



Long-term cosmogenic ^{10}Be catchment-wide erosion rates in the Kruger National Park

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In this study we estimated long-term catchment-wide erosion rates in the central and southern Kruger National Park with cosmogenic ^{10}Be analyses. Samples were collected in small catchments (2-100 km²) upstream of dams, which were used to determine short-term sediment yield rates. ^{10}Be -derived erosion rates vary from 4-15 mm/kyr. Although there are significant site-specific differences in geomorphic parameters and precipitation we could not identify a single parameter controlling long-term erosion.

Geomorphic fieldwork reveals that an unknown fraction of sampled sand-sized channel sediments derived from partly extensive and up to a few-meters deep gully erosion, which may lead to an overestimation of ^{10}Be -derived erosion rates. Cosmogenic nuclide production is rapidly decreasing with depth and consequently the measured ^{10}Be concentration of stream sediments is a mixture of (i) sand with high ^{10}Be concentration from colluvial creep or sheet flow from hillslopes and (ii) sand with low ^{10}Be concentration from gully erosion. To correct erosion rates, we quantify sediments derived from gullies using a combination of mapping gullies using remote sensing data and field work and geochemical characterisation of intact hillslopes and gully side walls.