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Investigations on technical measures to reduce ablation in critical areas of glacier ski resorts

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The recent year's strongly negative mass balances and the related recession of alpine glaciers also affect glacier ski resorts. Within an ongoing project of alpS, the centre of natural hazard management, three institutes of the University of Innsbruck and four Tirolean glacier ski resorts, the implications of glacial recession for glacier ski resorts were analysed. Methods to reduce snow and ice melt in limited parts of glacier ski resorts were developed and evaluated. First, critical areas were determined where recent evolution of glacier area and elevation causes most problems for the maintenance: The reduction of glacier area increases the effort for the preparation of ski and lift tracks in autumn and makes reconstruction of pylons or lift stations necessary. Lowering of the glacier surface causes problems where infrastructure like lift stations or other buildings built on rocks are harder to access. Ski and lift tracks can become steeper and therefore more difficult to ski. Where the ice is shallow, rocks can melt out and enforce the relocation of ski tracks. High ablation rates increase the effort of maintenance work e.g. by forcing workers to re-anchor the ski lift cable supports more often. Different technical measures to reduce snow and ice melt were evaluated. The methods tested from July 2004 to October 2004 include snow compaction, injection of water in the snow cover in winter and covering the snow surface during the ablation season. Mass and energy balance were measured at the test sites with and without application of measures. The results show that it is possible to retain a part of the winter snow cover over the entire ablation period even within the ablation area of a glacier. The next project phase will be dedicated to the improvement of the methods.