

## Bayesian Inference of Physicochemical Quality Elements of Tropical Lagoon Nokoué (Benin)

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**Abstract :** In view of the very strong degradation of aquatic ecosystems, it is urgent to set up monitoring systems that are best able to report on the effects of the stresses they undergo. This is particularly true in developing countries, where specific and relevant quality standards and funding for monitoring programs are lacking. The objective of this study was to make a relevant and objective choice of physicochemical parameters informative of the main stressors occurring on African lakes and to identify their alteration thresholds. Based on statistical analyses of the relationship between several driving forces and the physicochemical parameters of the Nokoué lagoon, relevant Physico-chemical parameters were selected for its monitoring. An innovative method based on Bayesian statistical modeling was used. Eleven Physico-chemical parameters were selected for their response to at least one stressor and their threshold quality standards were also established: Total Phosphorus (<4.5mg/L), Orthophosphates (<0.2mg/L), Nitrates (<0.5 mg/L), TKN (<1.85 mg/L), Dry Organic Matter (<5 mg/L), Dissolved Oxygen (>4 mg/L), BOD (<11.6 mg/L), Salinity (7.6 .), Water Temperature (<28.7 °C), pH (>6.2), and Transparency (>0.9 m). According to the System for the Evaluation of Coastal Water Quality, these thresholds correspond to "good to medium" suitability classes, except for total phosphorus. One of the original features of this study is the use of the bounds of the credibility interval of the fixed-effect coefficients as local weathering standards for the characterization of the Physico-chemical status of this anthropized African ecosystem.

**Keywords :** driving forces, alteration thresholds, acadjas, monitoring, modeling, human activities

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