

**Wednesday, September 24, 2025 | 108 Snell Engineering Ctr | 12:00 PM**

*Distinguished Seminar Speaker*

***Insights into the fate of precursors and novel PFAS using  
organofluorine mass budgets across diverse media***

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Per- and polyfluoroalkyl substances (PFAS) are a diverse family of highly fluorinated and persistent anthropogenic chemicals first synthesized in the 1940s that are not known to degrade under natural conditions. They are broadly used in modern commerce and are now detectable in the most remote environments on Earth. Manufacturing and industrial use of PFAS has shifted dramatically since the onset of their widespread production as concerns about human and ecological exposures to legacy PFAS have grown. The result has been abundant production of compounds in recent decades that are unknown/poorly identified because they lack available analytical standards needed to quantify their presence. Resulting major uncertainties about their fate include degradation in the environment and metabolism by organisms, propensity for bioaccumulation, and even their definition as part of the PFAS family of chemicals. This presentation will provide an overview of recent work toward developing total organofluorine mass budgets for U.S. human serum and liver samples and exposure media including freshwater fish, agricultural products, drinking water, and consumer products. Results will highlight major classes of compounds identified using targeted and non-targeted mass spectrometry in combination with combustion ion chromatography to characterize extractable organofluorine. Modeling techniques that help interpret these data and better identify and attribute sources of PFAS contamination will be reviewed. These data will be used to discuss the implications for future policy mechanisms and consumer interventions such as water filtration for mitigating future exposures.

**Biography.** Professor Elsie Sunderland is the Fred Kavli Professor of Environmental Chemistry and Professor of Earth and Planetary Sciences at Harvard University, where she has been a faculty member since 2010, and leads the [Biogeochemistry of Global Contaminants Research Group](#). Her research aims to better understand how chemical pollutants interact with natural ecosystems and affect life. Her group quantitatively analyzes the entire exposure pathway for environmental pollutants to identify key processes that have a large influence on their accumulation in living organisms. Prior to joining the Harvard Faculty, she spent five years at the headquarters for the U.S. Environmental Protection Agency working on regulatory impact assessments and developing guidance on how to best use environmental models to inform regulatory decisions. Over the past 20 years, she has collaborated extensively with indigenous groups, NGOs, and state, federal and international government organizations. Her work has informed strategies for managing risks associated with environmental chemical exposures from energy infrastructure such as coal-fired power plants and hydroelectric dams, and global regulatory efforts for mercury and per- and polyfluoroalkyl substances (PFAS). Professor Sunderland has mentored >50 graduate students and postdoctoral fellows. She is the Editor-in-Chief for the Royal Society of Chemistry journal *Environmental Science: Processes and Impacts* and on the Editorial Advisory Board for the American Chemical Society journal *Environmental Science & Technology*. Prof. Sunderland received her B.Sc. from McGill University in 1997 and Ph.D. from Simon Fraser University in 2003. Outside of science, she is interested in dogs (particularly if they have beards), running, being a soccer/sailing mom for her two kids, and [coastal conservation](#).