Key Largo Wastewater Treatment District
Board of Commissioners Meeting
Agenda Item Summary

Meeting Date:

August 5, 2025

Agenda Item Number: P-1

Action Required:

No

Department:

Commissioner's Item

Sponsor:

Commissioner Heim

Subject:

Meeting Presentations from WQPP Meeting on July 24, 2025

Summary:

Commissioner Heim will present slides from the WQPP meeting on July 24, 2025.

Reviewed / Approved		Financial Impact	Attachments
Operations:	_____	$	1. Presentation Slides
Administration:	_____		
Finance:	_____	Funding Source:	
District Counsel:	_____	N/A	
District Clerk:	_____	Budgeted:	
Engineering:	_____	N/A	

Approved By: _____ **Date:** 7-31-25

General Manager

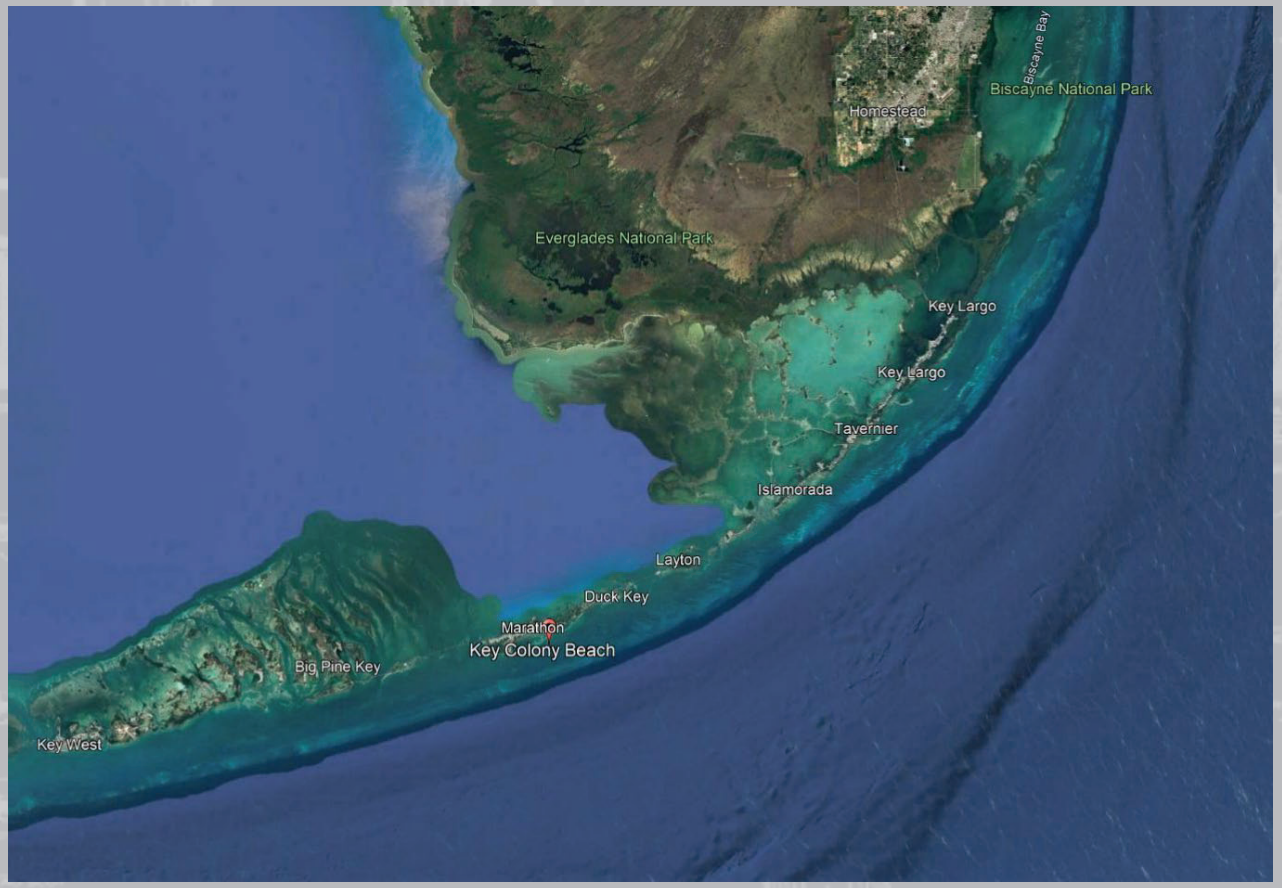
FLORIDA KEYS WATER QUALITY IMPROVEMENTS PROGRAM

U.S. ARMY CORPS OF ENGINEERS, JACKSONVILLE DISTRICT

USACE and Florida Keys National Marine Sanctuary

24 July 2025

Water Quality Protection Program Steering Committee Meeting



U.S. ARMY

US Army Corps of Engineers ®

- OVERVIEW -

AUTHORIZATION: PUBLIC LAW 106-554, SECTION 109

As amended by Section 8376 of the WRDA of 2022 (Public Law 117-263)

The U.S. Army Corps of Engineers (USACE) has been authorized to provide technical and financial assistance to carry out projects for the planning, design, and construction of treatment projects to improve water quality within the Florida Keys National Marine Sanctuary. The Corps has been authorized to expend up to **$200 million** for this effort.

US Army Corps of Engineers

AUTHORIZATION

- **Water Resources Development Act (WRDA) 2022**: (2) Florida Keys Water Quality Improvements, Florida.—Section 109(f) of title I of division B of the Miscellaneous Appropriations Act, 2001 (Public Law 106–554, appendix D, 114 Stat. 2763A–222 (as enacted by section 1(a)(4) of the Consolidated Appropriations Act, 2001 (114 Stat. 2763)); 121 Stat.1217) is amended by striking "$100,000,000" and inserting **"$200,000,000".**
- The Congress authorized up to $200 million (representing 65% of program costs).
- The Non-Federal interests will be responsible for 35% of the total project cost. Approximately $107.7 million.

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CURRENT REIMBURSEMENT STATUS

- Currently, $86M from the initial $100M authorization has been reimbursed back to the municipalities.
- By FY27, 100% of the remaining $100M balance is projected to be reimbursed.

Municipality	Total Allocation	Remaining to be Reimbursed
Key Colony Beach	$ 200,000.00	$ -
Layton	$ 800,000.00	$ -
Key West	$ 10,320,000.00	$ -
Islamorada	$ 29,560,000.00	$ 7,877,855.85
Marathon	$ 29,560,000.00	$ 459,321.60
Key Largo	$ 29,560,000.00	$ 933,090.76
	$ 100,000,000.00	$ 9,270,268.21

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CURRENT PPA'S AGREEMENT AMENDMENT STATUS

- Islamorada Municipality: PPA Agreement Amendment executed on 12 May 2025.
- Key Largo Municipality: PPA Agreement Amendment under review for approval.
- Marathon Municipality: PPA Agreement Amendment under review for submission.

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CURRENT REIMBURSEMENT FUNDING STATUS

- On Previous years, the program funding included ARRA funding, Congressional Ad funding and Workplan funding.

- USACE under the Earmark process requested $9.9M in May 2024 for reimbursement on FY25.

- In FY25 no funding have been received and FY26 reimbursements will be dependent on receipt of workplan funding.
  - Workplan is tied up with passing a FY26 budget for USACE.
  - We're still under a continuing resolution.

- When FKWQI Program is included in the appropriations bill and the bill is ultimately signed into law, the earmarked funds will be allocated to the project in that FY.

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FUTURE MUNICIPAL EFFORT

County

- Monroe County

Municipalities

- Key Colony Beach
- Key Largo
- Key West
- Islamorada
- Marathon
- Layton

US Army Corps of Engineers®

Florida Keys National Marine Sanctuary (FKNMS) Water Quality Protection Program (WQPP) Steering Committee Meeting

