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Does climate-change effect the occurrence of landslides? The robustness of landslide-triggering rainfall thresholds in the Flyschzone in Lower Austria

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For many years it is under debate, if climate change affects landslide occurrence, either as first-time failure or within reactivation. Some argue that other factors such as land-use change and human modification of slopes are much more important than climate change, others investigated that extreme triggering events increased within the last years and lead to changing failure conditions. In this study, we are investigating the temporal conditions of landslide-triggering rainfall thresholds and their robustness towards climate change for the lithological unit "Flyschzone" located within Lower Austria. For this area, detailed records on damaging landslide events are available from the Geological Survey in Lower Austria. In combination with hydro-meteorological data from the Austrian weather service ZAMG, landslide-triggering rainfall thresholds are calculated using the Antecedent Daily Rainfall – ADR model. The main aim of this study is to investigate the robustness of landslide-triggering rainfall thresholds with respect to changing meteorological conditions, possibly caused by climate change.
The full record covers 45 years of daily data. We examine how the number and locations of landslides have changed in the period of 1971 to 2016. Furthermore, the potential effects of increasing length of data periods on the respective rainfall thresholds are explored. Finally, the potential effect of climate change on rainfall thresholds and consequent landsliding is discussed.
The final result is very important for any landslide early warning system. It will indicate, how the length of available datasets might influence the landslide-triggering rainfall thresholds, and for which period of recording length we can assume a reliable robustness of the thresholds. Finally, the potential climate change effects on rainfall-triggering thresholds and the importance for landslide early warning systems is explored.