Discrimination of sediment sources by using suitable fingerprinting properties
(Case study: Atary Catchment)

This contribution uses a combination of statistical procedure to investigate the degree of discrimination of potential sediment sources by using suitable fingerprinting properties. First the Kruskal-Wallis test has been used for eliminating redundant fingerprint properties as a whole then discrimination function analysis (DFA) was used to assess the discriminatory power of individual fingerprint properties and composite fingerprints drawn from the individual groups of fingerprint properties. Finally, a multivariate stepwise selection algorithm, based on the minimization wilks’lambda, was used to identify the smallest combination of properties drawn from any group that provided the maximum discrimination of the source categories. Statistical Analysis confirms that there is no single diagnostic property capable of discriminating the range of potential sediment sources. The use of composite fingerprints based on several constituents drawn from a single group of properties consistently improves sediment source discrimination. Composite fingerprints incorporating constituents selected from several groups of properties using a stepwise statistical selection procedure consistently provide the most robust discrimination of potential sediment sources. Results show that organic constituents group of properties is extremely useful for sediment source discrimination in similar catchments.

Keywords: sediment source, fingerprinting, Kruskal-Wallis

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