



Sediment tracing by ‘customised’ magnetic fingerprinting: from the sub-catchment to the ocean scale

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Robust identification of catchment suspended sediment sources is a prerequisite both for understanding sediment delivery processes and targeting of effective mitigation measures. Fine sediment delivery can pose management problems, especially with regard to nutrient run-off and siltation of water courses and bodies. Suspended sediment load constitutes the dominant mode of particulate material loss from catchments but its transport is highly episodic. Identification of suspended sediment sources and fluxes is therefore a prerequisite both for understanding of fluvial geomorphic process and systems and for designing strategies to reduce sediment transport, delivery and yields. Here will be discussed sediment ‘fingerprinting’, using the magnetic properties of soils and sediments to characterise sediment sources and transport pathways over a very wide variety of spatial scales, from Lake Bassenthwaite in the English Lake District to the Burdekin River in Queensland and even the North Atlantic Ocean during the last glacial maximum. The applicability of magnetic ‘fingerprinting’ to such a range of scales and environments has been significantly improved recently through use of new and site-appropriate magnetic measurement techniques, statistical processing and sample treatment options.