

USGS NSF GRIP Opportunity

USGS Center:	Office of Groundwater, Branch of Geophysics
Project Title:	Scaling geophysical approaches to hydroecological research in the river corridor
Project Hypothesis or Objectives:	<p>The physical exchange between surface and groundwaters (SW/GW) controls many aspects of aquatic habitat including water quality and temperature. Under climatic warming trends and extremes, groundwater discharge zones provide habitat stability and resiliency, both in the form of patch thermal refugia and larger-scale thermal buffering. However, it is not enough to simply locate cold spots in summer; mechanistic understanding of the multiscale controls on SW/GW exchange is necessary to make useful habitat predictions. In the stream domain, geophysical approaches (e.g., electromagnetic, electrical resistivity, thermal, radar, seismic) are quickly emerging as tractable methods to connect point scale measurements to larger scale physical controls. At the USGS Branch of Geophysics we push the boundaries by field-testing new instrumentation and developing analysis and modeling techniques that enhance the quantitative aspects of research in the river corridor. A Research Fellow with our Branch will help drive geophysical method application to national river habitat research, specifically in regard to stressed fish species.</p>
Duration:	6 - 12 months
Internship Location:	Storrs, CT
Area of Discipline:	Hydrology, Geophysics, Ecology, Environmental Science Studies
Expected Outcome:	<p>The project will improve our understanding of the physical template that controls critical aspects of aquatic habitat and water quality in the stream corridor. The USGS will also benefit through improved methodology and analysis techniques that will be disseminated broadly to interested USGS personal through the several geophysical training courses the Branch participates in annually. The Intern will develop fluency in electrical, electromagnetic, and temperature geophysical methods and associated analysis and modeling skills. The Intern will also make an author-level</p>

contribution to at least one Journal Article involving the application of geophysics to hydroecology and/or climate change research.

-  **Special skills/training Required:** 1. Ability to work independently. 2. Coursework in the hydrological sciences, geophysical training a bonus. 3. Familiarity with software used to manipulate large datasets, such as Matlab, R, Python, etc. 4. Comfortable in multiple day field efforts in challenging conditions (e.g. poor weather, rugged terrain). 5. Strong written and oral communication skills.
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