



Arctic avalanche dynamics

Alexander Prokop (1), Mari Eiken (1), Kerstin Ganaus (2), and Lena Rubensdotter (1)

(1) UNIS - The University Centre in Svalbard, Arctic Geology Department, (2) BOKU – University, Vienna, Austria

Since the avalanche disaster December 19th, 2015 in Longyearbyen (Svalbard) happened, where two people were killed within settlements, the dynamic of avalanches in arctic regions is of increasing interest for hazard mapping in such areas. To investigate the flow behavior of arctic avalanches we focused on avalanches that occurred in Central Svalbard. In this regions historic avalanche events can be analyzed due to their deposition behavior visible on geomorphological maps in the run-out area of the avalanches. To get an idea about possible snow mass that was involved in the avalanches we measured the snow volume balance of recent avalanches (winters 2015/16) via terrestrial laser scanning. In this way we gained reasonable data to set calibration and input parameters for dynamic avalanche modeling. Using state of the art dynamic avalanche models allowed us to back calculate how much snow was involved in the historic avalanches that we identified on the geomorphological maps and what the return period of those events are. In our presentation we first explain our methodology; we discuss arctic avalanche behavior of the avalanches measured via terrestrial laser scanning and how the dynamic avalanche models performed for those case examples. Finally we conclude how our results can improve avalanche hazard mapping for arctic regions.