

EGU21-7718

<https://doi.org/10.5194/egusphere-egu21-7718>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Qualitative analysis of the impact of mass movements on the alpine hiking infrastructure

Florian Albrecht¹, Daniel Hölbling¹, Lorena Abad¹, Zahra Dabiri¹, Gabriela Scheierl², Tobias Hipp², Hannes Resch³, Gernot Resch³, and Gerald Reischenböck⁴

¹University of Salzburg, Department of Geoinformatics - Z_GIS, Salzburg, Austria (florian.albrecht@sbg.ac.at)

²German Alpine Association, Munich, Germany

³Austrian Tourist Club, Vienna, Austria

⁴MJP Ziviltechniker GmbH, Gmunden, Austria

The hiking infrastructure of trails and huts is a strong asset for summer tourism in the Austrian Alps. However, this infrastructure is prone to different types of mass movements, such as rainfall-induced shallow landslides, debris flows and rockfalls, that potentially block the access to mountain huts and hiking routes for weeks or even months. Thus, alpine infrastructure management has an increased need for information about mass movements that affect trails.

The project *MontEO* ("The impact of mass movements on alpine trails and huts assessed by Earth observation (EO) data") aims for a better understanding of the diverse impacts of mass movements on the alpine infrastructure and the related efforts for infrastructure management and maintenance, by mass movement mapping and susceptibility modelling. We performed a user requirements analysis that identified relevant stakeholders and pinpointed both user needs and requirements for information about mass movement impact on alpine infrastructure. Semi-structured interviews with trail keepers and other stakeholders revealed information about the relevance of the topic for the respective organisation, the role of the interviewed person within the organisation and the experiences and tasks that relate to mass movements.

Our preliminary results identified sections of alpine associations, tourism associations, and alpine farmers as the main stakeholders that assume responsibility for operating the trails. The interviews with trail keepers, alpine association officials and professional trail builders indicated that they consider information on mass movement particularly valuable for mid- to long-term planning of maintenance efforts and revisions, as well as for the construction of new and the relocation of existing trails. Damage due to mass movements is mainly relevant in high alpine regions and in locations where terrain and environmental conditions favour them. An example of how mass movements can affect infrastructure is a rockfall damaging safety ropes and feeding a scree that becomes a source for debris flows covering the existing path. Resulting maintenance efforts include the restoration of a debris-covered trail and the re-installation of safety ropes along the trail by a skilled builder with heavy equipment. If situated in a heavily affected region, the frequency of damage from mass movements may render the trail too costly to maintain. Either it

needs to be relocated to a new route in less landslide-prone terrain or it has to be given up entirely.

Currently, we are in the process of mapping mass movements with optical and radar satellite data in four Austrian study areas. Combining the mass movement mapping and susceptibility modelling results with estimated efforts for trail maintenance will enable the detailed assessment of the mass movement impact for an entire area of responsibility of the section of an alpine association. If the validation with stakeholders proves that the impact assessment can be used in strategic trail management or the planning of maintenance activities, the *MontEO* project will result in a safer alpine infrastructure and an increased value for the tourism industry.