USGS NSF Internship Opportunity

Point of Contact Name:	Jamie Shanley
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USGS Center:	New England Water Science Center
Project Title:	Dissolved organic matter dynamics from mountains to sea
Summary:	Research the movement of organic carbon out of the mountains and into the stream -- the “forgotten flux” of the global carbon budget. Assess how climate extremes, including both floods and drought, will alter carbon and other nutrient cycling. Lead a scientific paper on an aspect of this research that excites you.
Project Hypothesis or Objectives:	This internship will build on dissolved organic matter (DOM) research at the long-term Sleepers River Research Watershed in northeastern Vermont, to examine the factors controlling DOM concentration and character from the small watershed scale to the entire Connecticut River basin. The central science question of our study is: “How will changing land use and climate, including extreme floods and drought, affect quantity and quality of fluvial carbon (and N and P) export to receiving water bodies?” The intern will utilize long-term DOM, hydrology, and climate data from Sleepers River, including several years of in-stream fluorescence measurements. She or he will gather existing data from USGS and other sources for the larger Connecticut River basin, and collect new field data as needed to investigate the fate, transport, and transformations of DOM as it moves from the headwater mountains to Long Island Sound. New data collection will include grab samples and potentially in-stream sensors. The intern will have latitude to pursue his or her own research angle within the confines of the project, and will be expected to develop a targeted dataset to support a first-authored paper.
Duration:	Up to 12 months
Internship Location:	Montpelier, VT
Keywords:	Chemistry/Geochemistry, Climate Change, Hydrology
Applicable NSF Division:	GEO (Atmospheric, Earth Sciences, Ocean Sciences, Polar Programs)
Intern Type Preference:	Any Type of Intern

Duties/Responsibilities:	The intern will gain experience with environmental sensors, and learn to optimize their performance for the highest data quality. He or she will gain experience with handling “big data”, and will learn skills with data management software and/or use his or her own code. The project will be most successful if the intern takes advantage of broader USGS and academic expertise within the region. Laboratory facilities in Vermont are limited, but arrangements are commonly made to use facilities at local universities. The intern will have considerable freedom to pursue the research most exciting to her or him. The internship will be based in the USGS office in Montpelier, USA’s smallest capital city, in the heart of the Green Mountains of Vermont. The intern will interact with USGS researchers and technicians in other offices. She or he will also benefit from our connections with the Forest Service and academia. The Northeast is a hotbed for catchment science, with a strong network of long-term small watersheds. Hydrologists and biogeochemists with common interests and science questions frequently collaborate on cross-catchment synthesis papers, which leverage intensive place-based science with the regional perspective of the distributed sites. The intern is encouraged to make connections within this network and present results at regional meetings and working groups.
Expected Outcome:	The project will enhance much-needed understanding of the role of stream carbon transport in the global carbon cycle. In so doing the intern will further the programmatic goals of the Land Change Science Program. The intern will build his or her research skills in data processing, data analysis, networking, and communicating scientific results (speaking and writing).
Special skills/training Required:	Prorgramming skills (R or Python) desirable but not required. Field work in challenging conditions (extreme heat and cold, rain and snow) is likely.

Internal Information - Not to be posted:

Center Director Name: Bob Lent
USGS Responsibilities: Equipment, Facilities, Mentoring, On-boarding, Background Check, Volunteer Agreement Management
Preliminary Approval: I have not discussed this proposal with my Center's Leadership, but I plan to.
I already have a student in mind:

Comments: