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# The correct use of Sr isotopes in river-groundwater mixing models: A Breede River case study

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## Abstract

Stable isotopes are used extensively in hydrology as a means of establishing the contribution of different reservoirs and sources to the water budget. If the information contained in stable isotope data is to be used in a quantitative sense, appropriate mass balance equations have to be used. Specifically, differences in the equations used for isotopes such as $^{87}Sr/^{86}Sr$ associated with minor water constituents, and the isotopes associated with the water molecule itself, i.e. $^{18}O/^{16}O$ and D/H, has to be recognised. Failure to do so, as illustrated by a re-analysis of a published Breede River study, may lead to significant errors in the inferred magnitude of groundwater contribution to river flow and misleading assertions in regards to the cause of salinisation of river systems.

**Keywords:** strontium, isotope hydrology, Breede River, salinisation