Title: A new toxicity testing framework: Interpreting complex PFAS mixtures for ecological risk assessment using macromolecular and sub-organismal data

Abstract:

Aqueous film forming foams (AFFF) commonly used in firefighting and on military bases are known to release a mixture of per- and poly- fluoroalkyl substances into the surrounding environment. Using a reconstituted PFASS mixture and environmentally relevant concentrations of PFOS found at our field site near the previous Wurtsmith Air Force Base, we will conduct standardized tests observing lethal and sublethal toxicity (mortality, growth, reproduction) and apply new approach methodologies (NAMS) that include transcriptomic analyses, and molecular docking in *Daphnia magna*. We will also use dynamic energy budget modeling (DEB) to establish linkages between transcriptomic signature responses to biological effects through physiological modes of action (pMoAs), to improve population predictions for ecological risk assessment. With the development of this new complex mixtures testing framework, we hope to conduct prospective and retrospective risk assessment, reduce animal testing, and produce a new method to screen chemical mixtures that will inform hazard estimations and future remediation.