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Connectivity and colluvial sediment dynamics in the Saldur River basin, Eastern Italian Alps

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We present an integrated approach that aims to: (i) document the spatial distribution of mass-wasting activity and sediment production in the Saldur River basin (97 km2); (ii) detect causal linkages between mass-wasting intensity and the potential spatial distribution of discontinuous permafrost; (iii) identify source-to-sink colluvial sedimentary pathways as modulated by the spatial organization of active and relict glacial and periglacial depositional landforms; and (iv) test the reliability of a geomorphometry-based index of sediment connectivity. In so doing we compare spatial patterns of process-based and structural geomorphic connectivity.

To these ends, we map rock glaciers, protalus ramparts and moraines, and compile a field- and air photo-based multi-temporal (1959-1969-1982-1997-2000-2006-2008-2011) inventory of colluvial sediment sources. We then combine these data with two historical datasets of debris flow and landslide events (both implemented and maintained by the Autonomous Province of Bolzano) and analyse mass-wasting spatial distribution and intensity in relation to proximity to glacier fronts, intact and relict periglacial landforms, and a permafrost index map (i.e. PermaNET; http://www.permanet-alpinespace.eu/).

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