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**INVESTIGATION OF WATER QUALITY STATE DYNAMICS OF THE DANUBE
RIVER IN THE EASTERN PART OF ROMANIA**

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Abstract: The study of aquatic systems is an extremely important issue in the context of saving natural resources. In this respect, the description of the evolution over time and the dynamics of some status parameters describing the dynamic aquarium system is a rather difficult problem.

This paper presents a method of representing evolution over time and some status parameters that allow assessment of the status of an aquatic system. The method outlined in the paper is based on the use of automated neural network (ANN) models. As a case study, the aquatic system of the Danube River near Galati, Romania is considered. The article describes the stage of training, validation and application of neural network models (ANN) for assessing pH and carbonic acid level. For a fair evaluation, a total of 20 different models were constructed and a number of 6 ANN models were presented which had the best performances for assessing the HCO₃ concentration and pH value in Danube waters respectively.

The performance of the ANN models was evaluated by the coefficient of determination (R) (square of the correlation coefficient), the mean square error (MSE). The identified models can be used as tools for calculating water quality parameters

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