



## **Feedbacks between fluid-rock interaction, mineral reaction and deformation at the Glarus Thrust (Switzerland)**

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The Glarus Overthrust, located in the eastern Helvetic Units of the Swiss Alps, is a magnificently exposed prominent thrust, which was generated during the Miocene and after suturing of the European and African plates.

Infrahelvetetic units, represented by para-autochthonous sedimentary cover of the Aar-massif in the south, and North Helvetic Flysch in the north are both overridden by the Glarus nappe system, which pertains to the Helvetic s.str.. The base of the Glarus nappe system is comprised of Mid Permian conglomerates and greywacke called "Glärner Verrucano". Hanging wall and footwall are separated by a usually up to one meter thick calcareous layer, the so called "Lochseiten calc-mylonite".

Despite of more than 150 years of geological investigations, the provenance of the Lochseiten calc-mylonite and phenomena of fluid-rock interaction along the Glarus Thrust are still not entirely resolved. We present new geochemical data and reconcile the different processes that may have occurred during thrusting.

Carbon and oxygen isotope data from profiles across the thrust suggest that the Lochseiten calc-mylonite was derived from primary marine carbonates in the eastern part of the Glarus thrust (Pizol area). In contrast, the carbonates at the classical Lochseiten locality near Schwanden might be a product of precipitation from fluids. Alternatively, it might represent a completely reworked carbonate with its primary marine isotope signature, totally overprinted through isotope exchange with an externally derived fluid.

Additional evidence for fluid-rock interaction at the base of the Verrucano is obtained from new bulk rock analyses, field observations and petrography in five sampling profiles across the thrust. Typically sodium is removed, whereas potassium seems to have remained in the rock. This is ascribed to the decomposition of feldspar, which primarily liberates sodium and potassium and the intense growth of white mica, which selectively scavenges potassium.