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Title:	Spatio-temporal variations in the water quality of the Doorndraai Dam, South Africa: An assessment of sustainable water resource management
Authors:	Yunus, Ali P. (/jspui/browse?type=author&value=Yunus%2C+Ali+P.)
Keywords:	Land use land cover SPM
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Abstract:	<p>The problem of water scarcity and clean water in sub-Saharan Africa is a growing concern. This study aims to quantify the water quality on a temporal scale in the Doorndraai dam site in sub-Saharan Africa to design possible management options. Here, an integrated approach using both in-situ measurements of water quality parameters and remote sensing data was used to derive the water quality index (WQI) and inherent optical properties of water to deduce the factors governing seasonal and annual variability. The results show that all the water quality parameters analyzed fall under the permissible limit of the World Health Organization (WHO) for drinking water, except turbidity. The average value of turbidity for the dry and wet periods was 12.52 and 3.39 NTU, respectively. WQI value ranges from good to excellent during the wet season, and poor in the dry season owing to the high values of turbidity in the water samples. Both in-situ and remote sensing-based analysis shows that during the last five years, the value of suspended particulate matter (SPM) based on Landsat-8 increased gradually in the study area. The Sentinel-2 derived modified normalized difference water index (MNDWI) shows a decreasing trend in the water area due to encroachment. The strong correlation between in-situ and remote sensing data supports the usefulness of remote sensing techniques for water resource management, especially in data-scarce regions. Looking at the spatio-temporal trend of water quality evolution, the findings of this study will help local decision-makers design sustainable plans for water resource management of Doorndraai dam.</p>
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