

# South Carolina PFAS Response

Henry Porter Ray Holberger

November 3, 2025





1. WISE MOTHER! She knows how to stay dry when it's wet. Her coat is protected by "Zelan." Rain or snow, mist or sleet rolls away. "ZELAN" SHEDS WATER!

How Du Pont "Zelan"
Protects Your Clothes

-Rain or Shine



2. LICKIN' GOOD—and no lickin's ahead! For Mother doesn't care about splashes when playclothes are protected with "Zelan." All spots and spills that aren't greasy sponge off.

"ZELAN" RESISTS STAINS!



**3.** S'PRISE for Uncle Jim—a spick-and-span jacket. Mother knows it will still keep him neat and dry. Standard Army spray test proves, when clothes are properly washed or cleaned, "ZELAN" WON'T WASH OUT!

weather protection that won't wash out



DU PONT, WILMINGTON 98, DELAWARE

DuPont Zelan



BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

### TEFLON: The Clean Winner.

STAINLESS

ALUMINUM







When it comes to getting cleanest quickest, TEFLON is the clean winner. And when it comes to easy cleaning, any contest between TEFLON-coated cookware and stainless steel or uncoated aluminum is no contest.

And that's been true for fifteen

Now TEFLON has been improved for longer lasting no-stick cooking and baking. Look for the Quality Seal on improved TEFLON II. You'll see it on a wide variety of attractive cookware, bakeware, and

Each of them makes an ideal present for this time of year - as well as something ideal to present yourself. And while you're shopping, you should also look for something

In Missourical 800-342-6600. Free booklet offer expires December 31, 1975.

Call 800-325-6400 to find out where to get this free recipe booklet.

This booklet containing 25 winning recipes is free from TEFLON. To get it, just call the toll free number for the name of a participating store near you.

And be sure to look at the beautiful new TEFLON-coated items available for Christmas gift-giving, or just for giving yourself. They're the clean winners every time.

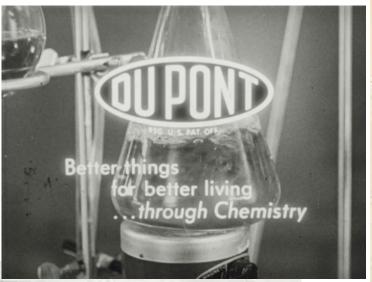














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Cotchgare







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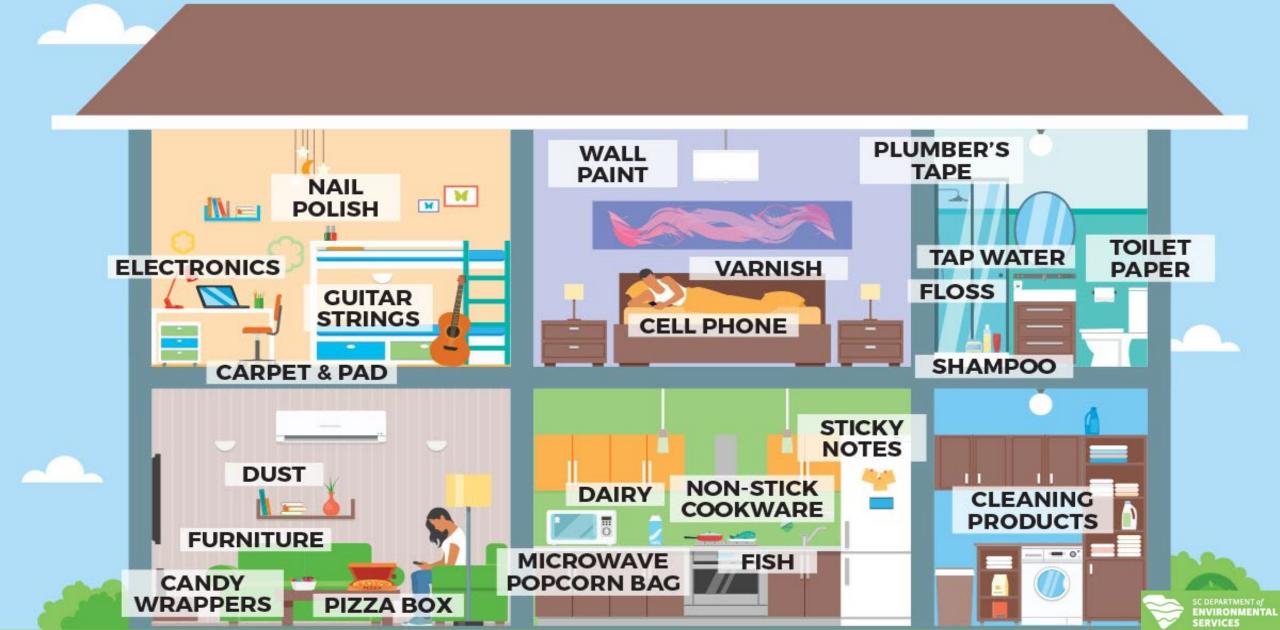
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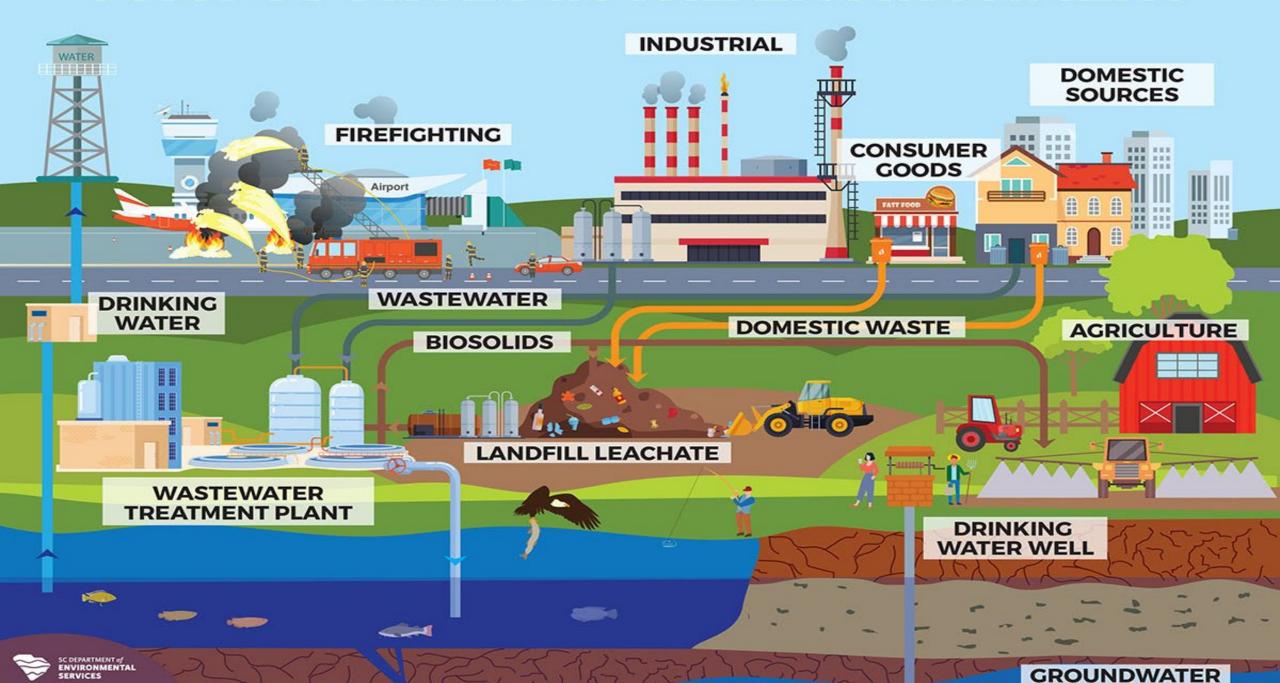
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# PFAS SOURCES IN THE HOME



