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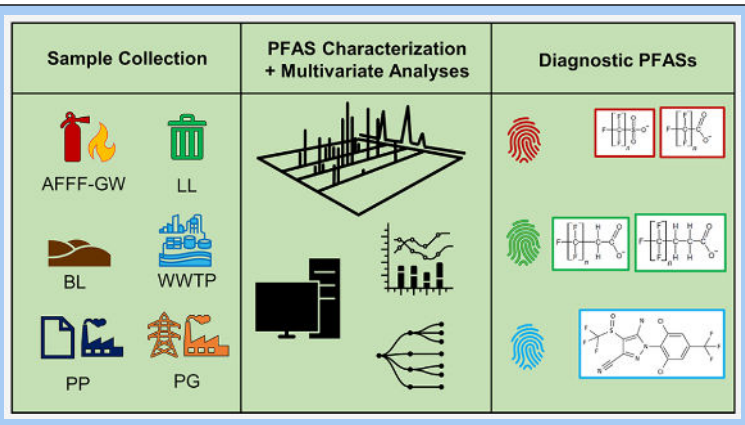
NewFields Note

PFAS Forensics

New Publication Reveals Diagnostic Source Fingerprints

NewFields Note: Technical information in a condensed, easily digestible format that is intended to promote environmental science education, knowledge transfer, and empowerment … *one note at a time*.

A new publication co-authored by NewFields scientist Dr. Trever Schwichtenberg has revealed diagnostic PFAS for common PFAS sources. This work involved a number of the world's leading PFAS researchers and was funded by the Department of Defense's environmental research division.



"Target and Suspect Screening Integrated with Machine Learning to Discover Per- and Polyfluoroalkyl Substance Source Fingerprints"

https://pubs.acs.org/doi/10.1021/acs.est.3c03770

The study looked at common PFAS sources to the environment, including AFFF-impacted groundwater (collected near firefighter-training areas), landfill leachate, biosolid leachate, and wastewater collected from municipal, power generation, and pulp and paper facilities. Over 90 samples in total were collected and underwent advanced PFAS characterization via high-resolution mass spectrometry. The data was then reduced using a number of advanced data analysis techniques including principal component analysis, hierarchical clustering, and machine learning.

Diagnostic PFAS emerged for AFFF-impacted groundwater, landfill leachates, and biosolid leachates. Wastewaters were less resolved, and this is likely due to low PFAS levels in wastewater compared to the other matrices. Wastewater remains an important PFAS source, though, due to the high mass flows coming from wastewater facilities.

The advanced PFAS characterization and data analyses performed for this study are at the forefront of emerging PFAS forensics techniques. As these techniques proliferate, understanding their potential impacts as well as their shortfalls will be key to performing your own similar analysis, or just as likely, interpreting an opposing party's forensic analysis. **PFAS forensics is improved by using advanced characterization techniques paired with machine learning and other multivariate statistical analyses.**

For additional information, please contact your NewFields Technical Lead. Or send us an email at Science_Info@newfields.com!

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