



USGS NSF GRIP, GSP Opportunity

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● USGS Center:	Leetown Science Center
● Project Title:	Behavioral thermoregulation in brook trout: implications for climate change
● Summary:	Our proposed research bridges this gap between field- and laboratory-based research by simulating thermal heterogeneity and measuring fish habitat selection in an experimental setting. This research would benefit the GRIP Intern by providing technical skills for fish collection and behavioral assessment, as well as analytical skills for understanding dynamic responses to climate change. The incumbent would collaborate with Leetown Science Center (LSC) staff on presentations and publications from this research.
● Project Hypothesis or Objectives:	Native trout are sentinel species for assessing climate change due to their requirement for coldwater habitats. Although upper thermal tolerance limits are well-known from experimental exposure studies (i.e., uniform conditions), stream ecosystems are instead characterized by spatially and temporally patchy thermal conditions. Therefore an understanding of behavioral thermoregulation in trout is important to predict individual and population responses to climate change. Our objectives in the proposed research are to: (1) Simulate groundwater upwelling in a set of experimental streams to create thermal heterogeneity; (2) Collect a set of native brook trout (<i>Salvelinus fontinalis</i>) from regional streams and measure their selection of thermal habitat use using radio-frequency tags in the experimental streams; (3) Quantify brook trout thermal habitat selection over time and space.
● Duration:	Up to 12 months
● Internship Location:	Kearneysville, WV
● Field(s) of Study:	Life Science

● Applicable NSF Division:	EAR Earth Sciences, DEB Environmental Biology
● Intern Type Preference:	Either Type of Intern
● Keywords:	Climate change, fish, behavioral thermoregulation
● Expected Outcome:	This project will yield new inferences on how native brook trout populations may respond to climate change. Prior research demonstrates that stream ecosystems are highly patchy in their thermal habitat structure for fishes, but laboratory-based assessments of upper thermal tolerance limits typically assume uniform thermal conditions.
● Special skills/training Required:	This project requires an interest in ecological research and climate change.
● Duties/Responsibilities:	The GRIP Intern would work closely with research staff at the Leetown Science Center (LSC). Intern responsibilities would include: (1) Monitoring experimental stream water chemistry and temperature; (2) Assisting LSC staff with stream thermal habitat assessments and collection of brook trout; (3) Managing fish feeding and monitoring of fish condition; (4) Coordinating data collection for fish movement and habitat selection from radio-frequency tags in the experimental streams; and (5) Collaborating with LSC staff on statistical analysis and inference.