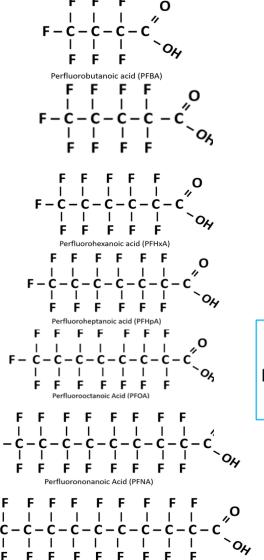
### PFAS SOURCES IN THE ENVIRONMENT



# Hydrocarbons

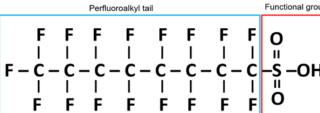
Propane	C <sub>3</sub> H <sub>8</sub>	H H H H - C - C - C - H I I I H H H
Butane	C4H10	H H H H 
Pentane	C <sub>5</sub> H <sub>12</sub>	H H H H H-C-C-C-C-H I I I I H H H H H
Hexane	C <sub>6</sub> H <sub>14</sub>	H H H H H 
Heptane	C7H16	H H H H H H 
Octane	C <sub>8</sub> H <sub>18</sub>	H H H H H H H H-C-C-C-C-C-C-C-H I I I I I I H H H H H H H
Nonane	C9H20	H H H H H H H H H-C-C-C-C-C-C-C-H I I I I I I I H H H H H H H H
Decane	C10H22	H H H H H H H H H H-C-C-C-C-C-C-C-C-H I I I I I I I I H H H H H H H H H

### **Fluorocarbons**





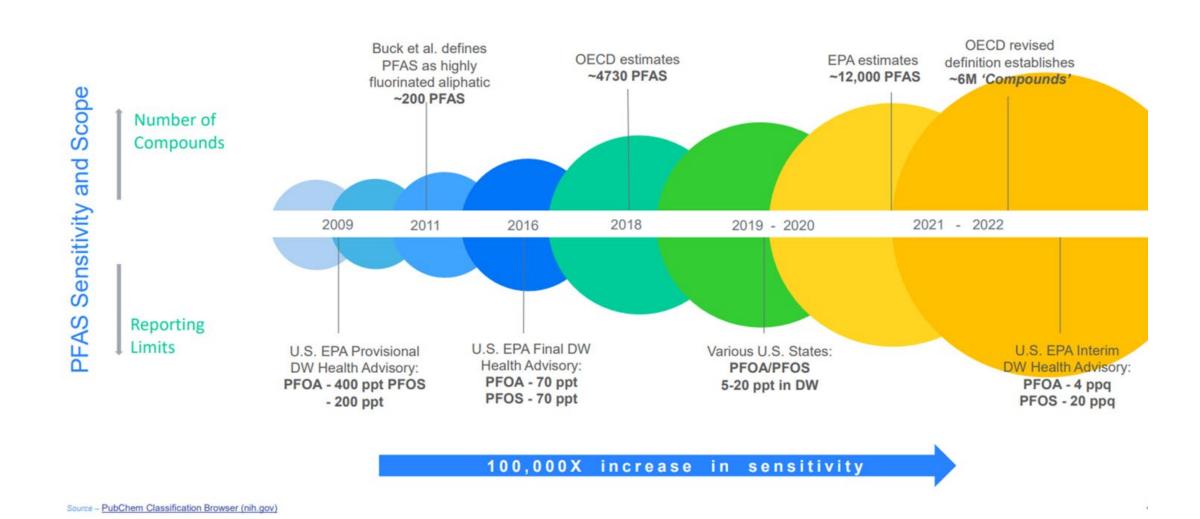
Pertiuoronexanesuipnonic Acid (PFHXS)



