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Debris flow modelling in Julian Alps

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Cucco is a small village located in the Julian Alps, in the municipality of Malborghetto Valbruna, in the Friuli Venezia Giulia Region (North-Eastern Italy). Steep rocky slopes characterise the area located upstream of Cucco. These are crossed by torrents and channels and, under particularly harsh weather conditions, are subject to debris flows. The latest event recorded in this area dates back to August 2003, when 386 mm rain fell in 10 hours and massive debris flow phenomena impacted the zones located along torrents. These involved a total of 100,000 m3debris, partially flooded houses and severely damaged infrastructures.

The DEBRISWIN program – which was originally developed by the Operating Coordination Unit for the Defence of the Soil and the Civil Protection of the Udine Province – has been used and compared with the commercial FLO-2D software to better evaluate the characteristics of the event and to prevent any future occurrence. The two pieces of software were used to perform a back-analysis that permitted to thoroughly examine those phenomena, to define the physical parameters of the event and to simulate a possible future alluvial phenomenon by determining the maximum expansion limits of debris, also in light of the protection works built in the area.