

The influence of tropical cyclones on circulation, moisture transport, and snow accumulation at Kilimanjaro

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Tropical cyclones represent an important component of intraseasonal atmospheric variability in the southwest Indian Ocean, and their landfall can be devastating to coastal communities. However, relatively little is known about their impact on precipitation in the high-elevation regions of East Africa. Here we combine in-situ measurements from the summit of Kilimanjaro and high-resolution atmospheric modelling of the region to investigate their influence for a case study season. Results show that some tropical cyclones transport moisture directly to the region while others induce moisture transport from the Congo Basin. Certain storms with westerly moisture transport are associated with large daily snow accumulation on Kilimanjaro's glaciers, exceeding ~5% of the observed average annual total in one day. Our findings suggest that these storms are relevant for extracting climate signals from East Africa's glaciers.

[1] <https://www.uibk.ac.at/acinn/graduate-seminar/index.html.en>