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## From Source to Sink: Spatial and Temporal Variability of Suspended Sediment Load in two Glaciated Alpine Catchments

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This study investigates suspended sediment transport in two glaciated catchment areas of the Eastern Central Alps within the DFG Research Group SEHAG (Sensitivity of High Alpine Geosystems to climate change since 1850). The main objective of this work is to characterize the conditions that trigger suspended sediment transport and the resulting sediment dynamics, emphasizing the sediment supply activated under specific hydrometeorological conditions.

The methodology combines continuous meteorological data with monthly suspended sediment measurements conducted during the ablation period of 2024 using manual samplers at strategically positioned sampling stations across the Upper Kaunertal and Martelltal catchments. Two primary research questions are addressed: (1) How do suspended sediment concentrations and loads vary spatially and temporally when comparing glacier terminus locations with downstream stations? (2) What characteristic patterns emerge in the suspended sediment samples under different hydrometeorological conditions?

During days dominated by glacial melt, the suspended sediment samples show a typical diurnal peak around 15:00-16:00, with concentrations up to 2.5 g/l in Kaunertal and 11.8 g/l in Martelltal, following the glacial hydrograph. However, notable increases of up to 1169 % occur during precipitation events, suggesting the activation of different sediment sources. These findings provide insights into how different hydrometeorological conditions activate distinct sediment sources and contribute to the understanding of sediment dynamics in glaciated catchments. The results lay the foundation for future suspended sediment monitoring.