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Landscape evolution rates for a cyclic climate within an uplifting massif

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Quaternary rates of rocks exhumation and transport have been determined from the watersheds to the outlet of a 20-km-long, 2-km-high catchment within an uplifting massif of the Gobi-Altay mountain range (Mongolia). This massif is set in a structurally and chronologically well-studied restraining bend along the Bogd fault, characterized by semi-arid climate alternating long dry and short wet stages with a 100-kyrs periodicity. My approach combines geomorphic field-based investigation and 10Be concentration distribution analysis on bedrock, hillslope colluvia and alluvial sediments from active river or abandoned terraces and fans. The main geomorphic questions addressed in this work are: 1) What are the mechanisms and rates of pre-deposition processes, from sediment formation until deposit and abandonment of alluvial terraces and fans? In particular, I focus the analysis on bedrock exhumation, stocking of colluvia on the hillslopes, and their remobilization and transport within the drainage network. Characteristic times of these processes are poorly known up to date, although they have dramatic importance in landscape evolution modeling. 2) What is the impact of post-deposition processes in the evolution of alluvial surfaces morphology? Analyzing terraces of different ages and at different settings along the river, I compare their relative denudation rates derived from changes in topographic slope and local lowering rate due to matrix remobilization by wind deflation and runoff.