Geophysical Research Abstracts,
Vol. 11, EGU2009-6818, 2009
EGU General Assembly 2009

Holocene climate variability in the Himalayan region: preliminary results from lake sediments in the Spiti valley, India

A. Ambili (1), S. Gaerber (2), S. Prasad (1), A. Brauer (1), N. Basavaiah (3), and B.S. Kotlia (4)

(1) GeoForschungsZentrum, Sedimentation and Basin Analysis, Potsdam, Germany (sushma@gfz-potsdam.de), (2) Geography Department, Freie Universität, Berlin, Germany, (3) Indian Institute of Geomagnetism, Mumbai, India, (4) Department of Geology, Kumaon University, Nainital, India

The Himalayan region shows the presence of two rainfall regimes. During the winter months the mid-latitude westerlies provide more precipitation in the western Himalayas. During the monsoon months the ITCZ moves north bringing the eastern Himalayas under the influence of monsoon rainfall. The summer rains decrease progressively to the west and north as one approaches the northern limit of the ITCZ. Due to these longitudinal and latitudinal precipitation gradients, the Himalayan region provides a valuable laboratory for studying variations in both winter and summer rainfall.

Laminated (palaeo)lake sediments from the Himalayan region are an unexplored potential source of high resolution palaeoclimate data. Recently, we have begun investigating laminated lacustrine sediments in Atargoo (Spiti valley). Radiocarbon dates and OSL dates indicate that these were deposited in a lake formed by landslide damming of the Spiti river during the early Holocene intensified monsoon phases. During the fieldwork of summer 2007, we have investigated ca. 16m of the 38m thick lacustrine sediments in coarse resolution (few tens of cms) and are now investigating the microfacies and geochemistry of selected samples in μ-resolution. Our preliminary field investigations indicate facies changes pointing to highly dynamic and rapidly changing (decadal scale) environmental conditions. Laboratory investigations on laminated sediments indicate: (i) each couplet comprises dark (quartz dominated) and light coloured (calcite dominated) sublaminae that were deposited during the same event, (ii) three different facies were identified on the basis of mineralogy, quality of lamination, grain size and nature of contact, (iii) the thickness (0.25-8mm), grain size (clay to coarse sand), and mineralogical composition of the couplets are highly variable, (iv) better laminated facies show a higher proportion of illite. Our preliminary results suggest that mineralogical and facies changes could potentially provide information on the periods of enhanced westerly snowfall and increased monsoon precipitation.

Laminae counting coupled with a high resolution chronological framework (in progress) can help identify if these laminae are varves thus providing high resolution paleoclimate data.