



## **Stable water isotopes and Rn-222 to determine dam and groundwater contribution to baseflow and event flow in a small agricultural catchment**

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In order to improve local water managers understanding of nutrient inputs into Sydney's drinking water catchments, a detailed study of nutrients in streamflow has been carried out in the headwaters of Kellys Ck in the New South Wales southern highlands, Australia. One component of this study attempted to determine the flow pathways contributing to baseflow and to runoff generation during a rainfall event over a 128 ha catchment area.

Rainfall, stream, shallow groundwater, spring and dam samples were collected during baseflow (pre-event), flow event and post event periods around a 4 day rainfall event in July 2008. Samples were analysed for stable water isotopes, Rn-222, DOC, nutrients and major ions. Hydrograph separation and transit time distribution modelling were used to examine the contribution of event water, dam water and pre-event water to streamflow for a 9 day period encompassing the rain event. The results show that pre-event and event water contribute equally to streamflow with the pre-event contribution dominated by evaporated water (pre-event dam storage and soil water) rather than the more depleted shallow groundwater and spring water. Rn-222 was also used to understand the spatial variation of groundwater contribution during baseflow conditions.