USGS NSF GRIP Opportunity

USGS Center:	National Research Program - Eastern Branch
Project Title:	Understanding Surface Water Availability for the Nation
Project Hypothesis or Objectives:	Daily streamflow information is critical for solving any number of hydrologic problems. If a suitable probability density function (pdf) was identified to represent daily streamflow, one could provide functional linkages between the pdfs of daily streamflow and precipitation toward a probabilistic framework that explains how catchments filter the precipitation signal. This topic has been a fundamental – yet currently unsolved – problem in hydrology. Further, when changes to the landscape, climate, or water use, it is unknown how these changes then affect the behavior of streamflow. The objective of this work is to understand the behavior of streamflow time series and how streamflow behavior changes due to changes in climate, land cover, and water use within the contributing catchment.
Duration:	9-12 months
Internship Location:	Reston, Virginia
Area of Discipline:	Earth Science, Hydrology, Environmental Statistics, Stochastic Hydrology, Physical Sciences
Expected Outcome:	Results of this project will advance our fundamental understanding of the behavior of streamflow and have implications for a number of USGS programs, particularly two research thrusts of the National Water Census. The project will publish at least one paper in the peer-reviewed literature. The intern will receive mentorship, opportunities to broaden their professional network, and exposure to USGS culture, mission and research efforts.
Special skills/training Required:	Completion of a bachelors or masters degree in computer science, earth sciences related discipline (geology, biology, hydrology, etc.), applied mathematics, econometrics or related field. Background in environmental statistics and hydrology preferred. Applicant must be proficient in at least one computer programming language, preferably R.

Duties/Responsibilities:	1. Collection and analysis of daily streamflow obtained from approximately 6,000 streamgages across the Nation. 2. Application of statistical theory to streamflow time series, including theory related to probability density functions, L-moments, order statistics, and plotting positions. 3. Collection of information related to hydrologic alteration (water use, climate, and land cover) and application to the analysis of streamflow time series, including econometric theory. 4. Publication of findings in the peer-reviewed literature.
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