

## **Hydrological investigations of surface water–groundwater interactions in a sub-catchment in the Namoi Valley, NSW, Australia**

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**Abstract** In catchments with multiple inputs and outputs of water it can be difficult to reconcile why various reaches of a river are gaining or losing water. If rivers and adjacent aquifers are to be managed sustainably, while balancing environmental, economic and social goals, it is important that the link between the river and the aquifer is correctly characterised. This paper demonstrates how the joint analysis of rainfall, streamflow and borehole hydrograph data can contribute to elucidating the hydrological processes occurring in the catchment and hence understanding these links. In particular, the impact of the groundwater abstractions are examined by analysing the hydrological data over large time scales (decades) which span the pre- and post-irrigation development periods as well as short time scales (weeks) during pumping and flooding events.

**Key words** surface water; groundwater; connectivity; losing and gaining rivers; catchment hydrology; correlation analysis