

Snow on Kilimanjaro

Monday 16 April, 15:00 – 16:00

Glaciers on top of Kilimanjaro grow again. After recent rapid retreat, last year saw heavy snowfalls on top of Africa's highest mountain. Will there be hope again for Kilimanjaro's icecap? An Austrian study sheds new light on the processes that control the transport of moisture to East Africa.

Strong precipitation in East Africa during October-December caused a mass gain for the glaciers on top of Kilimanjaro in 2006. These new data come from three automatic weather stations in the summit region of the mountain. The measurements have started in 2000 and, prior to 2006, confirmed continuous mass loss of the glaciers as expected from the observed long-term retreat. El Niño events, one of which developed in summer 2006, are known to cause above-average precipitation from October to December in East African lowlands. The automatic weather station data show – for the first time – that this relation may also hold for higher-altitude regions, which are particularly vulnerable to climate change.

Although the exceptionally high 2006 snowfalls cannot compensate for the great mass loss and retreat of Kilimanjaro glaciers over the past 120 years, they demonstrate the paramount impact of precipitation on the glaciers. This fact is substantiated by two types of modeling: glacier mass balance and global climate models.

Mass balance models, which simulate the physics of the glacier-climate interaction, show the glaciers are most sensitive to precipitation (i.e., snowfall) fluctuations. Climate models reveal that large-scale circulation patterns over the Indian Ocean, which bring abundant precipitation to eastern Africa, have occurred less frequently in the 20th century. The results support other studies finding that global warming and regional drying in the tropics are concurrent phenomena. The shrinking glaciers on Kilimanjaro are one alarming example of increased drying in the tropics.

A direct impact of the studies was that the national park area on Kilimanjaro has been extended recently, to better control illegal deforestation on the mountain. Since the presence of vegetation stimulates moisture potential and cloud formation in the near-surface air layers, deforestation was contributing to the drying in the Kilimanjaro region.

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Session: CR80 Mass and energy balance of snow and ice | [>>programme](#) [abstract](#)

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Additional information:

Con Allègre, ma non troppo by Georg Hoffmann. RealClimate.org [>>article](#)