

Aggradation and incision following the 1934 and 1255 A.D earthquakes at Charnath river (Eastern Nepal)

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The Charnath Khola is a large river crossing the Himalayan megathrust system in the mesoseismal area of the great 1934 Bihar-Nepal earthquake. The fluvial sediments deposited and incised by the river and offset by the frontal faults at the foot of a large cumulated scarp give the opportunity to circumscribe the last seismic events rupturing the most frontal thrusts in this region east of the trace of the Gorkha-Nepal M 7.8 earthquake. The excavation of a 70 m-long, 10 m-deep paleoseismic trench through the fault scarp exposed Siwaliks units overthrusting a thick series of quaternary sedimentary units, a sequence including several colluvial wedges interfingering with fluvial sands. 72 detrital charcoals sampled in the trench and pits excavated in stream terraces abandoned by the rivers place radiocarbon constraints on the sedimentological processes which follow the last two historical earthquakes in 1934 and 1255 AD. The large numbers of radiocarbon ages straddling the last earthquake's horizon document potential charcoal age biases and the short history of a massive aggradation pulse following the earthquakes.