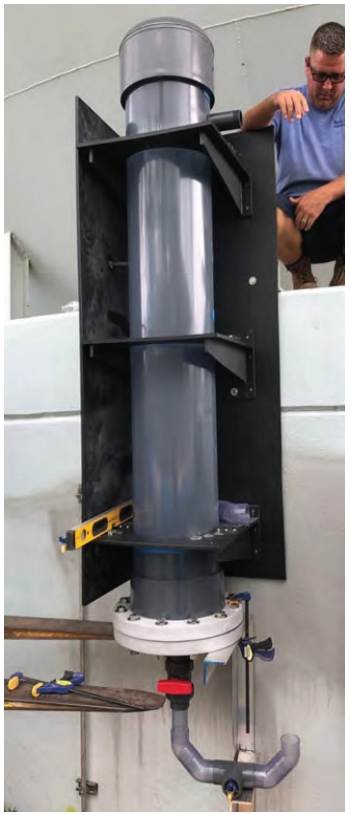
July 24, 2025

Approach to Remedy PFAS in Biscayne Aquifer

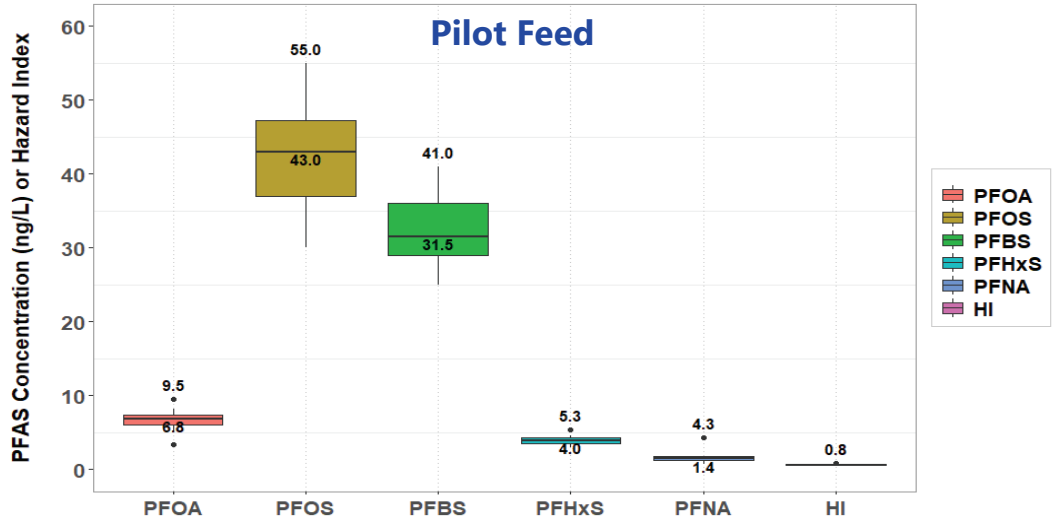
David Hackworth, PE., FKAA

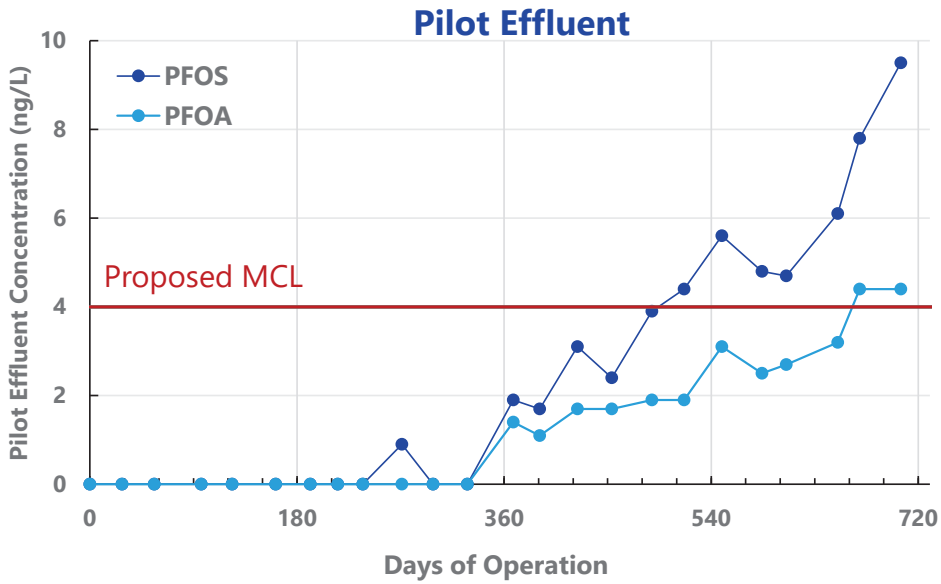
Florida Keys Aqueduct Authority

GAC Pilot Study



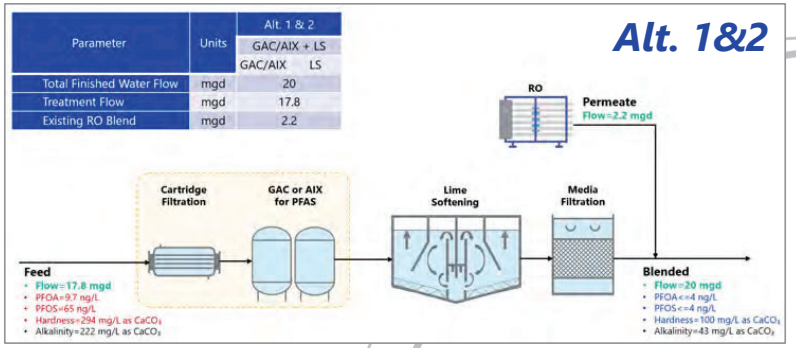
- GAC column design
  - » Diameter 12 inches
  - » Length 3 feet
  - » Volume 18 gallons
  - » EBCT 20 min
  - » Flow 0.88 gpm
- Operation
  - » August 2019 – July 2021

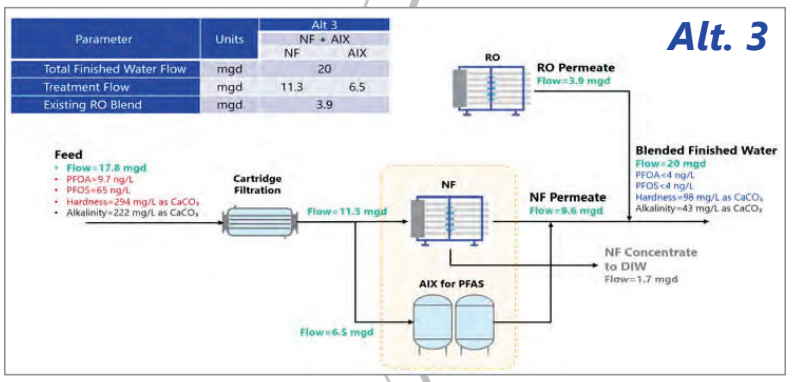


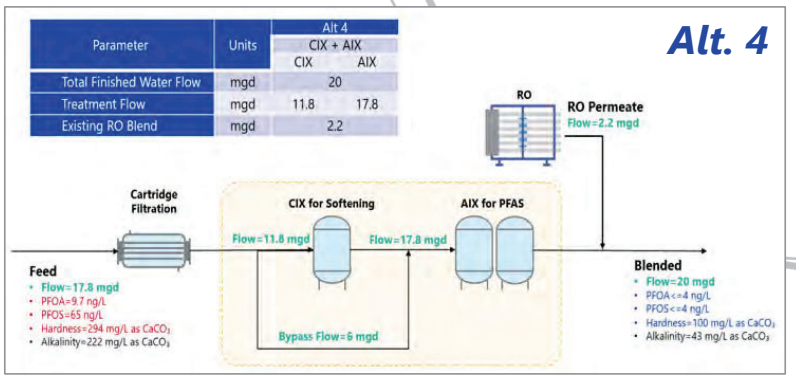


Parallel comparison of treatment alternatives for hardness & PFAS

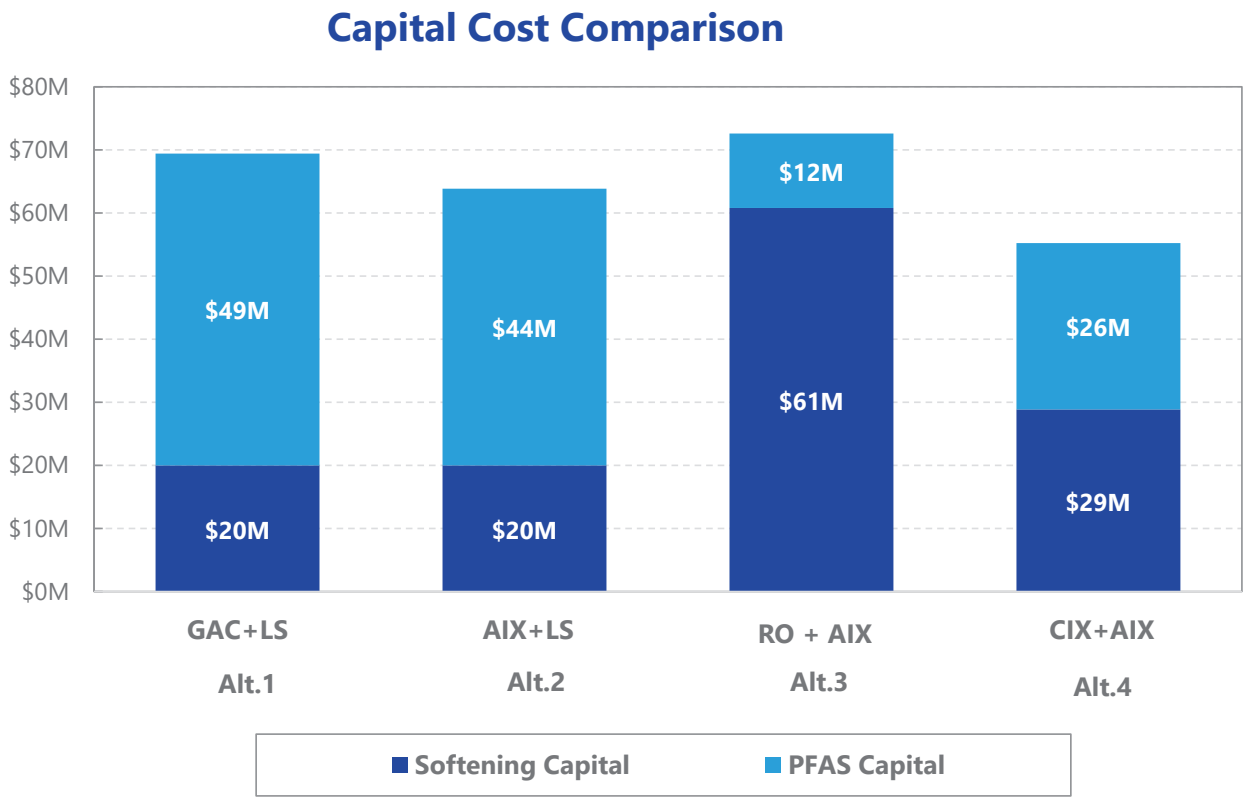
- Treatment goals
  - » Total finished water flow=20 mgd
  - » Finish water hardness=100 mg/L as $CaCO_3$
  - » Meet proposed PFAS NPDWR MCLs
- Treatment alternatives
  - » Alt. 1—GAC (PFAS) + Rehab Existing LS System
  - » Alt. 2—AIX (PFAS) + Rehab Existing LS System
  - » Alt. 3—NF + Side-stream PFAS treatment by AIX
  - » Alt. 4—CIX (softening) + AIX (PFAS)



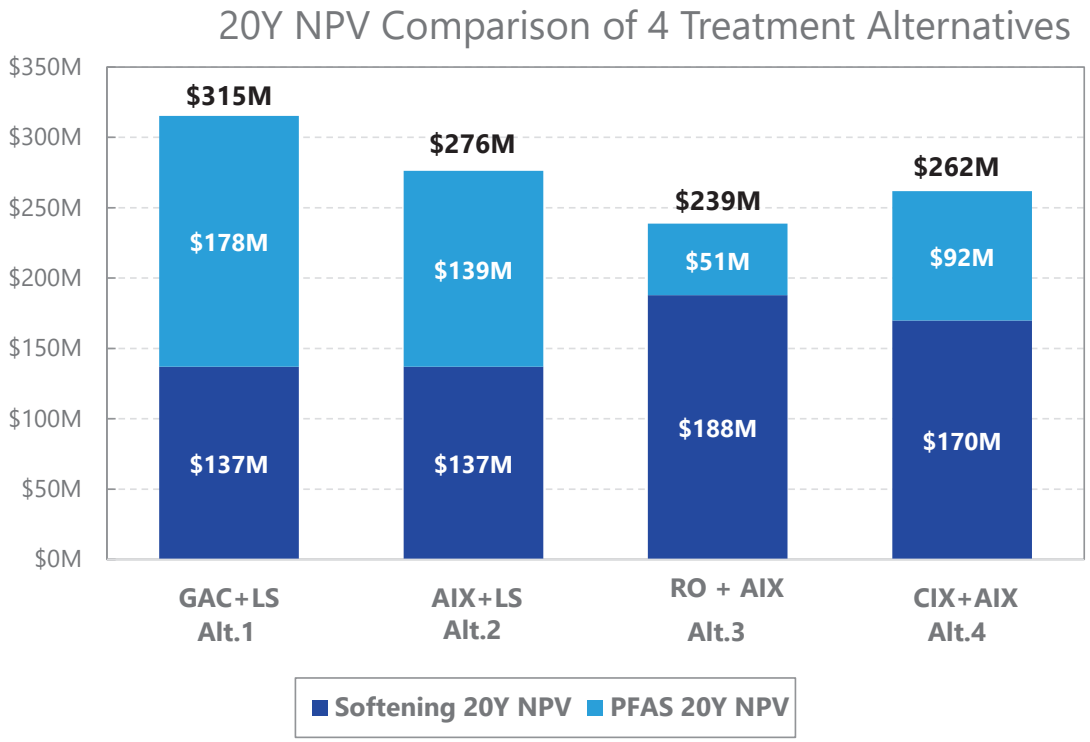




Reverse Osmosis has the highest capital cost



Alternative 3 (RO + AIX) has the lowest net present value cost.



