

Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11110, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11110
EGU General Assembly 2008
© Author(s) 2008



Techniques for tracing organic matter between terrestrial and aquatic environments

E. L. Petticrew and N. D. Williams

Geography Program, University of Northern British Columbia, Prince George, British Columbia, Canada. (ellen@unbc.ca / Fax: 1 250 960-5539 / Phone: 1 250 960-6645)

Material transfers from the terrestrial component of the watershed to its rivers, which are the aquatic vectors for the delivery of material out of the system, involve a range of processes from the macro to the molecular-scale. Soil erosion delivers both inorganic and organic matter to the stream networks and while a great deal of research has been undertaken on inorganic source tracing, less emphasis has been placed on tracing organic matter. Successful methods used to differentiate organic source material include stable isotope analysis of C and N which can demarcate terrestrial, aquatic and marine derived nutrients in riverine seston and sediment. Microbial populations have also been used to track fecal material in rivers with varying degrees of success. Experiments in southwest England in 2006 attempted to characterize variable sources of organic matter delivered to streams through measures of bacterial activity and genetic markers. Adenosine triphosphate (ATP) analysis allowed a comparison of the relative abundance of active bacteria, indicating organic matter quality, while genetic characterization of the organic source material in watershed soils and fertilizers were analyzed using a DNA fingerprinting technique that provides evidence of specific organisms (bacteria, fungi) and persistent genetic assemblages of organisms which may be particular to that source. The potential for, and the success of these techniques for tracing organic matter in watersheds will be presented.