

Title of Article: Reaeration coefficient modeling: a case study of river Atuwara in Nigeria

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Abstract: A study of the self-purification capacity of River Atuwara was done with the aim of developing a reaeration coefficient model, k_2 , for the river. The k_2 model was evaluated and validated by comparing its performance with the Streeter-Phelps and Agunwamba models. Atuwara model was developed using non-linear regression while its performance was checked by the use of statistical and graphical parameters. The model gave the best dissolved oxygen predictive capacity in comparison with other models when used with the modified Streeter-Phelps equation in spite of the limitations imposed on it by the sinusoidal shape of the dissolved oxygen recovery curve caused by frequent interruptions in the recovery processes of the river system. It is also of note that due to its importance to human and aquatic life sustenance, the natural recovery processes of River Atuwara from frequent pollution loads could only be enhanced through an effective monitoring and regulation of effluent discharges into it by the Ogun State Environmental Protection Agency.

Key words: Dissolved oxygen, model, non-linear regression, Ota, re-aeration coefficient, river system