

Modelling of nitrates in River Nzoia using MIKE 11

ABSTRACT

Eutrophication is a serious problem in Lake Victoria as a result of enrichment by nutrients transported by the rivers draining into it. River Nzoia is one of the main rivers draining into the lake. The main aim of this study was to simulate the level of nitrates using MIKE 11 and to establish relationship between nitrogen and phosphorus. The model was calibrated using water quality data for 2009 and validated with March 2013 data and then it was used to simulate nitrate concentration for the wet month of April 2013. The model performance was good with R-2 values of between 0.87 and 0.98 and EF values of between 0.73 and 0.96. From the simulations, the effluent discharge from municipal and industrial wastewater ponds elevated the concentration of the nitrates in the river. Analysis of the concentrations of nitrates for wet and dry periods showed significant variations indicating significant contributions from the catchment through runoff. The relationship between total nitrogen and total phosphorus was analysed and found to have a strong positive correlation ($r = 0.714$, $p < 0.05$) indicating that both originate from similar sources or are influenced by the same factors such as agriculture.

AUTHORS

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