



## Frequency and spread of debris floods on fans: A dendrogeomorphic case study from a dolomite catchment in the Austrian Alps

Barbara Mayer (1), Markus Stoffel (2), Michelle Bollschweiler (3), Johannes Hübl (1), and Florian Rudolf-Miklau (4)

(1) Institute of Mountain Risk Engineering, University of Natural Resources and Applied Life Sciences, Peter Jordanstrasse 82, A-1190 Vienna, Austria, (2) Laboratory of Dendrogeomorphology, Institute of Geological Sciences, University of Berne, Baltzerstrasse 1+3, CH-3012 Berne, Switzerland, (3) Climate Change and Climatic Impacts, Environmental Sciences, University of Geneva, 7 chemin de Drize, CH-1227 Carouge-Geneva, Switzerland, (4) Federal Ministry for Agriculture, Forestry, Environment and Water Management, Marxergasse 2, A-1030 Vienna, Austria

Growth disturbances in tree-ring series have been regularly used to date debris-flow events in mountain environments. In contrast, no studies are available to date that have reconstructed debris floods by means of dendrogeomorphology. Therefore, the aim of this study was to determine the event frequency and the spread of debris floods in the Gratzental (Tyrol, Austria). The analysis of growth disturbances in the tree-ring series of 227 *Picea abies* (L.) Karst. and *Larix decidua* Mill. allowed the reconstruction of 37 events for the last 200 years. The lateral spread and preferable avulsion locations of reconstructed debris flood events were assessed based on the dating of the events and the spatial position of trees affected by an event on the fan. Results show that the Gratzentalbach preferentially avulsed to the east, but affected trees were evenly spread over the fan. Reconstructed data illustrates the high potential of dendrogeomorphology for hazard assessment of debris floods.