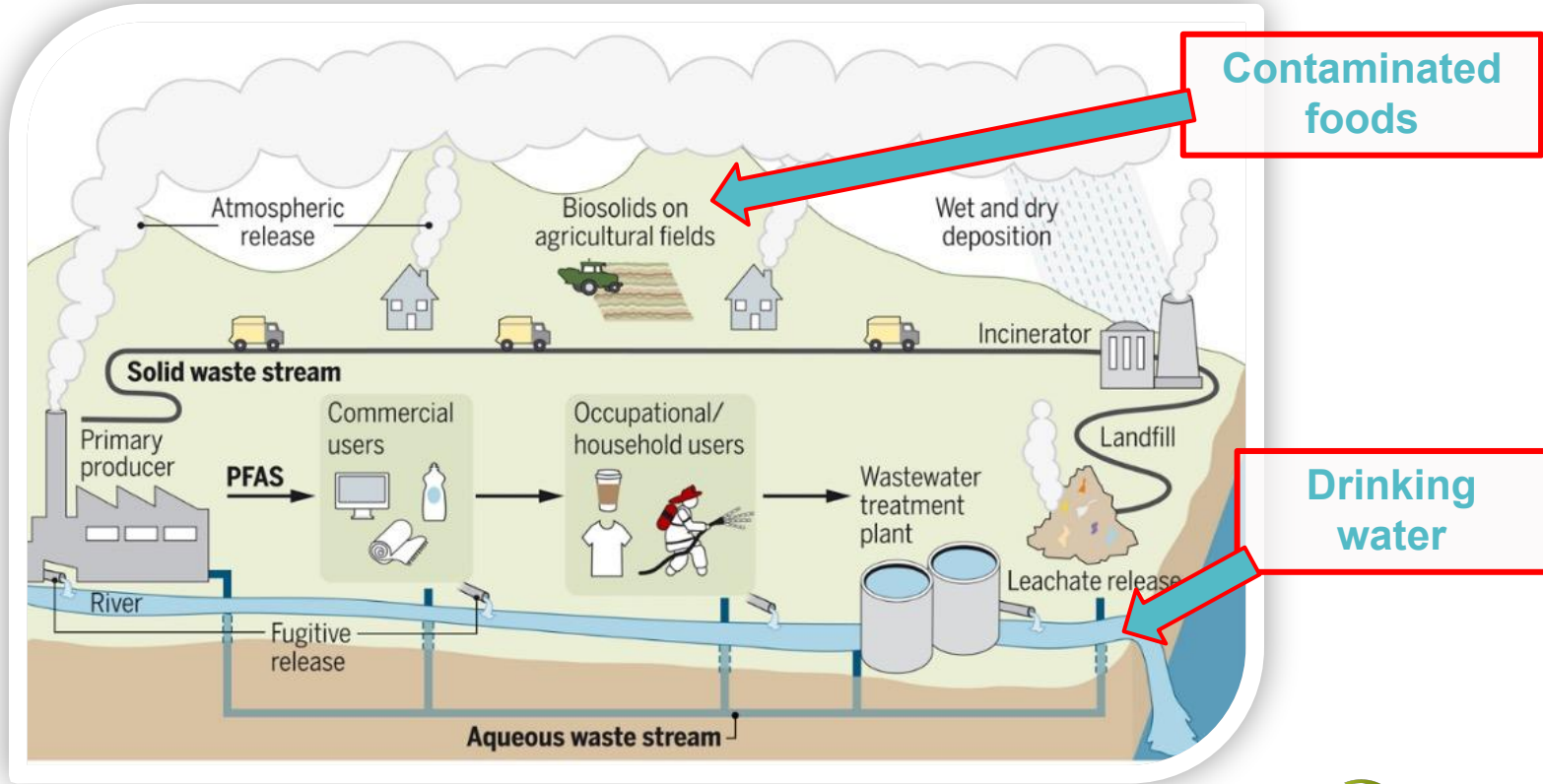
Perfluorooctane sulfonate acid (**PFOS**)



