



Vulnerability scenarios for flash floods occurred in Campanian Apennines (South Italy)

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Flash floods are related to short duration and high intensity rainfalls, they are common phenomena in many parts of Europe as well as Italy. These events can result in debris flow, debris flood or water flood. The main differences are in the triggering, propagation, and depositional phases and more importantly in terms of velocity, impact forces and associated damage.

In Campania Region (Southern Italy) these phenomena historically involved the catchments several times, with an increase in frequency in the last decade. They are associated to small watershed – fan systems that fall in the southern Apennines characterized by intermittent flow. The alluvial fans in the outlet zones are highly urbanized, hence the population living in the deposition areas is exposed to high risk.

In this study, the geomorphic response to flash floods is assessed through magnitude evaluation of some flash floods recently occurred in heterogeneous geological and geomorphological settings in both coastal and inland areas. Each scenario is reconstructed through the mapping of areal extent, water heights, particle sizes and estimate of volumes and built damage aiming at vulnerability definition, a relevant topic considering the global climate changes.

In this study, an approach aimed at developing vulnerability curves is proposed. It is based on a application of a typical method widely adopted in the earthquake engineering that in this case assume as intensity parameter the water height measured in post-event surveys.

The results are expressed as vulnerability curves at different damage scenarios that can be valuable tools for local authorities, emergency, and disaster planners since they can assist decision making analysis of protection measures for future events.