



## **Reconstruction of debris-flow activity on the Illgraben cone (Valais Alps, Switzerland)**

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Debris flows represent a widespread geomorphic phenomenon in mountainous regions. Under certain circumstances, they may cause damage to infrastructure, residential areas or even provoke the loss of human life. In the Swiss Alps, the Illgraben is considered one of the most active debris-flow producing torrents with several events per year, most often between July and September. The catchment area of the Illgraben is built of quartzite, limestone and gypsum, thus experiencing high erosion rates. While most events remain within the deeply incised channel, some surges have left the currently active channel and deposited their material on the cone over the centuries.

In the past few decades, numerous investigations have been realized about the current torrent activity of the Illgraben by different research programs. However, there have not been any studies so far about the activity of the Illgraben over the last few centuries.

It is therefore the aim of our study to reconstruct past events on the Illgraben cone. The frequency of past breakout events as well as activity in currently abandoned channels is investigated by means of tree-ring analyses. In order to reconstruct the events, we first produced a geomorphic map of the study area representing the characteristic features of debris flow events, such as lobes, levees and previously active channels. Thereafter, trees growing in these deposits and showing obvious signs of past debris-flow activity were sampled using increment borer. Normally two cores per trees were extracted. We concentrated on injured, buried and tilted trees reacting to the impact with changes in growth and wood structure. In our study, we report on results obtained from 1008 cores from 493 disturbed *Pinus sylvestris* L. trees. Preliminary results will

be shown on the past frequency of breakout events as well as on the spatial extent of events.