PFAST Network (Per- and Polyfluoroalkyl Substance Testing Network)

Meet Team 5d: Bioaccumulation of PFAS in crop plants

Owen Duckworth, Ph.D., project co-lead, is Professor of Crop and Soil Sciences at NC State University. Dr. Duckworth's research in soil and environmental biogeochemistry combines methods in microbiology and wet- chemistry (laboratory and field-based) with modern spectroscopic, microscopic, genetic, and theoretical techniques to better understand mechanisms and reaction pathways on molecular to macroscopic scales.

Stephen Broome, Ph.D., project co-lead, is Professor of Crop and Soil Sciences at NC State University. Dr. Broome's research in coastal zone restoration emphasizes the application of agronomic principles to environmental restoration and conservation including: use of vegetation for erosion control, habitat creation, restoration, and mitigation; constructed wetlands for wastewater treatment; biofilters for nonpoint source drainage; and revegetation of mined land.

Detlef Knappe, Ph.D., project co-lead, is Professor of Civil, Construction, and Environmental Engineering at NC State University. Dr. Knappe's research focuses on source water protection by identifying contaminants through targeted and non-targeted analyses and on the development of treatment approaches for the removal of unregulated contaminants.

Yuanbo Li, Ph.D., Postdoc at NC State, conducting greenhouse studies

Team Objective: Improve understanding of PFAS uptake and distribution within plant tissues and to explore how soil properties and management strategies may impact PFAS uptake and distribution. Specific aims include:

- Measure uptake of PFAS compounds by two plants relevant to Eastern NC agriculture via greenhouse experiments and determine the effects of organic carbon content on PFAS availability by varying compost composition of the soil.
- Image plant tissues found to contain high level PFAS by STXM (scanning X-ray transmission spectroscopy) to determine the distribution and molecular associations of PFAS in plant tissues.