



## **Fine particulate sediment transport and retention in two lowland streams with seasonally changing in-channel vegetation**

G.R. Davies

Department of Geography, Queen Mary University of London, UK (g.r.davies@qmul.ac.uk)

Previous work on lowland gravel-bed streams have highlighted some of the problems associated with the oversupply of fine particulate matter (FPM) (<1mm). Increased loading of FPM into streams and rivers has been shown to cause an increase in turbidity, infilling of gravel and ultimately colmation which in turn causes perturbation and degradation of the in-stream habitat. Consequences of increased FPM supply include decreased salmonid fecundity, reduced hyporheic flow exchange and increased inclusion of contaminant particles.

UK chalk streams are a specific example of lowland stream which currently suffer from an oversupply of fine sediment. They are aquifer-fed streams and rivers within small catchments, with headwaters and or conduits flowing over calcareous geology. They possess characteristic 'gin clear' water, stable hydrographic responses and productive in-stream flora and fauna communities. Abundant seasonal growth of aquatic macrophytes within chalk stream catchments has previously been associated with high localised FPM retention.

Aquatic macrophyte species such as water crowfoot (*Ranunculus* sp.) act as 'biological engineers' that can influence the deposition of fine sediment in lowland streams and rivers due to localised changes in water velocity gradients. It is suggested that channels of high velocity flow are created by the roughness of macrophyte stands, and these channels promote entrainment and transport of FPM within the main channel of flow. The aim of this work is to analyse the spatial, compositional and temporal changes of in-channel macrophyte growth within two chalk stream reaches and quantify their impact on FPM transport and retention.

This is an on-going investigation which comprises of monthly in-stream surveys combined with seasonal analogue particle releases on two stream 30m reaches in the Frome-Piddle Catchment, Dorset. Data from monthly in-stream surveys are analysed using a specially designed GIS. In conjunction with surveys the transport and retention of FPM within two chalk stream reaches are currently being assessed using release and capture of analogue particles in the form of stained corn pollen. Corn pollen particles are a good representative surrogate for natural FPM particles due to their mean particle diameter (87µm) and similar density (1.09 g cm<sup>-3</sup>). Results include changes and comparisons of seasonal macrophyte coverage with associated changes in localized channel velocities and analogue particle transport and retention.