



Geomorphic processes triggered by a flash flood in a small basin: the event of Rio Cucco (eastern Italian Alps), 29 August 2003

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On August 29, 2003, an intense convective system affected the Fella River basin, in the eastern Italian Alps, producing rainfall peaks of about 300 mm in 6 hours. The storm triggered an unusually large debris flow in the Rio Cucco basin (0.65 km²), with a volume of about 80000 m³. Detailed geomorphological field surveys and the application of a distributed hydrological model have made it possible to evaluate erosion processes and sediment supply to the channel network and to quantify water runoff. The analysis of the rainstorm has been based on rainfall estimates from radar observations and data recorded by a rain gauge networks. Field surveys, which have been carried out both before and after the flood of August 2003, have permitted to assess the volume of eroded debris and to determine the space distribution of the sources of sediment. The accounts of eyewitnesses have provided useful elements for reconstructing the time evolution of the event. The hydrological analysis has shown that the balance between water and sediment is strongly influenced by water volume stored in the channel bed and sideslopes eroded during the debris-flow event. Observations on the deposits accumulated on the alluvial fan indicate that, although the dominant flow process was a debris flow, also sheetflood contributed to fan aggradation and fluvial reworking had an important role in winnowing debris-flow lobes and redistributing sediment on the fan surface.