Additional Benefits

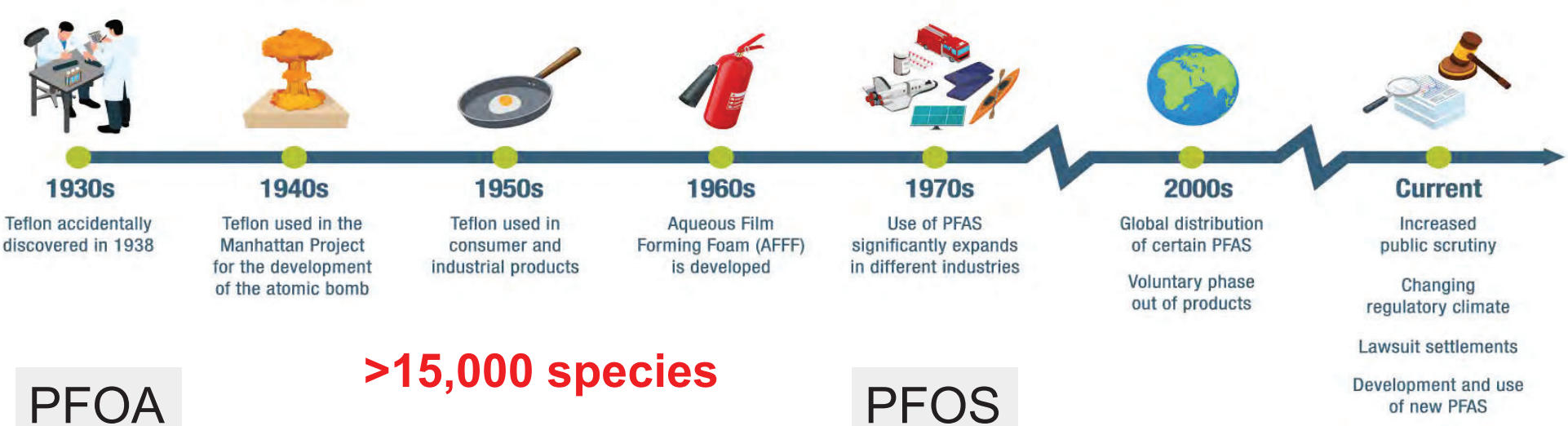
- ***Lowest Amount of Disposal Residue***
- ***Reverse Osmosis removes emerging contaminants***
- ***Reverse Osmosis is less labor intensive than lime softening***

Per- and Polyfluoroalkyl Substances in Florida's Water

FLORIDA KEYS NATIONAL MARINE SANCTUARY
Water Quality Protection Program Steering Committee Meeting

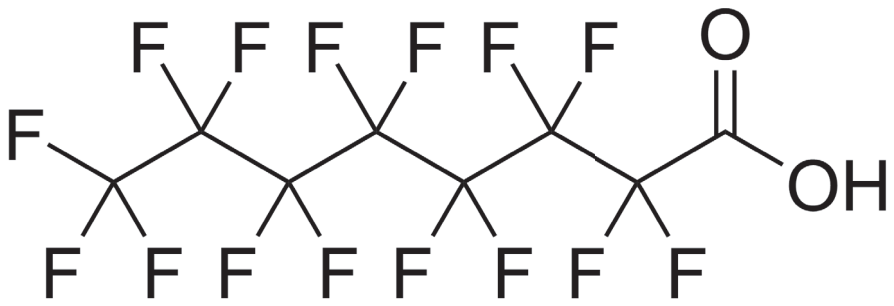
John Bowden, Ph.D.
Associate Professor
University of Florida
July 24, 2025
john.bowden@ufl.edu

Per- and Polyfluoroalkyl Substances (PFAS) History

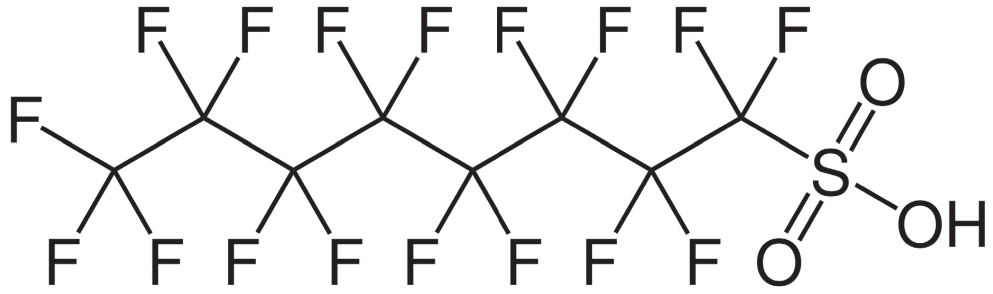


>15,000 species

PFOA



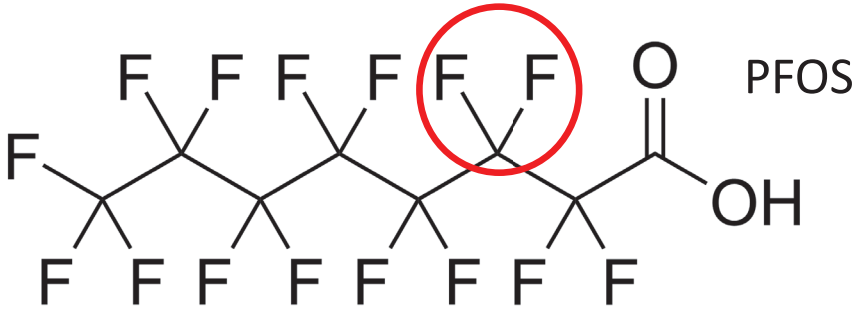
PFOS

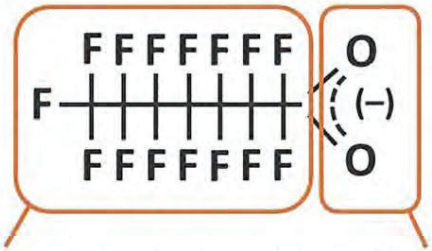


https://www.kimley-horn.com/what-is-pfas/

Common PFAS Uses

"forever chemicals"





