Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05995, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05995
EGU General Assembly 2008

Effects of snow cannons and artificial snow on energy industry and hydrology in the province Salzburg (Austria)

A. Reiter, U. Strasser, W. Mauser

Department of Geography, Ludwig-Maximilians University (LMU), Luisenstr. 37, 80333 Munich, Germany (a.reiter@iggf.geo.uni-muenchen.de / Fax: 0049-89-21806675)

The innovation of the first snow cannon in the province Salzburg in 1984 and the following rapid diffusion has been a big step for the winter tourism in Salzburg. However, this development had, and still has, enormous effects on the energy industry and the hydrology in the region. These effects were analysed using data from the "Department for Water management Salzburg" in 2006.

Actual energy and water consumption by all installed snow cannons in Salzburg was calculated on the basis of common rules in the snow-making technology with the purpose to compare the results with the annual water and energy consumption in Salzburg.

Almost 100 snow cannon systems exist in the ski regions of Salzburg which are allowed to take more than 4.2 Million m^3 snow-making water per season from natural and artificial lakes, streams and groundwater reservoirs. With this water the ski resort and snow cannon operators can produce artificial snow for more than 1840 hectare ski piste, which is about 38 percent of the entire skiing area of the region.

The energy consumption for producing artificial snow is dependent on the snow cannon system and the actual environmental conditions. Actually, the snow making systems need only 0.8 to 2.1 percent of the common annual energy consumption of Salzburg (depending on the efficiency). But the provision of the required electrical power can be problematical when lots of snow cannons are in use and the private demand is high as well (e.g. heating, lighting).

Gauge data from the hydrological yearbook of Austria was used to compare the approved water withdrawal to the surface discharge in the catchments of the Salzach, Enns and Mur. Compared to mean low water discharge the withdrawal is only noticeable in the headwaters of the Salzach, but there it can reach up to 10 % of mean low water (at full power of all concerned snow cannons) which is close to the limit of ecological capacity. Compared to the lowest low water discharge, the withdrawal can reach up to three quarters which can result in extreme consequences for the environment and the downstream water use.