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The use of agent-based modelling in the evaluation of future scenarios for water use in the tropical savannas of the Northern Territory

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Water use in a tropical savannas region of the Northern Territory, Australia is guided and governed by the physical conditions of the aquifer and river system, the attributes of the community, and the rules embedded in legislation and in social norms. The current policy direction throughout Australia is driven by the National Water Initiative, one aspect of which is movement towards the use of water markets. This represents a change in the rules governing water use, and may have a range of impacts in the region. This paper describes a research project that evaluates how changes in the rules that guide and govern water use in the region could impact on social and environmental outcomes. The project is based around the Institutional Analysis and Development (IAD) framework, and makes use of agent-based modelling to model the responses of outcome variables to changes in the rules by which water is allocated. The IAD framework emphasises how the evaluative criteria chosen will impact on the outcome variables considered and from what perspective they are considered. The agent-based model enabled modelling of future scenarios to support and inform different groups' evaluation of the impacts, by revealing the key interactions between social, economic, political and ecological systems that might result from a water market.