Modeling watershed dynamics in agricultural/silvopastoral system of a semi-arid zone: Enxoé River in southeast Portugal

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Abstract

Enxoé watershed is located in the south-east of Portugal and this watershed is ended by a reservoir. Enxoe river is a semi-arid system of the southern Europe. Enxoé reservoir was built in year 2000 serving water for human consumption and in the first year high flow season (a dry year in the area) introduced excess nutrients in the reservoir boosting cyanobacteria blooms (up to 300 μg/l) that are toxic algae and jeopardize water quality for water production.

The watershed land use is composed of i) olive trees and ii) oak silvopastoral systems. In Enxoé watershed floods rise fast (rising levels to peak occur up to couple of hours) showing runoff contribution that may drag sediment and organic material deposited during dry periods in upland and river. The understanding of watershed soluble and particulated fluxes and their quantification may help in the design and testing of implemented management actions to reduce Enxoé reservoir trophic state.

Enxoé reservoir algal blooms diminished their intensity but still remain high concentrations up to the present and the goal of the study was: i) to quantify the watershed input loads to the reservoir and ii) understand watershed dynamic to support management responses.

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Keywords: watershed modelling, SWAT, erosion, Enxoé, Aguaflash