



Koppen-Geiger climate type maps of the Last Glacial Maximum over south coast

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The cyclic nature of climate at Milankovitch timescales, and in particular the periodic occurrence of the ice ages, drove shifts in species distributions globally. To understand the prehistoric southern African landscape, and also the present-day biome distribution of the region, it is critical to understand the effects of these dramatic shifts on climate-vegetation across the southern Africa. Climate classifications are helpful tools to better identify and understand certain patterns in climate data. Koppen-Geiger (K-G) zones are one of the most widely used climate classifications and are based on regional temperature and precipitation patterns. Here we present K-G type maps corresponding to the Last Glacial Maximum (LGM) climate over southern Africa. The maps were constructed using climate model simulations performed over southern Africa for the LGM. An ensemble of global climate model (GCM) simulations of the Coupled Model Intercomparison Project Phase Five (CMIP5), obtained for the LGM, were downscaled for this purpose. The regional model used is the Conformal-Cubic Atmospheric Model (CCAM), a variable-resolution global atmospheric model of the CSIRO. The integrations were performed on the XSEDE supercomputing facility in the United States and the Centre for High-Performance Computing in southern Africa. The results are insightful in terms of providing an indication of how climate regimes and vegetation biomes over southern Africa may have looked like during the LGM. In particular, the results are indicative of a significant northward expansion of the winter rainfall region (compared to present-day climate), with implications for the distribution of the Fynbos biome.

Keywords: Koppen-Geiger climate zone, Last Glacial Maximum, climatic change