

Land & Water Australia

Previously proposed activity as per a draft LWA Annual Operational Plan (AOP) for 2009-10, based on ongoing funding of \$13m+ pa.

The final AOP for 2009-10 will reflect the announced savings measures and is yet to be agreed between LWA and the Minister for Agriculture, Fisheries and Forestry.

Discussions on the content of the revised AOP are currently underway between LWA and the Department of Agriculture, Fisheries and Forestry.

Strategy One: Research programs

SUSTAINABLE LANDSCAPES ARENA

Tropical Rivers and Coastal Knowledge (TRaCK)

The aim of TRaCK is to provide the science and knowledge that governments, communities and industries need to make better decisions for the sustainable use and management of Australia's tropical rivers, estuaries and coasts. Further information can be found at www.track.gov.au. TRaCK brings together a multidisciplinary consortium to focus on the rivers and estuaries between the tip of Cape York Peninsula and Broome.

Established in 2007, most projects within the program (unless otherwise noted in the list below) will continue throughout 2009-10. The focus in 2009-10 will be on consolidating the program of research, communicating the new insights and findings emerging from the research projects and planning the future dissemination of results and next phase of a longer term research and development program.

Executive Manager: Jim Donaldson

Partners

- The Australian Government through the Commonwealth Environment Research Facilities Program
- The National Water Commission's Raising National Water Standards Program
- The Queensland Government's SmartState Program
- Research institutions and state and territory governments which form the TRaCK consortium. They include Charles Darwin University, the University of Western Australia, Griffith University, CSIRO and the North Australia Indigenous Land and Sea Management Alliance.

Program duration

2006-07 to 2010-11

Total expenditure budget for program

\$18.512 million

Expected program outcomes

- Increased understanding of the important natural assets and ecosystem services provided by tropical rivers and coasts
- Developed methods and tools to assess the implications of potential developments

- Identified opportunities to develop genuinely sustainable enterprises
- Enhanced capacity and knowledge of the community to engage in management planning processes

Expenditure budget for 2009-2010

\$4.759 million (Land & Water Australia funding \$0.720 million, partners \$4.039 million)

Projects within the program *(lead research providers are named in brackets)*

- Scenarios for tropical rivers and coasts (Charles Darwin University)
- Capacity building tools for effective planning and decision-making in Indigenous contexts (Charles Darwin University)
- Development of planning tools (Griffith University)
- Valuing and managing the ecosystem (CSIRO)
- Indigenous values and river flows (CSIRO)
- Socio-economic activity and water use in the tropical rivers region (James Cook University)
- Biophysical classification of riverscapes across northern Australia (Griffith University)
- Ecohydrological regionalisation of Australia (Griffith University)
- Catchment water budgets and water resource assessment (CSIRO)
- Regional scale sediment and nutrient budgets (CSIRO)
- Impacts of land management on productivity in the Daly and Flinders rivers (CSIRO)
- Bedload transport in large tropical rivers and effects on dry season pool habitats (Griffith University)
- Bottom-up and top-down control of riverine food webs (Charles Darwin University)
- Refugial pools in tropical rivers (Griffith University)
- River flood plain food webs (Griffith University)
- Effects of urbanisation and catchment development on ecosystem health in estuaries (Griffith University)
- Flow and ecology relationships; biodiversity and ecosystem processes (University of Western Australia)
- Flow impacts on estuarine fin fish of the Gulf of Carpentaria (Qld Department of Employment, Economic Development and Innovation)
- Environmental flow tools for northern rivers (University of Western Australia)
- Bio-regionalisation, conservation priorities and predictive models of aquatic biodiversity (Griffith University)
- Sustainable economic development in northern riverine and coastal environments (North Australia Indigenous Land and Sea Management Alliance)
- TRaCK integration, knowledge and adoption (Charles Darwin University)

Environmental Water Allocation

The goal of the Environmental Water Allocation Program is to provide research which enables the benefits of water allocated for environmental purposes to be better assessed and understood. More effective use of water resources is required in Australia to achieve the multiple aims of viable agriculture, industries, communities and the environment.

The Environmental Water Allocation Program aims to engage with policy advisors, water managers and regional communities to build upon the knowledge required for managing our rivers and waterways in a healthy state.

The program is moving into a phase whereby research projects are being completed and more emphasis is being given to communicating the results of the research undertaken. Further information can be found at www.lwa.gov.au/environmentalwater/index.aspx.

