



Age and origin of cold climate landforms from the Eastern Cape Drakensberg, southern Africa: palaeoclimatic implications

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Reliable dating is crucial for resolving the nature and timing of cold events in southern Africa and the associated cold climate landforms produced. Evidence for glaciation has been proposed for the Eastern Cape Drakensberg, based on the identification of moraines that were presumed to be of last glacial maximum age. Temperature depressions of 10-17°C have been proposed for this region, based on the presence of these moraines (Lewis and Illgner, 2001) and the identification of a relict rock glacier. Such large temperature depressions are, however, unsupported by other palaeoclimatic proxies in southern Africa. Debate regarding the occurrence of glaciation in southern Africa has been ongoing for several decades. There is good evidence for small-scale glaciation during the last glacial cycle in Lesotho, at elevations exceeding 3000 m a.s.l., but these sites are more than 1000 m higher in elevation than those identified in the Eastern Cape, and suggest a temperature depression of only \sim 6°C and a change to a winter dominated precipitation regime during the last glacial cycle.

This paper presents preliminary cosmogenic nuclide exposure ages for the Eastern Cape 'moraines' and a periglacial blockstream in this region. We discuss potential alternative interpretations for the formation of the landforms and suggest that glaciers were absent in the Eastern Cape Drakensberg during the last glacial period. However, there is widespread evidence for periglacial activity down to an elevation of \sim 1700 m a.s.l., as illustrated by extensive blockstreams, stone garlands and solifluction deposits. These periglacial deposits suggest that the climate was much colder (\sim 6°C) during the last glacial cycle, in keeping with other proxy records, but not cold enough to initiate or sustain glaciers at low elevations.

References

Lewis C. A., Illgner, P. M., 2001. Late Quaternary glaciation in Southern Africa: moraine ridges and glacial deposits at Mount Enterprise in the Drakensberg of the Eastern Cape Province, South Africa. *Journal of Quaternary Science* 16, 365–374.