

REDUCING UNCERTAINTIES AND ENABLING MULTIPLE BENEFITS IN WATER DELIVERY OPERATIONS

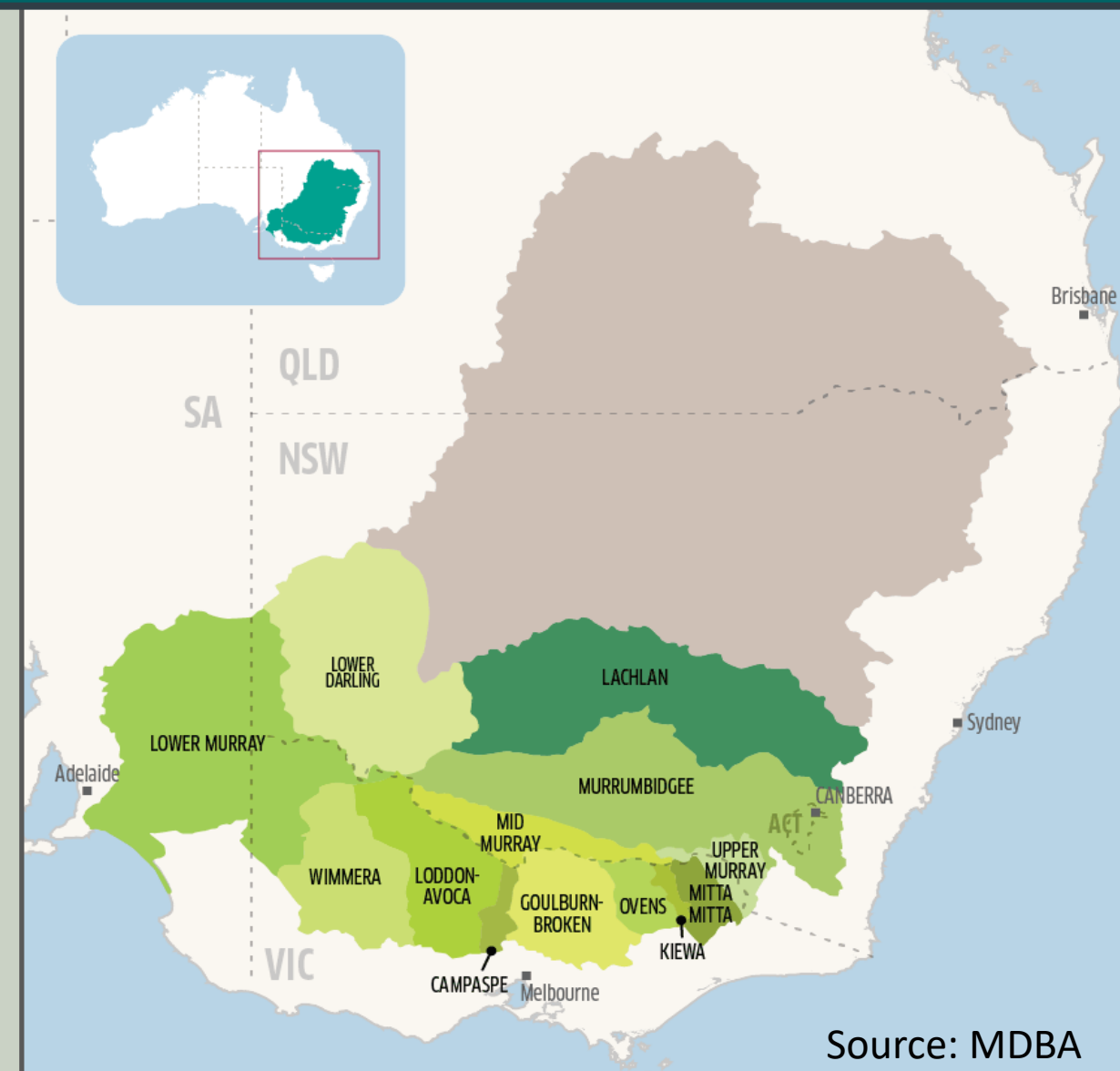
THE CHALLENGE

With increasing water scarcity, there is growing pressure to achieve more value from each drop of water. Water is currently delivered to farmers, communities and environmental assets across the Murray Darling Basin by a multitude of federal, state and local agencies in a fragmented manner, such that opportunities for generating co-benefits are missed.

For each delivery of water, water system operators are faced with uncertainties around water availability, water demand, transmission losses, unregulated inflows, and the outcomes of delivery options. Decision making around water deliveries is therefore a difficult task even when targeting a single outcome, let alone multiple outcomes.



Working with industry partners, the research will be based on case studies across the regulated Southern Connected Basin.



This project aims to improve information systems and processes that underpin decisions around water deliveries to reduce uncertainties faced by water system operators in the MDB, and to enable multiple environmental, social, cultural and economic benefits.

EXPECTED OUTCOMES

- Understand the institutional landscape necessary for fostering cooperation among water system operators and producing co-benefits at scale through water deliveries.
- Development of user-friendly, relevant and reliable tools to support water system operators in:
 - ❖ reducing water delivery uncertainties
 - ❖ increasing their capacity to implement and deliver strategies that deliver benefits to their organisations & customers and other water users.

OUR RESEARCH:

Systems of decision making

Understand current & alternative systems of decision making for water deliveries

- Examine rights and responsibilities around water deliveries and water accounting in MDB, including current and possible future models.
- Explore how water systems operators make decisions in case studies.
- Investigate information & tools used by decision makers.

Multiple benefits framework

Develop & test a multiple benefits framework that identifies the range of environmental, cultural, social and economic benefits of water

- Identify the broad range of benefits of water and their indicators.
- Synthesize and build on existing frameworks for assessing uses, outcomes and values of water
- Test & demonstrate in case studies.
- Explore challenge of understanding how to incorporate First Nations' values, needs and knowledge.



Models for evaluating delivery strategies

Co-develop & test models for evaluating transfer and delivery strategies

- Proposed evaluation tool based on rapid inundation modelling to assess delivery outcomes such as: whether demands are met, inundation footprint, potential benefits & disbenefits, and water losses.
- Develop, implement and evaluate models on core case study systems.

Control systems

Design a prototype control systems to aid water system operators in day-to-day operations

- Control systems use real-time measurements (e.g. water levels, flows, inundation levels) as input, and adjust the operational settings (e.g. flow releases, diversions) in order to achieve certain desired outcomes or objectives.
- Develop prototype control system for one case study leveraging the evaluation model.

Integrating tools into decision-making

Develop plans with industry partners to integrate tools into decision-making processes

- Develop work processes for integrating tools in operations
- Develop communication and engagement strategies for scaling project impact across the MDB
- Develop plans for future work in improving tools, and addressing knowledge gaps around water delivery strategies to achieve synergistic environmental, social, cultural and consumptive outcomes

The project will provide a blueprint of how water delivery systems can be managed for multiple benefits, including the governance, procedures, and tools required to facilitate this transformation in water deliveries in the Basin.



This 3-year project commenced mid-2024 and involves a number of partners.

Core Partners:



Affiliate Partners:

- ❖ Coleambally Irrigation Co-operative Limited
- ❖ eWater Limited
- ❖ HARC
- ❖ SA Water
- ❖ Western Murray Land Improvement Group (WMLIG)
- ❖ Bureau of Meteorology
- ❖ Goulburn-Murray Water (GMW)
- ❖ North Central Catchment Management Authority (NCCMA)



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