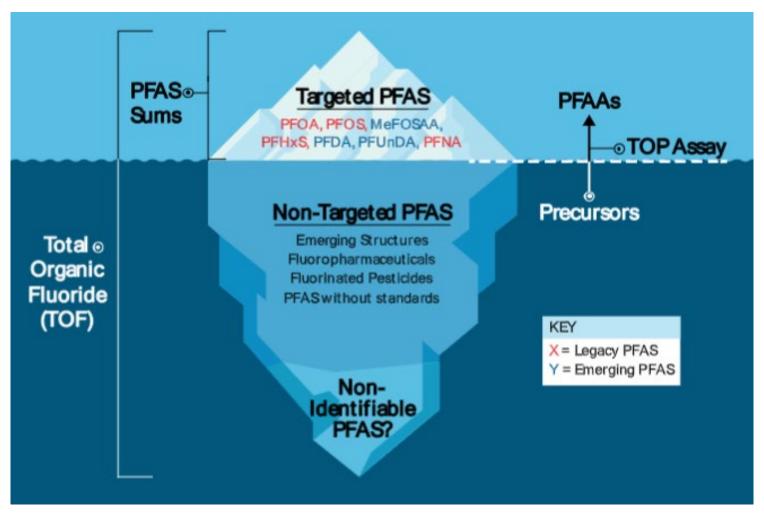
Perfluorooctanesulfonic acid (PFOS)

### PFAS: Evolution of the Science



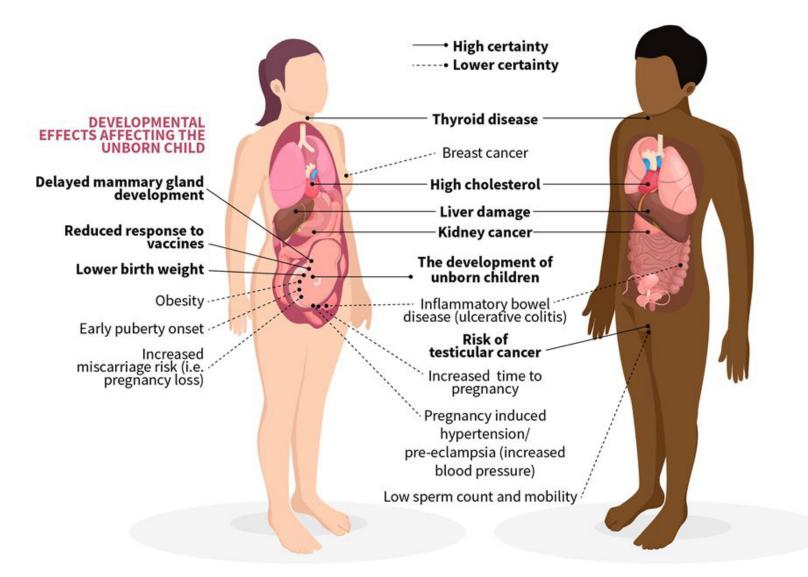


## What else are we looking for?



From: Manz 2024. https://doi.org/10.1021/acsmeasuresciau.4c00052

### **Health Effects Associated with PFAS Exposure**



### **SCDES PFAS Response Timeline**

2018

GALEY & LORD REMOVAL ACTION

First PFAS samples analyzed

Dozens of wells impacted by industrial land application

First public

outreach efforts

INSPECTION

2019

SHAW AFB

HAS PFAS

CONCERNS

SITE

Internal PFAS **Affinity Group** 

**ITRC Training** 

**PFASs Questions** in NPDES APPs

> Strategy to Assess the Impact of Drinking Water in South Carolina

> > South Carolina Department of Health & Environmental Control

> > > 2600 Bull Street



Widhec

2020

COMMUNITY DRINKING WATER STRATEGY PUBLISHED

408 Water Supply

Systems Sampled

Website created

Closure requiring

SCDES PEAS

First WWTP

2021

SURFACE WATER STRATEGY PUBLISHED

**Systematic** sampling of 48 Watersheds

More than 100 sites sampled quarterly

98 sites added

Strategy to Assess the Impact of Per- and Polyfluoroalkyl Substances on Ambient Surface Waters in South Carolina Bureau of Water

South Carolina Department of Health & Environmental Control



2022

PRIVATE WELL STRATEGY PUBLISHED

funding \$10m -

wells and small

FC Proviso

systems

2023

PRIVATE WELL AND LONG-TERM SW SAMPLING 2024 -2025

FOCUSED **ASSESSMENTS** BEGIN

6 Adaptive mgmt. SW

Outreach focused on areas of interest

40 Long-term SW Locations

Per- and Polyfluoroalkyl Substances (PFAS)

Fact Sheet



**Fact Sheet** Drinking Water Investigation at Former Galey & Lord Textile Plant in Society Hill

Per- and Polyfluoroalkyl Substances on

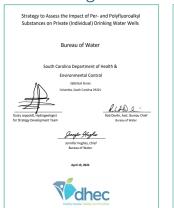
PFAS sampling

Bureau of Water

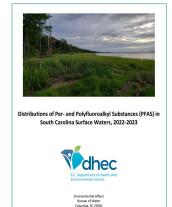
Cuil Clen Mike Marcus, Ph.D., Chief Bureau of Water

