USGS NSF GRIP Opportunity

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USGS Center:	Water Mission Area, Office of Water Quality
Project Title:	Application of high frequency water-quality data to better understand river and watershed processes
Project Hypothesis or Objectives:	The recent availability of new water quality sensors and enabling technologies (the telecommunications, collection platforms, data standards, and data management tools required to log, transmit, manage and serve data in a timely manner) are becoming increasingly important for water quality monitoring and associated water resource management decisions. Water quality sensors allow for nearly continuous measurements of certain specific parameters (e.g. seconds to minutes), thereby reducing the likelihood that changes in water quality are missed or obscured as often happens with infrequent discrete sampling alone. This presents new opportunities for quantifying the temporal patterns in water quality, improving the accuracy of trends and load assessments, and better understanding the drivers of water quality over time. The USGS is leading efforts to synthesize data from the 117 site National Water Quality Network and seek a research fellow to help analyze patterns in water quality time series data from rivers and streams across the country.
Duration:	up to 12 months
Internship Location:	Reston, VA
Field(s) of Study:	Hydrology, Biogeochemistry, Biology, Ecology, Water Resource Management, Statistics
Expected Outcome:	The project will improve our understanding of how high frequency water quality data can be used to quantify biogeochemical processes and drivers. The USGS will benefit through improved methodology for the interpretation of high frequency data, particularly in the context of the 117 site National Water Quality Network. The Fellow will benefit from conducting a synthesis of

	existing data and developing fluency in the tools and techniques used by the USGS to collect and manage high quality data. The Fellow will also develop writing skills as an author or co-author on at least one journal article involving the application of high frequency sensor data across a national network.
Special skills/training Required:	Course work in biogeochemistry and watershed science. Familiarity with software used to manipulate large datasets, such as Matlab, R, Python, etc. Strong written and oral communication skills.
Duties/Responsibilities:	1. Synthesize existing high frequency water-quality data from the USGS to answer a question of mutual interest related to watershed biogeochemistry, hydrology or ecology. Examples include patterns of diurnal variability in dissolved oxygen and nutrients; the use of specific conductance for tracking water flowpaths; or comparisons of nutrient load computation techniques. 2. Lead or contribute findings and text to at least one journal article (as an author).