Geophysical Research Abstracts
Vol. 18, EGU2016-8384, 2016
EGU General Assembly 2016

Storing snow for the next winter: Two case studies on the application of snow farming.

Thomas Grünewald and Fabian Wolfsperger
WSL Institute for Snow and Avalanche Research SLF, Davos, Switzerland (gruenewald@slf.ch)

Snow farming is the conservation of snow during the warm half-year. This means that large piles of snow are formed in spring in order to be conserved over the summer season. Well-insulating materials such as chipped wood are added as surface cover to reduce melting. The aim of snow farming is to provide a "snow guaranty" for autumn or early winter – this means that a specific amount of snow will definitively be available, independent of the weather conditions. The conserved snow can then be used as basis for the preparation of winter sports grounds such as cross-country tracks or ski runs. This helps in the organization of early winter season sport events such as World Cup races or to provide appropriate training conditions for athletes.
We present a study on two snow farming projects, one in Davos (Switzerland) and one in the Martell valley of South Tyrol. At both places snow farming has been used for several years. For the summer season 2015, we monitored both snow piles in order to assess the amount of snow conserved. High resolution terrestrial laser scanning was performed to measure snow volumes of the piles at the beginning and at the end of the summer period. Results showed that only 20% to 30 % of the snow mass was lost due to ablation. This mass loss was surprisingly low considering the extremely warm and dry summer. In order to identify the most relevant drivers of snow melt we also present simulations with the sophisticated snow cover models SNOWPACK and Alpine3D. The simulations are driven by meteorological input data recorded in the vicinity of the piles and enable a detailed analysis of the relevant processes controlling the energy balance. The models can be applied to optimize settings for snow farming and to examine the suitability of new locations, configurations or cover material for future snow farming projects.