Strategy identifies areas of interest

QA and Analytical Contracting



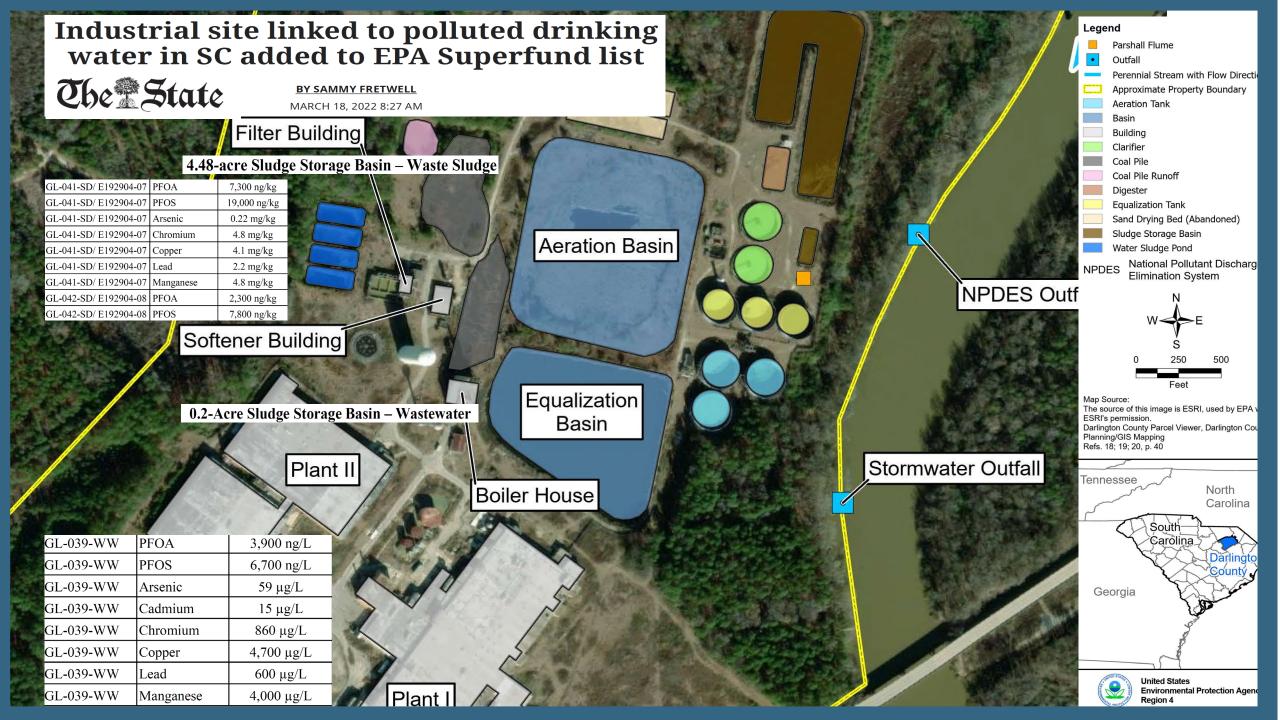
investigations



On-site Wastewater Study

**PFAS Profile Study** NTA, TOP, TOF

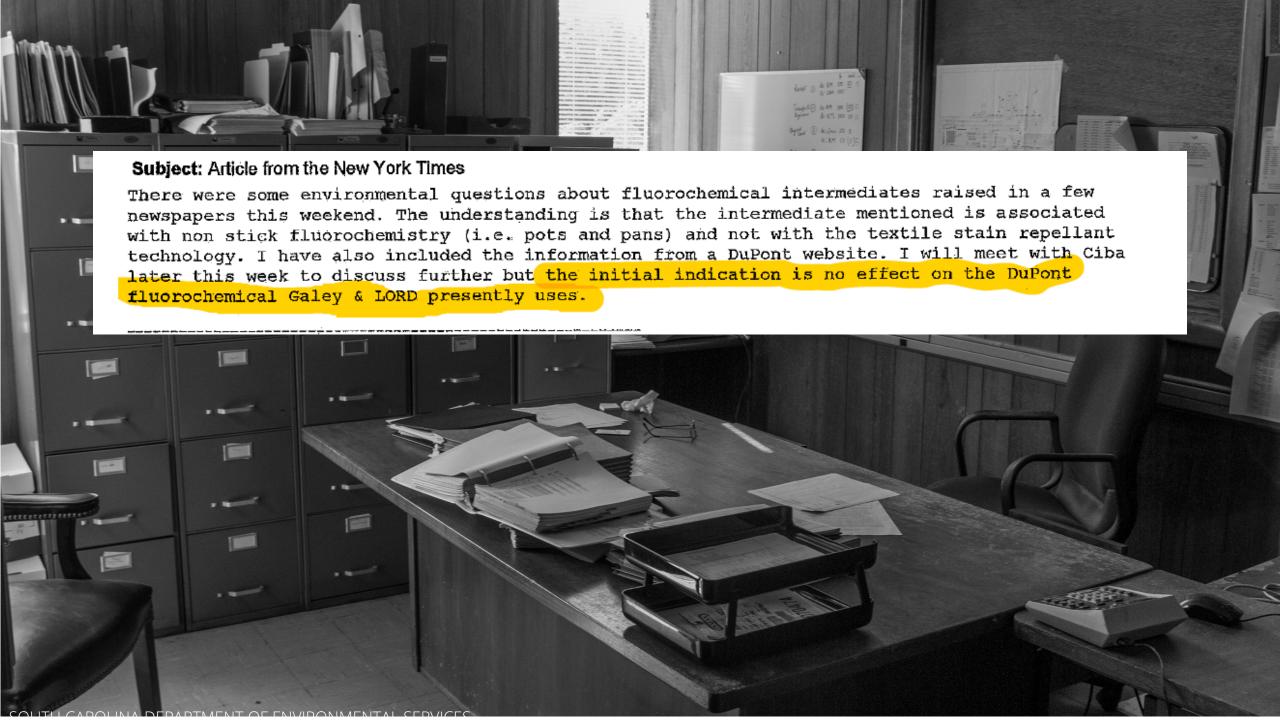
Well and SW Sampling Continue

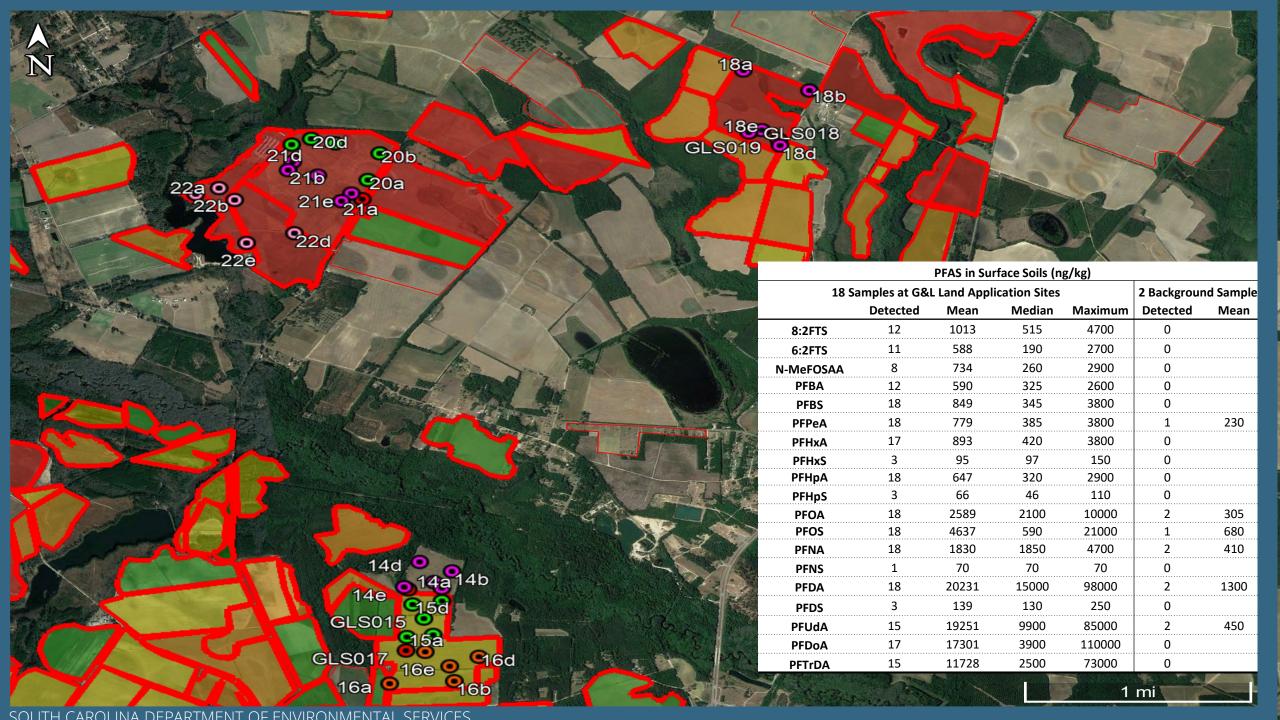


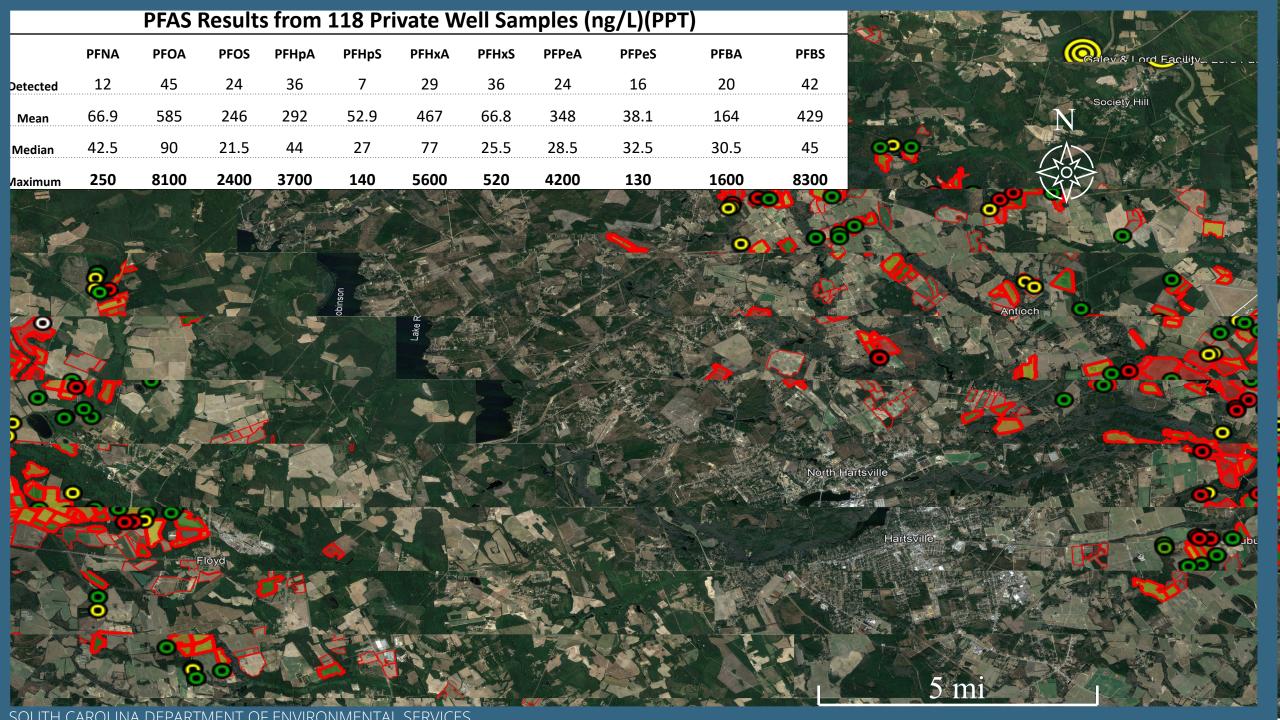


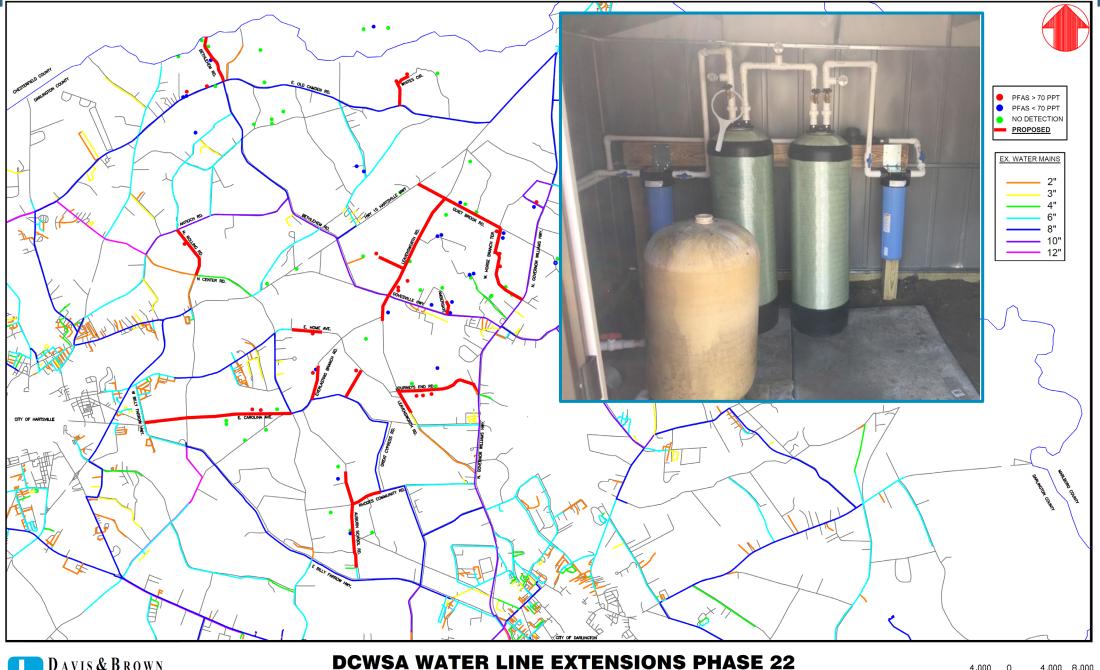
SOLITH CAROLINA DEPARTMENT OF ENVIRONMENTAL SERVICES













DCWSA WATER LINE EXTENSIONS PHASE 22
LOCATION MAP

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**Fact Sheet** 

2019

SHAW AFB SITE INSPECTION HAS PFAS CONCERNS

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PRIVATE WELL STRATEGY PUBLISHED 2023

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Wastewater Study

**PFAS Profile Study** 

NTA, TOP, TOF

Well and SW

Sampling

Continue

On-site

First public outreach efforts.

