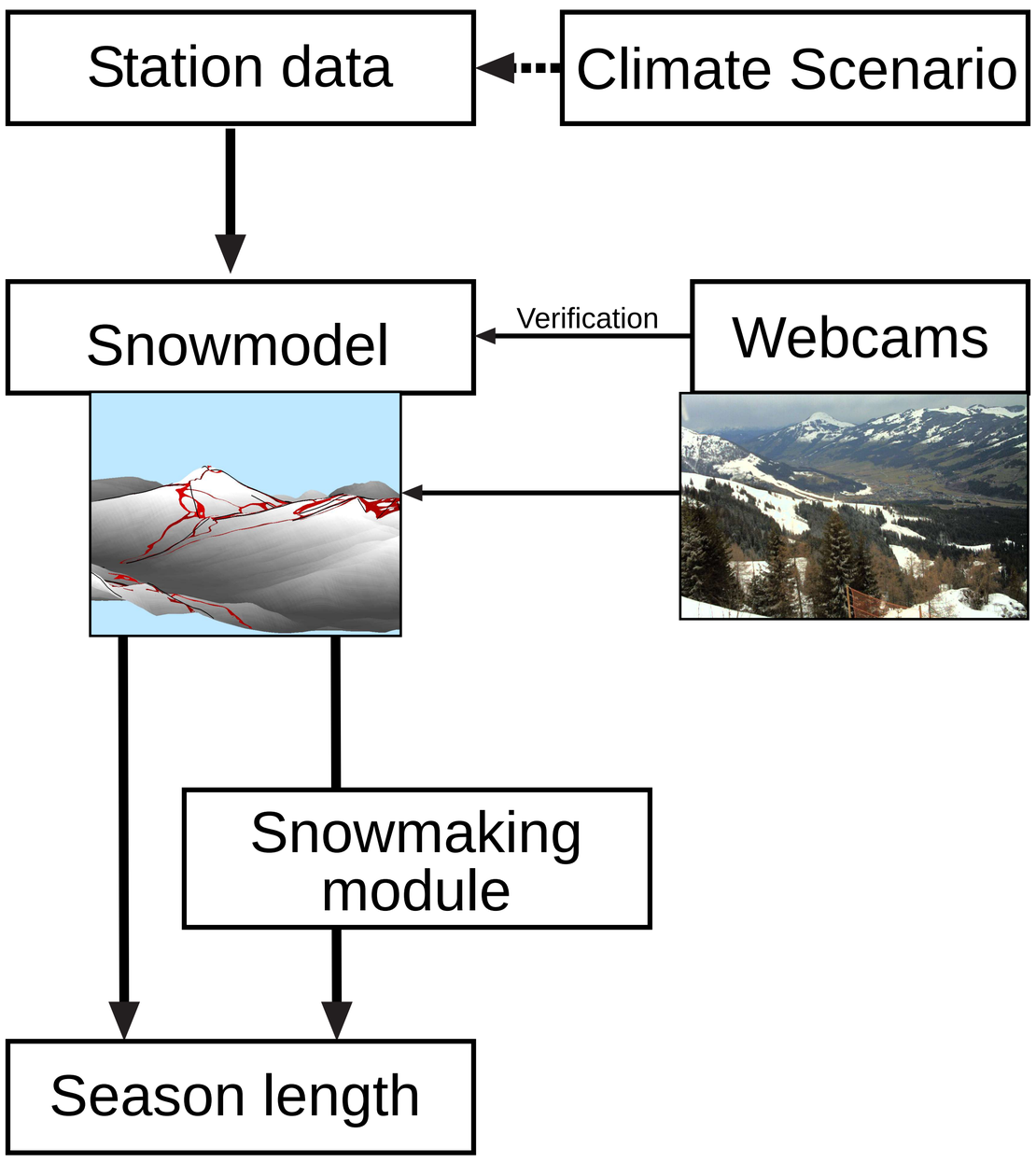
Geographie Innsbruck

Limits of Snowmaking in a changing Climate

Research Objective

Climate change poses a severe threat to ski resorts, as natural snow reliability will be declining (Abegg et al 2007). The industry´s answer to extraordinary warm winter seasons like 2006/07 is intensified snowmaking (higher output per time unit). Recent studies concluded, that snowmaking makes ski resorts significantly less vulnerable to climate change (Scott et al 2007, Mayer et al 2007, Steiger 2007a, 2007b, 2008) than 1st generation climate impact studies supposed. But snowmaking is also at risk as periods too warm to produce snow are very likely to become more frequent. Thus a more detailed look on technical snow reliability and season length of ski slopes is necessary, which is the goal of



Methods

Station data (1960-2008) in the model region of Kitzhühel is used to calibrate the **snowmodel** based on Kleindienst (2000). The distributed degree-day model includes orographic (slope, aspect) as well as physical features (snow metamorphosis, cold content). The spatial distribution of station data is verified by **webcam** archives, which allow to determine the date of start and end of the snow cover at different elevations and expositions.

Season length of ski slopes in the model region differentiated by exposition and elevation is simulated in two model runs: One run with station data as single input and a second run with a snowmaking module included (adopted from Scott et al 2007). For the simulation of future season length (time horizon 2050), data derived from the **regional climate model** REMO driven by two emission scenarios (A1B, B1) will be used.

With data from climate stations and webcams outside the model region, it will be possible to simulate ski season length in detail for every ski resort in North an South Tyrol.

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