

## CAESER's Dr. Jenn Pickering Conducting International Research on Climate Change and Sedimentary Dynamics of the Ganges-Brahmaputra Delta



*Image 1: Sampled the Ganges River near a new nuclear power plant*



*Image 2: Note the cross beds*



*Image 3: More sand — this is from the Brahmaputra River near the Jamuna Bridge*

Dr. Jenn Pickering, a post-doctoral fellow at CAESER (Center for Applied Earth Science and Engineering Research) (Center for Applied Earth Science and Engineering Research), recently sampled the Ganges & Brahmaputra Rivers in Bangladesh along with colleague Dr. Michael Blum and two graduate students from the University of Kansas. This project is funded by the National Science Foundation. The overarching aim is to identify changes in river and sediment discharge that can be attributed to climate change. The team uses detrital zircon geochronology to fingerprint the signature of different sediments that were previously collected from the Bengal Fan during the [International Ocean Discovery Program \(IODP\) Expedition 354](#). By analyzing the sediment deposited by the rivers in this region, they hope to shed light on the influence of climate change on the region's geology and gain insight into the broader impacts of these processes on global environmental change.



*Image 4: Dr. Jenn Pickering speaking at Bangladesh Open University*



*Image 5: Bangladesh Open University's seminar on "Climate Change and Disaster Management"*

Following the field campaign, Dr. Pickering delivered a keynote lecture on April 4, 2023, at Bangladesh Open University's seminar on "Climate Change and Disaster Management." During this event, she shared her expertise on the impacts of early Holocene megafloods, which have significantly affected the region's geology. In recognition of her groundbreaking research, Bangladesh Open University has conferred upon her an Honorary Professorship. Afterwards, Dr. Pickering and

Dr. Blum were invited to participate in a national news program to discuss the dynamics of the delta region. The focus of the conveners centered on Bangladesh's desire to control their rivers similarly to the way the Mississippi River is managed in the United States, and the impact of that control on the fragility of delta sustainability. Currently, the Mississippi River delta coastal system suffers from significant erosion due to decrease sediment deposition from river management policies.

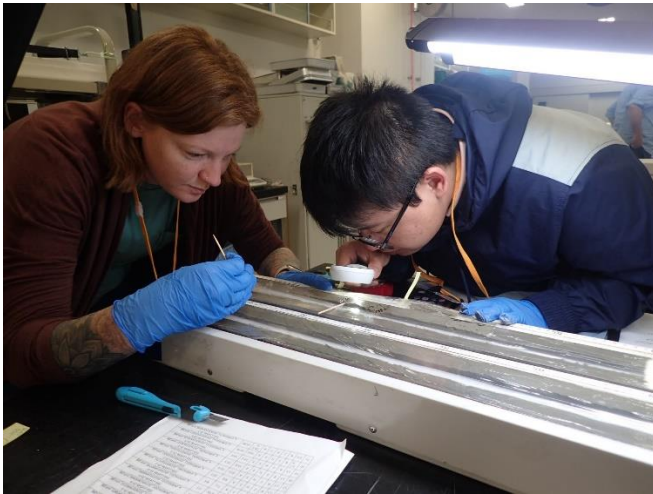


Image 6: Dr Pickering and PhD student ZI Gao studying IODP 354 Bengal Fan core courtesy of the Kochi Core Center



Image 7: Dr Pickering and Dr. Blum studying IODP 354 Bengal Fan core courtesy of the Kochi Core Center

Dr. Pickering's lecture coincides with a paper she co-authored which was recently published in [Nature Communications](#). This paper focuses on the resilience of the Ganges-Brahmaputra delta coastal system. As climate change continues, storm severity and sea levels will continue to increase. Currently, as many as 630 million people live in regions that will be uninhabitable by 2100 due to sea-level rise, flooding, and inundation. To validate predictions, the authors studied the Ganges-Brahmaputra delta response to climate change during the Holocene, a period which had similar climate changes currently being observed. The authors noted that the increase in monsoon precipitation would increase the amount of sediment deposited in the delta regions. This increased sediment would offset the amount of erosion occurring from accelerated sea-level rise. However, sediment delivery would decline by 15-80% if planned dams and river diversions were implemented. It is research like this that provides policymakers insights needed for climate change mitigation strategies not only in the Ganges-Brahmaputra delta coastal system but worldwide. The University of Memphis and CAESER are committed to continuing research of this caliber both here and internationally.