



## **Denudation rates across the fluvially/glacially Hörnli landscape (Switzerland) during the late Pleistocene/Holocene**

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The Hörnli region of NE-Switzerland has long been recognized for its contrasting landscape. While lower regions (mainly the western Hörnli/Glatt valley and eastern Hörnli/Thur valley) are glacially modified landforms, the inner part of the Hörnli region (the Töss valley and surrounding highs) is a landscape sculptured by fluvial and associated hillslope processes. Valley form and hillslope curvatures and other morphometric parameters show distinct differences between both landform types, while originally glacial landforms are now additionally remodelled by fluvial processes.

However, it is controversial to what extent and with what rates the inherited shape and form or the transient stage of a landscape (glacial vs. fluvial) controls short and long-term processes and hence denudation rates. The Hörnli region is an ideally suited field area to study these issues because it is uniform in lithology (late Miocene Upper Fresh Water Molasse), tectonics (being very slow - but rather uniformly - uplifted) and a present climate with only minor variations in the precipitation pattern. As such, crucial parameters that potentially control denudation rates can be ignored and focus can be given to landscape's inheritance and relief.

In order to quantify denudation rates we sampled various rivers around the Hörnli region for catchment-wide denudation rate estimations using terrestrial cosmogenic nuclides ( $^{10}\text{Be}$ ,  $^{21}\text{Ne}$ ). In a further, second step, we will analyze  $^{14}\text{C}$  to capture short-term variations in a steady or transient stages of erosion. The dataset comprises samples from rivers that are sourced in landscapes with purely glacial or fluvial morphometries, or that originate in regions with mixed fluvial and glacial landforms. Preliminary results from samples of the trunk river and tributaries yield denudation rates that are on the order of 0.05-0.5 mm/yr. similar to the range of rates previously acquired for Swiss Middleland rivers, (Norton et al., 2008; Wittmann et al., 2007) with some isolated values above this range. The data show some scatter in concentrations and hence denudation rates, though with rates tending to be higher in glacially compared to fluvial overprinted catchments. Further investigations are underway to obtain precise low  $^{21}\text{Ne}$ -concentration in our samples.

Norton, K.P., et al., 2008. *Geomorphology*, 95(3-4): 474-486.

Wittmann, H., et al., 2007. *Journal of Geophysical Research- Earth Surface*, 112: F04010, doi:10.1029/2006JF000729.