



GIS-based analysis of water quality deterioration in the Nerus River, Kuala Terengganu, Malaysia

Hassan Mohammed Ali Alssgeer^a, Muhammad Barzani Gasim^a, Marlia M. Hanafiah^{b,*}, Elhadi Ramadan Ali Abdulhadi^c, Azman Azid^a

^aEast Coast Environmental Research Institute (ESERI), University Sultan Zainal Abidin, Gong Badak Campus, 21300 Kuala Nerus, Terengganu, Malaysia

^bSchool of Environmental and Natural Resource Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia (UKM), 43600 Bangi, Selangor, Malaysia, email: mhmarlia@ukm.edu.my

^cSchool of Social, Development and Environmental Studies, Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia (UKM), 43600 Bangi, Selangor, Malaysia

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ABSTRACT

The Nerus River Basin is located on the east coast of Peninsular Malaysia passes through the populated urban area of northern region of Kuala Terengganu, Malaysia. Over the last 10 years, the Nerus River has experienced population growth and rapid development, resulting in large-scale of land use changes. Changes in land use cause deterioration of the water quality of the Nerus River. This study aimed to estimate land use changes from the past condition (2000–2013) and the present condition (2016) within the Nerus River using geographical information system and statistical approaches. Main factors such as seasonal changes and pollution sources were included in the analysis. The monitoring of water quality was done based on three sampling stations during both dry and wet seasons, involving analysis of six water quality parameters (pH, dissolved oxygen, BOD, chemical oxygen demand, NH₃-N, and total suspended solids). Water quality classification is using the National Water Quality Standard for Malaysia and the Water Quality Index. Multivariate statistical technique such as principal component analysis was conducted to determine sources of water pollution, to evaluate the similarities and dissimilarities between sampling stations, and to determine the influence of sources of pollution on the water quality parameters of the Nerus River based on the available land use database. Overall, the river was classified as Class III (slightly polluted) in accordance with previous studies.

Keywords: Water pollution; Water quality; GIS-based analysis; Nerus River; Malaysia

* Corresponding author.