

Graduate Position: Environmental Fate and Transport; Water Resources

Priority Deadline: December 1, 2022

Apply to: The University of Minnesota [Water Resources Science graduate program](#)

Start Date: Summer or Fall 2023

Funding: Fully Funded Position

Project: Wet deposition (transport through precipitation) of per- and polyfluoroalkyl substances (PFAS) is a known but unconstrained mechanism of PFAS introduction to hydrologic systems. This project aims to broaden the understanding of chemical tracers, source regions, and the importance of wet-deposited PFAS in the Great Lakes region. This project will leverage PFAS precipitation, sediment, and runoff data from the National Atmospheric Deposition Program (NADP), the Environmental Protection Agency (EPA)-supported Great Lakes Sediment Surveillance Program, and the United States Geological Survey (USGS)-supported sampling efforts.

Position: Dr. Alexander Frie's [Source, Fate, and Transport Group](#) seeks a graduate student to start summer or fall 2023. Our group investigates transport of chemicals between the atmosphere and other environmental "spheres," particularly the hydrosphere. We work at the interface of atmospheric modeling, environmental chemistry, and water resources. Our group is part of [Minnesota Sea Grant](#), a systemwide program of the University of Minnesota. Our group is located on the University of Minnesota Duluth (UMD) campus. This student will also work closely with Dr. Bridget Ulrich's Environmental Chemistry Lab at the UMD [Natural Resource Research Institute](#).

Duties

- Execute atmospheric modeling to investigate PFAS source regions.
- Perform receptor-based source apportionment analyses using tools such as positive matrix factorization, principal component analysis, or hierarchical cluster analysis on large chemical data sets.
- Assist in PFAS analysis using techniques including liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF).
- Coordinate data access and collection from partners, including the USGS and NADP.
- Interpret data within chemical, environmental, geographical, and social contexts.
- Prepare manuscripts, present at conferences, and mentor undergraduate students.

Required Qualifications:

- Bachelor's degree in chemistry, environmental engineering, environmental science, atmospheric science, or related field.
- Interest in understanding the fate and transport of chemicals in the environment.
- Applicants must apply to, and be accepted into, the Water Resources Science graduate program.

Desired Qualifications

- Course or professional experience applying environmental transport models
- Experience working in a Linux/Unix coding environment.
- Course or professional experience in analytical chemistry.
- Course or professional experience investigating the sources, fate, and transport of chemicals.
- Operational knowledge of a statistical analysis platform such as Matlab, R Studio, or Igor Pro.
- Demonstrated scientific or non-scientific writing ability.

How to Apply: The student must apply and be accepted to the University of Minnesota [Water Resources Science](#) (WRS) graduate program. WRS is an integrated interdisciplinary graduate program that spans various departments and institutes at the University of Minnesota Twin Cities and the University of Minnesota Duluth. The research will be conducted at Minnesota Sea Grant and NRRI in Duluth, Minnesota.

Interested candidates should apply to the WRS graduate program and indicate interest in working in Dr. Frie's group in their application.

Contacts: For more information about the project and position, contact Alexander Frie (afrie@umn.edu). For questions about the WRS graduate program and application process, contact wrs@umn.edu. Additional information is provided on the [Water Resources Science](#) (WRS) graduate program website.

Deadlines: The priority deadline for Fall 2023 applications to the WRS program is **December 1 2022**. Students who apply by this date will be considered for certain fellowships. However, all applications will be reviewed and are eligible for assistantships after that date.