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The Longyearbyen (Svalbard) debris flow event July 1972 revisited

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A debris flow is a flowing mixture of water-saturated debris that moves downslope under the force of gravity, and may represent a hazard to human life in mountain areas. In the evening of 10 July 1972 the slopes around the main settlement Longyearbyen in Svalbard were affected by numerous debris flows, some of which reached the valley bottom, thereby crossing areas where several new buildings have come up since 1972. This spectacular debris flow event has previously been described in the literature (e.g. Larsson 1982), emphasizing the importance of heavy rain and the likely position of the permafrost table. The event has, however, never been seen in a global change context, which is the main purpose of this presentation. The Longyearbyen debris flow event took place within a period known as a relatively cold period in Arctic. The purpose of the present study is to obtain improved understanding of factors responsible for this event. In this analysis national and international databases are used to investigate the meteorological developments leading up to the actual event, supplemented by modelling the active layer thickness at the time of release, and by actual field observations from the areas affected. The present contribution is part of the research project CRYOSLOPE Svalbard, focusing on climate change effects on slope processes in central Spitsbergen, Svalbard.