

Geo-hydrological hazards in a changing climate: an open problem

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Geo-hydrological events, such as landslides, debris flows and floods, are recurrent natural phenomena that contribute to shape the Earth morphology and landscapes. These frequent natural events are the result of mostly natural processes, that become a hazard when they interfere with the human environment, i.e., with the population, structures, the infrastructure, the societal interests and economic assets. Landslides, debris flows and floods are caused chiefly by meteorological events, including intense or prolonged rainfall and rapid snowmelt.

The location, intensity and frequency of the triggering events depend on climate and its variations. This leads to the conclusion that climate – and its observed or forecasted temporal and geographical changes – influences natural events with potential human consequences, hampering our ability to forecast geo-hydrological events. Forecasting landslides, debris flows and floods is a problem of scientific and societal relevance that requires information on past events and their consequences.

Although a consensus has not been established on the use of historical records to investigate geo-hydrological hazards, it is clear that one of the most difficult tasks we are facing is to advance our ability to decouple the human and natural (climatic) effects on geo-hydrological events and their consequences