Project fact sheet

Multiple benefits

Reducing uncertainties and enabling multiple benefits in water delivery operations

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

Key points

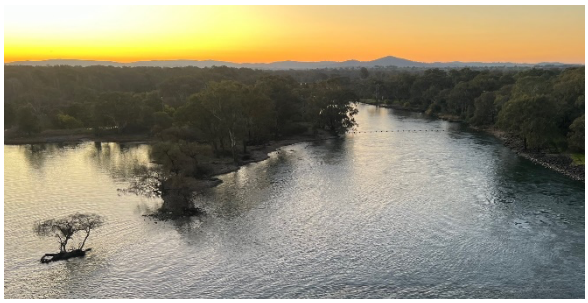
With a focus on water transfers and deliveries, this project examines how water system operations can be improved for water efficiency and cultural, social, environmental and economic co-benefits to other water users.

- We will examine how water system operators make decisions and why, including their decision criteria, the rights and responsibilities for water delivery and water accounting, and the information or tools operators use to support decisions.
- We will develop a range of prototype tools to support strategic water delivery decisions that generate multiple benefits, including:
  - a framework for assessing the broad range of benefits associated with water deliveries
  - models to evaluate potential outcomes of alternative transfer and delivery strategies, including accounting for future uncertainties
  - control systems to aid operators in achieving their objectives, by tuning operations based on real-time data.

The challenge

With increasing water scarcity, there is growing pressure to achieve more value from each drop of water. Currently, water is delivered to farmers, communities and environmental assets across the Murray–Darling Basin by a multitude of federal, state and local agencies in a rather 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. A reduction of uncertainties is therefore critical for helping operators to improve the effectiveness and efficiency of deliveries to achieve their own requirements (e.g. delivery to their customer) as well as co-benefits to others.



The opportunity

Working with industry partners, the research will examine the governance and institutional arrangements and operational decision-making space around water deliveries, and develop prototype tools for supporting the evaluation and implementation of delivery strategies. These models will be co-designed, developed and tested with end-users in select case studies in the southern basin.

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Cooperative Research Centres Program

Our research

The project will aim to:

1. understand the current and alternative systems of decision making for water deliveries
2. develop a multiple benefits framework that identifies the broad range of environmental, cultural, social and economic benefits of water and their indicators, at multiple scales
3. co-develop and test models for evaluating transfer and delivery strategies
4. co-develop and test a prototype control system to aid water system operators in day-to-day operations
5. develop plans to integrate tools into decision-making processes.

The project will focus on the regulated southern connected basin, using case studies.

Intended outcomes

- Understanding of the institutional landscape required to enable cooperation amongst water system operators and production of co-benefits through water deliveries
- Relevant, reliable and user-friendly tools that reduce uncertainties for water system operators and increase their capacity to develop and implement delivery strategies that yield better outcomes for themselves, their customers and other water users

Key personnel

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- QJ Wang
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Core partners

- Australian National University
- University of Melbourne
- Murrumbidgee Irrigation
- Murray–Darling Basin Authority
- University of Adelaide
- Water Technology

> “ 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.

One Basin CRC

Since our inception in mid-2022, the One Basin Cooperative Research Centre has brought together 85 partners across the Murray–Darling Basin.

Our purpose is to work together to grow value from water in a changing world.

From Queensland to South Australia, we are finding practical solutions to complex challenges, training the next generation of scientists, and nurturing regional communities.

Our collective goal is a productive, resilient and sustainable Murray–Darling Basin.

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