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Distributions of Per- and Polyfluoroalkyl Substances (PFAS) in South Carolina Surface Waters, 2022-2023



Fact Sheet





Per- and Polyfluoroalkyl Substances on Drinking Water in South Carolina Bureau of Water South Carolina Department of Health & Environmental Control Cirl Clun January 30, 2020

dhec

Strategy to Assess the Impact of Per- and Polyfluoroalkyl Substances on Ambient Surface Waters in South Carolina 8 8 1 Bureau of Water South Carolina Department of Health & Environmental Control Cuil Clen

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## **Community Drinking Water Systems**

# Some Observations: Surface Water Plants (56 plants)

Analyte	# Over MCL	Max concentration (ng/L)
PFOA	13	12
PFOS	24	16
PFNA	0	Non Detect
PFHxS	0	5
HFPO-DA	0	5
Hazard Index	0	0.5

#### Groundwater Wells (352 systems with 870 wells)

Analyte	# Over MCL	Max concentration (ng/L)
PFOA	35	220
PFOS	29	33
PFNA	0	5.4
PFHxS	4	380
HFPO-DA	0	2.8
Hazard Index	3	42

<sup>\*</sup>Page last updated 4/17/2024

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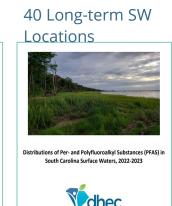
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Contracting Strategy to Assess the Impact of Per- and Strategy to Assess the Impact of Per- and Polyfluoroalkyl Polyfluoroalkyl Substances on Ambient Surface Substances on Private (Individual) Drinking Water Wells Waters in South Carolina 8 8 1 Bureau of Water Environmental Control South Carolina Department of Health & Environmental Control

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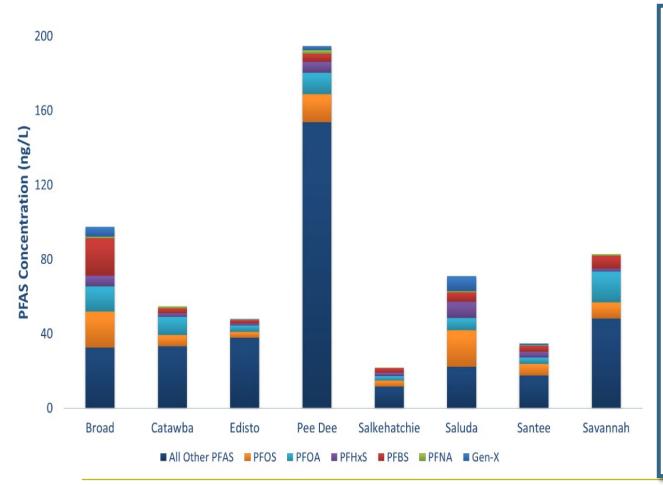
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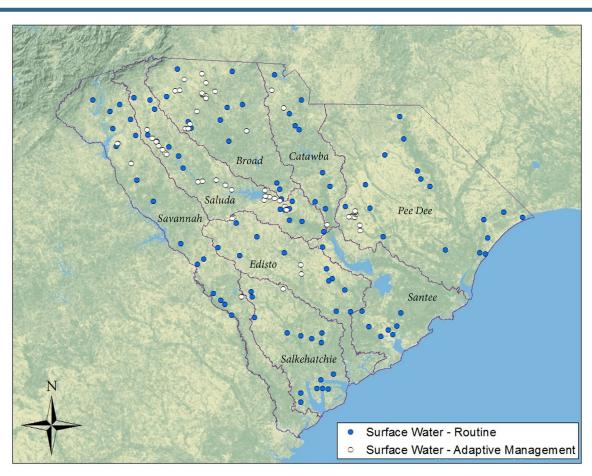




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# **Ambient Surface Water PFAS Assessment**





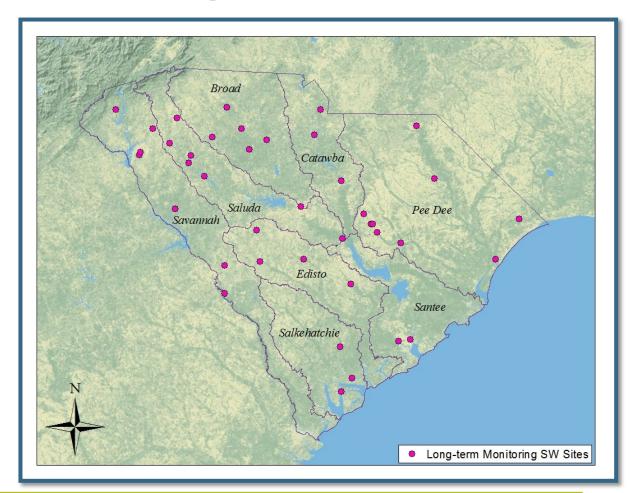
# Long-term Ambient Surface Water PFAS Monitoring