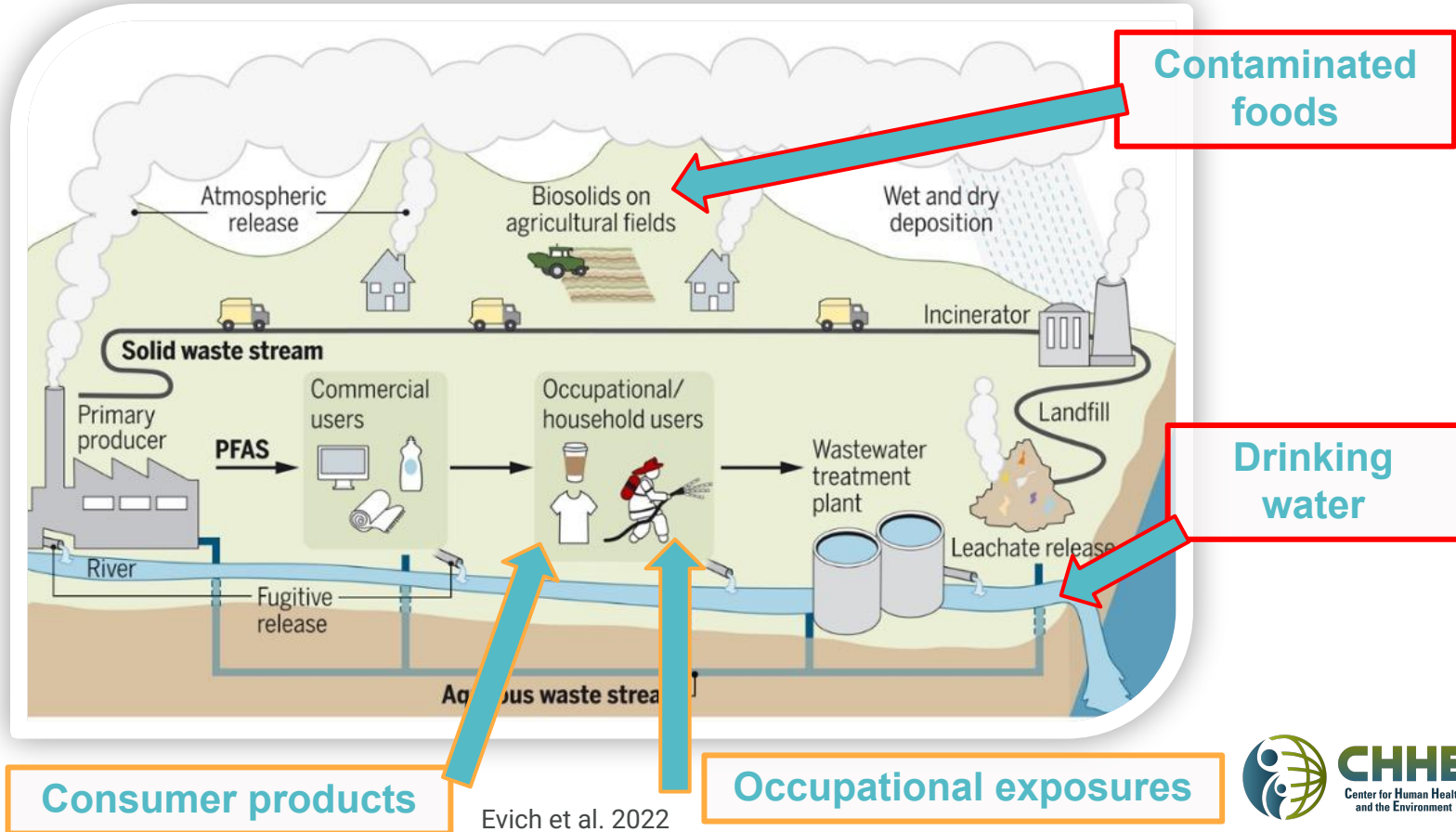
How do PFAS get into the environment?



