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Fingerprinting sediment sources in agricultural watersheds using inorganic properties

Increases in erosion rates and sediment loads within watersheds can cause serious environmental problems. Currently, the goal of research is to understand the source, fate, and transport of sediment mobilized within a watershed. This information is critical to developing and targeting management strategies that will reduce erosion rates and sediment loads. Sediment tracing is an emerging technique being used to help address these issues. This technique is based on the assumption that one or more of the properties of the sediment will reflect the source form where it originated from and can be used as a tracer to trace the sediment back to its sources. However, the processes that link the sediment sources to the point of collection are not well understood or quantified and currently there is an underlying assumption of a direct link between hill slope and downstream sediment in terms of property conservativeness. The main objectives of this research are to test the assumptions of tracer conservativeness by investigating how the physical and geochemical properties of sediments change as it moves through each of the three key areas of the landscape; the hill slopes, riparian zones and river channels. These objectives will be addressed with both field and experimental studies using the facilities at UNBC's Quesnel River Research Centre and field sites within the Quesnel River watershed.