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Value of ground information in regions with limited landslide inventory for trigger threshold development — Application in Nilgiris, Tamil Nadu State, India

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Forecasting rainfall-induced landslides, whilst challenging, is increasingly important due to the impact these hazards can have on society. The difficulty in forecasting arises from the inherent variability of geo-environmental factors and the scale at which underlying processes operate. The availability of data required to develop and validate thresholds for operational purposes is often limited. In regions where data (e.g. meteorological, or geotechnical) is sparse or incomprehensive, it is important to have a framework to systematically fuse the incomplete datasets to aid the development of a threshold model or to supplement an existing preliminary trigger threshold model.

For this study, a bespoke conceptual hydrological model called the ‘BGS water balance model’ is used in Nilgiris (Tamil Nadu state, India) to integrate the ground and meteorological information for informed decision making on the landscape saturation condition. This simple conceptual model with applicability over a large area provides an approximation of the degree of saturation value that can be used to map the potential antecedent wetness pathway leading to the initiation of landslides.

In this session, the BGS water balance model features along with the study area geological characteristics, landslide controls, input datasets and sensitivity analysis will be discussed. Further, we will show the results of the back-analysed landslides and explore the value of this approach in the context of landslide forecasting.