# The role of water resource planning models in integrated water management: A Melbourne Water case study

**S.C. Ashbolt and M.D.U.P. Kularathna**

*Melbourne Water, Victoria, Australia*
*Email: stephanie.ashbolt@melbournewater.com.au*

**Abstract:** Alternative sources of water such as stormwater, rainwater and recycled water have been identified as important options to maintain water supply security for Melbourne over coming years, alongside the centralised surface water and desalinated water supplies (GWW 2023). At the same time, there is increasing effort and direction towards integrated water management at the local, state and federal level (e.g., GWW 2023, DEECA 2023, Productivity Commission 2021). This creates both a need and opportunity for water supply planning to identify and consider the potential contribution of alternative water sources, as well as to contribute to integrated water management and planning.

Melbourne Water's water supply planning is supported by a water resource planning model which represents the bulk water supply system, including urban, irrigation and environmental demands and supply to surrounding regions. Alternative sources are not currently explicitly represented in the model, but implicitly through reductions in projected water demand. However, local and catchment-scale models of stormwater treatment and harvesting schemes also exist to support catchment, flood and waterway health management and planning. Additionally, customer surveys provide data on rainwater harvesting which inform end-use modelling and demand projections. With the National Hydrological Modelling Platform (eWater 2023) supporting integrated water modelling at the local, catchment and regional scale, there is an opportunity to increase integration of these models to support integrated water management. This could help not only to identify the potential of existing rainwater, stormwater and recycled water supply schemes to reduce potable water demand and return water to the environment, but also to identify additional opportunities across different parts of the water cycle and planning scales.

However, what integrated water modelling means in practice is less clear. Most probably there will remain a need for separate models to support planning for different geographical scales and aspects of the water cycle, but for these to have greater integration with other models and planning activities. Therefore, questions for our water resource modellers to answer include:

1. How do we best determine the potential contribution of alternative water sources to water supply security?
2. How might water resource planning models best support integrated water management?

With this in mind, we are improving the capability of our water resources planning model in an 'Agile' approach. So far this includes the ability to represent stormwater and rainwater harvesting and their end-use demands as well as catchment run-on and run-off. Next steps involve determining how best to harness this capability, guided by the questions above. To help answer the first question, we plan to test potential approaches for scaling local-scale alternative sources to the catchment and regional scale of the model. The second question is being considered by: participating in integrated water management forums to understand the questions asked by planners; identifying interface points with other models; and extending and further testing the capability to model impacts of harvesting on catchment runoff and environmental flows.

## REFERENCES

DEECA, 2023. Integrated Water Management Forums, Department of Energy, Environment and Climate Action. https://www.water.vic.gov.au/liveable/integrated-water-management-program/forums

eWater, 2023. The National Hydrological Modelling Strategy & Platform, https://ewater.org.au/about-us/nhms/

GWW, 2023. Greater Melbourne Urban Water & System Strategy – Water for Life, Greater Western Water, Melbourne Water, South East Water and Yarra Valley Water. https://waterforlifestrategy.com.au/

Productivity Commission, 2021. National Water Reform 2020, Inquiry Report no. 96, Canberra

***Keywords:*** *Integrated modelling, water management, water resource planning*