Executive Manager: Jim Donaldson

Partners

- Australian Government Department of the Environment, Water, Heritage and the Arts
- Murray Darling Basin Authority

Program duration

2004-05 to 2010-11

Expected program outcomes

- Improved methods for monitoring and evaluating environmental water allocation
- More effective engagement of researchers with managers in designing environmental allocations
- Improved ability for policy-makers, planners and managers, particularly regional groups, to make decisions on water allocation
- Improved understanding of water needs of aquatic ecosystems across Australia
- Improved understanding of the opportunities and threats to water availability

Total expenditure budget for the program

\$5.159 million

Expenditure budget for 2009 - 2010

\$0.552 million (Land & Water Australia funding \$0.500 million, partners \$0.052 million)

Projects within the program *(lead research providers are named in brackets)*

- Adaptive management of environmental flows in the regulated Macquarie River (University of NSW)
- Flow requirements and resource delivery to the lower Murray lakes and northern Coorong (University of Adelaide)
- Water regime dependence of fish in the wet-dry tropics (Charles Darwin University)
- With the wisdom of hindsight: reconsidering institutional arrangements for water (University of Adelaide)

Native Vegetation and Biodiversity

The management of native vegetation and biodiversity continues to be a priority issue for research investment by Land & Water Australia because of the critical role of vegetation in providing ecosystem services, improving landscape function, enhancing production and mitigating climate change through carbon sequestration.

The aims of the Native Vegetation and Biodiversity program are to:

- Understand and value the role of native vegetation and biodiversity in the delivery of ecosystem services;
- Underpin the effective and efficient retention and restoration of native vegetation to improve the conservation of native plants and animals;
- Identify management regimes for native vegetation that improve biodiversity values and ecosystem services at the landscape scale; and
- Build capacity for adoption and application of knowledge to achieve the maintenance or restoration of healthy landscapes.

The program is moving into its final phase whereby research projects are being completed and more emphasis is being given to communicating the results of the research undertaken. Further information can be found at <http://www.lwa.gov.au/nativevegetation/>.

Executive Manager: Jim Donaldson**Partners**

- CSIRO
- Greening Australia

Program duration

2004-05 to 2009-10

Expected program outcomes

- Improved understanding and valuing of the role of native vegetation and biodiversity in the delivery of ecosystem service
- Effective and efficient retention and restoration of native vegetation to improve the conservation of native plants and animals

- Management regimes for native vegetation that improve biodiversity values and ecosystems services at the landscape scale
- Greater capacity for adoption and application of knowledge to achieve the maintenance and restoration of healthy landscapes

Total expected budget expenditure for the program

\$5.799 million

Expenditure budget for 2009 - 2010

\$0.710 million (Land & Water Australia funding \$0.473 million, partners \$0.237 million)

Projects within the program (*lead research providers are named in brackets*)

- Linking biodiversity benefits to management actions on conservation reserves (Bush Heritage Australia)
- Harvesting general principles from research to improve the effectiveness and uptake of conservation strategies and actions (Australian National University)
- Capturing the pest control services of native vegetation (Cotton Catchment Communities Cooperative Research Centre)
- Understanding genetic constraints to vegetation persistence in fragmented landscapes (CSIRO)
- Assessing biodiversity outcomes from water point management in the arid rangelands (CSIRO)
- Using spatial variation in climate and vegetation growth to improve rangeland management (CSIRO)
- Measuring the biodiversity values and ecosystem services of regrowth vegetation in modified landscapes (Environmental Protection Agency)
- Working with Indigenous communities to manage fire in tropical woodlands for improved ecological, economic and social outcomes (Tropical Savannas Management Cooperative Research Centre)
- Designing agricultural landscapes in the monsoon tropics to maintain biodiversity and ecosystem services (Tropical Savannas Management Cooperative Research Centre). Due for completion December 2009
- Determining appropriate fire mosaics for biodiversity conservation in Mallee ecosystems (La Trobe University)
- Working with farmers to manage and restore native vegetation for ecosystem services, conservation and profit (University of Melbourne)

Weeds Research and Knowledge Exchange

Land & Water Australia formally completed its contract for managing the Defeating the Weeds Menace R&D program on behalf of the Australian Government in 2008-09. During the year, the corporation was awarded a grant of \$93,900 from the Australian Weeds Research Centre to continue to undertake activities to communicate the results of the research generated by the former program so as to maximise its benefits.

