Contribution ID: **86** Contribution code: **PSB-26** Type: **Poster**

East vs West: comparing the rates of landscape change in the southern African region.

Wednesday, 23 October 2024 17:15 (20 minutes)

For channel incision rate determination and comparison, bedrock samples from sections of the Olifants River (n = 10) in the dry tropical/subtropical Kruger National Park, as well as samples from sections of the Orange River (n = 20), in the arid Northern Cape were collected. Using cosmogenic in-situ 10Be in pure quartz, average incision rates determined from granitic samples of the Olifants River indicate that the channel is incising at a rate of 26.4 ± 1.77 m/Ma, while granitic and quartzitic samples from along the Orange River produce a slower average rate of 6.89 ± 0.45 m/Ma, implying considerably slower channel evolution in the west. These rates fall within a very wide range of previously determined rates of erosion and channel incision across various southern Africa of 0.2 –255 m/Ma landforms. The roughly four times faster channel incision rate along the Olifants River, compared to that of the Orange River, suggest that the prevailing long-term climate is a driver on erosion and apparent exposure ages, where the wetter east yields faster rates and younger apparent exposure ages, while the drier west, slower rates and older apparent exposure ages. Quartzitic rates of incision are also seen to be slower than those of granitic composition along the Orange River, suggesting a further lithological control on the rates of erosion and landscape change. Although the southern African landscape has been considered tectonically quiescent, the data presented here imply that landscape evolution is not uniform, and that is prevailing long-term climate variability and lithology are the primary drivers of differential erosion across the region.

Student Submission

Yes

Primary author: KHOSA, Rivoningo (iThemba LABS)

Co-authors: Dr TOOTH, Stephen (Aberystwyth University); Dr PICKERING, Robyn (University of Cape Town); Dr MBELE, Vela (NRF iThemba LABS); Dr WINKLER, Stephan (Helmholtz Zentrum Dresden Rossendorf); Dr STÜBNER, Konstanze (Helmholtz-Zentrum Dresden-Rossendorf)

Presenter: KHOSA, Rivoningo (iThemba LABS)

Session Classification: Poster Session B

Track Classification: Applications of Cosmogenic Isotopes