



Monitoring and modelling snow avalanches in Svalbard

O. Humlum, H. Christiansen, U. Neumann, M. Eckerstorfer, A. Sjöblom, K. Stalsberg, and L. Rubensdotter
University of Oslo, Physical Geography, Institute of Geosciences, Oslo, Norway (ole.humlum@geo.uio.no, +47 22 85 42 15)

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Ole Humlum 1,3, Hanne H. Christiansen 1, Ulrich Neumann 1, Markus Eckerstorfer 1, Anna Sjöblom 1, Knut Stalsberg 2 and Lena Rubensdotter 2.

- 1: The University Centre in Svalbard (UNIS).
- 2: Geological Survey of Norway (NGU)
- 3: University of Oslo

Ground based transportation in Svalbard landscape all takes place across mountainous terrain affected by different geomorphological slope processes. Traffic in and around the Svalbard settlements is increasing, and at the same time global climate models project substantial increases in temperature and precipitation in northern high latitudes for coming century. Therefore improved knowledge on the effect of climatic changes on slope processes in such high arctic landscapes is becoming increasingly important.

Motivated by this, the CRYOSLOPE Svalbard research project since 2007 has carried out field observations on snow avalanche frequency and associated meteorological conditions. Snow avalanches are important geomorphic agents of erosion and deposition, and have long been a source of natural disasters in many mid-latitude mountain areas. Avalanches as a natural hazard has thereby been familiar to inhabitants of the Alps and Scandinavia for centuries, while it is a more recent experience in high arctic Svalbard. In addition, overall climate, topography and especially high winter wind speeds makes it difficult to apply snow avalanche models (numerical or empirical) developed for use at lower latitudes, e.g. in central Europe.

In the presentation we exemplify results from the ongoing (since winter 2006-07) monitoring of snow avalanches in Svalbard along a 70 km long observational route in the mountains. In addition, we present observations on the geomorphological impact of avalanches, with special reference to the formation of rock glaciers. Finally, we also present some initial results from numerical attempts of snow avalanche risk modelling within the study area.