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DISSERTATION TITLE: *Snow avalanches in central Svalbard: A field study of meteorological and topographical triggering factors and geomorphological significance.*

In the snow covered high relief mountain landscape of Svalbard, snow avalanches are a common phenomenon. From a geomorphological point of view, they contribute to the accumulation of avalanche fans and rock glaciers. From a geohazards point of view, they threaten people and infrastructure. This is the case in the populated and frequently used areas around Svalbard's main settlement Longyearbyen. To study snow avalanches both from a geomorphological and geohazards point of view, frequent snow avalanche field-based monitoring was conducted in the area around Longyearbyen between 2006-2012. Cornice fall avalanches are found to be the most dominant avalanche type in central Svalbard due to the extensive plateau mountain topography, lack of any high vegetation and a constant prevailing winter wind direction. Almost half of all snow avalanches were cornice falls.

This thesis contributes to an increased understanding of the seasonal cornice dynamics influenced by meteorological conditions and the cause of sudden catastrophic failures leading to cornice fall avalanches. We find that cornices are effective in plucking rock sediment from the plateau edges, as well as in transporting them downslope. They thus significantly contribute to avalanche fan and rock glacier formation.

Two wet avalanche cycles were observed during the study. They were both extreme in their meteorological triggering, as well as in the magnitude of releases, sizes and runouts. It was shown that not the general warming climate, but the atmospheric low-pressure passage time and intensity determine the occurrence of such extreme wet avalanche events.

Another finding dealt with the identification of the snow climate in central Svalbard. Knowledge about snowpack characteristics like typical depths, layering and temperatures has not only implications on the study of snow-permafrost interactions, but is also important for the establishment of any future snow avalanche forecasting. Knowing the snow climate and the snow avalanche regime enables now to establish observations routines and computer models for future warning. This is timely and important, since 5 people died in snow avalanches in the last 10 years in Svalbard.