

## **Collaborative Research: Bangladesh Delta: Assessment of the Causes of Sea-level Rise Hazards and Integrated Development of Predictive Modeling Towards Mitigation and Adaptation (BanD-AID)**

**Call:** Coastal Vulnerability

**NSF code:** G8MUREFU3FP-2201-126

**Lead PI:** C. K. Shum, Ohio State University

**Partners:**

Jurgen Kusche, University of Bonn

Boris Braun, University of Cologne

Fabrice Papa and Stephane Calmant, Observatoire Midi-Pyrenees

J. Craig Jenkins, The Ohio State University

Faisal Hossain, Tennessee Technological University

Zahirul Khan, Institute of Water Modelling\*

Michael Kuhn, Curtin University\*

Raquib Ahmed, University of Rajshahi\*

\* partners bringing their own funding/in-kind support

**BF/G8HORC sponsors:** ANR, DFG, NSF

**Amount:** €1.620K

**Time period:** 36 months

Bangladesh, a low-lying, one of the most densely populated countries in the world located at the Bay of Bengal, is prone to transboundary monsoonal flooding, potentially aggravated by more frequent and intensified cyclones resulting from anthropogenic climate change.

Sea-level rise, along with tectonic, sediment load and groundwater extraction induced land uplift/subsidence, have significantly exacerbate these risks and Bangladesh's coastal vulnerability. We propose to build a robust Belmont Challenge identified Earth System Analysis & Prediction System (ESAPS) for Bangladesh, to adapt/mitigate the detrimental hazards including sea-level rise.

We will establish an advanced observation system based on contemporary space geodetic sensors to quantify (1) causes of sea-level rise and land motion and their robust vertical datum link, and (2) human interactions that governs coastal vulnerability in Bangladesh. This knowledge will be used for the integrated development of a natural and social science framework employing robust predictive modelling towards the adaption of sea-level rise and other hazards in coastal Bangladesh. Our international, cross-disciplinary science team, consists of natural and social scientists including local stakeholders, will leverage upon ongoing environmental and social projects in the region. Our approach includes observation/fieldwork based syntheses to discern sea-level rise and land motion and their projections at century timescales, socioeconomic analyses including vulnerable population projection, micro adaptation, land use change, and community adaptive capacity, and integrated assessment including scenario analysis, dissemination, and decision-support service in coastal Bangladesh.

The developed BanD-AID ESAPS prototype system is transportable to other regions of the world. Our work will both leverage and benefit other existing projects (e.g., Fulbright, NASA,

NSF, ONR, USAID). The project will train students, technicians and social workers who will be the next-generation local stakeholders.