2024-2025

Quarterly sampling continues

40 ongoing sampling sites

- Selection of sites from assessment project
- Capture major rivers
- Further characterize areas of interest
- Locations revised as necessary



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Strategy to Assess the Impact of Per- and Polyfluoroalkyl Substances on Drinking Water in South Carolina Bureau of Water

South Carolina Department of Health & Environmental Control



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January 30, 2020

Polyfluoroalkyl Substances on Ambient Surface Waters in South Carolina 8 8 1 Bureau of Water South Carolina Department of Health & Environmental Control Cuil Clen

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Distributions of Per- and Polyfluoroalkyl Substances (PFAS) in South Carolina Surface Waters, 2022-2023

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### **Private Well PFAS Assessment**

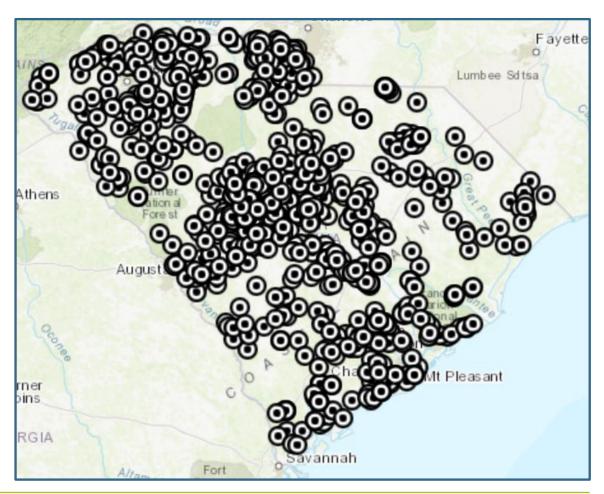




2022 SC Legislative Budgetary Proviso 34.63\$10M to Assess Emerging Contaminants

Sample request form available on agency website beginning in 2023: des.sc.gov/PFAS

Areas of interest are prioritized



### **Communications and Outreach**

- All results reported directly to well owners with lab reports
- MCL exceedances come with guidance and point-of-use filters
- Statewide media briefings to describe the agency's goals for the project





#### **Private Well Water PFAS Sampling**

SCDES is offering a free service to check for PFAS chemicals in private drinking water wells. If you would like to participate, use the QR code to fill out an application. There will be no cost to you for this

RESULTS: SCDES will provide results over the phone or schedule a time to discuss them with you in



Per- and Polyfluoroalkyl Substances (PFAS) are manmade chemicals that affect our environment through impacted wastewater, landfill leachate, surface water, groundwater and air

SCDES personnel can be identified by their employee badges.











