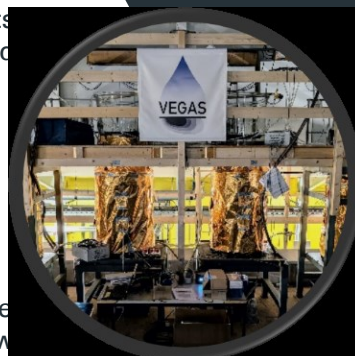


PFAS sorption to air-water interfaces during heavy precipitation events

M.Sc. Topic

Per- and polyfluoroalkyl substances (PFAS) represent a vast class of contaminants that have become pervasive due to over 80 years of use in industrial and consumer products. Increasing field evidence shows that the unsaturated zone—the layer between the land surface and the groundwater table—has accumulated significant PFAS concentrations, posing a long-term risk of groundwater contamination. Understanding the potential threats to groundwater requires comprehensive knowledge of PFAS fate and transport within the unsaturated zone. However, the complex interactions between PFAS and **air-water interfaces** (AWIs) in unsaturated soils, make the behavior of PFAS in this zone challenging to fully comprehend. To address this, we have established large-scale lysimeters to simulate environmental conditions within a controlled laboratory setting. Our objective is to deepen our understanding of the sorption and desorption processes of PFAS at the air-water interface, particularly during heavy precipitation events that cause significant fluctuations in water saturation. The successful applicant will be involved in research activities, including the sampling of porewater from suction cups and lysimeter leachate, as well as sample preparation. You will have the opportunity to enhance your expertise in **High-Resolution Mass Spectrometry** for the determination and quantification of PFAS. Additionally, there is potential to broaden the research focus to a non-targeted approach for identifying emerging PFAS compounds. Beyond quantification, our research aims to determine parameters that describe sorption at air-water interfaces, considering compound characteristics and varying water saturation levels.



Prospective Tasks

- Literature review of PFAS and sorption to air-water interfaces
- Sampling, analytical method development, sample preparation & analysis
- Data interpretation: estimation of key parameters, describing sorption to AWIs
- Visualization of results and discussion

Advisors: Tobias Junginger, Hue Nguyen & Claus Haslauer

Desireable Skills

- Experiences in laboratory work: hands-on experience with sample preparation/ handling of environmental samples, good laboratory practice, data analysis
- Problem solving, team collaboration, attention to detail, communication skills
- Environmental & analytical chemistry, hydrology



Apply now!

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