In 2009-10, Land & Water Australia aims to work with Weed Societies in each state, relevant state and territory agencies, WONS Coordinators and researchers to conduct a series of knowledge assimilation forums bringing together scientists, policy-makers and land managers (both public and private) to share the knowledge generated and to identify the preferred ways of integrating that knowledge into weeds management at a landscape scale.

The focus of Land & Water Australia's weeds research has been on weed issues across Australia that are having impacts on extensive land management systems and conservation areas, where the benefits are largely to the community as a whole.

Executive Manager: Jim Donaldson

Partners

- Australian Government Department of Agriculture, Fisheries and Forestry

Program duration

2009-10

Expected program outcomes

Communication of the results of the Defeating the Weed Menace R&D through the aegis of funding from the Australian Weeds Research Centre during 2009-10 will assist in:

- Lowering the rate of emergence of new weed problems
- Reducing the impacts of existing weed problems of national priority
- Increasing the national capacity to manage weeds
- Improving decision-making on resource allocation to manage weeds

Total expenditure budget for the program

\$0.093 million

Expenditure budget for 2009 - 2010

\$0.093 million (All partner funding)

Projects within the program *(All projects will be completed during 2009-10.)*

- All research projects have been completed; this project will be administered by Land & Water Australia:
Maximising knowledge for adoption: Building on recent weeds research

PEOPLE ARENA

Social and Institutional Research

This program invests in research, knowledge and adoption activities concerning the social and institutional dimensions of land and water issues. Our portfolio of work focuses on understanding, supporting and informing people working in natural resources management (NRM) including policy development.

Land & Water Australia believes that people, culture and institutions are an integral part of sustainable landscapes, and our investment in the People Arena is driven by activities that build human and social capital for productive and sustainable landscapes.

Executive Manager: Jim Donaldson

Partner

- The National Water Commission (NWC)

Program duration

This is an ongoing program under the 2005-2010 Strategic Plan

Expected program outcomes

- Social and institutional knowledge for primary industry adaptation strategies and managing the socio-economic impacts of climate change and water availability
- The advancement of knowledge and practice that facilitates and improves the participation of Indigenous Australians in natural resource management
- The advancement of knowledge and provision of options for the creation of markets and best regulatory practice for environmental goods and services
- Building the capacity of NRM regions (including regional NRM and industry groups, catchment management authorities and shires) in planning, managing, monitoring and evaluating natural resource use and conservation, and adapting NRM governance, investment and practice

Total expenditure budget for the program

\$9.923 million over the life of the program under the 2005-2010 Strategic R&D Plan

Expenditure budget for 2009 - 2010

\$2.740 million (Land & Water Australia funding \$1.073 million, partner \$1.667 million)

Projects within the program *(Lead research providers are named in brackets.)*

- Investing in natural resource management practice change (Hassall and Associates Pty Ltd)
- Monitoring and evaluating the Social and Institutional Research Program (Su Wild River)
- Water planning tools (Griffith University Consortium)
- National water planners' forum
- National Indigenous water planners' forum (with NWC & Indigenous groups)

Proposed projects in:

- Indigenous natural resource management/cultural and conservation economy
- Regional natural resource management
- Adaptive agriculture/Sustainable primary industries
- Environmental goods and services and market based instruments
- Social, institutional and cultural dimensions of large scale landscape restoration

- Indigenous water policy project - Kimberley case study
- Integrated water and environmental planning, NSW
- Water planning: lessons, gaps and adoption - synthesis

SUSTAINABLE INDUSTRIES ARENA

National Program for Sustainable Irrigation (NPSI)

The National Program for Sustainable Irrigation (NPSI) invests in research to improve the productivity and sustainability of irrigation in Australia. Coordinated investment in irrigation research by Land & Water Australia first commenced through the National Program for Irrigation Research and Development (NPIRD) in (1993-2002), followed by NPSI Phase 1 (2002–2006). NPSI Phase 2 (2007-2010) continues the investment commitment with 14 partners from research and development corporations, government and private industry.

The program delivers new knowledge, tools and techniques and a mechanism for irrigation research investors Australia wide to collaborate. NPSI Phase 2 will enable irrigation industries to be environmentally responsible and productive users of water. Research results are for use by irrigators, policy makers and planners. Key areas of investment include sustainable production in a water scarce environment; sustainable futures and the environment; and knowledge into practice.

