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Approaching sediment dynamics on Little Ice Age (LIA) lateral moraines in Upper Kaunertal valley, Austria using long-lived radionuclide ^{129}I

Sarah Kamleitner (1), Verena Czarnowsky (2), Johannes Lachner (3), Peter Steier (3), David Morche (4), and Sabine Kraushaar (1)

(1) Department of Geography and Regional Research, University of Vienna, Vienna, Austria (sarah.kamleitner@gmx.net), (2) Institute for Geography, Leipzig University, Leipzig, Germany, (3) Isotope Research and Nuclear Physics, University of Vienna, Vienna, Austria, (4) Institute of Geoscience and Geography, Martin Luther University Halle – Wittenberg, Halle, Germany

The Upper Kaunertal, as many other valleys situated in the Eastern Alps, has recently undergone large deglaciation processes as a result of global warming, leaving behind large moraines exposed to geomorphic processes. Steep lateral moraines represent large and easily erodible sources of material within an Alpine sediment cascade. In order to quantify the amount of sediments provided by the moraines, methods of surface change detection such as aerial and terrestrial laser scanning or sfm (structure from motion) generated Digital Elevation Models (DEM) are being applied. However, morphological changes due to the melt out of persisted ice are overlain by processes of mass movement, slope wash, and fluvial erosion, and therefore often remain unnoticed. Yet melting alone could account for a volume reduction in the sediment matrix of up to 13%, the additional leaching of water to a further unknown amount. Hence, the hydrological situation on the lateral moraines needs to be clarified. Previous investigations of springs evolving from the LIA lateral moraine were showing light isotope signatures comparable to those of glacier ice, and resulted in first assumption about the presence of ice lenses within the moraines (Kraushaar et al. 2014). Stable isotope measurements applied by Czarnowsky et al. 2015 confirm former findings. However, fail to distinguish between recently developed ice and dead ice lenses originating from former glacial maxima. This study therefore aims to date evolving spring waters on lateral moraines of the Gepatschferner, sampled between May and October 2015, using the radioactive isotope iodine-129. The environmental abundance of this long-lived radionuclide has been, analogue to tritium, significantly altered due to human activity since Nuclear Age, and is therefore believed to provide feasible relative age estimations. Hence, measurements will allow the clarification of the hydrological situation on site and the specification of processes causing volume reduction. Furthermore, the results will have implications for the interpretation of local sediment dynamics as well as the validation of applied surface change measurements.

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