Three PhD Student Cluster Hire for:

Hydrologic, Geomorphologic and Geochemical Controls on Iron, Arsenic and Organic Matter Cycling along River Corridors Spanning the Riverine to Tidal Continuum

Supported by NSF WaLCZ Program

We are seeking PhD students for a 3-year collaborative project between three US Universities and Dhaka University. The anticipated start date is August 2027.

Project Application Deadline: Varies based on university, typically December, but interviews begin in October 2026

Application Materials (in addition to graduate program-specific requirements)**:**

- 2 page CV including previous publications in peer reviewed journals and conference presentations
- 300 word statement of purpose
- Two names and contact information for references

Application Process and PI Information: Students may list more than one theme outlined below, but they should rank them according to their interests and qualifications. The student should contact the PI that aligns with their top interest and send their application materials to that person by a target deadline of October 1. Top applicants will be invited to a zoom interview.

Research Themes, PI and PhD Supervisors and Schools:

Sediment Biogeochemistry and Organic Geochemistry
Prof. Saugata Datta, Dept. of Earth and Planetary Sciences, Univ. of Texas at San Antonio
Saugata.Datta@utsa.edu

Hydrogeology and Aqueous Geochemistry
Prof. Peter Knappett, Dept. of Geology & Geophysics, Texas A&M University
knappett@tamu.edu

Reactive Flow and Transport Phenomena
Prof. Bayani Cardenas, Dept. of Earth and Planetary Sciences, Univ. of Texas at Austin
cardenas@jsg.utexas.edu

Other Senior Personnel
Hydrogeology and Bangladesh Water Resources
Prof. Mahfuz Khan, Dept. Geology, Dhaka University
m.khan@du.ac.bd

Desired Qualifications:

- Strong preparation in quantitative hydrogeology including prior experience with field work
- Strong theoretical and practical capabilities in aqueous geochemistry field, laboratory and/or modeling (i.e., using PHREEQC)
- Knowledge and competence with water isotope systematics and mixing modeling
- Data visualization and analysis using Matlab, R, Python
- Geographical Information Systems (ArcGISPro) and Spatial Statistics
- Experience publishing and presenting research
- Ability to work in hot weather and lift 30 lbs objects
- Ability to work independently and as a closely integrated team
- Numerical flow and transport modeling, geomorphology, near surface geophysics, remote sensing, or machine learning is considered an asset

Project Description and Goals: Despite mitigation programs and research in understanding arsenic's source and distribution, millions of people continue to drink arsenic contaminated groundwater, especially in Bangladesh. The extremely heterogeneous distribution of arsenic is one reason for the lack of progress. This project investigates the river corridors in Bangladesh to understand the three-way transport of arsenic between rivers, floodplain sediment, and aquifers. The study's goal is to understand the physical and chemical conditions which generate arsenic and how human activities and geomorphic changes may impact these. Our project focuses on floodplain aquifers along the Jamuna and Padma Rivers. At these sites, we will map and monitor water levels and flowpaths and characterize sediment and aqueous chemistry and isotopic composition. We will conduct microcosm experiments to constrain reactions. Reactive transport modeling based on all the observations will be utilized to more broadly determine where arsenic will be mobile as a function of river hydraulics, organic matter reactivity, and subsurface geology.

