

MULTIOBJECTIVE MODEL FOR WASTE-LOAD ALLOCATION

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ABSTRACT

Waste-Load Allocation is a difficult problem, multiobjective in nature, requiring models that consider the full range of competing goals for identifying good and practical solutions. In this work, a general multiobjective mathematical optimization model is proposed. The model is able to integrate different decision variables related with multiple wastewater treatment plant efficiencies and outflow discharges into water bodies, considering equity and dissolved oxygen and biochemical oxygen demand concentration limits. The model is solved through a simulated annealing algorithm and QUAL2E rivers water quality simulation model. The method was applied to Santa Maria da Vitória river watershed, located in Espírito Santo State, Brazil. There were illustrated several case studies, to present the type of results that can be obtained through the application of the model. The results demonstrated that the proposed optimization model can help optimal waste load allocation planning.

PALAVRA-CHAVE: Waste-Load Allocation, Water Pollution, Simulated Annealing