

USGS NSF GRIP Opportunity

 USGS Center:	National Research Program
 Project Title:	Sediment transport, storage, and lag times in Chesapeake Bay watersheds
 Project Hypothesis or Objectives:	<p>Transport of sediment and particle-associated nutrients from upland watersheds into the Chesapeake Bay is an ongoing geomorphic and ecological concern for the region. Every year millions of dollars are spent on managing this flux. A “lag time” occurs between initiating a best management practice in a watershed and achieving the intended benefit in the estuarine receiving waters. Lag times for sediment occur because sediment is deposited between transport events before reaching long-term storage locations. This has been a concern for Chesapeake Bay restoration for decades, but little progress has been made towards quantifying lag times.</p> <p>Our research goals are to: 1) Measure contemporary sediment waiting time distributions for alluvial storage reservoirs in two typical mid-Atlantic Piedmont watershed where rates of erosion, deposition, and transport are well-constrained by ongoing monitoring; 2) Use the measured waiting time distributions with a suspended sediment routing model in a series of scenarios designed to illustrate timescales required for suspended sediment to move from upland sources to basin outlet.</p>
 Duration:	9 to 12 months
 Internship Location:	Reston, VA
 Area of Discipline:	Geomorphology, Hydrology, River management
 Expected Outcome:	This project will result in several peer-reviewed journal articles and will be disseminated to river managers in the Chesapeake Bay watershed. We expect the intern to provide intellectual and technical support for the project in terms of field mapping, data collection, laboratory analyses, data entry, and GIS processing. The ideal candidate will be able to provide interpretation of the field data that they are collecting and assist with project planning and

development. The intern will benefit from being able to conduct independent work (which will be mentored at the appropriate level), training in field techniques (sediment and woody debris mapping, sediment collection techniques, field safety), laboratory techniques (gamma spectroscopy, laser particle-size analysis), GIS experience, data analysis training (Sigma Plot, Microsoft Excel), and job related safety. In addition to technical experience, the student will benefit from interaction with scientists from multiple disciplines which would provide excellent preparation for future graduate work or a career in the physical sciences.

● Special skills/training Required:

We require the intern to be able to work in adverse field conditions including irregular terrain, poison ivy, and inclement weather. The intern should demonstrate a strong interest in geomorphology and surface water hydrology. The ideal candidate will have a working knowledge of ArcGIS, Photogrammetry, experience with advanced statistical software (Sigma plot, SAS, R), and prior laboratory experience. Organizational skills and the ability to multitask are essential for this position. Interns will be required to operate a government-owned or -leased vehicle in the performance of their official duties and will possess a valid State license with a safe driving record.

● Duties/Responsibilities:

The intern would be responsible for developing sediment budgets related to in channel storage of material. Approximately 30% of the intern's time would be devoted to local field work including coring of in-channel sediment deposits, collecting water and sediment samples, and mapping river channel characteristics using Structure from Motion techniques. 30% of the intern's time will involve laboratory analysis including grain size analysis, processing for radionuclide dating, and core logging. Data analysis from this field work will comprise about 40% of the intern's time. The intern will be expected to help develop conceptual and mathematical models of sediment transport and storage.

● Point of Contact or Mentor:

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