



USGS NSF Internship Opportunity

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USGS Center:	Maryland-Delaware-Washington, DC Water Science Center
Project Title:	Quantifying and explaining patterns in nutrient and sediment export from urban streams within the Chesapeake Bay watershed
Summary:	Urban landscapes in the Chesapeake Bay (CB) watershed are growing at a rapid pace. A key component for the Chesapeake Bay restoration effort is identifying factors that control pollutant export from urban streams. Join our diverse team of water quality experts to explore emerging approaches to quantifying and explaining patterns in pollutant export in urban streams.
Project Hypothesis or Objectives:	The overall goal of this project is to understand factors that drive spatial and temporal variability in nutrient and sediment fluxes from urban stream ecosystems in the Chesapeake Bay region. To support this goal, nutrient and suspended sediment exports are quantified using surrogate modeling approaches, which leverage continuous water quality information to predict high-frequency water quality constituent concentrations. Because we have a rich network of urban watersheds with continuous water quality information, cross-site comparisons can be used identify factors controlling spatial variability in fluxes. Inter-event comparisons can be used to quantify temporal variability in nutrient and sediment export, and long-term records of flux estimated by surrogate modeling may be used to infer about trends in water quality over time. The intern would have opportunities to participate in all aspects of this project.
Duration:	Up to 12 months
Internship Location:	Baltimore, MD
Field(s) of Study:	Chemistry, Engineering, Geoscience, Life Science, Computing
Applicable NSF Division:	AGS Atmospheric and Geospace Sciences, EAR Earth Sciences, OCE Ocean Sciences, DBI Biological Infrastructure, DEB Environmental Biology, BD HS Big Data Regional Innovation Hubs and Spokes, HPC High Performance Computing, SES Social and Economic Sciences,

BCS Behavioral and Cognitive Sciences, SMA SBE Office of Multidisciplinary Activities, CBET Chemical, Bioengineering, Environmental, and Transport Systems, CMMI Civil, Mechanical & Manufacturing Innovation, EFMA Office of Emerging Frontiers and Multidisciplinary Activities, CHE Chemistry, DMS Mathematical Sciences, PHY Physics, EHR Education and Human Resources, ENG Engineering, OAC Office of Advanced Cyberinfrastructure, CISE Computer and Information Science and Engineering

Intern Type Preference: Any Type of Intern

Keywords: Urbanization, water quality, continuous water quality monitoring, Chesapeake Bay, best management practices, ecosystem restoration, stormwater

Expected Outcome: The intern would be expected to assist with data analysis and interpretation of water quality fluxes in urban streams, and would have the opportunity to lead the development of a journal article summarizing these results, including mentoring support after the internship ends. The student will gain exposure to a science-based government agency and networking opportunities with a wide variety of partners engaged in the Chesapeake Bay program.

Special skills/training Required: Proficient in R and basic statistics; comfortable managing/manipulating large data sets in R; background in environmental sciences.

Duties/Responsibilities: The intern would have opportunities to engage in many USGS Chesapeake Bay science activities since the MD-DC-DE Water Science Center is heavily involved in providing science to inform the Chesapeake Bay restoration effort. The majority of the internship would consist of reviewing relevant literature, data analysis/interpretation, and summarizing results in a journal article. However, opportunities to engage in field work, including water quality sampling, are also available. There are additional opportunities for exposure to other research areas in our Center (e.g., geomorphology or emerging contaminants).

Internal Information - Not to be posted:

Center Director Name: Mary Kay Foley

USGS Responsibilities: Equipment, Facilities, Mentoring, On-boarding, Background Check, Volunteer Agreement Management

Preliminary Approval: This opportunity has my Center's approval

I already have a student in mind:

Comments: Although we don't have a student identified yet, our Center is very well positioned to support student internships since it is located on University of Maryland-Baltimore County (UMBC) campus. We are also easily accessible from University of Maryland-College Park, Johns Hopkins University, and other universities in the Washington-Baltimore region.
