International Cartographic Association
Association Cartographique Internationale

A hydrogeomorphic approach to river characterization in the Breede River catchment, South Africa.

Pearl Mzobe [a,b]*, Nancy Job [a], Michael Grenfell[b]

[a] *South African National Biodiversity Institute (SANBI), Kirstenbosch Research Centre, South Africa; p.mzobe[at]sanbi.org.za N.Job[at]sanbi.org.za*
[b] *University of the Western Cape, Department of Earth Sciences, South Africa; mgrenfell[at]uwc.ac.za*

* Corresponding author

Keywords: river ecosystem types, fluvial geomorphology, biodiversity assessment, freshwater

Abstract:

The South African National Biodiversity Institute (SANBI) is mandated to produce a comprehensive report every four years, called the National Biodiversity Assessment (NBA), which outlines the state of biodiversity in the country. Many biodiversity conservationists and monitoring practitioners use the findings of the NBA to direct their efforts and allocate programme funding. The latest report, NBA 2018, focused on six realms: terrestrial, inland aquatic, estuarine, marine, integrated coast, and sub-Antarctic. In the inland aquatic realm, 222 river and 135 inland wetland ecosystem types were assessed. A finding of the assessment was that the ecological condition of river systems in South Africa was in decline due to factors such as degradation and human pressure. Spatially, the assessment indicated that there were shortcomings in the rivers assessment component related to poor river type representation and insufficient availability of baseline data. Our research aims to address the river ecosystem type problem and contribute to growing the number of baseline indicators available. Using geospatial analysis and modelling driven by open-source algorithms, we adopt a bottom-up physiographic, i.e. fluvial geomorphology, approach to provide river type metrics in the Breede River catchment. Preliminary results indicate that topographic and fluvial geomorphology indicators can be extracted and used with confidence to represent broad catchment typology. Future applications of the methodology include upscaling the analysis to national level and evaluating the ecological implications of our findings using biomonitoring data. These efforts will help strengthen the science base from which the NBA 2024 draws and update the guidelines supporting biodiversity assessment practitioners in the field.

Abstracts of the International Cartographic Association, 6, 179, 2023.
31st International Cartographic Conference (ICC 2023), 13–18 August 2023, Cape Town, South Africa.
https://doi.org/10.5194/ica-abs-6-179-2023