Fluorocarbon tail
- Strong bonds
- Hydrophobic

Functional group
- Hydrophilic

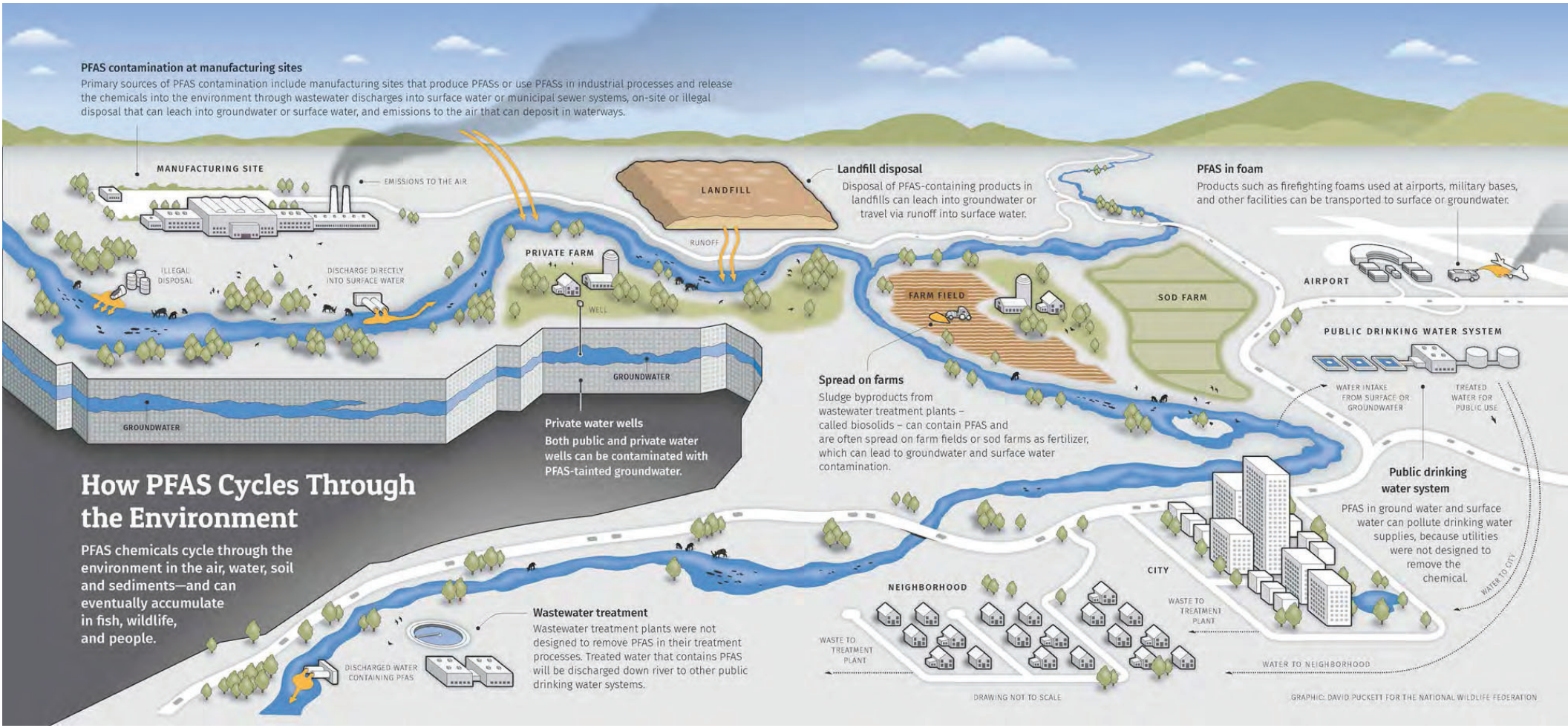
Bandaids

Toilet paper

Watch bands

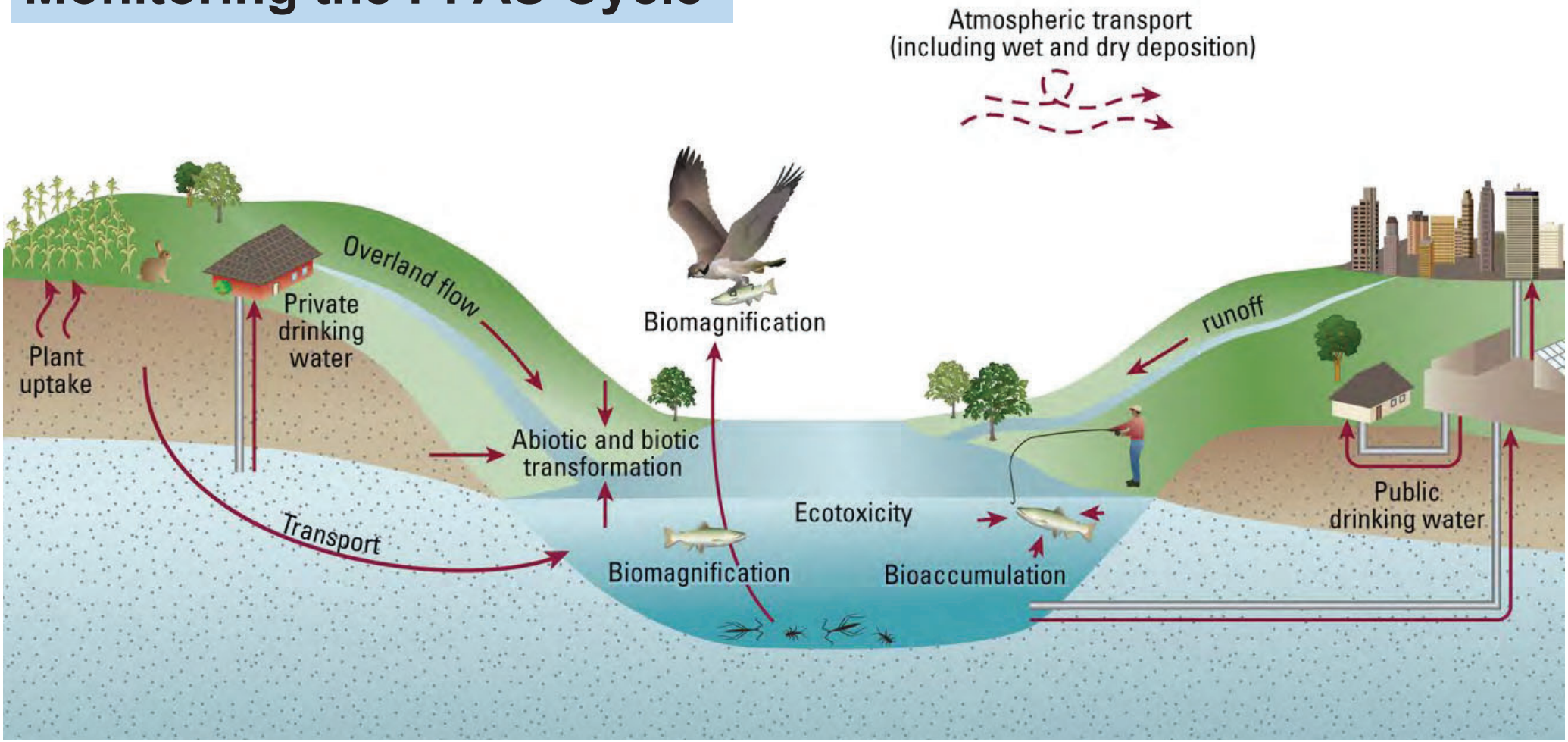
UF UNIVERSITY of FLORIDA

The PFAS Cycle



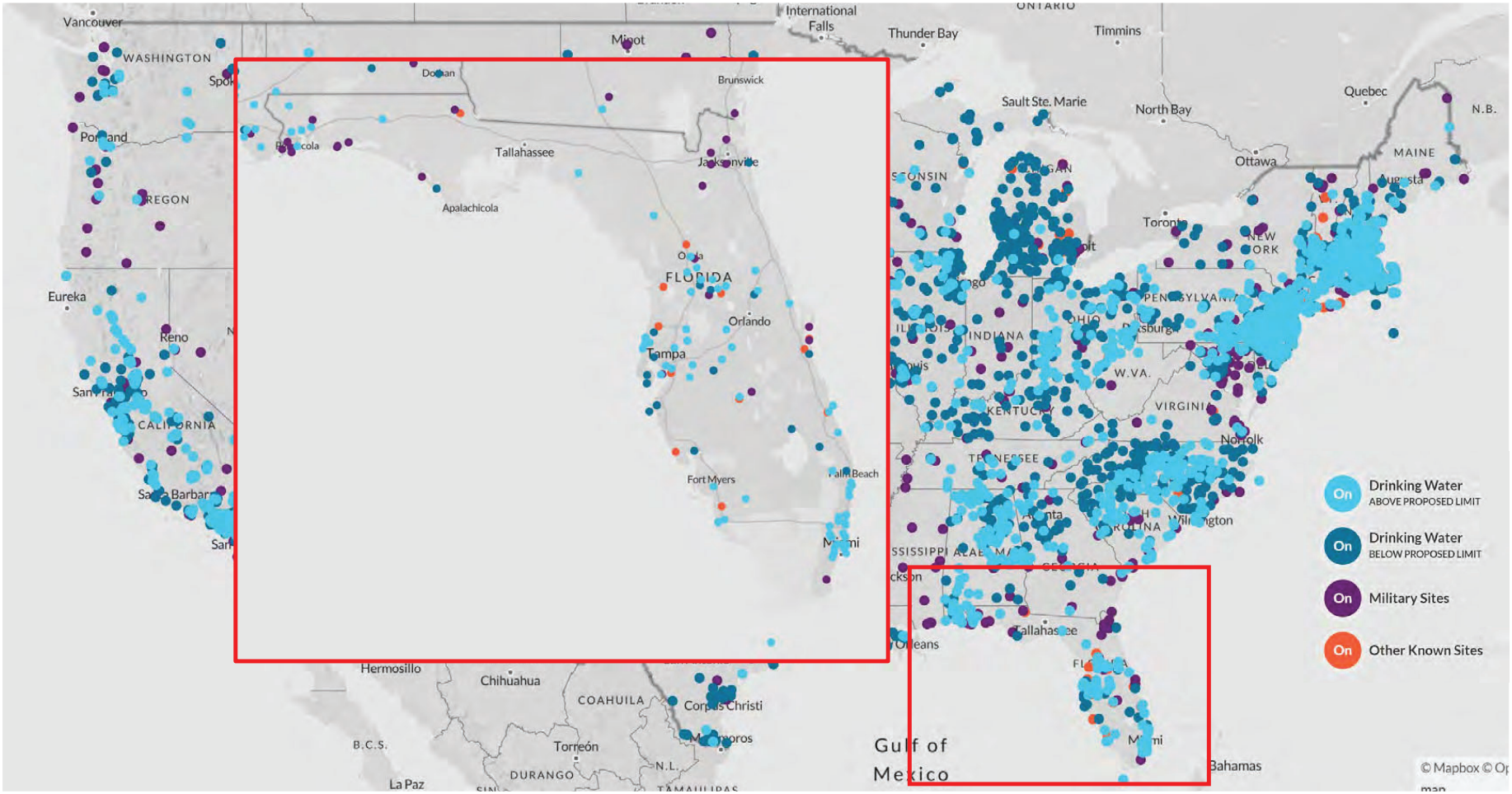
via [The National Wildlife Federation]

Monitoring the PFAS Cycle



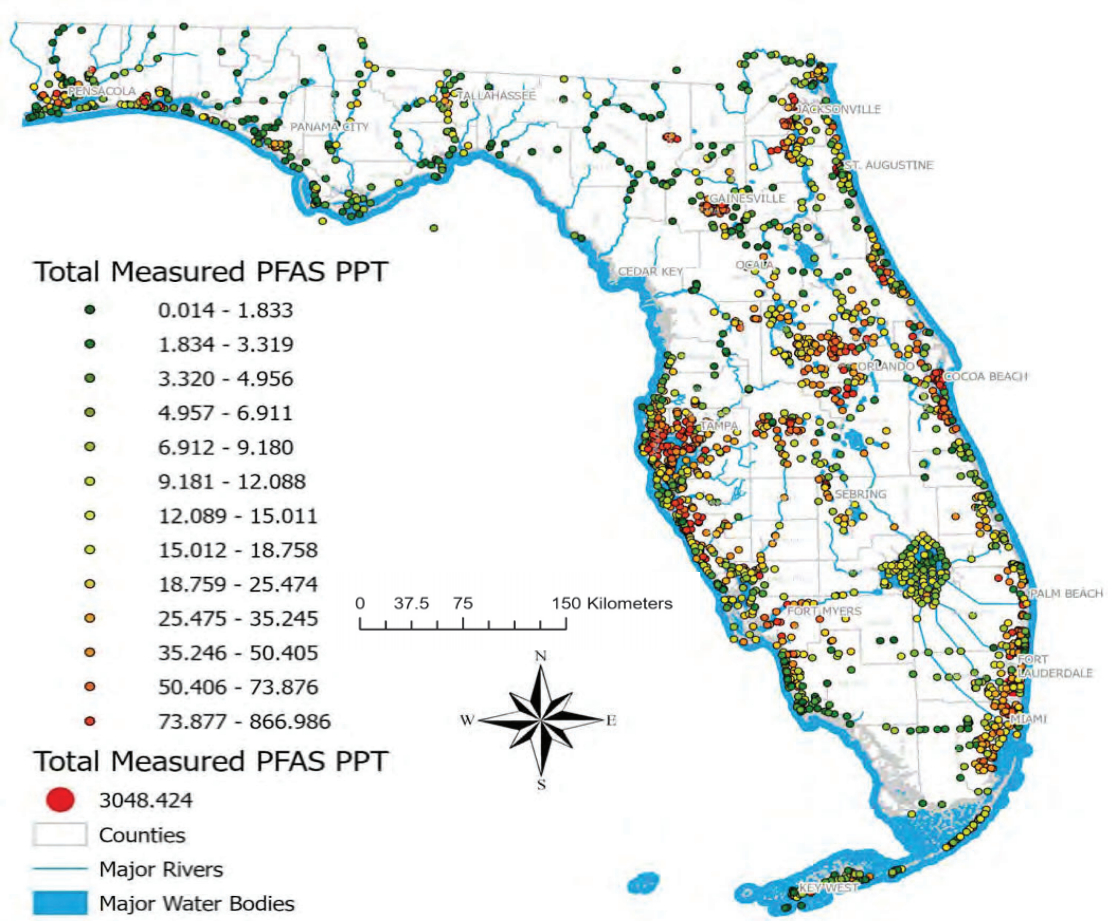
USGS PFAS Website

PFAS Surveillance in Water



Interactive Map: PFAS Contamination Crisis: New Data Show 2,854 Sites in 50 States (ewg.org)

