

# Water Information Research and Development Alliance

Water for a Healthy Country

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**Australian Government**  
**Bureau of Meteorology**

National Research  
**FLAGSHIPS**  
Water for a Healthy Country



Water scarcity and increasing demand are major challenges facing Australia. The need to accurately monitor, assess and forecast the availability, condition and use of our water resources is now more vital than ever.

The Water Information Research and Development Alliance (the Alliance) brings together the research and development expertise of the CSIRO's Water for a Healthy Country Flagship in water and information sciences, and the Bureau of Meteorology's (Bureau) operational role in hydrological analysis and prediction to transform the way Australia manages water resources.

## Transforming Australia's water resources information

Water resources data is currently collected by more than 200 organisations across Australia, using a variety of methods. The range of collection and reporting methods and arrangements for accessing water data has made it difficult to monitor the status and use of Australia's water resources, and reliably forecast water availability. This has compromised the effectiveness of water resources management and planning.

Through the Commonwealth *Water Act 2007*, the Australian Government has given the Bureau of Meteorology responsibility for compiling and delivering comprehensive water information across the water sector.

Improved accessibility, integration and use of national water resources information will result in better informed policy and infrastructure decisions, and better evaluation of water sector reforms. This will also lead to greater confidence in how Australia manages this vital resource.

These outcomes require substantial innovation and this can only be achieved through a world-class water information research and development program.

## A water information alliance

In 2008 the Bureau of Meteorology and CSIRO established the Water Information Research and Development Alliance (the Alliance). The Alliance is a strategic investment of \$50m

over five years that will deliver most of the innovation required by the Bureau to fulfil its national water information mandate.

The Alliance brings together CSIRO's nation-leading expertise in water and information sciences with the Bureau's new operational responsibilities in water information. Around 40 leading CSIRO researchers will focus on topics including data interoperability, hydrologic modelling, water accounting, water resources assessment and forecasting.

## A major research and development program

Through the Alliance, the Bureau and CSIRO will improve the management of Australia's water resources by delivering value-added water information products, based on a comprehensive and robust nationwide water information system.

The Alliance builds on the water informatics and water resources assessment achievements of Australia's premier water research program, CSIRO's Water for a Healthy Country National Research Flagship. Notably, the Flagship has completed assessments of the water availability in the Murray-Darling Basin, Northern Australia, Tasmania and south-west Western Australia under scenarios of climate change.

CSIRO will deliver new science and technology that will enable the Bureau to undertake real-time interactive analysis of water information and begin using advanced methods for forecasting of water availability, streamflow and floods across Australia. An outline of Alliance projects follow.



> Warragamba Dam, New South Wales

## Water Information Systems

**Water data access and management:** The Sustainable Water Information Models (SWIM) project is developing methods and tools for managing and ensuring interoperability between the different water information models needed to support the water sector. It will provide the Bureau of Meteorology's Australian Hydrological Geospatial Fabric (Geofabric) and Australian Water Resources Information System (AWRIS) projects with the information model framework required to ensure robustness and evolvability into the future.

**Water data transfer standards:** The Water Data Transfer Standards (WDTS) project is defining and developing data transfer standards and procedures for supply of specified water data from more than 200 information providers in Australia to the Bureau of Meteorology (Bureau). The new standards will help organisations meet the Bureau's data compilation and publishing requirements.

**Water data and modelling workflows:** The Hydrologists Workbench project will develop tools to automate common workflow processes to access and use hydrological data and models. These tools will enable the Bureau of Meteorology's hydrologists to more readily perform complex and repetitious tasks involved in the integration of hydrologic data and models.

## Foundation Data Products

**Rainfall and evapotranspiration:** The Precipitation and Actual Evapotranspiration Data Products project is developing new methods and tools to produce gridded water data products of precipitation and actual evapotranspiration to underpin hydrologic assessment and forecasting across Australia.

*A water information R & D alliance between the Bureau of Meteorology and CSIRO's Water for a Healthy Country Flagship*

**Digital elevation model:** The One-second SRTM Digital Elevation Model (DEM) project is developing consistent elevation datasets from Shuttle Radar Topographic Mission (SRTM) data, at a resolution of approximately 30 metres across the Australian continent, targeting hydrological applications.

## Water Accounting and Assessment

**Data and models for water resource assessment:** Water Resources Assessment and Accounting projects are developing methods and technologies that will enable the Bureau to provide integrated surface and groundwater resource assessments, water accounts and water resource outlooks to Australian governments, business and people.

The prototype Australian water resources assessment modelling system uses daily precipitation and evapotranspiration information of unprecedented quality and detail. The system includes a landscape hydrological model that describes the vegetation and soil water balance. The landscape water balance model is currently being coupled to models to estimate water use and the river and groundwater balances while also exploiting an array of satellite-based observational data sources.

## Water Forecasting and Prediction

**Short-term water forecasting and prediction:** The Short-term Water Forecasting and Prediction project is developing methods and tools to enhance the Bureau's operational flood forecasting and generate continuous short-term streamflow forecasts across Australia.

New techniques will also be developed to forecast water flow at particular river sites for periods from hours to a week.

## Seasonal and long-term water forecasting and prediction:

The Seasonal and Long-term Water Forecasting and Prediction project is developing new methods and tools to provide reliable seasonal (weeks to several months) and long-term water forecasts of inflows to river systems across Australia.

## The outcome

Through the Alliance, the Bureau will adopt CSIRO's leading science and technology, resulting in vastly improved water data integration, water resources assessments, National Water Accounts and flood and water availability forecasts.

## Further information

For further information please visit:  
[www.csiro.au/partnerships/wirada](http://www.csiro.au/partnerships/wirada)  
or  
<http://www.bom.gov.au/water/about/waterResearch/wirada.shtml>

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## CSIRO and the Flagships program

Australia is founding its future on science and innovation. Its national science agency, CSIRO is a powerhouse of ideas, technologies and skills. CSIRO initiated the National Research Flagships to address Australia's major research challenges and opportunities. They apply large scale, long term, multidisciplinary science and aim for widespread adoption of solutions.