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Eawag Seminar Invitation

Advancing Environmental Forensics of Per- and Polyfluoroalkyl Substances

Speaker **Prof. Jennifer A. Field, Oregon State University, Corvallis, USA**

When **June 2, 2022, 16:00 – 17:00, CEST**

Where **Eawag Dübendorf, room FC C20**
Online via Zoom, contact seminars@eawag.ch for access details.

Abstract The wide use of per- and polyfluoroalkyl substances (PFAS) in commerce is now questioned due to concerns regarding toxicity, bioaccumulation and persistence, especially for the longer-chain perfluorinated forms such as perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS). In media outlets PFAS are commonly called “Forever Chemicals”. Their unique chemistry and chemical properties along with complex nomenclature are among the chal¬lenges to communicating information on PFAS. International attention has widened beyond just perfluorinated forms to polyfluorinated forms. Exposure pathways are complex and include non-point and point sources. In particular, repeated use (over decades) of aqueous film forming foams (AFFF) for extinguishing hydrocarbon-based fuel fires during fire fighter training resulted in extensive environmental impacts and human exposure worldwide. Even though the PFAS used in AFFF constituted only 3% of PFAS production, AFFF are proprietary products comprised of highly concentrated PFAS solutions (g/L) along with other additives including hydrocarbon surfactants, solvents, and corrosion inhibitors. The high aqueous solubility of PFAS in AFFF has resulted in extensive contamination of groundwater, which has now impacted drinking water supplies. Current research focuses on the use of liquid chroma¬tography high mass accuracy mass spectrometry (LC-HRMS) for the identification of PFAS associated with AFFF and processes that retain PFASs in ‘source zones’ of fire-fighter training areas located on US military bases. Discussion will include interfacial processes that retain PFAS in soils and enrich PFAS in the surface microlayer and foams of open water bodies. Enrichment of long-chain PFAS in foam and surface water increases human and wildlife exposure yet little is known about dermal uptake. For this reason, current research is aimed at quantifying the flux of perfluoroalkyl carboxylates through silicone, a model for human skin. Lastly, given the need to treat impacted water bodies, the focus is on the development of forensics tools in order to identify the responsible parties. Fingerprinting and differentiating source terms will be discussed as active areas of research.