How do PFAS get into us?



How do PFAS get into us?

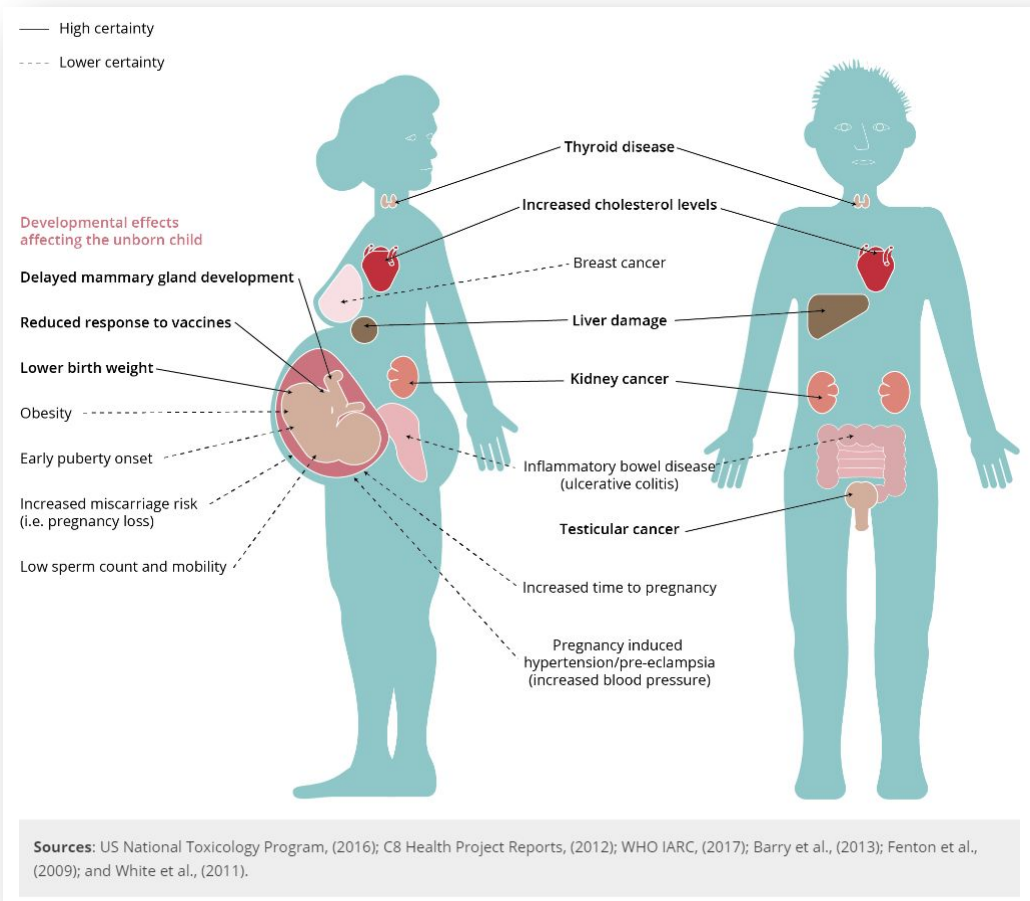


Consumer products

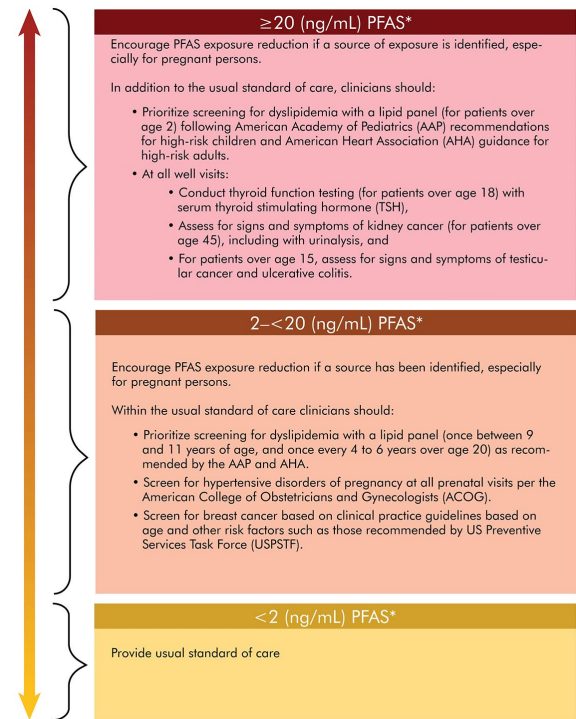
