



The role of macrophytes in the deposition, erodibility, and transport of fine sediments in lowland permeable streams

Geraldene Wharton

Queen Mary University of London, School of Geography, London, United Kingdom (g.wharton@qmul.ac.uk)

Increased inputs of fine sediment to lowland permeable streams in the UK, as a result of changing land-use practices, channel modifications, and groundwater abstraction, have been raising concerns for the health of these aquatic ecosystems. Fine sediment ingresses into the gravel beds of permeable rivers and affects the exchanges in the hyporheic zone; and contaminants adsorbed to fine sediments, such as pesticides, nutrients and heavy metals, alter the biogeochemical processes in these systems.

This paper will present the key findings from several research projects conducted in the Frome-Piddle catchments, Dorset, UK, since 2002, examining the interactions between in-channel vegetation, flows and fine sediments. Research has quantified the role of submerged and emergent macrophytes, which can typically reach total cover values of 80%, in the trapping and retention of fine sediments. Sediment budgets have been estimated for macrophyte-dominated reaches and the importance of macrophytes in determining the timescales for the in-channel storage of fine sediments has been demonstrated. The processing of sediments by suspension feeders living on the macrophytes and the biogeochemical processes in the sediments trapped within macrophyte stands have also been studied. Results from tracer experiments are providing insight into how spatial and temporal (seasonal) changes in macrophyte cover control the transport of fine sediments through reaches. And detailed studies of the erodibility of surficial fine sediment deposits in relation to in-channel macrophyte growth are further improving our knowledge of the stability of these deposits in lowland vegetated rivers.