



A record of orogenic exhumation preserved in Himalayan foreland basin sediments, NW India.

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The relative importance of various proposed mechanisms of accommodation of convergence between India and Asia, and consequent evolution of the Himalayan-Tibet region, are the subject of much debate. A number of models emphasise the importance of tectonic-erosion coupling in the evolution and exhumation of the mountain belt (e.g. Beaumont et al., 2000; Zeitler et al. 2001). Recent work in the Sutlej region of NW Indian Himalaya (Vannay et al. 2004; Thiede et al. 2004; Richards et al 2005; Caddick 2004) has provided constraints to the timing of thrust events south of the Main Central Thrust. It has been proposed that rapid exhumation in this region, influenced by efficient fluvial erosion (Vannay et al 2004), has been accommodated by extrusion of material along back-stepping thrusts in order for critical taper to be maintained (Thiede et al 2004).

Our detrital study of the foreland basin sediments in this relatively well studied region allows us to further constrain the tectonic evolution of this region, as well as to assess the degree to which the detrital record can provide an accurate record of source region tectonics. Our data indicate decreasing exhumation of the Higher Himalaya since ca 17 Ma, as shown by lag time studies from detrital mica Ar-Ar ages. Petrography, and Sm-Nd analyses on clasts, clearly shows exhumation of the Lesser Himalaya by 11 Ma. Input from this source is not identified by any change in detrital mica ages, or Sm-Nd whole rock values at this time. However, these analyses, and petrographic

data, clearly document a dramatic change of provenance at ca 6 Ma, consistent with a second thrusting event. Our data are entirely consistent with the bedrock studies referenced above.