

Exploring the potential of Himalayan Bhutanese lake sediments for Holocene reconstructions of temperature and Indian monsoon intensity

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Climate changes associated with the boreal summer Indian Monsoon (IM) directly affect the livelihoods of the ca. 1.5 billion people that live on the Indian subcontinent.

The importance of the Indian Monsoon to agronomy and society in Southeast Asia has long made the phenomenon a target for meteorologic and climatic study. To reconstruct precipitation and monsoon variability in the heart of IM region in the recent past and thus extend our knowledge of climate dynamics in this important region, I intend to conduct a preliminary investigation of Himalayan lakes in Bhutan to assess their suitability as archives of Holocene climate changes associated with the IM. This investigation will consist of both exploratory field work to target lakes (lake coring, limnological survey, soil and water collection) and initial geochemical analyses of any collected sediment cores. The focus will be on assessing the feasibility of applying organic geochemical proxies for IM circulation intensity (the stable hydrogen isotopic composition of fossil terrestrial leaf waxes) and temperature (the relative methylation of branched glycerol dialkyl glycerol tetraethers). Bhutan's location at the foot of the Himalayas makes it an ideal location for IM intensity reconstruction, and the target lakes are in close proximity to existing tree ring sites potentially allowing for direct comparison of tree ring-derived reconstruction of drought and the lacustrine organic geochemical reconstructions.