Analysis of Per- and Polyfluoroalkyl Substances in Solid Samples by LCMS

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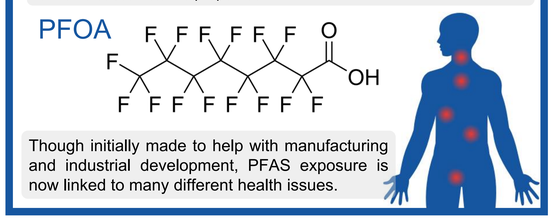
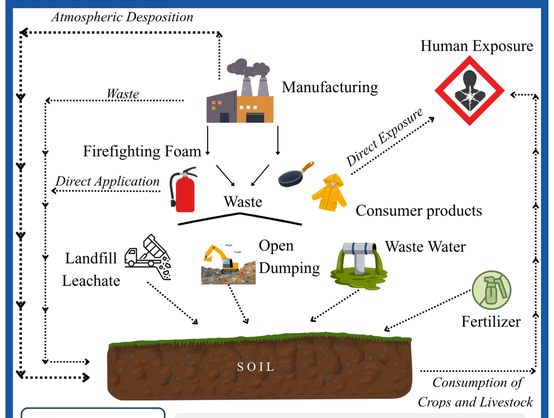
Per- and Polyfluoroalkyl Substances[1]

Per- and Polyfluoroalkyl substances are a group of synthetic chemicals with a structure that allows high chemical and thermal stability, contributing to their bioaccumulative properties.



Though initially made to help with manufacturing and industrial development, PFAS exposure is now linked to many different health issues.

PFAS in Soil



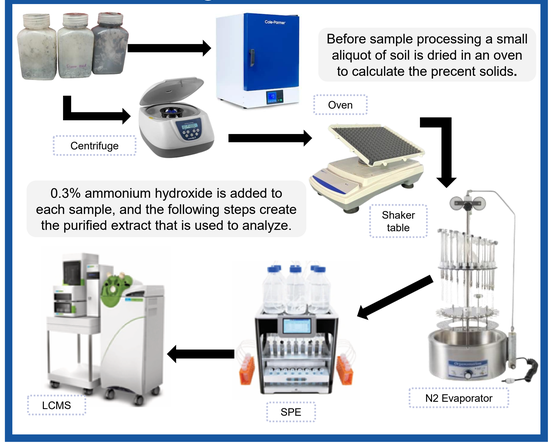
Research Goal

Quantify different PFAS analytes in soil and sediment samples.

EPA Methods[2]

Drinking Water (EPA Methods 533 & 537.1)	Wastewater and Solids (EPA Method 1633A)
Used for compliance testing	Multiple matrices can help evaluate the source of PFAS
Maximum contaminate level = 4ppt	**NO CURRENT REGULATIONS**
PFOS  **PFOA** 	