PFAS Distribution in Surface Water

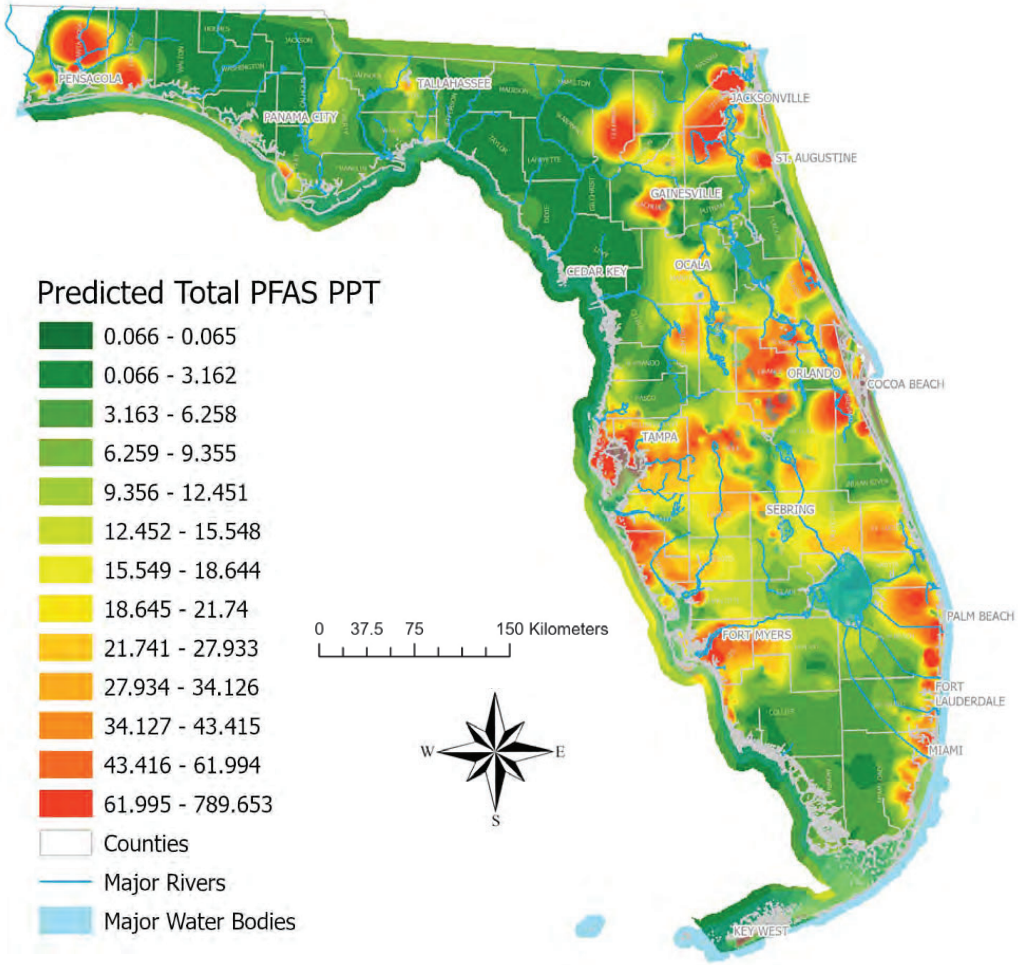


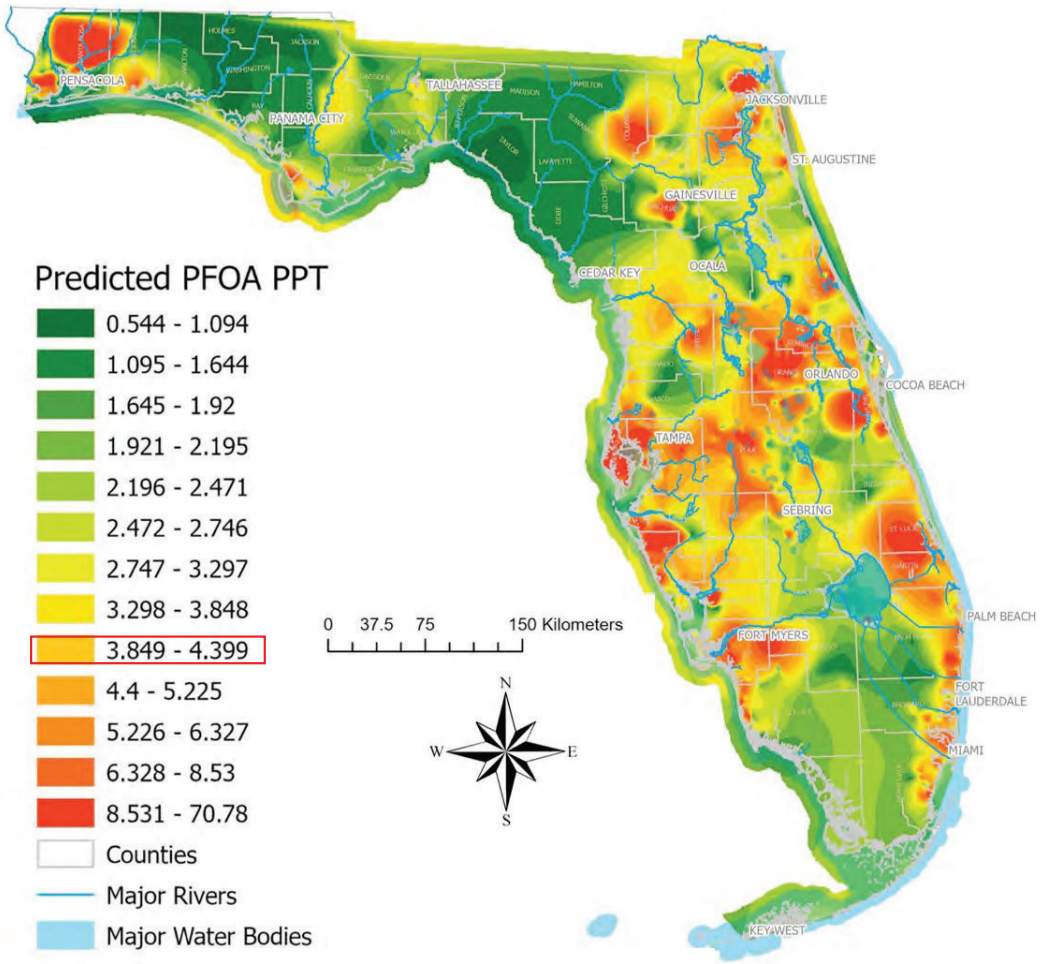
- 92 PFAS monitored
- 33 unique PFAS detected
- ΣPFAS max was 3048 ppt
- ΣPFAS mean was 29 ppt

