Submitted Abstract

ID IMC22-FSAbstr- 867

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Country	Switzerland
Region	Western Europe
Title	Large-Scale Rockfall Risk Modelling Facing Climate Change.
Keywords	Rockfall, Risk Assessment, Hazard, Climate Change, Hazard Indication Map
Type	List Of Focus Session
Focus Session ID	12

Abstract

Various studies suggest that changes in the climate system such as temperature rise and extreme precipitation events may influence gravity-driven hazards. Within the WSL research program “Climate Change Impacts on Alpine Mass Movements”, we develop a framework to model mass movement hazards and risk altered by climate- and socio-economic changes in Switzerland.

For rockfall under current climate conditions, we use a high-resolution terrain model, a soil classification layer, an algorithm for automatic detection of potential release points and a forest layer as input for the RAMMS::LSHIM Large Scale Hazard Indication Mapping method to develop hazard indication maps for scenarios with a 30y, 100y and 300y return period.

To address possible changes on rockfall due to climate change, we additionally consider data of the CH2018 climate change scenarios, information on permafrost degradation at the release areas and altered forests in the transit zones to show the likely influence on rockfall run-out.

These hazard indication maps are taken as input into risk assessment models to produce risk maps, which depict spatial and temporal changes of rockfall risks based on the combination of hazard, exposure and vulnerability information. These maps can support decision making processes and will allow to define risk adaptation measures considering climate change impacts.