



USGS NSF GRIP Opportunity

- USGS Center:** USGS, Hydrologic Networks Branch
- Project Title:** Sediment Acoustics
- Project Hypothesis or Objectives:**

Acoustic instruments are increasingly being used to measure suspended-sediment concentration (SSC) in fluvial environments. The USGS Office of Surface Water, USGS Sediment Acoustics Leadership Team, and the Federal Interagency Sedimentation Project are developing standardized methods and software for estimating SSC from acoustic backscatter from acoustic Doppler current profilers (ADCPs). The objective of this work is to (1) enhance ongoing work to estimate SSC from downward looking ADCPs used in river measurements, (2) create an operational software tool for doing this, and (3) validate the approach by means of field data collection and analysis.
- Duration:** 6–12 months
- Internship Location:** Boise, ID
Urbana, IL
- Area of Discipline:** Water Resources, Computer Science, Earth Science, Geomorphology
- Expected Outcome:**

The expected outcome of this work is to build on existing research methods to create operational software for estimating SSC from acoustic backscatter. The data collected in this work will help advance sediment acoustics research. Because ADCPs are used routinely throughout the USGS for streamflow measurements, using acoustic backscatter data from ADCPs as a surrogate for SSC has the potential to revolutionize sediment science by providing rapid measurements of sediment flux and distribution in space and time.

Special skills/training Required: Applicant must be proficient in MATLAB and scientific computing in general. Other programming experience (especially Python) is beneficial but not required. Completion of a bachelors or masters degree in computer science, earth science related discipline, engineering, applied mathematics, or related field. Fluency in Spanish is desirable, but not required.

Duties/Responsibilities: (1) Summarize existing sediment acoustics research to date. (2) Document available information from ADCP manufacturer(s) and colleagues. (3) Develop and incorporate desired enhancements. (4) Standardize processing techniques. (5) Continue development of MATLAB code for processing data to create an operational software tool. (5) Collect and process sediment and ADCP data. (6) Collaborate with domestic and international researchers.

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