



## **Morphoevolution of slope-to-channel systems in active extensional domains: testing the potential of basin and river profile metrics in the inner sector of the Apennines (Italy)**

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This work explores the relevance and potential of a quantitative approach based on the time-dependent basin and river profile metrics for constraining the morphoevolution of slope-to-channel systems associated to Quaternary intermontane basins.

Previous researches successfully applied this approach to regions experiencing base-level changes due to tectonic uplift, though significant tests in areas undergoing local base-level changes related to extensional faulting are still lacking. The axial zone of the Apennine chain (Italy) has provided test sites, where the activity of normal faults and associated slope-scale gravitational deformations evolving in rock avalanche have been already documented. Hypsometric integrals at three nested levels of a set of catchments allowed obtaining the morphometric characterization of slopes affected by rock avalanches, which had been documented to occur in different morphostructural settings (i.e. forelimb rock-slide avalanches and backlimb slide-wedge rock avalanches). Furthermore, river profile metrics recorded the effects of the rock avalanche emplacement along connected streams. Basin and river profile metrics provided quantitative geomorphic constraints to the morphoevolutionary steps of slope-to-channel systems, in particular for massive rock slope failures and drainage network reorganization.

Our methodological test provided further insights for the interpretation of landscape metrics in case of transient response of slope-to-channel systems to local, fault-related base-level changes.