



## **Concept for the cumulative assessment of damage potential – case study Tyrol, Austria**

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In alpine areas, the procedure of risk assessment for natural hazards is established for relatively frequent events such as landslides or avalanches. However, processes with low frequency but high intensity like extreme inundations, earthquakes or catastrophic rock slides follow not necessarily the demands of the risk concept, especially in east alpine regions. Furthermore, the cumulative damage is not yet operationally assessed by risk analyses.

In this study, the development of a concept for the assessment of cumulative damage – with a special focus on the parameters probability of presence and vulnerability – is presented. The study will not only be limited to the assessment of immobile values (for example buildings) but will also investigate the damage potential of mobile values like vehicles as well as persons. Cumulative damage is subdivided in two categories: 1) the temporal occurrence of multiple hazardous events in a chronological order within a defined region and 2) the temporal occurrence of multiple events in a cause-and-effect relationship within a defined region. The concept will be tested in the State of Tyrol, Austria, on different scales.

The study aim is to highlight the economic effects of so-called worst-case events for a whole region. Furthermore, possible mitigation strategies, such as mandatory building insurances, will be evaluated and discussed. The methods of this conceptual study will be integrated in a GIS tool to serve as a decision basis for multiple users, such as decision makers in policy or insurers. The methodical results will help insurers to evaluate the cumulative damage of their risk-portfolios in order to minimise their risks

with an appropriate reinsurance policy.