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Evaluation of In-Stream Processes of Four Temporary Rivers

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Temporary waters courses dominate the semi-arid climate of the Mediterranean area. Temporary rivers are natural bodies of water that experience a recurrent dry phase of varying duration and spatial extend. There is high spatial variability during the wet and dry period especially at their estuaries. In the wet period we have floods with remobilization of nutrients, high sediments loads and expansion of the wet area of the river and during the dry period we have slow accumulation of sediments, creation of "hot spots", and high variation of temperature and soil moisture and contraction of the river wet area. The in-stream processes influencing nutrient availability in temporary rivers are poorly understood.

The objective of this study is to evaluate the in stream processes of four Mediterranean temporary rivers: Krathis river (Greece), Tagliamento river (Northen Italy), Mulargia river (Sardinia, Italy), Pardiela river (Portugal). In the EU-project tempQsim (EVK1-CT2002-00112) a Conceptual Site Model for the study sites has been established and from the analysis of nitrogen and phosphorous cycles the most important in-stream processes were identified and studied in the laboratory. Thus, mineralization was identified to play an important role in the nitrogen cycle and was studied in the laboratory under different soil moisture conditions, simulating the drying period. The majority of the processes in sediments continue to occur even with minimum soil moisture of 20 %. Leaching studies were performed in order to simulate the behaviour of nitrogen and phosphorous leaching in saturated conditions. These studies evaluated the effect of temperature on the leaching of nutrients. Finally, the adsorption capacity of sediments for nutrients under different temperature conditions was studied.

Sediments were collected from the 4 sites from three different habitats (Margin of the wetted channel (CM), Dry gravel or sand bar (B), Margin of the riparian zone (R)). A physicochemical characterization of the sediments was conducted by estimating the pH, porosity and dry bulk density as well as the chemical composition of the sediments. A comparison of the in-stream processes of the four rivers will be presented.