Geophysical Research Abstracts
Vol. 14, EGU2012-10954, 2012
EGU General Assembly 2012

Modelling technical snow production for skiing areas in the Austrian Alps with the physically based snow model AMUNDSEN

F. Hanzer (1), T. Marke (1), R. Steiger (2), and U. Strasser (1)

(1) University of Graz, Department of Geography and Regional Science, Graz, Austria (florian.hanzer@uni-graz.at, +43(0)3163809886), (2) Institute of Geography, University of Innsbruck, Austria

Tourism and particularly winter tourism is a key factor for the Austrian economy. Judging from currently available climate simulations, the Austrian Alps show a particularly high vulnerability to climatic changes. To reduce the exposure of ski areas towards changes in natural snow conditions as well as to generally enhance snow conditions at skiing sites, technical snowmaking is widely utilized across Austrian ski areas. While such measures result in better snow conditions at the skiing sites and are important for the local skiing industry, its economic efficiency has also to be taken into account.

The current work emerges from the project CC-Snow II, where improved future climate scenario simulations are used to determine future natural and artificial snow conditions and their effects on tourism and economy in the Austrian Alps. In a first step, a simple technical snowmaking approach is incorporated into the process based snow model AMUNDSEN, which operates at a spatial resolution of 10–50 m and a temporal resolution of 1–3 hours. Locations of skiing slopes within a ski area in Styria, Austria, were digitized and imported into the model environment. During a predefined time frame in the beginning of the ski season, the model produces a maximum possible amount of technical snow and distributes the associated snow on the slopes, whereas afterwards, until to the end of the ski season, the model tries to maintain a certain snow depth threshold value on the slopes. Due to only few required input parameters, this approach is easily transferable to other ski areas.

In our poster contribution, we present first results of this snowmaking approach and give an overview of the data and methodology applied. In a further step in CC-Snow, this simple bulk approach will be extended to consider actual snow cannon locations and technical specifications, which will allow a more detailed description of technical snow production as well as cannon-based recordings of water and energy consumption.