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A study of silcrete raw material acquisition in the Howiesons Poort at Klasies River using GIS catchment analysis techniques

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ABSTRACT

Klasies River Main (KRM) site contains Middle Stone Age archaeological material from the Howiesons Poort (HP) techno-complex that demonstrates a marked expression of complexity. The complexity is also apparent in the lithic technology of the HP that is characterised by an increase of different types of silcrete raw material. Although changing mobility patterns have been related to the increase in silcrete in the HP at KRM, no studies have investigated this aspect in detail. Therefore, the mobility patterns involved in the procurement of silcrete has been investigated through GIS modelling methods. GIS Least Cost Path (LCP) algorithms have been used to model silcrete raw material acquisition in the HP at KRM, using the currently recorded sources of this material in the south Eastern Cape. The results demonstrate that GIS LCP algorithms produce differing output results. The Tripcevich Tobler Hiking Function (TTHF) and ArcGIS Default Built-in Cost (DBC) algorithms modelled paths that favoured flat terrain whereas the White Tobler Hiking Function algorithm modelled paths that favoured steep terrain. The two time-based algorithms models produced different travel time ranges. The TTHF algorithm produced travel time that are more comparable with Google maps and the White Tobler Hiking Function (WTHF) produced slightly larger travel times. The travel times of TTHF implied that HP groups at KRM followed a daily foraging strategy, while the WTHF travel times imply that the groups followed a logistical foraging strategy. The nearest silcrete source from KRM is located 28.3 kilometres from the site and can be reached in 4 hours according to the TTHF. The possibility of interaction between groups from KRM, Pinnacle Point (PP) and Nelson Bay Cave (NBC) was investigated by calculating LCP's from these sites to the silcrete sources. The results demonstrated that there was a high possibility of interaction between groups from the three sites, if they sourced silcretes in the Uitenhage and Grahamstown areas. Mapping procurement patterns of silcrete raw material and modelling predictive paths that the HP groups from KRM may have followed bring new perspectives regarding the complexity of human behaviour within this period and add to studies of silcrete raw material use in the South African Middle Stone Age.