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# Analyzing periglacial sediment dynamics under a special climate setting in the Qugaqie basin (Tibet Autonomous region)

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Sediment fluxes in the Qugaqie basin at NamCo Lake (Tibetan plateau) underlie a special regional climate setting. The setting is characterized by an intersection of the Westerlies, the South West Asian monsoon (Indian summer monsoon), and the East Asian monsoon. Additionally, sediment fluxes in high mountain areas are controlled by strong temperature variations and a seasonal variability. The elevation of the Qugaqie basin ranges from 4722 (lake level NamCo) up to 6119 m a.s.l., which suggests a strong influence of permafrost and the periglacial process domain throughout the year. It is hypothesized that periglacial processes dominate the sediment flux in the catchment. The aim of the study, embedded in the DFG-sponsored research training group TransTiP, is to describe, differentiate and quantify the controlling factors of sediment flux, especially the sediment transport by periglacial processes.
Therefore, different methods have been applied: (1) Mapping: A geomorphological map locates and visualizes sediment storage types, geomorphometric features and active geomorphological processes. (2) Geophysical methods: Electrical resistivity tomography (ERT) identifies permafrost and reveals the subsurface structure of periglacial landforms. (3) Radar remote sensing: To detect surface changes we are using the Interferometric Synthetic Aperture Radar (InSAR) time-series analysis based on ESA's Sentinel-1 satellite data to track periglacial landform creep.
The geophysical measurements show zones of high resistivity that can be associated with the occurrence of permafrost, e.g. in moraine deposits. The InSAR time-series analysis detects moving surface areas that are assigned to mapped periglacial landforms. Areas of movement match the mapped periglacial landforms, e.g. rock glaciers and protalus ramparts. Classical field techniques (mapping & geophysics) combined with a new satellite-based surface deformation tracking are suitable to extrapolate ground-based investigations to a larger spatial coverage and leads to a better understanding of the "cold spots" of the permafrost induced sediment dynamics of the Qugaqie basin.