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Hydrological response of temporary streams in an Italian pre-alpine catchment monitored by low-cost cameras

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Temporary streams are extremely important because their activation controls runoff response and permits exchange of fluxes between the riverbed and the riparian zone, as well as along the stream. Despite their importance from both a hydrological and ecological point of view, they have received little attention compared to perennial streams. The aims of this study are to: i) demonstrate the use of low-cost cameras for the characterization of the activation time and the hydrometric peak time in the temporary streams; ii) relate the inferred hydrometric information to the runoff response on a medium size catchment. In this study, we combine hydrometric data and the use of seven low-cost cameras for detecting the activation and connectivity of temporary streams over the Posina river basin. This is a 116 km2 basin located at the foothills of the Eastern Italian Alps (Veneto Region). The basin is characterized by a complex lithology, mainly carbonate rocks, and a fractured bedrock. We monitored three temporary streams (catchment area varying between 6.8 and 44.7 km2). The cameras were installed on trees along the banks or, when it was possible, on bridges.
The low-cost cameras were used during a 28-hrs duration rainfall-runoff event characterized by 80.7 mm rainfall amount. The cameras registered pictures at 30-minutes interval for a total of 240 hours. Preliminary results for all the monitored sections show that the three selected streams activated under different conditions. The images analysis revealed that the activation as well as the disconnection are easily detectable during day and night even during long rainfall-runoff events.

Keyword: temporary streams; stream activation; low-cost cameras.