Geophysical Research Abstracts, Vol. 7, 02996, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02996

Retention and Mobilisation of Nutrients in two Mediterranean Temporary River Catchments: River *La Vène* in Languedoc-Roussillon/France and River *El Albujón* in Murcia/Spain

S. Kretschmer

University of Duisburg-Essen, Dept. of Soil Technology, 45117 Essen, Germany
(sven.kretschmer@uni-essen.de / Phone: +49 (0)201 1833202)

This study is part of the EC-project *TempQsim* (EVK-CT-2002-00112) that is aimed at creating efficient tools for water management in European Mediterranean regions. The Mediterranean temporary rivers are characterized by water scarcity during summer months and flood events during autumn and winter months. In dry seasons when river flow is low or absent, organic matter is accumulating within river channels. Heavy rainstorms generate a sudden river discharge that sweeps along accumulated organic material and loose sediment. In addition the surface runoff in semiarid agriculture landscapes causes soil erosion (especially on horticulture, pomiculture and viticulture). In total the first flush brings high nutrient and sediment loading to marine or limnic ecosystems and affects fresh water resources.

Therefore it is necessary to locate and prevent nutrient and sediment input to streams, especially during dry months. The main nutrient sources that affect stream water quality resp. sediment quality are sewage input and non-point sources like fertilizer and soil erosion.

This study describes the standing stock of nutrients in soils, sediments and macrophytes that are potentially being moved and mobilised by surface runoff and first flush discharge. Two southern European semiarid river catchments are compared. One river channel (*El Albujón*) is located in southwest Spain and drains a flat plain (400 km^2).

The other temporary river (*La Vène*) is located in south France and drains a 67 km^2 basin with a large carstic area. Both rivers discharge into coastal lagoons.

The survey of phosphorus along the Spanish study river reveals considerable concentrations in topsoil and dust ($P_{total\ in\ soil}$ = 490-1180 mg kg^{-1}; $P_{total\ in\ dust}$ = 420-930 mg kg^{-1}) and a very high range of phosphorus in upper sediment layers ($P_{totalinsediment}$ = 140-1220 mg kg^{-1}). In three large settling basins sediment profiles were sampled up to a depth of 50 cm. The sediment is built up by many different layers that are striking different in texture, color, gravel content and nutrient concentration. That indicates different sediment sources. The *Albujón* catchment is intensely used by horticulture and pomiculture with irrigation and is susceptible to wind erosion. The stream banks are liable to water erosion because of the lack of protection. Erosion is an essential factor for movement of particle bound phosphorus. Sources of particulate phosphorus in the *Albujón* channel include eroded surface soil, stream banks and the channel bed. There, a stock of accumulated easy removable matter (topsoil and dust) with high phosphorus content exists that will be washed away by the next surface runoff.

Hydrology and sediment/nutrient storage of the second study catchment *La Vène* (France) is different compared to the *Albujón* river. Pools are retaining water even during dry summer months. Macrophytes (mainly algae and mosses) are building up a 1-3 cm thick organic layer that covers the channel bed and keeps it moist. It is possible that accumulation of organic matter plays an important role concerning transformation-, retention- and release-processes of nutrients. A mapping of biomass of algae and moss and the calculation of total organic nutrient storage within the 10 km river channel has been performed (Carbon: 3300 kg; Nitrogen: 300 kg; Phosphorus: 100 kg; Sulphur: 90 kg). Furthermore the fine sediment storage was mapped and its inorganic nutrient content has been analysed. This biomass and sediment survey will deliver a raw estimation of the possible first flush discharge loading during the next storm event.