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Tracing sediment back to their sources with biogeochemical fingerprints involves multiple assumptions. One of the most fundamental assumptions is the conservative behavior of tracer properties during sediment generation, transportation, and deposition processes. Essentially, the biogeochemical fingerprints used to trace sediment must remain constant, or conservative, during these erosion processes, or they must vary in a predictable way. At the core of this assumption of conservative behavior are potential particle size impacts. Owing to the significance of particle size for sediment tracing research, we believe it is important to present an overview of past and present techniques used to address particle size, along with possibilities for future research. The two primary approaches utilized to address particle size impacts are fractionation (e.g., $<10\mu$m and $<63\mu$m fractions) and corrections (e.g. specific surface area), with both approaches often used simultaneously. The effectiveness of fractionation and corrections to address particle size has received increasing attention, testing fundamental assumptions central to the applicability of sediment tracing and fingerprinting. Alternative approaches to addressing particle size have also been presented. For example, researchers applying the tributary tracing approach or sampling sediment generated directly on hillslopes may potentially address particle size impacts in their sampling design. Although these approaches have been presented in the literature, their effectiveness has yet to be determined. For the future, we boldly suggest that there are likely situations where particle size may be potentially used as a fingerprint in and of itself. Indeed, potential particle size impacts are directly related to the biogeochemical fingerprints used to trace sediments and we believe that there is a fantastic opportunity to obtain further sediment source information through comprehensively investigating and unravelling inherent particle size complexities.