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Aquifer recharge from overbank floods

REBECCA C. DOBLE, RUSSELL S. CROSBIE & BRIAN D. SMERDON

Water for a Healthy Country, National Research Flagship, CSIRO Land and Water, PMB 2 Glen Osmond, South Australia 5064, Australia

rebecca.doble@csiro.au

Abstract Recharge from overbank floods is often neglected in water accounting as it is difficult to measure in the field, and highly variable between catchments. The physics of overbank flood recharge is not well understood, but it is becoming increasingly important for estimations of aquifer sustainable yield and accounting for artificial flooding used for improving riparian ecosystem health. Modelling of the overbank flood recharge process in a sandy loam aquifer was undertaken using a fully-coupled, surface–subsurface flow model to determine the prevailing characteristics of piezometric response to overbank flood recharge. Groundwater response to floods was also monitored in bores on the flood plain of the Bremer River catchment, South Australia. Both modelling and field monitoring showed that the rise in water table due to flood inundation was more rapid and the total rise was higher than for those examples where the bore was not inundated. The decline in piezometric level following the flood was slower than the bank storage response to within-bank events. The modelling showed that rapid infiltration and associated bore response did not necessarily take place in areas at the extremities of the flood extent if the period of inundation was short, as the vadose zone did not become fully saturated.

Key words recharge; floods; groundwater–surface water interactions