



Land-use change around Kilimanjaro and its potential impact on glaciation

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Changes in glacier extent are effects of the variability of the atmospheric conditions integrated over a time span similar to that often referred to as the timescale on which the climate system should be assessed (i. e., decades). In remote locations characterized through sparse instrumental data records, such as Kilimanjaro, glaciers therefore provide a valuable opportunity to reveal climate change. However, in order to be able to make statements about the large scale, potential local influences have to be understood.

In the case of Kilimanjaro, large changes in vegetation have been observed, in particular resulting in reduced montane and subalpine forest coverage. Using a numerical atmospheric circulation model (WRF), we quantify the impact of anthropogenic land-use change around Kilimanjaro on summit climate, using on-site automated weather stations as validation tools. We then use a glacier mass balance model to directly evaluate the impact of local scale vegetation change on the glaciers of Kilimanjaro.