



Towards a holistic sediment budget in a glacier forefield (Gepatschferner/Austria) – The contribution of fluvial sediment transport

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Glaciers in the European Alps have been retreating since the end of the Little Ice Age around 1850. Where the glaciers shrink, they leave unconsolidated sediment stores (moraines, till, glacial deposits). These deposits are highly vulnerable to subsequent erosion. But knowledge of sediment fluxes and the interrelated geomorphological processes in proglacial areas, based on field-data, is lacking. Therefore, a new joint research project PROSA (High resolution measurements of the morphodynamic in rapidly changing PROglacial Systems of the Alps), is set up in the Kaunertal valley, Austrian Alps. It is focussed on the quantification of recent and subrecent sediment transport processes in the entire catchment in order to construct a holistic sediment budget.

The fluvial system (main river) in proglacial areas is more or less continuously fed with (fine) sediment by glacial melt water (glacial milk) and infrequently (e.g. during rainstorm events) supplied with sediment by landslides, debris flows, rock fall from the slopes. A part of the sediment input is temporarily stored in intermitted sinks, such as the river bed, bars or braid plains. These stores can be reworked and become a source for fluvial sediment transport mainly during floods. These sediment transporting processes are highly variable in both time and space. So the main aim of this project is the investigation of the interrelations of the sediment transport rates in the proglacial river below the Gepatschferner in the Kaunertal valley and the connected sediment sources and how these interrelations influence the sediment budget of the river.

Suspended sediment load, solute load and bed load will be measured at several locations in the river on different time scales (event-based, daily, weekly etc.). Additionally the surface changes of important sediment sources (moraines, bars), which are directly connected to the river system, will be quantified by a comparison of multitemporal terrestrial and airborne laserscanning data.