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Landscape evolution of the southeastern Tibetan Plateau – Temporal and spatial relationships between glacial and fluvial landforms

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Landscape system components interact in ways which are not yet fully understood, and in tectonically active regions it is of particular interest whether endogenic or exogenic factors are the main drivers of landscape evolution. For example, fluvial terraces may form in response to exogenic disturbances like climatic changes or to endogenic forces like tectonic uplift. This study explores how temporal and spatial correlations between end moraines (denoting the advance of glaciers due to climate change) and fluvial terraces can yield insights about exogenic-endogenic processes determining landscape evolution during the Quaternary on the southern margin of the Shaluli Shan plateau, SE Tibet, a formerly glaciated and tectonically active region. A high-resolution TanDEM-X Digital Elevation Model (12 m) was used to produce detailed geomorphological maps of glacial valleys, marginal moraines, glacial lineations, and fluvial terraces. The geomorphological mapping was complemented with geomorphological and sedimentological field observations. Samples for Optically Stimulated Luminescence dating were taken from extensive and distinct terraces located in pull-apart basins bordering the plateau and samples for cosmogenic nuclide exposure dating were collected from selected boulders on end moraines formed by valley glaciers draining the Mt Genie massif on the Shaluli Shan plateau. Infrared stimulated luminescence (IRSL) signals from feldspar multi grains aliquots, and ¹⁰Be and ²⁶Al concentrations from quartz, were

used to determine depositional ages of terraces and moraines, respectively. In combining both dating techniques, we compare the timing of glacial expansions with the depositional ages of the terraces to tease out the effects of exogenic and endogenic drivers on terrace formation and to formulate a conceptual model of landscape evolution.