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Early warning of landslides in Scotland using probabilistic weather pattern forecasts

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Through the European Space Agency (ESA) funded project - LiveLand, the Met Office and British Geological Survey have been working to enhance the rainfall-induced landslide forecasting capability in the UK, with a specific focus on Scotland. This research encompasses two complimentary components: (1) improving methods to forecast periods with an increased likelihood of landslide occurrence in the 1-2 day timeframe and (2) trialling a new 'heads-up' warning approach in the medium-range, which forecasts the probability of a heightened likelihood for landslide occurrence in the 7-30 day timeframe using synoptic weather pattern forecasts.

The medium-range forecasting tool has been running as a trial prototype since October 2016. The tool gives the forecast probability of a heightened risk of landslide incidence, which is associated with the occurrence of specific weather patterns. These 'high-risk' weather patterns, which are relevant to landslide occurrence, were identified by analysing historical landslide events and the weather patterns that preceded them. Once identified these high-risk patterns can be used to generate the forecast probabilities for a number of regions across Scotland, based on operational weather pattern forecasts from a variety of medium range and monthly ensemble forecasting systems. The methods used to develop the medium-range prototype and its use in conjunction with shorter-range forecasting products will be described. Some initial results from the current trial will also be shown.