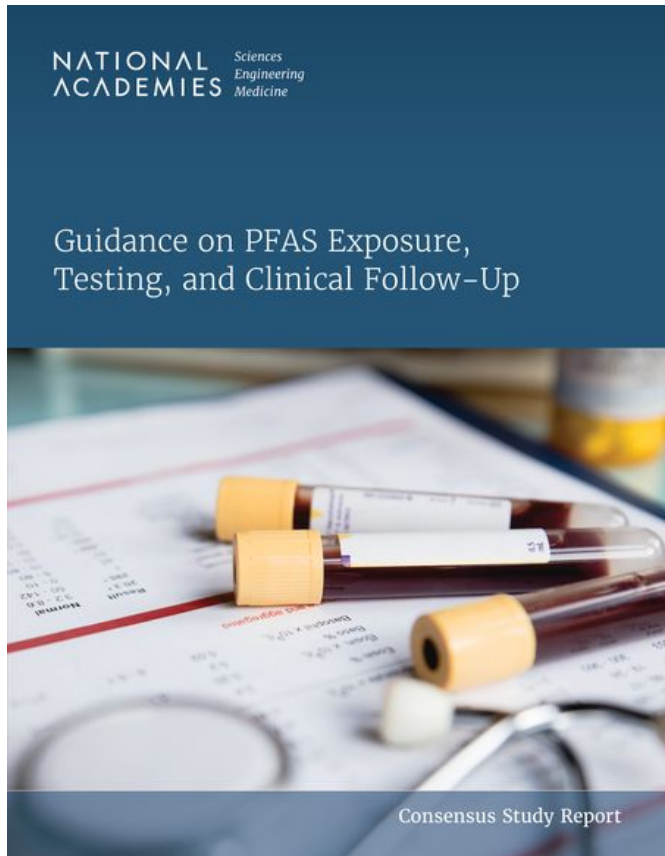
Evich et al. 2022

Occupational exposures

Why do we care about PFAS exposure?

