

Research to support Murray-Darling Basin industries and communities

Water for a Healthy Country Flagship

Factsheet 4 of 7, 2010

National Research
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Water for a Healthy Country



CSIRO has a long history of conducting research that supports communities in the Murray-Darling Basin.

CSIRO research has included studies of irrigated agriculture production as well as both on-farm and off-farm water use efficiencies and salinity.

Through this work, CSIRO has nurtured strong relationships with local industry, irrigators and other farmers. This has been helped by the presence of a scientific laboratory in Griffith, in the middle of the Murrumbidgee Irrigation Area of southern New South Wales, which opened in 1924.

The nature of the research has changed over the recent decade, to helping irrigation communities deal with Australia's changing climate and water reforms.

Irrigation efficiency

As part its Water for the Future plan, the Australian Government aims to deliver substantial and lasting returns of water for the environment and secure a long-term future for irrigation communities, through water purchases and modernising irrigation infrastructure. CSIRO has engaged in work on these issues.

The "Pratt Water Study" undertaken by CSIRO and others looked at all possible efficiency improvement measures, on-farm and off-farm, in the Murrumbidgee. The study, supported by the federal and NSW governments under a National Action Plan for Salinity and Quality in partnership with Visy Industries chairman Richard Pratt, concluded that big water savings were possible. The recommended water savings measures included improved metering of diversions and targeted remediation of sites with high seepage rates. The study found that full cost-benefit analysis of options should

be undertaken. More recent studies of water savings from delivery efficiency improvements across the Basin suggests that the total water savings from fixing leaky channels is unlikely to be large.

At a district level, our research has produced data, methods and models to enable irrigation areas to better target changes to water management. We have identified components of the irrigation infrastructure for which modernisation could result in water savings.

Parallel to this, CSIRO, in partnership with the Cooperative Research Centre for Irrigation Futures (CRC IF), has been developing systems to improve on-farm efficiencies. Two examples are Fullstop, a commercially available irrigation scheduling tool that detects when applied irrigation water reaches a set depth in the soil, and a low-cost irrigation SMS Irrigation Scheduling Service which converts satellite and weather station data into useful decision making information for the irrigator.

Dealing with change

Climate change is expected to reduce water availability in the southern Murray-Darling Basin. CSIRO's Murray-Darling Basin Sustainable Yields study examined the likely water availability across the basin under a changing climate. Changes in surface and groundwater diversions across the Basin are also expected to occur following the introduction of the Murray-Darling Basin Authority's (MDBA) new Basin Plan.

The Basin Plan will set sustainable diversion limits for each water resource planning area and there has been much speculation about changing



> Research aims to help secure the long-term future for irrigation communities.

the balance between consumptive users and the environment.

CSIRO is examining the economic feasibility of water recovery through economic studies, including comparing incentive policies to acquire water for environmental flows. Research has found that buy-backs offer advantages over infrastructure improvement in many cases.

Adaptation to changing water availability

CSIRO has provided science to underpin management decisions in restructuring irrigation areas to avoid stranded assets. (See 'Supporting future irrigation investment').

To help communities to cope with the challenge of reduced water availability and changing water allocations, CSIRO is undertaking research to support the adaptation of irrigation communities in a water scarce environment. This work involves investigating water trade offs for different uses, including irrigation, environment and urban use.

Direct support of the irrigation industry through the CRC IF is providing options for the management of the Coleambally Irrigation Area under reduced water availability. We are also working directly with irrigation bodies to identify irrigation management options that do not adversely affect groundwater while maintaining productivity.

CSIRO's researchers have also been developing new ways to assess the social, economic and environmental impact of a range of management decisions. Approaches used in a major three-year collaboration in the Lower Murray region can provide the basis for prioritising investment in other regions. (See 'Lower Murray Landscape Futures').

Supporting communities

To provide a systems-wide view of the irrigation industry at a time of major readjustment, CSIRO is investigating the social and economic consequences of change.

Multi-disciplinary teams are working to develop tools and information which can help enhance the multiple social and economic values obtained from water in a changing water regime. (See 'Supporting future irrigation investment').

Research involves characterising adaptation possibilities and economic implications of water availability and management scenarios for irrigation, municipal industrial water supplies and recreational amenities.

We are working to provide frameworks for irrigation communities and water authorities to plan their futures in the

face of prolonged drought and low annual water allocations. For example, a project with the Loxton community in South Australia's Riverland is looking at a community level how they are going to adapt to a drier future.

CSIRO science aims to support a future where community benefits can be maximised and investments can be well targeted.

Supporting future irrigation investment

A project in the southern Murray-Darling Basin has used spatial analysis to identify which parts of an irrigation district would provide the best public investment in future irrigation infrastructure and which parts, if retired, would help avoid high salinity impacts and avoid ecological degradation of local waterways.

The research evaluated opportunities to reconfigure land, water and infrastructure in Victoria's Kerang Irrigation district.

Working with partner Goulburn-Murray Water, the pilot study identified and estimated costs and benefits of a range of land and water management options under changed water allocation regimes.

Lower Murray Landscape Futures

The innovative Lower Murray Landscape Futures project was designed to prioritise natural resource management investment, especially for irrigation and salinity.

This tri-state project in the Murray-Darling Basin's Lower Murray region developed methods for assessing the social, economic and environmental impact of a range of management scenarios.

Due to the region's salinity issues, future methods for remediation require a mix of irrigation management, engineering schemes and dilution flows. This research provided support for prioritising future investment decisions.



> CSIRO has investigated opportunities to modernise irrigation infrastructure.

Want to know more?

Irrigation: <http://www.csiro.au/science/Irrigation.html>

Science to improve Australia's irrigation systems: <http://www.csiro.au/org/Irrigation-Research.html>

Irrigation in the Murray and Murrumbidgee Basins report: <http://www.csiro.au/resources/pf6y.html>

CSIRO Murray-Darling Basin Sustainable Yields project: <http://www.csiro.au/partnerships/MDBSY.html>

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CSIRO and the Flagships program

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