Executive Manager: Anwen Lovett

Partners

- Australian Government Department of Environment, Water, Heritage and the Arts
- Cotton Research & Development Corporation
- Gascoyne Water Cooperative & Gascoyne Water Asset Mutual Corporation
- Goulburn-Murray Rural Water Corporation
- Grains Research & Development Corporation
- Harvey Water
- Horticulture Australia Limited
- Lower Murray Water
- Ord Irrigation Cooperative & Ord Irrigation Asset Mutual Cooperative
- South Australian Research & Development Institute
- Sugar Research & Development Corporation
- SunWater
- Western Australia Department of Water

Program duration

2007-08 to 2009-10 (Phase 2)

Expected program outcomes

- Improved irrigation water use efficiency and enhanced ability to respond to changing levels of resource availability over time
- Reduced environmental impacts, more sustainable ecosystems and more prosperous communities
- Improved skills, knowledge and decision making of end users which leads to practise change, and more efficient and sustainable use and management of water
- A national approach to irrigation related R& D in Australia, which includes a strong focus on a skilled human resource base and enhanced R&D capacity and collaboration

Total expenditure budget for the program

\$7.134 million (Phase 2)

Expenditure budget for 2009 - 2010

\$2.078 million (Land & Water Australia funding \$ 0.570 million, partners \$1.508 million)

Projects within the program *(Lead research providers are named in brackets.)*

- Open hydroponics (SARDI)

- Long term sustainability of precision irrigation (University of Adelaide)
- Optimising delivery & benefits of aerated irrigation water (Centre for Plant & Water Science, CQU)
- Managing soil salinity for wine quality in groundwater-irrigated vineyards (PIRSA-SARDI)
- Soil Management for Australian Irrigated Agriculture (Soils Research Pty. Ltd.)
- Channel evaporation mitigation (Goulburn-Murray Water)
- New technologies to reduce evaporation from large water storages (CRC for Polymers)
- Quantifying surface water - groundwater exchange using thermal & chemical measurements (Water Research Lab UNSW)
- The effect of changing irrigation strategies on biodiversity (CSIRO)
- Farm dam management (CRC for Irrigation Futures)
- Adaptive learning through five strands of root-zone knowledge (CRC for Irrigation Futures)
- Review of precision irrigation technologies & their application (National Centre for Engineering in Agriculture)
- Knowledge and tools to manage fertigation technologies in highly productive citrus orchards for minimal environmental footprint (NSW DPI)
- Increasing the resilience of eastern Australian irrigated farm businesses (Qld Department of Employment, Economic Development and Innovation / CSIRO)
- Water smart cotton and grains in NSW (NSW Department of Primary Industries)
- Groundwater and surface water interactions in Western Australia (GHD)
- Preparing irrigated agriculture for statutory and climate change (Curtin University of Technology, WA)
- Informing future irrigation and water management at the Ord River (Brolga's Environmental Consulting)
- Knowledge Harvest (PR Day Resource Strategies)
- NPSI Phase 2 Monitoring and Evaluation (Qualdata)
- Impact of minimal vineyard irrigation (PhD)

Undergraduate Scholarships

- The effect of irrigation management on nitrate movement under a lettuce crop (University of Southern Queensland)
- Developing design criteria for tailwater input for wetland systems in the Burdekin River Irrigation Area (James Cook University)

Managing Climate Variability

The Managing Climate Variability program invests in seasonal forecasting and applications to assist farmers and natural resource managers to better manage climate risk. The program invests in research to deliver more accurate forecasts from multi-week to seasonal and decadal. Applications are developed to translate these forecasts into tools that assist primary producers to make the most of climate opportunities and reduce exposure to climate risk from. The current Phase of Managing Climate Variability builds on over a decade of research collaboration led by Land & Water Australia with partners from the rural Research & Development Corporations and the Australian Government.

Managing Climate Variability's Research and Development Strategy 2008 - 2014 identifies four priority themes of investment:

1. Improved climate forecasts
2. Soil, climate and water resources – predicting availability
3. Agricultural and fisheries applications
4. Knowledge, adoption and communication

Executive Manager: Anwen Lovett

Partners

- Grains Research & Development Corporation
- Meat & Livestock Australia
- Dairy Australia

- Rural Industries Research & Development Corporation
- Sugar Research and Development Corporation

Program duration

2007-08 to 2013-14

Expected program outcomes

Outcomes against the four themes in the R&D Strategy are:

