



Large scale climatological controls of the mass balance of tropical Lewis Glacier, Mt Kenya, East Africa

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Among other effects on the mass and energy balance, tropical glaciers are particularly sensitive to precipitation, which increases both mass accumulation and albedo (and thus reduces ablation). Therefore, precipitation variability is directly linked to mass balance variability. Multi-year and inter-annual fluctuations in large scale climate patterns (IOZM, ENSO) are known to strongly correlate with precipitation variability in equatorial East Africa, but little is known about how this effects the precipitation at high elevations on Mt Kenya.

In this study we compare (i) the mass balance time series of Lewis Glacier, Mt Kenya (1978 – 1996) and (ii) high altitude precipitation measurements from the mountain to gridded regional climate data and multi-year climate oscillations. These regional influences, superimposed on the overarching tropical climate conditions and seasonality, play a key role for seasons with abundant snowfall on the glacier and, in combination with radiative forcing, explain the predominantly negative mass balances on Lewis glacier.