

# River operations and seasonal planning product

P1

**Project Leader: David Nicholls**

The role of Project P1 is to create a software product that will improve the capacity of users to manage river systems on a daily and seasonal basis.

## Project summary

River operators already have techniques and models for visualising and organising the storage and delivery of water under their control. However, different valleys or organisations often use different methods, and these may be poorly linked to the tools that planning colleagues use within an organisation. As well, there is a strong demand for effective seasonal planning tools for use by river operators. Project P1 is developing a product that can be adapted to meet the needs of all the operators in a basin or region and the long-term planners and managers who interact with those operators. It will also provide operators with the capacity to generate seasonal operating plans for up to three years.

The product, provisionally called 'RiverOperator', will provide a highly productive and efficient framework for the customisation and implementation of river operating tools. It will be designed to become the standard operating tool for all river management agencies. The use of common tools allows for improvements in data transfer and linkages between river and catchment models. A common platform will also allow the sharing of model enhancements developed by other parties.

This product will use real time and forecast inputs to track the short-term storage and movement of water and other constituents within river systems. It will be designed to allow users to:

- forecast and monitor river system behaviour in the short term (weeks) and medium term (up to three years);
- calibrate daily river system parameters based on observed daily data and current system behaviour, to accurately route system flows;
- decide on the optimum operation of river systems for delivering water in the short and medium term to satisfy consumptive and environmental demands;
- plan water transfers between catchments, rivers and reservoirs, as specified in operation and management plans;
- change water delivery requirements as a consequence of external influences such as water trading;

- track and account for water shares through river systems on a daily basis;
- make rapid decisions with regard to flood operations and surplus flow events;
- access predictions integrating hydrology, ecology, economic and social impacts.

RiverOperator is also intended to form the basis of a training and accreditation program for river operators, and to meet user needs for the next 15 years.

Initially the product will expand existing functionality so that both consumptive use and environmental flow can be managed, in the context of planning objectives specified in water management plans.

Later, after further development, the product will let users assess how the ecology and economics of river systems will be affected by river operation scenarios and decisions involving:

- flow regimes,
- water quality constituents,
- habitat and connectivity between rivers, floodplains and wetlands,
- connected groundwater systems,
- capacity to achieve ecological outcomes, which involve trade-offs between ecological and economic/ water supply objectives.

RiverOperator will be designed for web-based delivery, for use by regional-based bulk-water operators, water authorities and irrigators, as well as managers in CMAs and state natural resources management agencies, and researchers. A facility to audit the decision-making processes involved in river management will make the product useful also to water users and community groups concerned with consumptive and environmental flows.

## Key achievements 2006

- Documented user requirements across four states and the ACT.
- Developed the detailed plan for the product.

## 2007–2008 key deliverables

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- User requirements for the interface between the product, operators and business systems.
- Prototype product based on the foundation developed in Project P2.
- Investigate application of Rainfall Runoff Library toolkit and knowledge from research in Project D1 (Forecasting of stream flow) to development of real-time rainfall / runoff models for river and flood operations.

## The project team

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Project leader David Nicholls is Manager Operations Services with River Murray Water (part of Murray-Darling Basin Commission). David has 18 years experience working in the rural water industry. He has experience in the management of water delivery systems, river operations, system planning and water resource management, and understands the complexity of issues that river operators and managers deal with on a daily basis. He has led the development of information management and decision support systems, for water delivery and river operations with Murrumbidgee Irrigation, NSW State Water and more recently River Murray Water.

Please contact him at <d.nicholls@mdbc.gov.au> for further details on Project P1.

The P1 project team is initially small — the focus in P1 and the related Project P2 is on creating the underlying platform for both, and on the related RiverManager product. P1 is in an early development phase and will ramp up in later years of the CRC. Partners and external organizations with a strong interest in RiverOperator are the MDBC, SunWater, Victorian CMAs, Gippsland and Southern Rural Water Authority, ACTEW Corporation and NSW State Water.