- More certainty in climate forecasts for monthly, seasonal, annual and inter-annual to decadal timescales
- Australians have the knowledge to predict key attributes – for example soil moisture, frosts, catchment runoff, wet season duration – over time and across landscapes as our climate varies and changes
- Climate variability related commodity-specific decision support tools that identify benefits and opportunities for increased profitability and sustainability
- Increased understanding and uptake of climate-related opportunities that benefit agriculture and Australia's natural resource condition
- Improved, quality assured, and readily available fundamental data sets

Total expenditure budget for the program

\$7.896 million

Expenditure budget for 2009-2010

\$2.124 million (Land & Water Australia funding \$0.200 million, partners \$ 1.924 million)

Projects (*Lead research providers are named in brackets.*)

- Improved Seasonal Forecasts for South-West WA (CSIRO)
- Integration of climate-related decision support system tools to improve their relevance (CSIRO Sustainable Ecosystems)
- Understanding frost risk in a variable and changing climate (CSIRO Sustainable Ecosystems) (currently being contracted)
- Critical thresholds ('tipping points') and climate change impacts/adaptation in horticulture (Queensland Department of Employment, Economic Development and Innovation)
- Climate change and variability: Assessing regional impacts of sugar cane production (Reef Catchments Mackay Whitsunday Inc)
- Assessing and managing heat stress in cereals (SARDI)
- Extremes, climate modes and reanalysis-based approaches to agricultural resilience (University of Southern Queensland)
- Teleconnections between climate drivers and regional climate, and model representation of these links (Centre for Australian Weather and Climate Research (CAWCR) (currently being contracted)
- Improving Forecast Accuracy, especially with improved Ocean Initialisation (CAWCR) (currently being contracted)
- Improving Reliability of Climate Model Derived Forecasts to enhance National Climate Centre products (CAWCR) (currently being contracted)
- Improving Multi-week Predictions (CAWCR) (currently being contracted)

The Program is focused now on delivering to its 2008-2014 R&D Strategy, securing commissioned research particularly in Theme 2 – soil, climate and water resources: predicting availability, and Theme 3 – agricultural and fisheries applications. With the ongoing high interest in climate change and the increasing recognition across the policy sector that smart adaptation is predicated by accurate forecasts and competent tools, Managing Climate Variability is actively seeking additional partners to increase the R&D investment to the level required to deliver to Australian agriculture's needs.

National Climate Change Research Strategy for Primary Industries (CCRSPI)

The aim of CCRSPI is to develop a truly nationally coordinated and collaborative strategic research framework for primary industries to prepare for the short and long-term opportunities and risks that will arise due to

climate change. The CCRSPI initiative commenced in 2007-08, and moved into its second phase in 2008-2009. A proposal has in-principle approval for about establishing CCRSPI as a 5 year initiative that continues its focus is expected to be on communication, coordination, strategic analysis and targeted research and development.

Aligned with its CCRSPI commitment, LWA has taken on the role of hosting the Primary Industries Climate Change Adaptation Research Network (PIARN). The network will coordinate across research institutions adaptation research and will contribute to the development of the National Climate Change Adaptation Research Plan for primary industry. This network exists under a contractual agreement between LWA and Griffith University. However, the benefits of close alignment with CCRSPI are clearly recognized, and the two networks will be managed internally under the CCRSPI program structure.

Executive Manager: Anwen Lovett

Partners

The partners are expected to be federal and state agencies responsible for primary industries, the CSIRO, rural research and development corporations, with potential for additional organizations joining.

The Primary Industries Adaptation Research Network initiative involves close collaboration with the Department of Climate Change, Griffith University, and seven other Climate Change Adaptation Research Networks.

Program duration

2009-10 to 2010-14

Expected program outcomes

- A nationally coordinated and collaborative strategic research framework for primary industries, including investment plans and coordinated research effort against priority themes agreed by CCRSPI partners.
- Increased capacity of program partners to contribute to, and support industry consultation on, national frameworks and plans relating to climate change mitigation and adaptation (in particular, the DCC led National Adaptation Research Plan for primary industry, and the PISC led cross-sectoral RDE strategy for climate change).
- Improved understanding and awareness of issues relating to agriculture's participation in an emissions trading scheme,
- Improved understanding of, and increased pooling of research investment to address, emerging cross-sectoral priorities for primary industry relating to climate change.
- Coordination which delivers more effective and industry-relevant outcomes from adaptation research, and supports positive engagement and collaboration amongst key primary industry stakeholders.

Total expenditure budget for the program

\$6.520 million

Expenditure budget for 2009-2010

\$1.110 million (Land & Water Australia funding \$0.100 million, partners \$1.010 million)

Projects *(Lead research providers are named in brackets.)*

- The Primary Industries Adaptation Research Network (hosted by LWA under contract with Griffith University) will be managed internally under the CCRSPI program.

