

## Evidences of global climatic events for last two millennia and their forcing factors from active mudflats of Western India

Upasana S. Banerji\*<sup>1</sup>, Ravi Bhushan<sup>1</sup> and A.J.T. Jull<sup>2</sup>

<sup>1</sup>Geosciences Division, Physical Research Laboratory, Ahmedabad-380 009, Gujarat

<sup>2</sup>NSF Arizona AMS Laboratory, University of Arizona, Tucson, AZ 85721, USA

Documenting climate for the last two millennia is essential to evaluate anthropogenic influence and future projection of climate trends but there exists ambiguity in amplitude, synchronicity and spatial extent of last two millennia climatic events. Solar Insolation and Volcanic eruption are the two major forcing factors which essentially controlled the climate and monsoon system of last two millennia. The Indian monsoon system is significantly constrained by the migration of Intertropical Convergence Zone (ITCZ). The paucity of climate records from the Indian subcontinent for last two millennia is a major impediment which reinvigorated us to study the climate and the forcing factors for a region significantly influenced by Indian Summer Monsoon (ISM).

The multiproxy approach on a sediment core raised from the active mudflat of western India suggested warm and humid conditions with enhanced ISM during 2000–950 cal yr BP (Roman Warm Period and Medieval Warm Period) interrupted by Dark Ages of Cold Period during ~1500 cal yr BP. Later, southward shift in the ITCZ triggered by volcanic activity enhanced western disturbances with improved winter precipitation resulting in cool and humid climate between 500–200 cal yr BP (Little Ice Age). Following this, a warm climate persisted since last 200 cal yr BP (Modern Warming period), period well known for both natural and human induced Climate Change.

The present study suggest that volcanic activity played a significant role in controlling the millennia scale climate variability with additional feedback mechanisms. Global climatic events of last two millennia observed in European sub-continent is also documented from the tropical region of India.