

# Remote sensing reconnaissance of the Congo-Zambezi watershed: exploration of palaeo-hydrological patterns and structural controls on biogeography

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## ABSTRACT

Earth's land surface is ultimately related to (and highly affected by) the underlying geology. Landscapes are the interface between terrestrial, subaerial and climatic processes, and this is where hydrological processes hold a dominant role in determining the nature of landscapes. The understanding of large rivers with their associated tributaries and evolution is of fundamental importance when looking at landscape evolution. Yet, the origin of these drainage systems, especially in Africa, rarely receives deserved attention in contemporary geology and biology. Our current understanding of the Congo-Zambezi watershed often invokes data that is over 50 years old. A dearth of recent research into the Congo-Zambezi system largely reflects challenges of fieldwork across a vast area that remains difficult of access; fortunately, analyses of remotely sensed data reveals invaluable reconstructions of landforms.

Although high resolution remotely-sensed data has been available since the late 1970's, it was computationally challenging to derive sufficiently accurate river profiles from these data. The precise resolution of elevation data was significantly rectified by the 2003 Shuttle Radar Topographic Mission (SRTM). Surface elevation models (SEM) obtained from the SRTM along with Landsat 7 ETM + imagery now allows precise mapping of rivers and their profiles across the encompassing landscape. The presence of water falls and rapids (knickpoints) along river profiles reveal subtle geological structure. Integrated maps point to present and historical links (and barriers) across neighbouring drainage systems in relation to structural controls. Additional to the resolution they provide into the dynamic histories of fluvial systems, spatial contexts of knickpoints reveal valuable insights into potential barriers to dispersal of aquatic biota through fluvial systems. This poster presents the preliminary findings of selected river profiles in the study region.

**Key words:** Congo, Zambezi, knickpoint, SRTM, south-central Africa.