STOCHASTIC MODELLING OF ORGANIC MATERIAL IN URBAN WASTE WATER SYSTEMS

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ABSTRACT

In order to understand and describe the production and variation of the organic material (described in terms of BOD_5) in an urban waste water system, the main parts of this system i.e. households, sewers and drainage (when a combined system is examined) should be integrated into a single model. This is a multivariable system and its combined response at the outlet of this system, which is usually the entrance of a waste water treatment plant, depends on a number of environmental (rainfall and temperature) as well as social (size of the urban area, population changes, water consumption per capita) variables.

Existing methods usually describe the individual components of this system focusing only on the changes that take place in the sewers and the waste water treatment plant while limited or no information is given on the mechanisms that affect the organic matter production.

In this paper a stochastic model is proposed in order to estimate the organic matter production and variation throughout a year in an urban area.

Limitations in data availability and the complexity of this system affect the ability to achieve robust model calibration. However, preliminary results of this BOD_5 model illustrate the potential of the stochastic modelling approach for assessing environmental problems.