



Assessment of water quality on a large scale using the Rapid Environmental Status tool

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Mediterranean basins are exposed to overexploitation and high pollution level, which produce degradation of water systems and a loss of biodiversity. To ensure a good ecological state of rivers, we proposed to develop a water quality model to simulate and evaluate environmental risk at a large scale.

The main objective of this study is to model the water quality of altered water regime of each type of water river bodies and analyse three physicochemical parameters (Total Organic Carbon [TOC], Phosphates and Ammonium). The methodology was applied to the Catalonia Internal Basins [CIC by its Spanish acronym], in the North-west of Spain.

The Rapid Environmental Status tool [R2EA by its Spanish acronym] was used to include the most important elements that affect the natural regime of the river and the main sources of pollution. This tool forms part of the Decision Support System [DSS] shell AQUATOOL (Andreu, Capilla, & Sanchís, 1996). Once the model was developed, it was calibrated using the records of the observed data provided by the Water Catalan Agency [ACA by its Spanish acronym].

Finally, we compared the actual ecological status with the classification did with the concentration series generated with the R2EA model. The model correctly represents the environmental state of more than 80% of the water bodies, based on TOC and Phosphates results. The ammonium is the parameter worst represented with a success rate of 70% respect the observed data.

In addition, the results showed a high environmental risk during summer months and droughts. Many studies about droughts are expected to increment in frequency, intensity and magnitude of this climatic phenomenon and a general reduction of inflows of the semi-arid basins. These periods are especially critical to the aquatic ecosystems, the decrease in ecological status by increased chemical risk can be an important problem to the biologic community of these habitats.

Hence, we conclude that the presented tool will be useful to the process of making decisions to manage with sustainable criteria. Besides, R2EA allows modelled water bodies without observed data control, that can be an opportunity to have an idea of the environmental status of these rivers and include or not their control in future data collections programs.

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