INNOVATION ARENA

This Arena addresses the need to provide information, knowledge and build capacity for achieving step-wise gains in the management of soil, vegetation, water and biodiversity. It articulates specific problems managers and policy makers face or will face, and then gets the best researchers to solve the problem. It also fosters integrated research to provide solutions that are joined-up from the user's perspective. In a typical year, about 10 new research investments are made through this Arena using nationally competitive procurement processes. Managing the transfer of new knowledge into practice is a key activity of this Arena.

There are three subprograms in this Arena: Innovation Call, Postgraduate Scholarships and Senior Research Fellows.

Innovation Call

This sub-program provides breakthrough research that aims to solve key natural resource management problems. These problems are articulated through engagement with resource managers, researchers and policy-makers. Each year through a highly competitive national call the best researchers from all over Australia are selected to work on these specified problems. In 2008-09 these included research to measure and report tropical soil carbon, evidence to guide investments using better metrics, developing quality adjusted life years for natural resource management and ways to reduce transaction costs in natural resource markets. The projects are typically 3 years in duration and produce outputs that include peer-reviewed research publications.

Postgraduate Research Support Scholarships

This sub-program invests in the next generation of Australia's researchers. It selects through a national call the best students, research trainers and research institutions to address significant knowledge gaps through postgraduate projects of three years. By enabling this research training we are both building Australia's productivity and sustainability research capacity and providing internationally significant contributions to knowledge for managing agricultural landscapes.

Senior Research Fellows

This sub-program supports experienced researchers to bring together and share knowledge. This addresses the need to build capacity for achieving step-wise advances in management of soil, vegetation, water and biodiversity. The Fellows also foster integrated research to address problems. For example in 2009 Prof Derek Eamus has developed useful synthesis publications of groundwater dependent ecosystems and the hydrological effects of woody revegetation.

Executive Manager: Bruce Wright

Partners

This Arena collaborates closely with the research community including Australian and state government agencies, universities and private researchers. It also invests in roundtable meetings, pilot projects and investment fora to develop collaborative research investment opportunities between the research community and policy makers and implementers. The collaboration of research organisations and users through the projects, postgraduates and senior research fellows is a key part of making the funded research more adoptable and building trust throughout this community.

Program duration

This Arena is an ongoing investment of Land & Water Australia with many three-year projects resulting in a pipeline of research outputs currently underway and some contracted for final delivery to 2012. This makes the program highly responsive to emerging knowledge needs and allows rapid incorporation of what has been learnt across the whole field of natural resource management.

Expected program outcomes

The Arena develops the evidence available to natural resource managers through deliberate investment in the scientific knowledge needed to manage soil, water, vegetation and biodiversity. It provides the people, knowledge assets and technology to solve and ameliorate land and water management problems. The outcomes are measured using Land & Water Australia's independent evaluator who completes a triple-bottom-line return on investment. In 2009 the Senior Research Fellow Dr Rick Evans and Indigenous natural resource management are being independently evaluated using this approach.

Expenditure budget for 2009-2010

\$2.494 million (All Land & Water Australia funding)

Projects within the arena *(Lead research providers are named in brackets.)*

Innovation Research Call Projects

- Transition to a biofuel economy in Australia (CSIRO Sustainable Ecosystems)
- Use of Bayesian decision support tools in sustainable management (Monash University)
- Dynamic non market valuation of ecosystem services (The University of Western Australia)
- Healthy catchments through detection and remediation of contaminants with novel technologies (Department of Primary Industries, Victoria)
- Sustainability of fresh water lenses under major rivers (University of Melbourne)
- Characterising southwest Australia's rainfall variability using speleothems and climate models (Australian National University)
- Irrigation futures for the Murray (CSIRO Land and Water)
- Modelling impacts of vegetation cover change on regional climate (University of Queensland)
- Changing the ownership-management paradigm in broadacre farming (The University of Western Australia)
- Characterising the effects of river regulation on longitudinal trophic pathways (Department of Water and Energy NSW)
- A rapid genetic approach for assessing sediment biodiversity and functioning (CSIRO Entomology)
- Exploiting Australia's Isoscape: novel methodology to underpin climate change modelling (CSIRO Sustainable Ecosystems)
- Climate Witness - a dispersed, national observer network for NRM phenology (Earthwatch Institute)
- Oil vulnerability in peri-urban and rural Australia (Griffith University)
- Empowering land managers with wireless soil monitoring (CSIRO Land and Water)
- Understanding multiple human impacts on stream flow regimes (University of Melbourne)
- Treated Effluent as Environmental Flows: A Climate Change Response (CSIRO)
- The recent Western Victorian drought and its impact: without precedent? (University of Ballarat)
- Transaction metrics for purchasing environmental services (University of New England)
- Measuring investments – principles and protocols for best practice MBI metrics in NRM (CSIRO Sustainable Ecosystems)
- A standardised metric to value environmental services (CSIRO Sustainable Ecosystems)
- Accounting for soil carbon fluxes in savanna land management (CSIRO Sustainable Ecosystems)

