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Assessment of the modeling results of an overall avalanche hazard indication map of Switzerland

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In an effort to generate an avalanche hazard indication map for Switzerland we employed the two-dimensional finite difference avalanche runout model AVAL-2D from a regional to national scale. We have specified input and output GIS-routines to automatically determine potential release areas, the fracture depths of these release areas and avalanche friction parameters for the mountainous regions and altitude ranges of Switzerland. In the first phase of the project, the method has been evaluated within seven control sites located in different regions of Switzerland. The method and the parameters were chosen to produce optimal results within these testsites. Then, the method has been applied to all mountainous terrain of Switzerland, i.e. an area of more than 25'000km^2, based on the assumption, that the chosen control sites are representative for the whole area of Switzerland.

The focus of this presentation is twofold. First, we present an assessment of the results in areas outside of the original seven control sites. The goal of this study was to check whether the results outside the control areas have a similar accurracy and to gain more data to describe the quality of the modeling results. For this purpose, five new assessment areas with good historical avalanche data were selected. The modeling results within these new areas were again compared to the observed avalanche data. Based on these comparisons we draw conclusions about the strengths and weaknesses of our modeling approach. Secondly, we present quantitative results about the potential avalanche hazard of Switzerland, such as the overall area endangered by avalanches, the number of endangered roads, houses and human beings. These numbers as well as the avalanche hazard indication map are very useful for overall risk assessments and the implemention of appropriate hazard mitigation measures.