https://www.bowdenlaboratory.com/

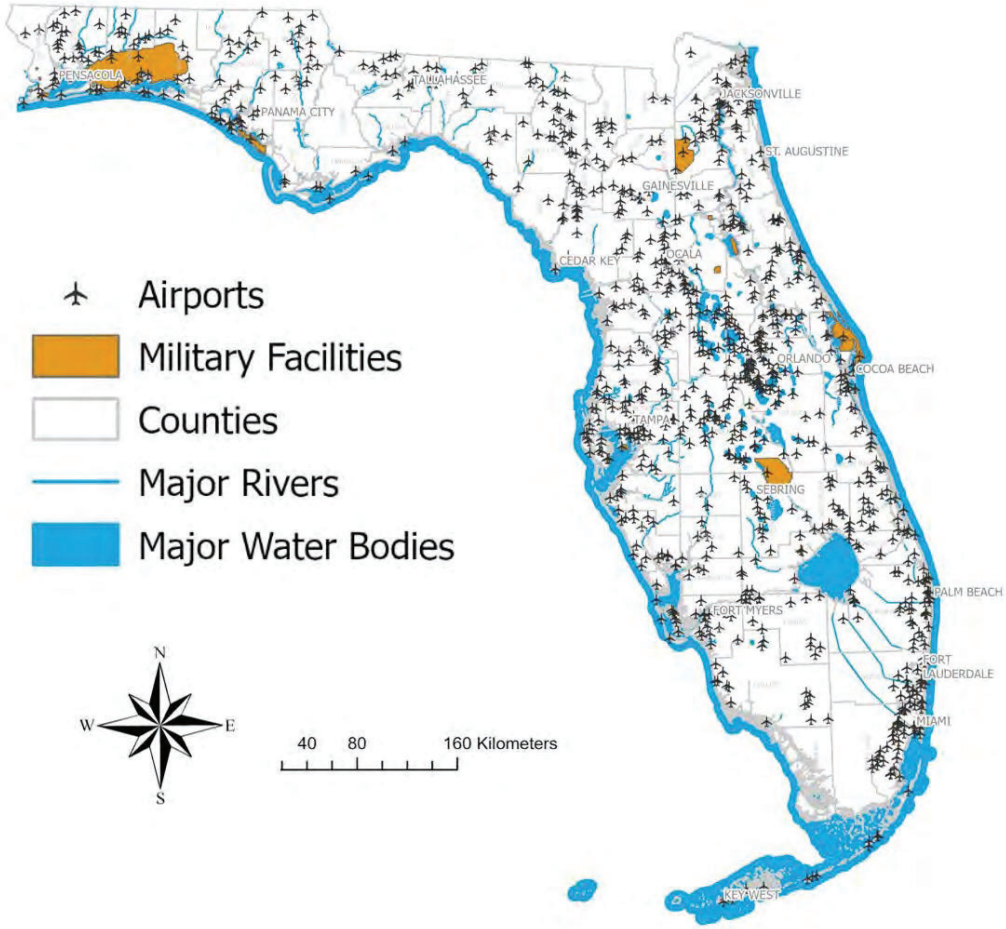
ACS EST Water 2024, 4, 10, 4343–4355

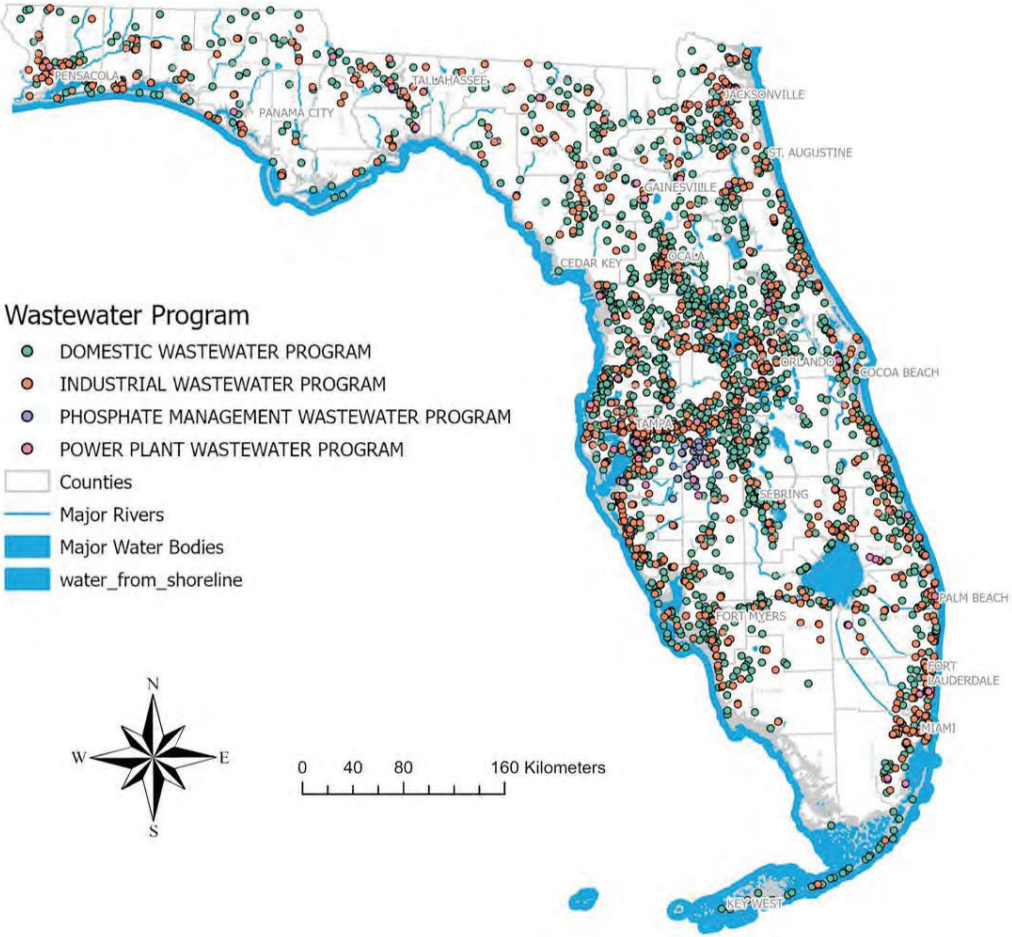
PFAS Prediction Maps for Florida Surface Water



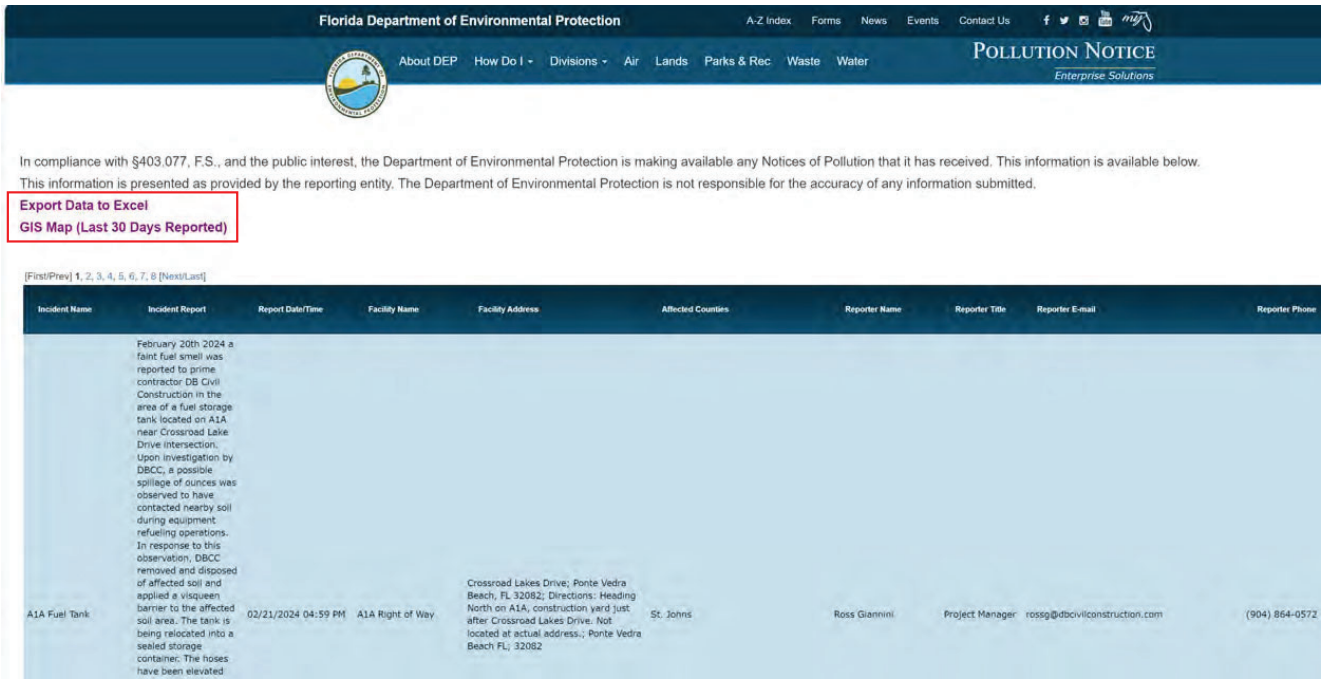


PFAS Sources in Florida Surface Water?





PFAS Sources in Florida Surface Water: Spills



Florida Department of Environmental Protection

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POLLUTION NOTICE
Enterprise Solutions

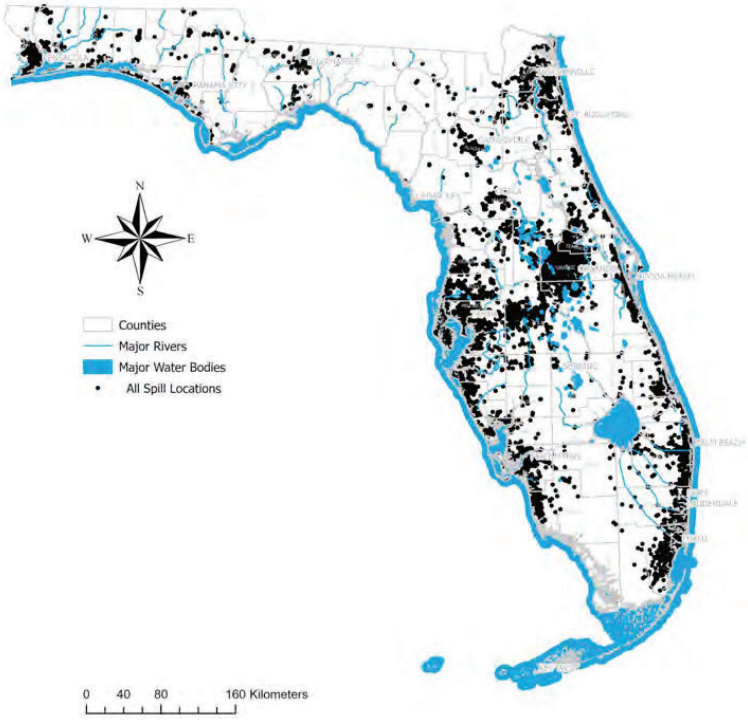
In compliance with §403.077, F.S., and the public interest, the Department of Environmental Protection is making available any Notices of Pollution that it has received. This information is available below.
This information is presented as provided by the reporting entity. The Department of Environmental Protection is not responsible for the accuracy of any information submitted.

Export Data to Excel
GIS Map (Last 30 Days Reported)

[First/Prev] 1, 2, 3, 4, 5, 6, 7, 8 [Next/Last]

Incident Name	Incident Report	Report Date/Time	Facility Name	Facility Address	Affected Counties	Reporter Name	Reporter Title	Reporter E-mail	Reporter Phone
A1A Fuel Tank	February 20th 2024 a faint fuel smell was reported to prime contractor DB Civil Construction in the area of a fuel storage tank located on A1A near Crossroad Lake Drive intersection. Upon investigation by DBCC, a possible spillage of ounces was observed to have contacted nearby soil during equipment refueling operations. In response to this observation, DBCC removed and disposed of affected soil and applied a visqueen barrier to the affected soil area. The tank is being relocated into a sealed storage container. The hoses have been elevated	02/21/2024 04:59 PM	A1A Right of Way	Crossroad Lakes Drive; Ponte Vedra Beach, FL 32082; Directions: Heading North on A1A, construction yard just after Crossroad Lakes Drive. Not located at actual address.; Ponte Vedra Beach FL; 32082	St. Johns	Ross Giannini	Project Manager	rossg@dbcivilconstruction.com	(904) 864-0572

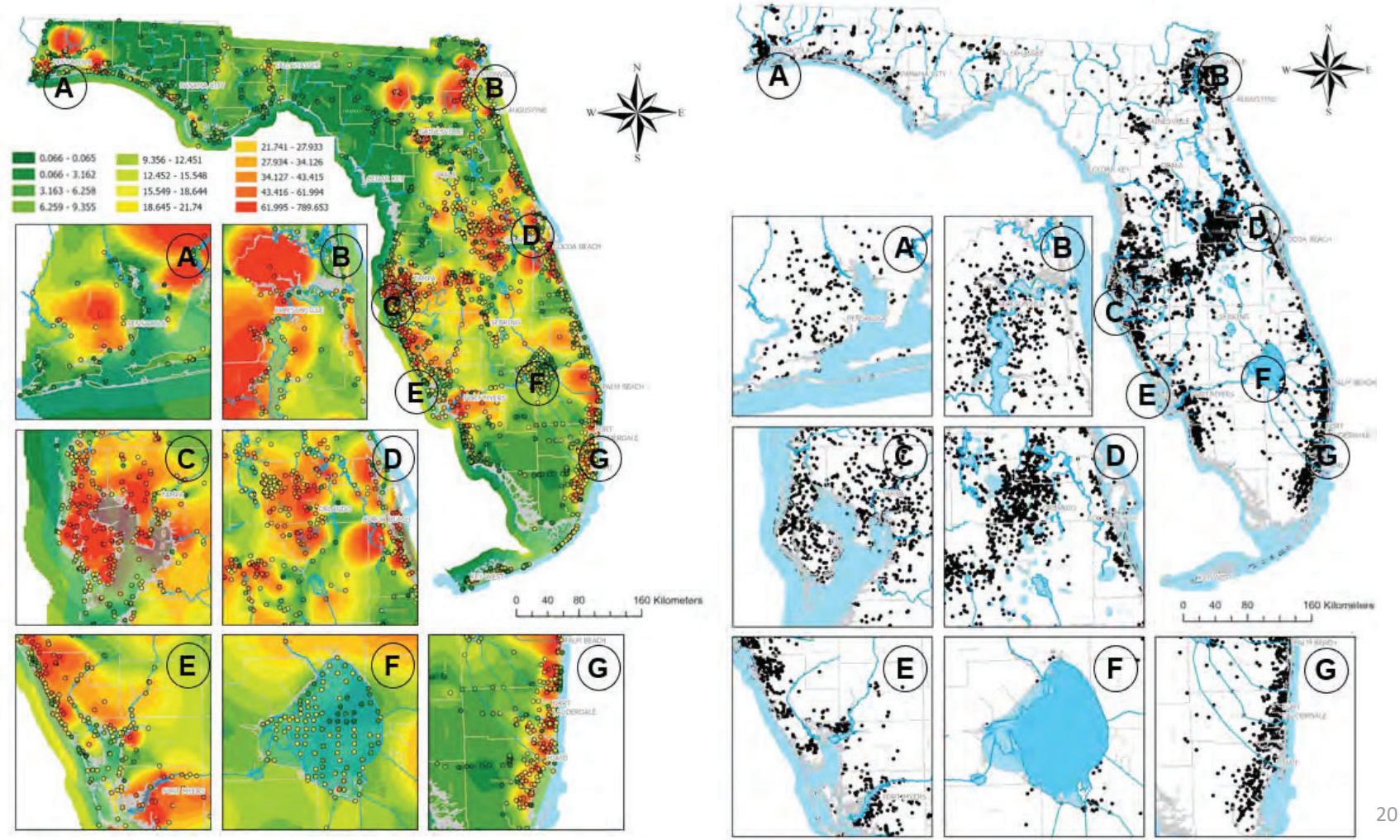
All spill locations (n = 10,959)