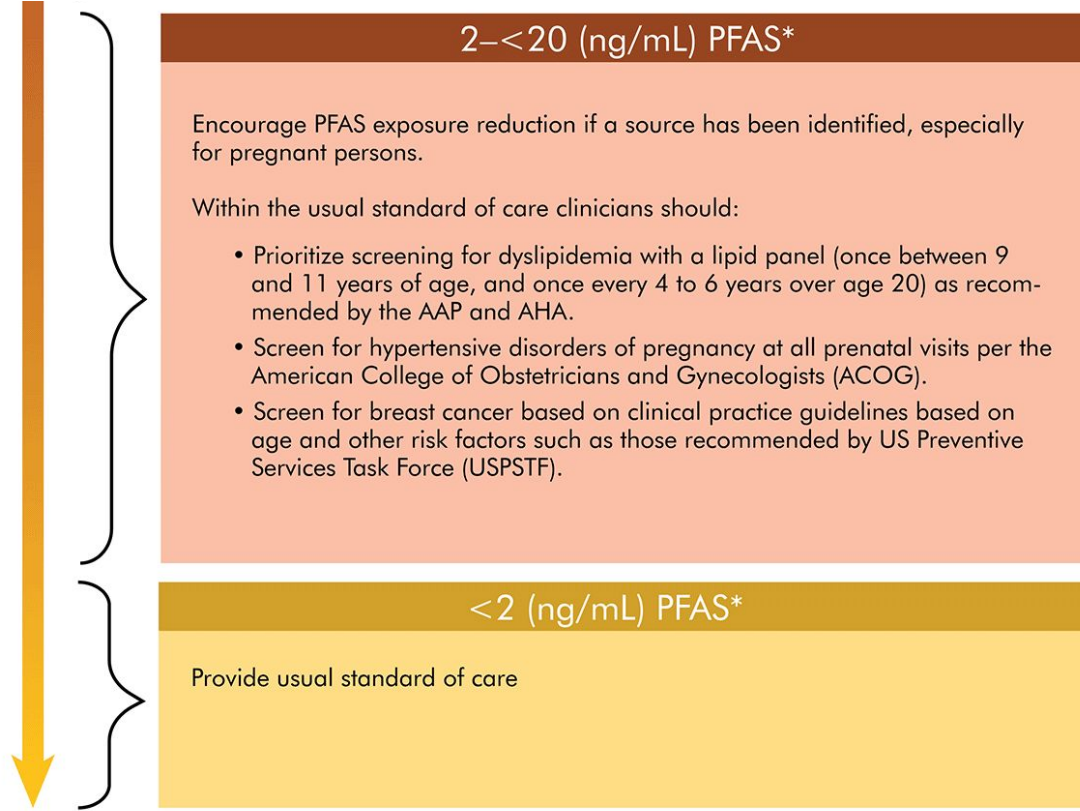


Why do we care about PFAS exposure?



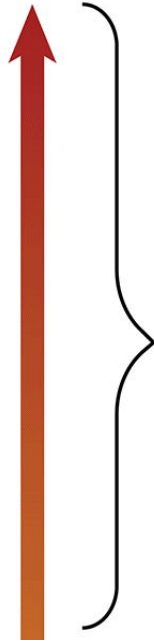
* Simple additive sum of MeFOSAA, PFHxS, PFOA (linear and branched isomers), PFDA, PFUnDA, PFOS (linear and branched isomers), and PFNA in serum or plasma

Why do we care about PFAS exposure?



* Simple additive sum of MeFOSAA, PFHxS, PFOA (linear and branched isomers), PFDA, PFUnDA, PFOS (linear and branched isomers), and PFNA in serum or plasma

Why do we care about PFAS exposure?



≥ 20 (ng/mL) PFAS*

Encourage PFAS exposure reduction if a source of exposure is identified, especially for pregnant persons.

In addition to the usual standard of care, clinicians should:

- Prioritize screening for dyslipidemia with a lipid panel (for patients over age 2) following American Academy of Pediatrics (AAP) recommendations for high-risk children and American Heart Association (AHA) guidance for high-risk adults.
- At all well visits:
 - Conduct thyroid function testing (for patients over age 18) with serum thyroid stimulating hormone (TSH),
 - Assess for signs and symptoms of kidney cancer (for patients over age 45), including with urinalysis, and
 - For patients over age 15, assess for signs and symptoms of testicular cancer and ulcerative colitis.