Postgraduate Research Projects

- Ecosystem services from grasslands - effects on tree regeneration processes (Charles Sturt University)
- Investigating adoption processes for sustainable farming practice: Potter Project case study (Royal Melbourne Institute of Technology)
- Optimising river flow management for environmental and economic sustainability (University of New England)
- Interactive effects of salinity and water regime on ecologically significant water plants (Monash University)
- Fire regimes and biodiversity conservation in the Murray Mallee (Deakin University)
- Maximising woodland bird diversity in Brigalow Belt Forests (University of Southern Qld)
- Salinity processes in Lake Eyre Basin Rivers (University of Melbourne)
- Impact of chemicals used in irrigation agriculture on macro invertebrate biodiversity (University of Technology Sydney)
- Water and Catchment Planning: Incorporating Demography and Population (Australian National University)
- Flooding Tolerance of Plants in Australian Wetland Ecosystems (The University of Western Australia)

- Applying justice frameworks to environmental decision-making (Australian National University)
- Sustainable Management of Connected Water Resources: Robbing Peter to pay Paul (Australian National University)
- Effects of river flows on downstream productivity in Tropical Rivers (Griffith University)
- If you build it, will they come? Reptile recolonisation following plant community restoration (Murdoch University)
- Quantifying acid and trace metal fluxes in aquifers under anthropogenic influence. (Flinders University)
- A Spatial Dynamic Framework to Integrate Regional Water use Efficiency and Energy Consumption Nexus (Charles Sturt University)
- Function and resilience of box woodland and related floodplain systems in agricultural landscapes (University of Southern Queensland)
- Ecosystem services: a concept linking management actions and ecosystem outcomes (University of Technology Sydney)
- Cross-tenure landscape management: integrating multiple values and institutions (Australian National University)
- How do floodplain habitats support fish biodiversity in tropical rivers? (Griffith University)

Senior Research Fellows

- A new charter for exploring Australia's 'hidden' Natural Resource, the Soil Biota (Department of Primary Industries Victoria)
- Blueprint for a Red Land (CSIRO Sustainable Ecosystems).
- Climate Change and natural resource management in Australia's grazing lands (Department of Natural Resources and Water Qld)
- The Scientist's Garden: reflections on food and water (CSIRO)
- The ecohydrology of Australian landscapes: an analysis and synthesis (University of Technology Sydney)
- What's around the bend for Murray Darling Basin river system? Implications of climate and resource management change for the state of the Basin's river ecosystems (Freshwater Systems, Tasmania)
- Integrating agricultural production and biodiversity conservation (Australian National University)
- Linking plant evaporative demand and pan evaporation (Australian National University)

Strategy Two: Collaboration and Strategic Analysis

Land & Water Australia's collaborations bring together researchers and stakeholders from across Australia to reach consensus on research priorities and desired outcomes. Collaborative efforts can involve rural industries, other funding bodies, government agencies and community-based groups. They often influence research directions while avoiding duplication of effort and providing a stronger platform for adoption.

We also play a leading role in co-ordination and informing debate through strategic analysis. For example, we actively participate in the development of the National RDE Framework being developed through Primary Industries Standing Committee and the Council of RDC Chairs. This includes the lead in development of the National Climate Change Research Strategy and the Water Use in Agriculture strategy.

We also have been active in leading the development of robust and defensible Return on Investment analyses and indicators for agriculture and environmental research development and extension, especially in the difficult social and environmental space. We have been leaders in the development of the cross RDC ROI studies and will continue in that role, as well as our own substantial portfolio investment analysis.

Strategy Two also leads the Corporation's strategic thinking and strategic initiatives. This year, the key task of Strategy Two is to develop the Corporation's new five year Strategic Plan. We have developed a comprehensive plan that will include significant consultation with our many stakeholders.