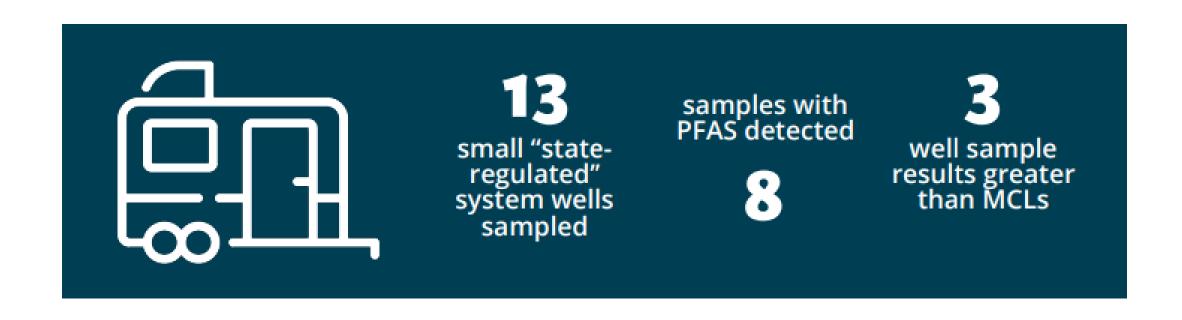
# **Private Well Sample Results**



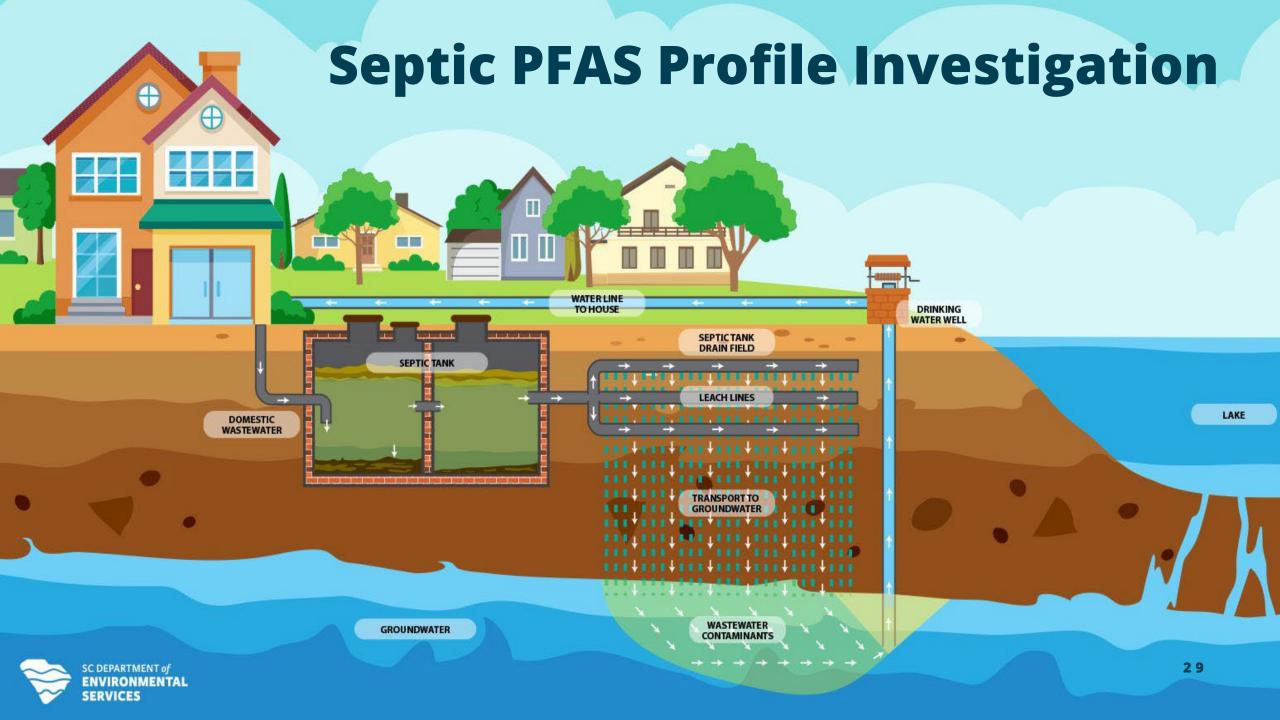




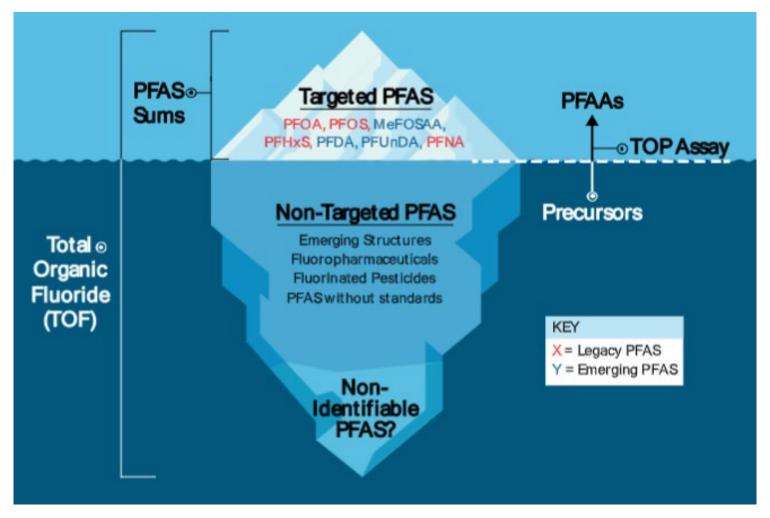
# "State System" Well Sample Results



### PFAS SOURCES IN THE ENVIRONMENT **DOMESTIC FIREFIGHTING** SOURCES **CONSUMER** INDUSTRIAL **GOODS** Airport 888 ... WASTEWATER **DRINKING** WATER **DOMESTIC WASTE BIOSOLIDS AGRICULTURE** LANDFILL LEACHATE **WASTEWATER** TREATMENT PLANT DRINKING WATER WELL GROUNDWATER



## What else are we looking for?



From: Manz 2024. https://doi.org/10.1021/acsmeasuresciau.4c00052

### **Future Directions**

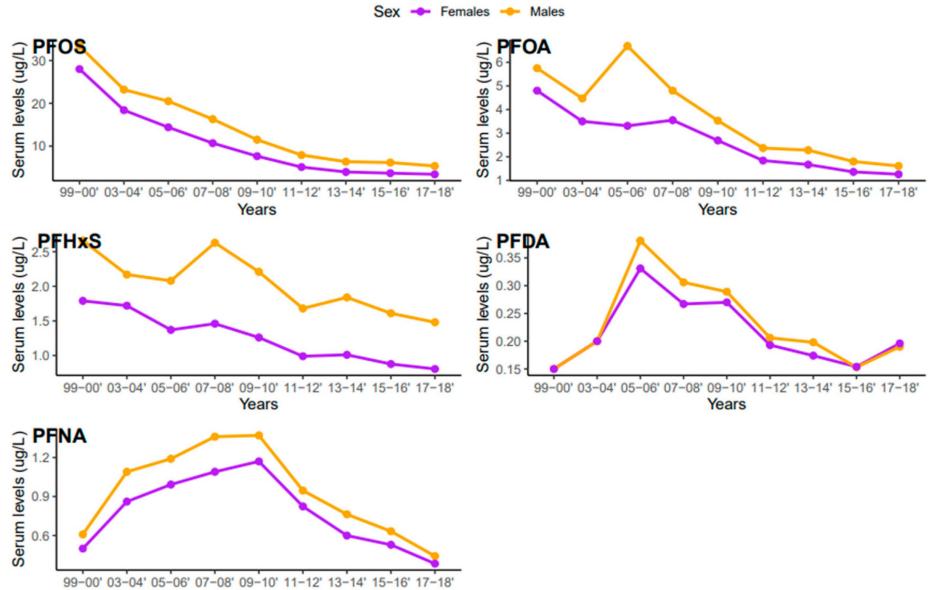
- Continue Private Well and Long-term Surface Water sampling
- Work with partners to improve drinking water quality
- Attempt to identify differences in PFAS Signatures
- Analyze existing data sources to identify further areas of interest
- Continue public outreach and PFAS exposure reduction efforts
- Stay informed of ongoing PFAS research developments

#### Trends in Serum Per- and Polyfluoroalkyl Substance (PFAS) Concentrations in Teenagers and Adults, 1999–2018 NHANES



Nilisha Khadgi Sonnenberg, Akinloye Emmanuel Ojewole, Catherine Oluwalopeye Ojewole, Otite Precious Lucky and Joseph Kusi\*

**Years** 





# Get in touch

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Thanks to *all SCDES staff* who volunteered time: Dusty Leypoldt, Matt Baumann, Coy Watts, Carolyn Moores, Will Cathcart, and *especially* Sandra Snyder RAY HOLBERGER // Risk Specialist
Office of Science Services
ray.holberger@des.sc.gov

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