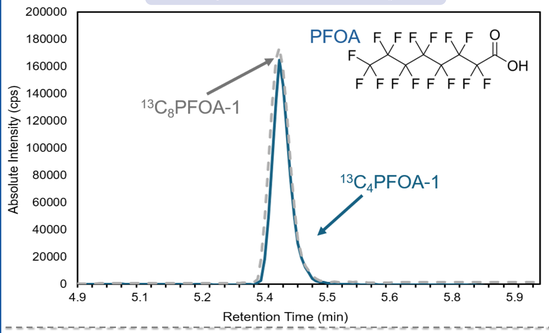
Solid Processing



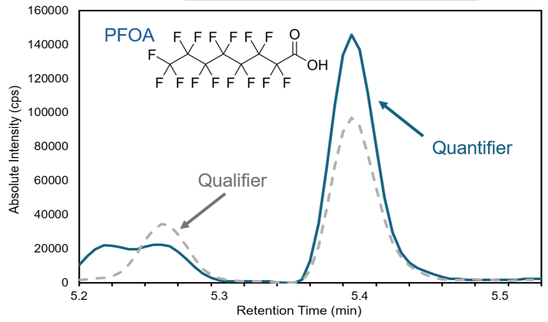
Method Validation and Analysis

Qualitative peak identification

Isotope Labeled Analysis

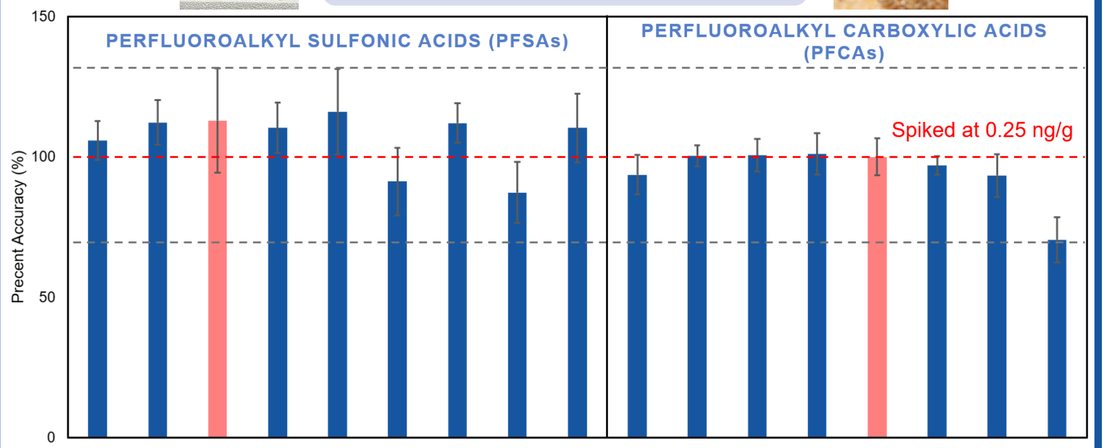


Natural Analyte Analysis

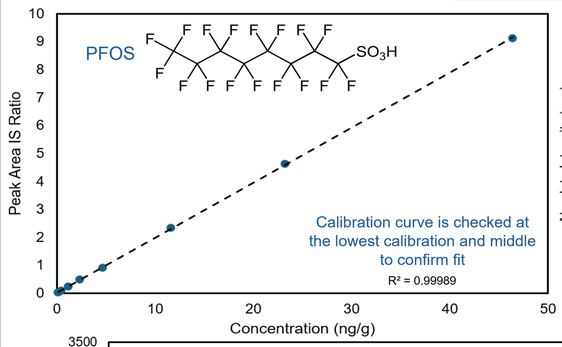


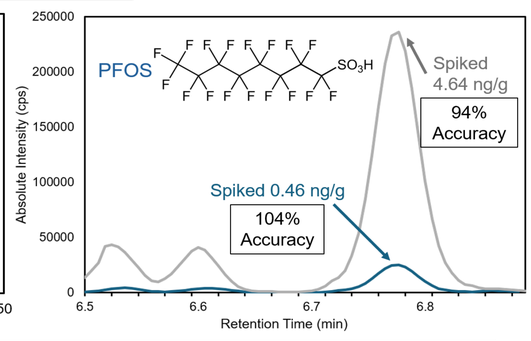
Spiked Samples

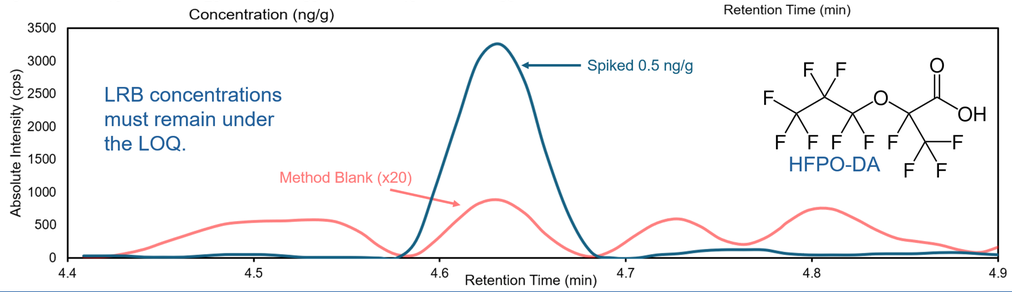
Can the method extract PFAS accurately from the reference matrix?



