



## **A mathematical model for wastewater modification processes assessment in a stabilization reservoir**

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### **ABSTRACT**

The paper presents a mathematical model for the simulation of the ecological status of a wastewater stabilization reservoir (WSR). WSRs are hypertrophic aquatic systems devoted to storage of water resources in warm countries where shortage conditions have quite often to be faced. Several factors that affect the stabilization reservoir effluent quality were taken into account: hydraulics and hydrology, solar radiation, atmospheric reaeration, algae, zooplankton, organic matter, pathogen bacteria, and sediment-water interaction. The model quantifies the specific influence of each factor on effluent quality, evaluating the correlation between the different considered factors. State variables included in the model were: algae, dissolved oxygen, organic matter, zooplankton and indicator bacteria. The model was applied to an Italian stabilization reservoir located in the south part of Sardinia: the Simbirizzi's lag. The model showed satisfactory results and can be employed as an useful tool for environmental water quality management of stabilization reservoirs.

### **KEYWORDS**

Water resources management, mathematical modelling, stabilization reservoir, wastewater treatment.