



USGS NSF GRIP, GSP Opportunity

● Point of Contact Name:	Greg Noe
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● USGS Center:	Hydrological-Ecological Interactions Branch
● Project Title:	Floodplain interaction with watershed and estuarine processes: impacts on water quality
● Summary:	<p>We are seeking an energized intern to work with us to advance the science of wetland-water quality interactions in watersheds. Come and be a part of our interdisciplinary team to push science forward while learning about careers in the USGS. You can add your research capabilities and perspectives to our existing umbrella of studies and also learn new approaches, measurements, and modeling techniques. We will work with you to identify the specific projects you could contribute during the internship.</p>
● Project Hypothesis or Objectives:	<p>Floodplains remove pollutants as they are transported through watersheds, but 'how much' and 'where' is poorly understood, quantified, or predictable, nor are the consequences for floodplain wetland ecosystems. This project has the goal of measuring and modeling the rates and controls of floodplain effects on water quality, geomorphic hazards, and habitat in order to improve regional-to-national spatially explicit models associated with floodplain deposition and bank erosion. Fundamental understanding of linkages between hydrologic connectivity and nutrient biogeochemistry in these ecosystems also needs advancement. The lack of predictive capability is limiting the development of watershed models that are necessary to manage TMDLs, and of management actions to restore floodplains and watersheds. Another goal is to understand how tidal freshwater rivers and wetlands impact freshwater, sediment, and nutrient delivery at the interface of watersheds and estuaries.</p> <p>The NSF intern has flexibility in choosing studies to support this research opportunity. Potential foci could include sediment-phosphorus interactions, hydrologic connectivity at regional scales, channel habitat for fish and wildlife, and impacts of sea level rise. The intern research would complement the existing long-term</p>

research on 1) Measuring and modeling the effects of floodplains on sediment and nutrient transport in watersheds; 2) Sea level rise and watershed impacts to the resilience and water quality functions of tidal freshwater wetlands; or 3) Quantifying the water quality benefits of wetland restoration and creation and how to optimize their design.

Duration: Up to 12 months

Internship Location: Reston, VA

Field(s) of Study: Geoscience, Life Science

Applicable NSF Division: EAR Earth Sciences, DEB Environmental Biology, CBET Chemical, Bioengineering, Environmental, and Transport Systems

Intern Type Preference: Any Type of Intern

Keywords: Ecosystem ecology
Biogeochemistry
Geomorphology
Watershed
Hydrologic connectivity

Expected Outcome: The intern will learn new research methods for understanding the hydrogeomorphic and biogeochemical controls on wetland soil processes, contribute to the emerging fields of watershed-scale impacts of wetlands on water quality or tidal freshwater response to climate change, and build a network of collaborators, colleagues, and contacts within the federal scientific community. The USGS will learn new laboratory and field methods, collaborate on new research studies to further understanding of impacts of floodplains on watershed processes, and advance the goals of the Water, Ecosystems, and Land Resources Mission Areas.

Special skills/training Required: Training and experience in collecting soil or sediment cores, measuring biogeochemical processes (C, N, or P), working in wetlands, and understanding of hydrogeomorphology

Duties/Responsibilities: The intern would collaborate as a member of our research team, leading a research component of their choosing that would advance our project and USGS goals. The intern will plan research, conduct field work and laboratory analyses, analyze and interpret data, and work towards publishing a manuscript. The intern would also participate in other research projects of our research team on the topic of ecogemorphic controls on the sources, transport, and fate of nutrients in wetland ecosystems.

Internal Information - Not to be posted:

Center Director Name: Joe Holomuzki

USGS Responsibilities: Equipment, Facilities, Mentoring, On-boarding, Background Check, Volunteer Agreement Management

Preliminary Approval: I have not discussed this proposal with my Center's Leadership, but I plan to.

I already have a student in mind:

Comments: We have a history of successfully integrating graduate students into our USGS research, mentoring the students, and having the students contribute to the USGS through methods advances and scientific publications.