Quality Controls

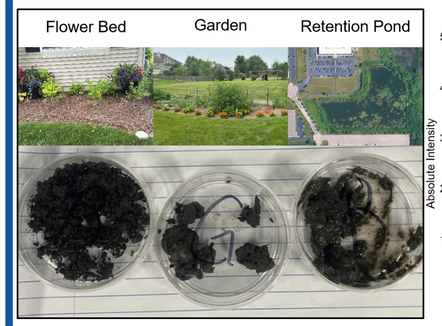




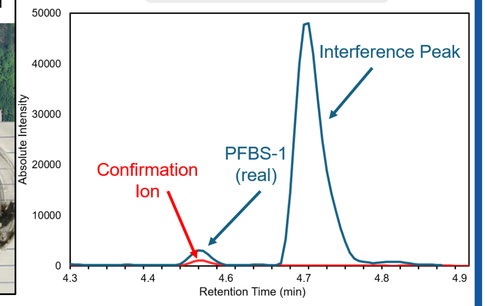


Testing Field Samples

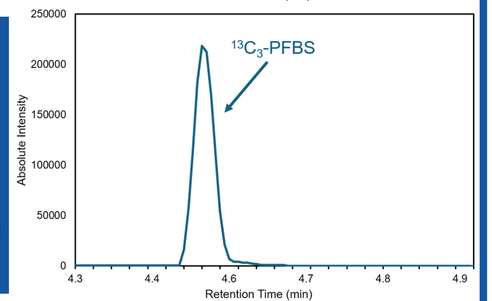
Can the method extract PFAS at lower concentration levels from a real soil sample?



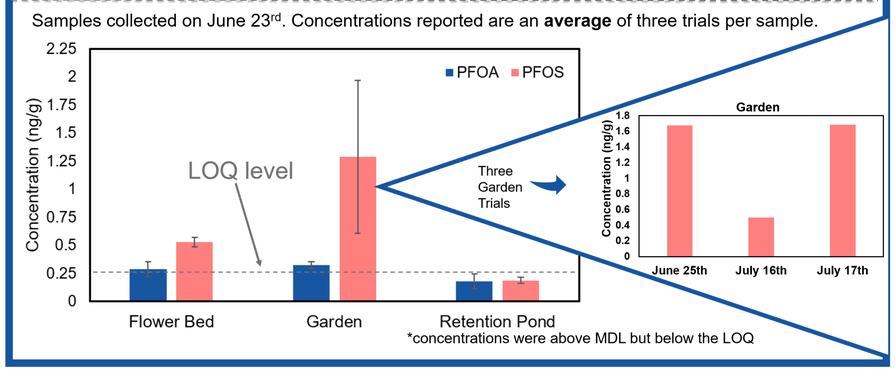
False Positives



A false peak of PFBS is reported by the LCMS. Checking the confirmation ion and internal standard peaks show the peak is a false positive and where the real PFBS peak will be.

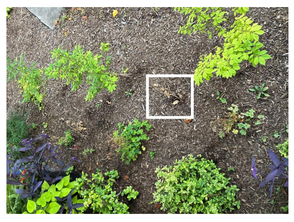


Samples collected on June 23rd. Concentrations reported are an **average** of three trials per sample.



*concentrations were above MDL but below the LOQ

Future Directions



Which sample is more accurate?

Acknowledgements

Zach Wood
Chris Otolski
Jake Doyle
Brad Dyer
Danny ODonnell

1. (Our current understanding of the human health and environmental risks of PFAS | US EPA 2026)
2. (*Per- and polyfluoroalkyl substances (PFAS)* | *US EPA* 2026)