



Utility of flood warning systems for emergency management

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The presentation is focused on a simple and crucial question for warning systems: are flood and hydrological modelling and forecasting helpful to manage flood events? Indeed, it is well known that a warning process can be invalidated by inadequate forecasts so that the accuracy and robustness of the previsional model is a key issue for any flood warning procedure. However, one problem still arises at this perspective: when forecasts can be considered to be adequate? According to Murphy (1993, *Wea. Forecasting* 8, 281-293), forecasts hold no intrinsic value but they acquire it through their ability to influence the decisions made by their users. Moreover, we can add that forecasts value depends on the particular problem at stake showing, this way, a multifaceted nature. As a result, forecasts verification should not be seen as a universal process, instead it should be tailored to the particular context in which forecasts are implemented.

This presentation focuses on warning problems in mountain regions, whereas the short time which is distinctive of flood events makes the provision of adequate forecasts particularly significant. In this context, the quality of a forecast is linked to its capability to reduce the impact of a flood by improving the correctness of the decision about issuing (or not) a warning as well as of the implementation of a proper set of actions aimed at lowering potential flood damages. The present study evaluates the performance of a real flood forecasting system from this perspective.

In detail, a back analysis of past flood events and available verification tools have been implemented. The final objective was to evaluate the system ability to support appropriate decisions with respect not only to the flood characteristics but also to the peculiarities of the area at risk as well as to the uncertainty of forecasts. This meant to consider also flood damages and forecasting uncertainty among the decision variables.

Last but not least, the presentation explains how the procedure implemented in the case study could support the definition of a proper warning rule.