



Fluvial transport and denudation rates in three small catchments in Eastern Iceland, Finnish Lapland and Swedish Lapland

A.A. Beylich (1,2)

(1) Geological Survey of Norway (NGU), Quaternary Geology and Climate group, Trondheim, Norway (achim.beylich@ngu.no), (2) Norwegian University of Science and Technology (NTNU), Department of Geography, Trondheim, Norway

Chemical and mechanical fluvial transport and denudation rates are analysed over several years in the Hrafnadalur catchment in sub-Arctic Eastern Iceland (2001 - 2007), the Kidisjoki catchment in the sub-Arctic Kevo region in northernmost Finnish Lapland (2001 - 2007) and the Latnjavagge catchment in the Arctic Abisko mountain area in northernmost Swedish Lapland (1999 - 2007).

In the alpine Hrafnadalur catchment denudation rates are relatively high, with mechanical denudation dominating over chemical denudation due to high mechanical weathering rates of the low-resistant rhyolites in this area. Both the Kidisjoki and the Latnjavagge catchments are characterised by low contemporary denudation rates where chemical denudation dominates over mechanical fluvial denudation. In Latnjavagge, the low intensity of mechanical fluvial denudation is mainly due to a closed and stable vegetation cover. The low-relief area of Kidisjoki is characterised by very low mechanical fluvial denudation rates.

Seasonal snowmelt-generated runoff peaks control annual fluvial sediment transport and denudation rates in Latnjavagge and Kidisjoki whereas rainfall-generated peak runoff is more important in Hrafnadalur. In all three catchments about 80-90% of the annual suspended sediment transport and connected denudation occur within a few days during peak runoff. These results also confirm that chemical denudation is a comparatively important process in cold environments.