



High-resolution measurements of morphodynamics in rapidly changing PROglacial Systems of the Alps – results from the PROSA project

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In June 2012, the PROSA-project was initiated with the goal to construct a sediment budget of the Upper Kaunertal Valley, Ötztal Alps, Austria. A unique feature of the project being the dedicated usage of study-area wide multi-volume LiDAR survey data of relatively high density on a meso-scale catchment resulting in a data base of over 4 billion LiDAR measurement points. A high effort was undertaken to produce classified point data as a methodological backbone of the project.

Both ALS and georeferenced TLS data as well as other remote sensing and mapping products were used in addition to extensive fieldwork as basis for a regionalization of monitoring-site based measurements to arrive at basin-wide sediment production rates and identification of sediment pathways. Results can now be presented for: Rock fall (plot-based measurement and subsequent model-based regionalization), debris flows (study area-wide direct measurement from LiDAR and analysis of historical orthophotos), rock glaciers (feature-tracking and direct differencing), hillslope channels (plot-based measurements and model-based regionalization) and avalanches (sample site measurement, mapping and extrapolation). Sediment budgets were subsequently constructed for different representative subsystems within the 62.5 km² catchment. Although also glacier and main channel transport was looked into by the PROSA-project, the presentation will focus on the processes mentioned above.