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Comment on "Geomorphic hazards and intense rainfall: the case study of the Recco Stream catchment (Eastern Liguria, Italy)" by Faccini et al. (2012)

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Abstract. Faccini et al. (2012) describe an intense rainstorm that caused a flash flood and triggered landslides in a sector of Eastern Liguria (Italy) on 1 June 2007 and discuss the implications for geomorphic hazard assessment and land use planning. This comment points out some weaknesses in the use of weather radar for the assessment of rainfall and in the documentation of flood response.

1 Comment

The purpose of this comment is to discuss some aspects of the hydrometeorological analysis of the 1 June 2007 flash flood in Eastern Liguria, studied by Faccini et al. (2012).

The analysis of the rainfall that caused the flash flood of the Recco Stream (Faccini et al., 2012) lacks integration of raingauges and weather radar data. Although the authors claim that weather radar data have been used for the analysis of rainfall, only a small rainfall map from the meteo section of a commercial Internet site is presented in the paper. The small size of the radar rainfall map, which encompasses a wide region from Switzerland to the Ligurian Sea, makes it unsuitable for evaluating spatial rainfall distribution in the study area. Information about location and characteristics of the radar/s, whose data have been used for developing the rainfall map, as well as on the methods for radar rainfall estimation, is missing and no comparison of raingauge and radar data is presented.

A similar discrepancy between study methods and presented results arises for flood discharge assessment. In the description of the research methods, the authors state that peak discharges of the June 2007 flash flood have been assessed by means of post-flood topographic surveys (survey of cross-sections and high water marks) and application of hydraulic equations. A valuable feature of post-flood estimates of peak discharge is the spatially detailed assessment of flood response, which is particularly important for flash floods characterized by large variability of rainfall inputs and resulting flood runoff (Borga et al., 2008). It is thus surprising that the complex and time-consuming post-flood assessment of peak discharge has not been exploited for the analysis of flood response. Actually, only one value of peak discharge is reported in the paper, and it seems to derive from a rainfall-runoff transformation, whereas estimates of peak discharge based on field observations are not mentioned. Model-based rainfall-runoff transformation, which is of great importance for checking the consistency of independent estimates of rainfall and discharge, cannot replace the assessment of discharge. Peak discharge assessment requires stream gauge data or, in ungauged streams, hydraulic estimations on the basis of surveys of flood marks and river cross sections (Gaume and Borga, 2008).

2 Concluding remarks

Although the hydrological analysis of the 1 June 2007 flash flood is not the only focus of the paper by Faccini et al. (2012), a sound assessment of rainfall and peak discharge is mandatory when analysing geomorphic hazards caused by intense precipitation and flash floods.

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Reporting, in a possible reply to this comment, data on peak discharge documented by means of post-flood observations in different cross-sections of the channel network would greatly increase the significance of the paper for readers interested in flash-flood response in the Mediterranean.

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