

## **Risk management frameworks: supporting the next generation of Murray-Darling Basin water sharing plans**

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**Abstract** Water jurisdictions in Australia are required to prepare and implement water resource plans. In developing these plans the common goal is realising the best possible use of the water resources – maximising outcomes while minimising negative impacts. This requires managing the risks associated with assessing and balancing cultural, industrial, agricultural, social and environmental demands for water within a competitive and resource-limited environment. Recognising this, conformance to international risk management principles (ISO 31000:2009) have been embedded within the Murray-Darling Basin Plan. Yet, to date, there has been little strategic investment by water jurisdictions in bridging the gap between principle and practice. The ISO 31000 principles and the risk management framework that embodies them align well with an adaptive management paradigm within which to conduct water resource planning. They also provide an integrative framework for the development of workflows that link risk analysis with risk evaluation and mitigation (adaptation) scenarios, providing a transparent, repeatable and robust platform. This study, through a demonstration use case and a series of workflows, demonstrates to policy makers how these principles can be used to support the development of the next generation of water sharing plans in 2019. The workflows consider the uncertainty associated with climate and flow inputs, and model parameters on irrigation and hydropower production, meeting environmental flow objectives and recreational use of the water resource. The results provide insights to the risks associated with meeting a range of different objectives.

**Key words** risk management; water resource planning; risk assessment, water management modelling, eWater Source