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40 000 years of environmental change in southern Africa; evidence from the Eastern Cape, South Africa

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Geomorphological and other evidence exists in the Eastern Cape for environmental change during the time-span that can be radiocarbon dated with appreciable reliability. The evidence includes glacial and periglacial landforms that now exist in a region of temperate climate.

The Birnam Interstadial, relatively moist and mild, existed from before 40 000 BP until $\sim$ 24 000 BP. The Bottelnek Stadial, in which small glaciers and rock glaciers formed in the Drakensberg above an altitude of $\sim$ 1800 m, existed after $\sim$ 24 000 BP and apparently terminated by 18 000 BP. MAAT may have been 110 C, or even more, below those of the present at that time at altitudes of 1800 m. (Isotopic analyses of ground water in the Uitenhage aquifer, in the much lower coastal region, suggest only a reduction of the order of 5.50 C between the Last Glacial Maximum and the present. This suggestion, based on comparison of two 13 000 year periods, might overlook relatively short-term climatic changes, such as may have been responsible for glacier and rock glacier formation at high altitudes). The Late Glacial, which was a time of considerable climatic oscillation, existed after $\sim$ 18 000 BP and before $\sim$ 12 000 BP. The Holocene, which has existed since then, witnessed initially moist conditions in the Drakensberg, but then semi-arid conditions between $\sim$ 7000 and 3200 BP. At lower altitudes, in the Fish River valley, conditions were apparently too dry for human settlement prior to $\sim$ 6000 BP