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Analysis, estimation and prediction criteria for damage from geohydrological events: a top-down approach

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A rapid evaluation of flood damage is strategic for the good success of emergency management activities after a natural disaster. A method for the estimation of economic damage is developed considering the impact of hydrogeological phenomena with meteorological forcing over settlements, industrial and rural areas and commercial activities.

Damage estimation is a very current research field, but the available methods are far from being effective in the period immediately following the event. This is due particularly to the intrinsic complexity and variability of the damage process and the lack of reliable and consistent damage measures across areas at least at the regional scale.

This work proposes a national scale first approximation correlation between vulnerated area and expected damage. The relationship, expressed in terms of power law, is calibrated on a huge number of single damage records collected by the Italian government all through the country during flood and landslide events in the last 6 years. Data have been grouped following the type of flood. Records come from official data provided by government commissioners in charge of emergency management, according to the national law. Validation, carried out on an independent data set, is quite encouraging and provides indications for further developments.