River-landslide erosion interaction assessed through LiDAR and UAV SfM high-resolution DEMs, SAR and photogrammetry

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River erosion and landslides are linked geomorphic processes that shape landscapes representing natural hazards for human settlements, infrastructure, and heritage. Remote Sensing & GIS methods, and Earth Observation data allow us to study these geomorphic processes to assess their interactions and evolution. We present a study case of a representative landslide triggered by river incision and its evolution in the last 50 years. Aerial imagery and photogrammetry are used to assess the initial state of the hillslope, while LiDAR and SfM high-resolution DEMs allow us to characterize the evolution mechanism and geomorphic changes between 2012 and 2019. SAR interferometry results correlate well with the geomorphic change detection data. The river is incising through meander migration, its right bank being developed in the landslide basal part. The continuous erosion of the basal part of the landslide maintains an active landslide process, with a slow-moving rate, intensified mainly by rainfall. The landslide is a translational slide with scarp slumps. Crucial information about the gravitational mechanism is shown by the SAR and change detection data: crown extension, scarp cracking, scarp slumping, translational flow, allowing us to sketch up a pattern of river-landslide interaction that can be used to assess the hazard, vulnerability, and risk for the river-induced landslides from Northeastern Romania.