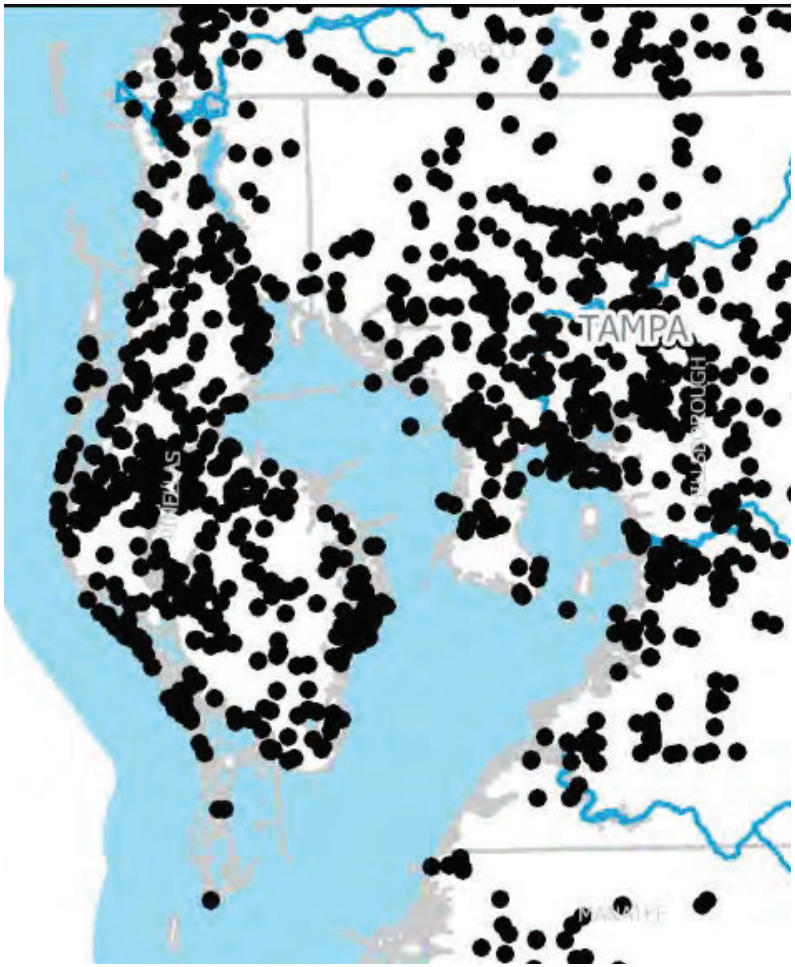
Reporting 2017-2022
7,395 Spills
1.4 billion gallons

https://prodenv.dep.state.fl.us/DepPNP/reports/viewIncidentDetails?page=1

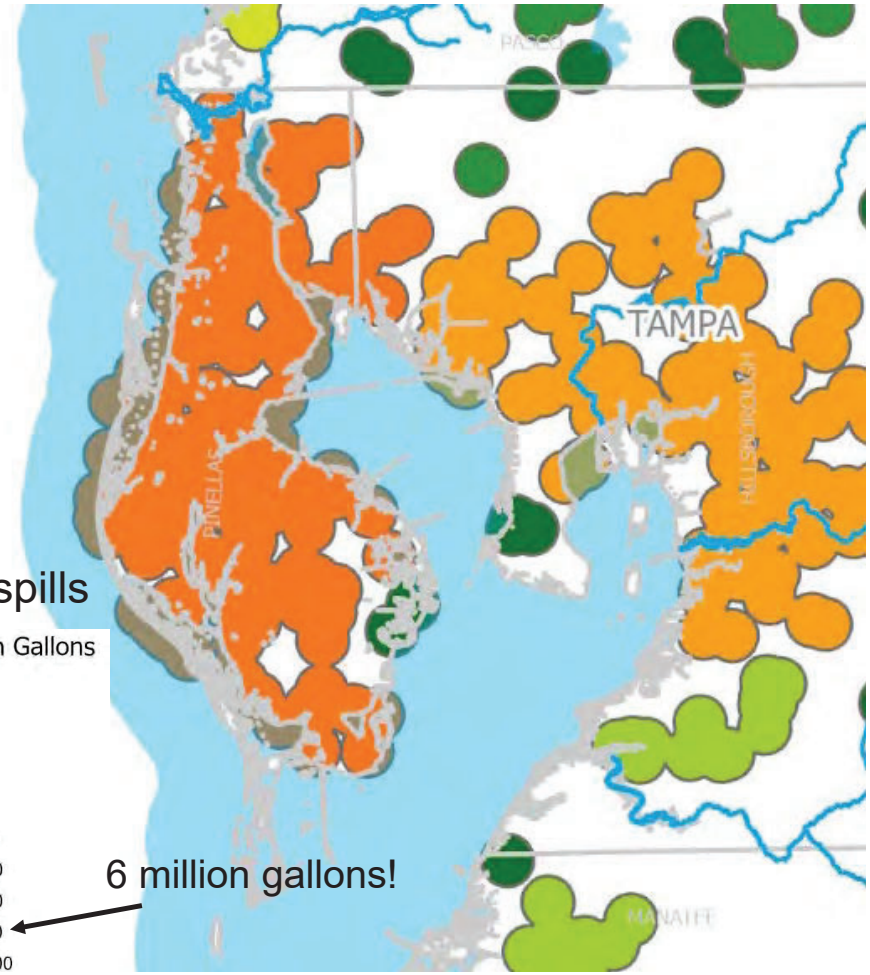
PFAS Sources in Florida Surface Water: Spills?



PFAS Sources in Florida Water: Raw Sewage



All spills

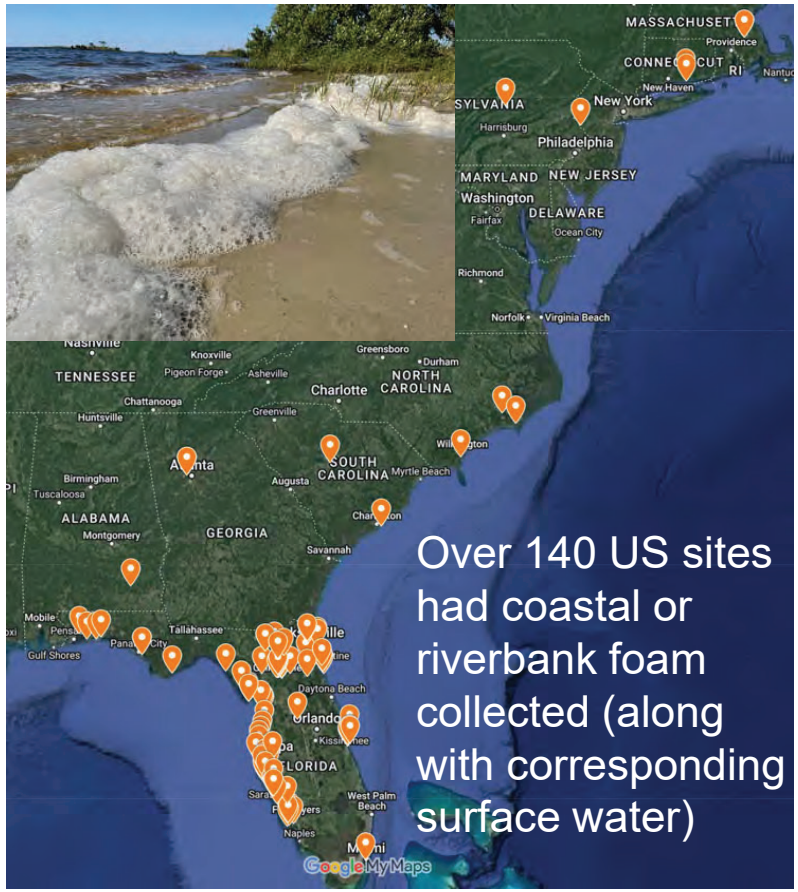


Raw sewage spills

Sum All Raw Sewage in Gallons
- 10.00 - 27000.00
- 27000.01 - 80218.00
- 80218.01 - 167579.00
- 167579.01 - 343945.00
- 343945.01 - 598650.00
- 598650.01 - 1055350.00
- 1055350.01 - 1598919.00
- 1598919.01 - 3717000.00
- 3717000.01 - 6058314.00
- 6058314.01 - 73988500.00

6 million gallons!

