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A framework for assessing landslide risk under various hydroclimatic scenarios

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Landslides pose a great threat in mountainous and steep terrain environments. Most of the slope failures are triggered by the build-up of soil pore water pressure, which is usually the result of extreme rainfall events. In order to assess the risk of landslide occurrences, a distributed physically based model, raster-based and continuous in space and time, was developed in order to investigate the interactions between surface/subsurface hydrology and landslides initiation. The model is applied in a small catchment in Switzerland, which is historically prone to rainfall-triggered landslides. Its application shows that this kind of modeling approach combined with the necessary meteorological and geological data can give a good estimation of the landslide risk at the catchment scale.