

EGU22-4314

<https://doi.org/10.5194/egusphere-egu22-4314>

EGU General Assembly 2022

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Landslide events in Portugal under future climate change scenarios

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It is expected that landslide events will occur more frequently, throughout the century, as a direct consequence of climate change. The main triggering factor, over Portugal mainland, is extreme precipitation. Thus, the aim of this study relied on the assessment of the projected future changes in the extreme precipitation over Portugal mainland and quantifying the correlation between extreme rainfall events and landslide events through Rainfall Triggering Thresholds (RTT). This methodology was applied for two specific locations within two Portuguese areas of great geomorphological interest.

To evaluate the possible projected changes in the extreme precipitation, we used the Iberia02 dataset and the EURO-CORDEX models' runs at a 0.11° spatial resolution. First, it was analyzed the models' performance to simulate extreme values in the precipitation series. The simulated precipitation relied on RCM-GCM models' runs, from EURO-CORDEX, and a Multimodel ensemble mean. The extreme precipitation assessment relied on the values associated to the highest percentiles, and to the values associated to the RTTs' percentiles. To evaluate the possible future changes of the precipitation series, both at the most representative percentiles and RTTs' percentiles, a comparison was made between the simulated values from EURO-CORDEX historical runs (1971-2000) and the simulated values from EURO-CORDEX future runs (2071-2100), considering two emission scenarios: RCP 4.5 and RCP 8.5. In the models' performance, the Multimodel ensemble mean appeared to be within the best representing models. As for the projected changes in the extreme precipitation for the end of the century, when following the RCP 4.5 scenario, most models projected an increase in the extreme values, whereas, when following the RCP 8.5 scenario, most models projected a decrease in the extreme values.

Acknowledgements

This work was financed by national funds through FCT–Portuguese Foundation for Science and Technology, I.P., under the framework of the project BeSafeSlide (PTDC/GES-AMB/30052/2017)