



Catchment scale budget estimates of mass movements in the Swedish Kärkevagge

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Research on sediment transport processes in the periglacial mountain environments of Scandinavia started already in the 1950s. A wide range of measurements is available for the Kärkevagge (northern Sweden) including transport rates for solifluction, slope wash, dirty avalanches and rock- and boulder falls.

Terrain parameters and optical satellite data have been jointly analyzed in order to identify active process areas and to define Geomorphic Process Units (GPUs) at catchment scale. Terrain parameters such as slope, curvature, aspect, topology together with NDVI (Normalized Difference vegetation Index; source Landsat TM) have been investigated for their suitability of process area identification. The actual method differs depending on the nature of the process: (1) Slow and/or spatially continuous processes below image data resolution: processes that are in general summarized as solifluction; processes that are associated with nivation; slope wash and rill erosion. (2) Rapid mass movements with separate area of source and deposition, which are directly adjacent to each other: rock- and boulder falls, dirty avalanches, mud and debris flow. (3) Rapid mass movements with separate area of source and deposition, which are separated by area of transport: slush flows and torrents.

Mass movement rates based on existing field measurements have been used in the budget calculations. 80% of the of the Kärkevagge catchment can be identified either as a source area for sediments or as a zone where sediments are deposited.