

### New approaches for the assessment of hydraulic hazard in small mountainous catchments RETURN-PB



**QUESTION** How can hydraulic hazard be assessed in small mountain basins?



**OBJECTIVE** To develop an application manual for evaluating hydraulic hazard scenarios and associated risks in small drainage basins.



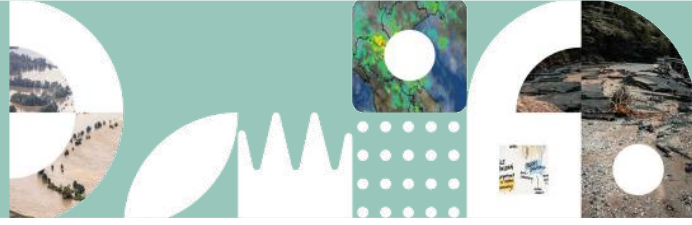
**DESCRIPTION** The RETURN-PB project aims to provide practical tools for analyzing hydraulic hazards in small drainage basins, which are characterized by nonlinear responses to forcing scenarios, rapid hydrological reactions, and limited spatial and temporal scales. These basins also experience intense sediment and wood debris transport, and may be affected by mass transport events. The project will consider different types of small basins, representative of the Italian landscape:

- steep alpine basins, prone to debris flow formation;
- Apennine/Mediterranean basins with hyperconcentrated sediment transport;
- basins affected by pyroclastic flows or mudflows;
- basins with ordinary sediment transport.



**HOW IT WORKS** RETURN-PB will deliver an application manual designed to assist in identifying potential forcing scenarios in small mountain basins within the context of climate change. This manual will be useful in both the planning and management phases. The approach integrates hydrology, sediment production, flow propagation, and riverbed dynamics, as well as risk mitigation measures. It also includes assessments of vulnerability and exposure and addresses the role of protective forests and wood debris transported by the current. The manual will be complemented by case studies illustrating its practical applications.





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“ Impact-based decision making allows the prioritization of strategies for targeted future investments.”