* Simple additive sum of MeFOSAA, PFHxS, PFOA (linear and branched isomers), PFDA, PFUnDA, PFOS (linear and branched isomers), and PFNA in serum or plasma

PFAS in Cumberland County

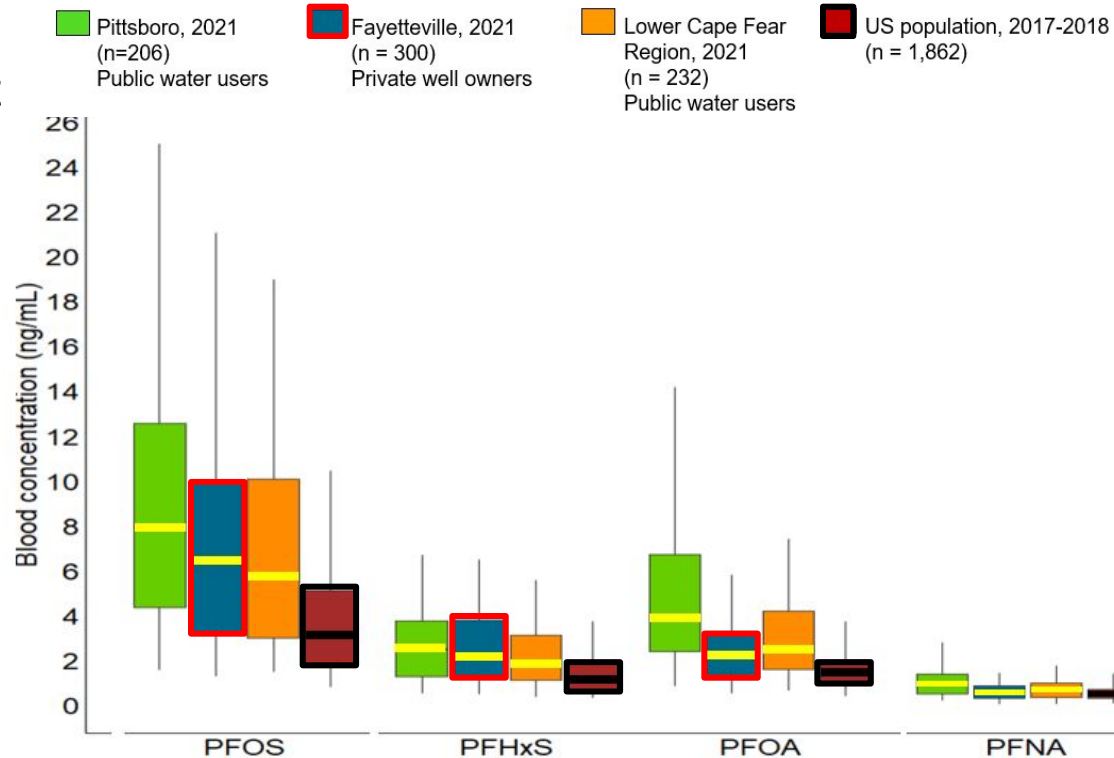
These 4 PFAS showed up in almost everyone in the study

Levels 2-4x higher than US national averages

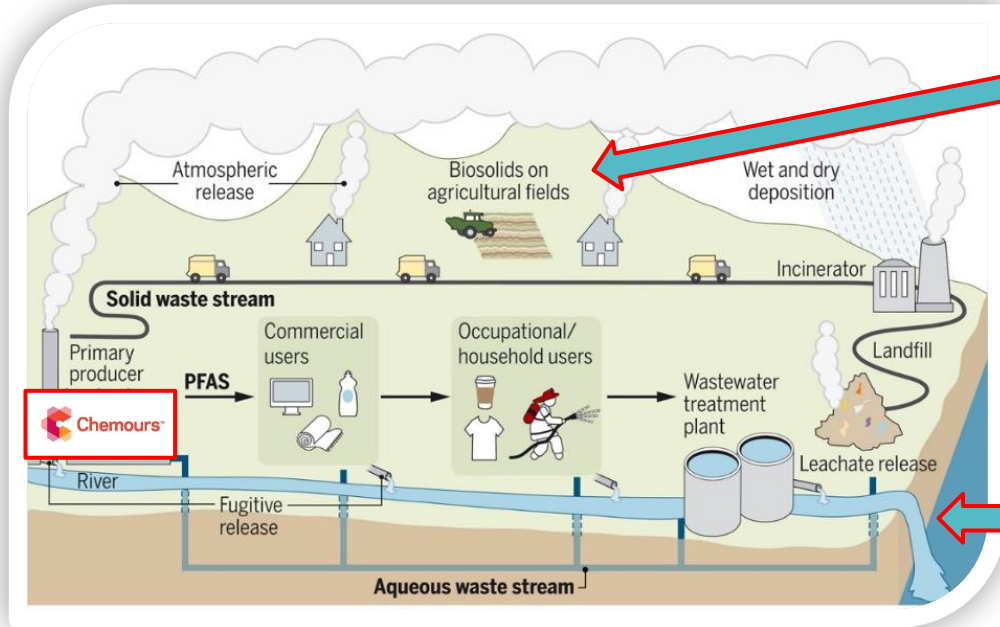
Widespread PFAS exposure throughout Basin

