



USGS NSF GRIP, GSP Opportunity

● Point of Contact Name:	Daniel J. Goode
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● USGS Center:	New Jersey Water Science Center
● Project Title:	Reactive Diffusion Field Method Development for VOCs in Fractured Rock
● Summary:	Protection, restoration, and long-term stewardship of volatile organic compound (VOC)-contaminated fractured-rock aquifers remains a national challenge. Improvements in characterizing aquifer properties and providing tools to estimate long-term fate will help sustainably manage these sites throughout the U.S. This research aims to provide methods to measure hydrologic, geochemical, and microbiological properties of fractured-rock aquifer in situ, and to use these properties to characterize long-term fate of volatile organic compounds such as TCE, PCE, and vinyl chloride in drinking-water aquifers.
● Project Hypothesis or Objectives:	USGS scientists, in cooperation with the University at Buffalo, and the Strategic Environmental Research and Develop Program (SERDP), are developing innovative field methods, including model analysis tools, for measurement of reaction and diffusion rate coefficients for prediction of long-term VOC fate in fractured-sedimentary-rock aquifers.
● Duration:	Up to 12 months
● Internship Location:	Lawrenceville, NJ
● Field(s) of Study:	Geoscience
● Applicable NSF Division:	EAR Earth Sciences, DEB Environmental Biology, CBET Chemical, Bioengineering, Environmental, and Transport Systems, CMMI Civil, Mechanical & Manufacturing Innovation, CHE Chemistry
● Intern Type Preference:	Either Type of Intern
● Keywords:	trichloroethene, biodegradation, abiotic degradation, sorption, mudstone, hydraulic tomography, borehole geophysics, modflow,

mt3d, GIS, parameter identification, navy, Newark Basin, Lockatong Formation, remediation, NAWC, Toxics Substances Hydrology Program, Environmental Health Mission Area

- Expected Outcome:** This internship will leverage ongoing USGS and cooperator research and allow the intern to contribute independent research that improves the methods being developed for characterization of long-term fate and transport of VOC contaminants at complex hydrogeologic sites. The intern will have the opportunity for guided, independent research on a topic that furthers their educational development and career goals. The USGS will benefit from contributions from the intern's recent advanced study to improve the outcomes of the USGS research program on the behavior of toxic substance in the environment, and effects of those substances on environmental health.
 - Special skills/training Required:** A strong background in hydrogeology, environmental geochemistry, or fate and transport of contaminants in groundwater is required. Field or laboratory experience in groundwater monitoring and water-quality sampling is preferred.
 - Duties/Responsibilities:** The intern will contribute to apparatus design, bench-top testing, field testing, data analysis, and development of modeling tools for analysis of field data. The intern will have the opportunity to develop a focused research program as part of the overall research program, depending on interest. For example, specific bench-top testing methods could be developed to evaluate innovative gas sampling methods in controlled experiments prior to field testing. Or, the intern could focus on numerical methods and user interface development for data analysis tools.
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