



## **Towards a sediment budget estimation of the Gepatschferner glacier (Tyrol, Austria) - Approaches and first results**

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Sediment production, storage and transport in glacial systems are spatially and temporally variable. Due to the ongoing global warming an accelerated glacial retreat is expected, leading to an exposure of unconsolidated sediments. Additionally, a higher sediment production from destabilised rock walls caused by permafrost degradation and glacial debuttressing is expected. At least those paraglacial processes become more important in alpine catchments in the near future. But, there is still a knowledge gap on the quantification of sediment transporting processes in those regions.

The research questions we are focussing on are part of the PROSA project (“High-resolution measurements of morphodynamics in rapidly changing Proglacial Systems of the Alps”) and are investigated at the Gepatschferner glacier.

The Gepatschferner is located in the Eastern European Alps at the south end of the Kaunertal valley. It is the second largest glacier in Austria (15.7 km<sup>2</sup>, 2012). The Gepatschferner is drained by the Fagge River.

In this presentation we will focus on two main components of the sediment budget of the Gepatschferner: the input to and the output from the glacier system.

The sediment input from the surrounding rockwalls to the glacier is observed by comparing multi-temporal airborne LiDAR DEMs (2006, July 2012, September 2012) to determine sediment delivery by rockfall.

In 2012 a gauging station was installed at the Fagge River in front of the glacier outlet in order to determine the glacio-fluvial output of sediment from the glacier system. During the ablation periods from 2012 to 2014 the water level was recorded. At different stages the discharge was measured and a reliable stage-discharge relation could be established. That relation was used in combination with the recorded stage for the computation of the hydrograph in each season. Additionally, the solid sediment output was estimated using the discharge data as well as suspended sediment concentration from several hundred water samples and dozens of bed load measurements with a portable Helley-Smith sampler.