Higher exposure than average person in US

Did not find GenX in any blood samples



PFAS in Cumberland County

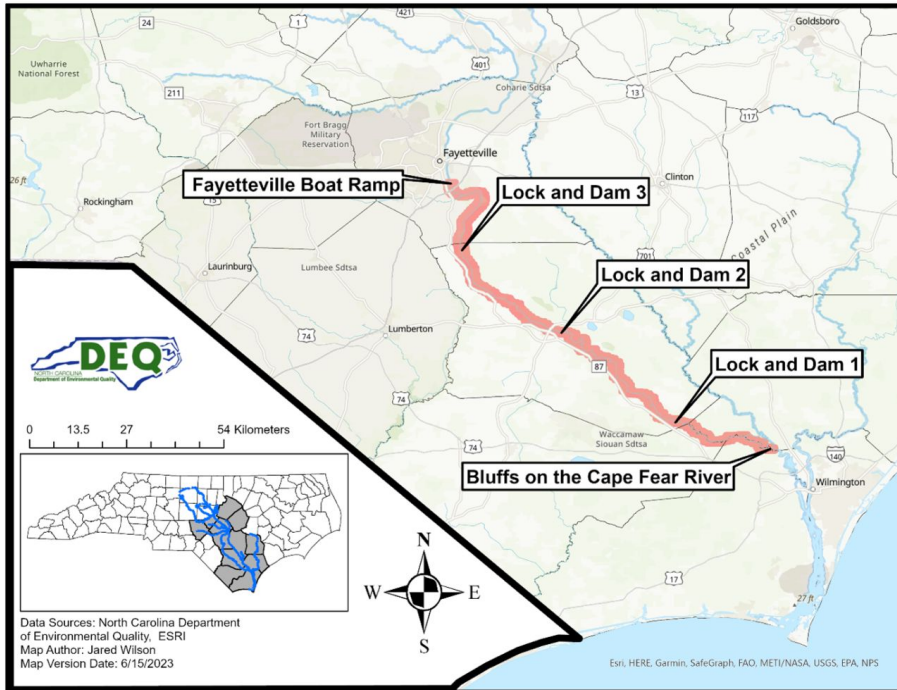


Contaminated foods:
Locally grown fruits & veggies
Locally caught fish
Locally hunted animals
Feed for livestock

Drinking Water:
Private well owners relying on
contaminated groundwater

PFAS in Cumberland County

One, very restrictive fish consumption advisory issued by NC DHHS for a small portion of Cape Fear River



PFOS FISH CONSUMPTION ADVISORIES*

for the Cape Fear River at the Fayetteville Boat ramp, near the I-95 overpass, to the Bluffs on the Cape Fear

1 NO MORE THAN 1 SERVING PER YEAR COMBINED ACROSS ALL SPECIES					
7 NO MORE THAN 7 SERVINGS PER YEAR COMBINED ACROSS ALL SPECIES					

*See separate advisory for women of childbearing age, pregnant women, nursing mothers and children.

