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## An extreme slush and slab avalanche event in the high arctic Svalbard

**Markus Eckerstorfer**[1] Hanne H. Christiansen[2]
*1. PhD-Student, Longyearbyen, Norway; 2. Professor in Physical Geography, Longyearbyen, Norway*

Ten slush avalanches and 31 slab avalanches were observed and documented in a 16.8 $km^2$ large mountainous area, around Svalbard's main settlement Longyearbyen. All avalanches released within a 15 days period between 14 - 29 January 2010. Extreme meteorological conditions in the winter prior the avalanche events, caused the slush and slab avalanches. Regular field observations in the Longyearbyen area over the last 3 years, as well as literature on past slush flow avalanches and extensive avalanche activity suggest, that the January 2010 avalanche period can be classified as an extreme event both in magnitude and frequency. In this paper we explain the unique meteorological and snowpack conditions that favored the slush avalanche release as well as the connected slab avalanche event. In particular an extreme warm November 2009 to January 2010 period with a record amount of solid precipitation compared to the whole Svalbard meteorological record (1912-2010) are the key releasing meteorological factors for both extreme events. These meteorological conditions developed a soft, coarse grained snowpack that was isotherm at 0 °C when both slush and slab avalanches slid on one of the several ice layers inside the snowpack after it got saturated with water.