



Location, location, location: The importance of sampling site in sediment source fingerprinting

Alexander J. Koiter (1), Philip N. Owens (2), Ellen L. Petticrew (3), and David A. Lobb (4)

(1) Natural Resources and Environmental Studies Program, University of Northern British Columbia, British Columbia, V2N 4Z9, Canada (koiter@unbc.ca), (2) Environmental Science Program and Quesnel River Research Centre, University of Northern British Columbia, Prince George, British Columbia, V2N 4Z9, Canada (owensp@unbc.ca), (3) Geography Program and Quesnel River Research Centre, University of Northern British Columbia, Prince George, British Columbia, V2N 4Z9, Canada (ellen@unbc.ca), (4) Department of Soil Science, University of Manitoba, Winnipeg, MB, R3T 2N2, Canada (david.lobb@ad.umanitoba.ca)

Sediment adversely impacts the quality of surface water and is a significant source of contaminants such as nutrients and pesticides. Correctly identifying the contributions of different sediment sources is an important part of designing and targeting conservation efforts. Effective river basin management strategies to address these issues increasingly rely on sediment fingerprinting to identify sediment sources. Basin geomorphology, topography and hydrology are factors that strongly influence sediment dynamics, and as such they need to be taken into consideration when selecting sampling locations and when interpreting the data. However, in sediment fingerprinting, the importance of sampling location is often overlooked. For example, sediment transport in low-order streams in the headwaters is controlled by hillslope processes, whereas in high-order streams closer to the outlet transport is controlled by channel processes. Therefore, sediment collected at the river basin outlet may not accurately represent processes affecting sediment dynamics elsewhere in the river basin, but in many studies samples are collected at outlets alone. This can lead to poor management decisions based on the incorrect assessment of the relative contributions of different sediment sources. The utility of sediment fingerprinting can be improved by carefully considering which locations to sample and recognizing the effect this choice will have on data interpretation.