Foam in Fresh and Salt Waters



Over 140 US sites had coastal or riverbank foam collected (along with corresponding surface water)

in preparation…

The range of ΣPFAS in foam was between 30x to 1000x higher in comparison to adjacent surface water

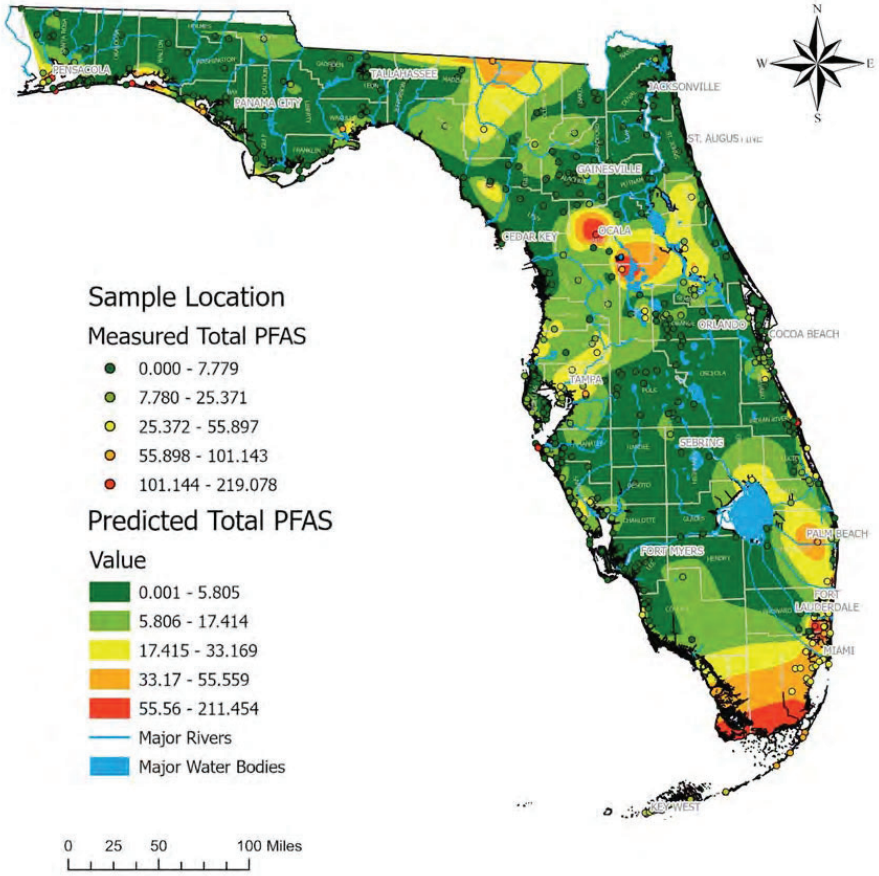
Highest ΣPFAS was 100 ppb, with most ranging from 5 ppb to 50 ppb in foam

“Crowdsourcing” – PFAS in Florida Drinking Water

As public awareness increases in FL, so does interest to test Florida drinking water

Started late 2022, sampled >450 taps in state of Florida with sampling network

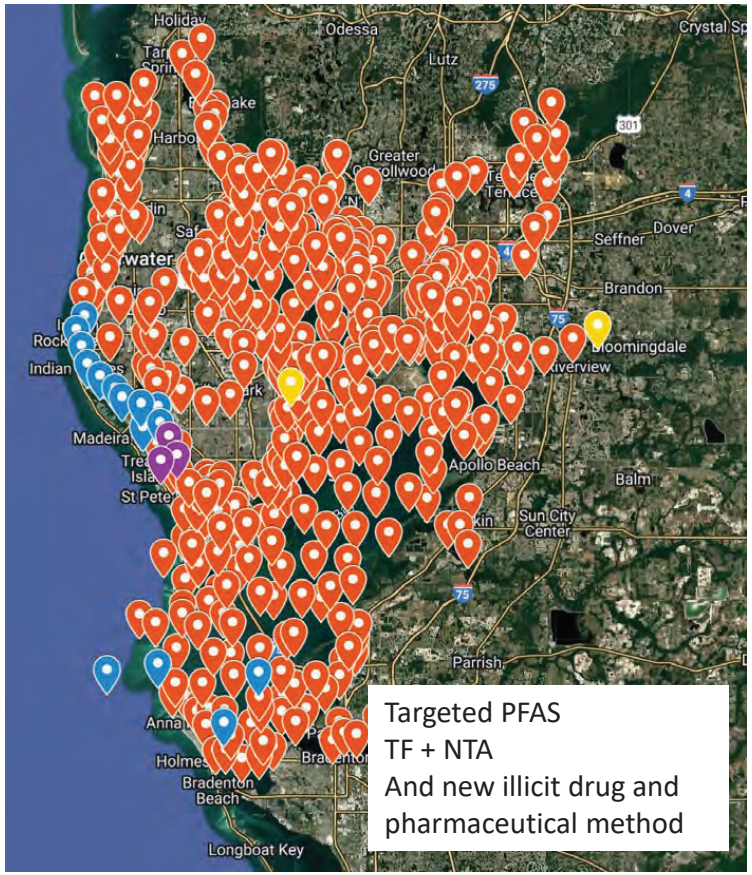
At least one in every county (n=67), from city water, well, and bottled water sources



Sci Total Environ. 2024, 926:171932

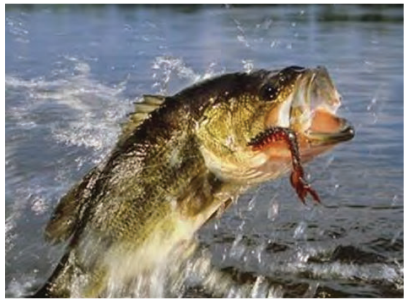
What's next?

Model site – Tampa Bay (heat map of PFAS)



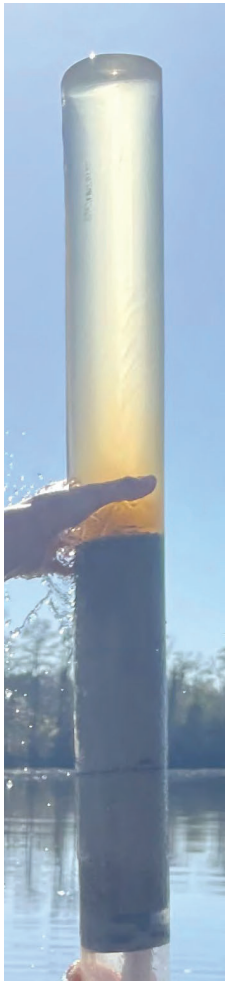
Targeted PFAS
TF + NTA
And new illicit drug and pharmaceutical method

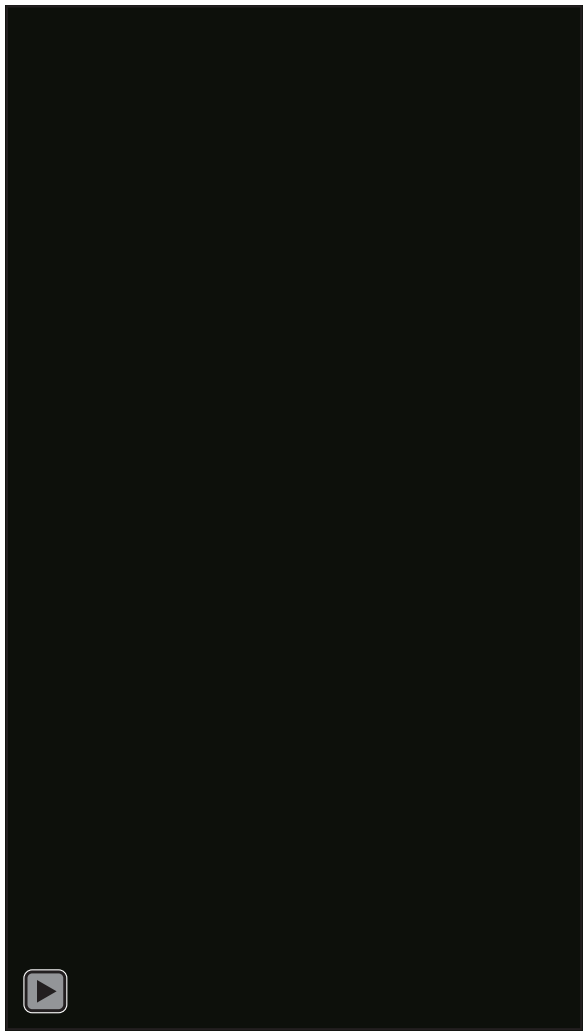
Fish consumption advisories (PFAS)



Body burden via blood measurement

Retrospective PFAS analysis with cores





Marine wildlife studies in Florida

UF UNIVERSITY of FLORIDA

Marine Pollution Bulletin
Volume 140, March 2019, Pages 610-615

Per- and polyfluoroalkyl substances (PFAS) in plasma of the West Indian manatee (*Trichechus manatus*)

Kady Palmer [a], Jacqueline T. Bangma [b], Jessica L. Reiner [c], Robert K. Bonde [d], Jeffrey E. Korte [e], Ashley S.P. Boggs [c], John A. Bowden [c f]

Journal of the American Society for Mass Spectrometry > Vol 34/Issue 9 > Article

Cite Share Jump to Expand

RESEARCH ARTICLE | May 10, 2023

Aquatic Vegetation, an Understudied Depot for PFAS

Emily K. Griffin, Lauren M. Hall, Melynda A. Brown, Arielle Taylor-Manges, Trisha Green, Katherine Suchanec, Bradley T. Furman, Victoria M. Congdon, Sara S. Wilson, Todd Z. Osborne, Shawn Martin, Emma A. Schultz, Mackenzie M. Holden, Dylan T. Lukacsa, Justin A. Greenberg, Katherine Y. Deliz Quiñones, Elizabeth Z. Lin, Camden Camacho, and John A. Bowden*

ECOTOXICOLOGY AND PUBLIC HEALTH | July 17, 2025

Occurrence and Maternal Transfer of Per- and Polyfluoroalkyl Substances (PFAS) in Pregnant Sharks from Florida Coastal Waters

Qaim Mehdi, Thomas D. Sinkway, Lauren E. Blackman, Adriana L. Iorfida, Avery M. Pittman, Corinna Sutterer, Hailey L. Hinchliffe, Kira A. Zautcke, Meg E. Morrow, Neel Shah, Ines A. Chambrier-Athias, Karly E. Cohen, Gareth J. Fraser, Douglas H. Adams, and John A. Bowden*

Science of The Total Environment
Volume 927, 1 June 2024, 171758

Species-specific profiles of per- and polyfluoroalkyl substances (PFAS) in small coastal sharks along the South Atlantic Bight of the United States

Qaim Mehdi [a], Emily K. Griffin [a], Juliette Esplugas [a], Jim Gelsleichter [b], Ashley S. Galloway [c], Bryan S. Frazier [c], Alina S. Timshina [d], R. Dean Grubbs [e], Keyla Correia [a], Camden G. Camacho [f],

Marine Pollution Bulletin
Volume 213, April 2025, 117673

Sand dollars (*Mellita quinquiesperforata*): A new bioindicator for tracking PFAS in coastal waters

John A. Bowden [a b], Qaim Mehdi [a], Lauren E. Blackman [a], Keyla Correia [a], Thomas D. Sinkway [b], Jana Marcin [b], Bradley T. Furman [c], Victoria Congdon [c], Joe Aufmuth [d]

Science of The Total Environment
Volume 809, 25 February 2022, 151143

Detection of long chain *per*- and polyfluoroalkyl substances (PFAS) in the benthic Golden tilefish (*Lopholatilus chamaeleonticeps*) and their association with microscopic hepatic changes

Erin L. Pulster [a 1], Amanda E. Wichterman [b 1], Susan M. Snyder [a], Susan Fogelson [c], Bianca F. Da Silva [d], Kaylie A. Costa [d], Joe Aufmuth [e], Kristina L. Deak [a 2], Steven A. Murawski [a], John A. Bowden [d 3]