Fish illustrations by Duane Raver

Benefits of Eating Fish

Fish are good source of lean protein that can promote bone health, decrease the chance of becoming overweight or obese, and decrease the risk of colon and rectal cancers.



Avoiding Bad Fish

The fish above have been found to have high levels of PFOS and/or PFAS. Eating fish with higher levels of chemicals like PFAS or PFOS may cause health problems. These health concerns can be and not limited to; increase in risk of cancer, liver damage, and higher cholesterol.



Serving Size

A serving of fish is:
 6 oz -OR- 8 oz
 cooked fillet raw fillet



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SCAN TO LEARN MORE

Or visit:
<https://bit.ly/44ocXZk>



PFAS in Cumberland County

No health or regulatory guidance for PFAS in homegrown plants or commercial crops

NC farmer losing crop because of unsafe levels of chemicals in water



Monday, July 15, 2024



North Carolina has 47 drinking-water systems with concerning levels of PFAS, also known as forever chemicals.

No health advisories or guidance for hunting, eating local game animals



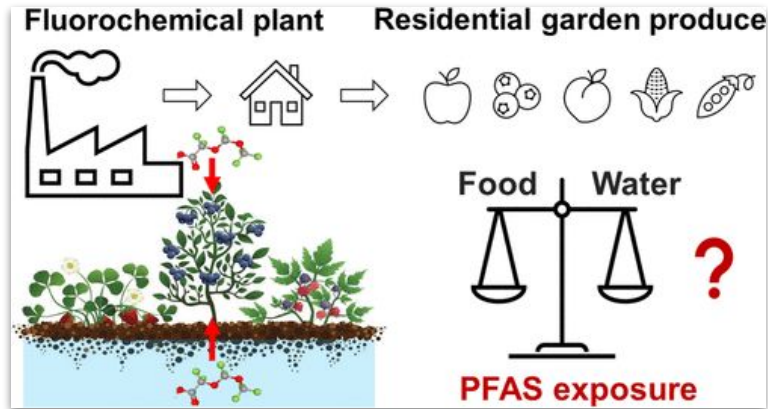
Watch Live News Weather Back to School Olympics Investigate Traffic Health Cape Fear Weekend Submit

NC Wildlife expert talks about deer hunting warnings after high levels of PFAS found in some animals

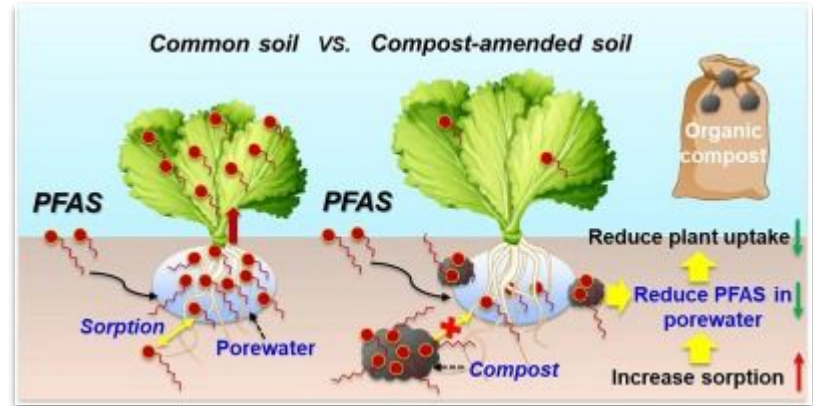


PFAS in Cumberland County

New research helps us understand exposure from locally grown produce, ways to understand risk, and potentially reduce PFAS uptake



Meng et al., 2024



Li et al., 2024

To Summarize:

- **P**er- and poly**f**luoro**a**lky**s** substances (PFAS) is a category of 14,000+ manmade chemicals
- Drinking water is the most important exposure source
 - Potentially contaminated local food
- PFAS have known negative health effects, and we continue to learn more
- PFAS are everywhere, but communities in NC face uniquely elevated exposures
- Take advantage of strategies for exposure reduction