Strategy Two will access a small amount of funds to initiate new strategic opportunities or react to strategic opportunities as they arise.

Collaboration and Strategic Analysis

Executive Director: Michael Robinson

Partners

Across our portfolio, Land & Water Australia will have about 57 co-investing program partners and many more partners at the project level.

Program duration

This is an ongoing program under the 2005-2010 Strategic Plan

Expected program outcomes

The program will support Land & Water Australia's partnership approach to investment for sustainable land and water management and deliver ongoing partnerships for the Corporation. It will also deliver our Monitoring and Evaluation activities through portfolio analysis, Return on Investment and Stakeholder Survey. The program will deliver the new five-year Strategic R&D Plan.

Total expenditure budget for the program

\$1.469 million over the life of the program under the 2005-2010 Strategic R&D Plan

Expenditure budget for 2009-2010

\$0.275 million (all Land & Water Australia funding)

Strategic Initiatives Program

The Strategic Initiatives Program was approved by the Board in 2008 to allow the Corporation the ability to create or proactively respond to new opportunities. Investments are made on strategic opportunities where there is significant opportunity to enhance the outcomes of our portfolio of existing work, or the development

of new work. Specific criteria include value to LWA's brand, consistency with strategic direction, and creating value from existing or legacy investments.

Executive Director: Michael Robinson

Partners

On a project by project basis

Program duration

2008-09 to 2009-10

Expected program outcomes

This program will deliver enhanced strategic outcomes from our portfolio of investments, or initiate new work consistent with desired outcomes.

Total expenditure budget for the program

Up to \$0.800 million

Expenditure budget for 2009- 2010

Up to \$0.400 million (all Land & Water Australia funding). Expenditure not included in the budget as initiatives are funded from reserves.

Projects within the program

- Senior Research Fellow 2009, Professor Graham Farquhar, funded through this program, managed by Innovations Program
- Development of a multi-partner Reef Rescue R&D Plan for submission to Caring for our Country

Strategy Three: Knowledge into Practice

Knowledge into Practice maximises the adoption of existing and new knowledge through engaging and building links between researchers, extension agents and those who have potential to adopt research results, including landholders, primary producers, policymakers and advisors, catchment management authorities and others. In 2009-2010 efforts will continue to improve access to information, sharing of knowledge and interpretation of research at enterprise, catchment, regional, state and national levels.

Knowledge and Adoption

Executive Manager: Bruce Wright

Program duration

This is an ongoing program within the 2005-2010 Strategic Plan

Expected program outcomes

Better informed policy making and improved practices in natural resource management through the uptake by policy makers and land and water managers of the findings of research funded by LWA.

Total expenditure budget for the program

\$9.133 million over the life of the program under the 2005-2010 Strategic R&D Plan

Expenditure budget for 2009-10

\$1.683 million (All Land & Water Australia funding)

Australian Agricultural and Natural Resources Online

Program Objectives

The Australian Agricultural and Natural Resources Online (AANRO) is an online service integrating three databases, Australian Agricultural Research in Progress (ARRIP), Australian Bibliography of Agriculture (ABOA) and Streamline (the national water research database). It is being redeveloped as an online full-text digital repository of research to assist sustainable and productive management of agriculture and Australia's land and water resources.

Land & Water Australia is managing the administration and redevelopment of AANRO on behalf of the program partners. AANRO is jointly funded by the Primary Industries Standing Committee, the Natural Resource Management Standing Committee, and the Rural Research and Development Corporations.

Executive Manager: Bruce Wright

Partners

- Australian Egg Corporation
- Australian Local Government Association
- Australian Pork Ltd
- Australian Wool Innovation Ltd
- Bureau of Meteorology
- Cotton Research & Development Corporation
- CSIRO
- Dairy Australia
- Department for Environment and Heritage

- Department of Agriculture and Food (Western Australia)
- Department of Agriculture, Fisheries & Forestry
- Department of Environment & Climate Change (NSW)
- Department of Environment & Conservation (Western Australia)
- Department of Environment, Water, Heritage and the Arts
- Department of Fisheries (Western Australia)
- Department of Infrastructure, Energy and Resources (Tasmania)
- Department of Natural Resources & Water (Queensland)
- Department of Natural Resources, Environment and The Arts (Northern Territory)
- Department of Primary Industries (Victoria)
- Department of Primary Industries, Water & Environment (Tasmania)
- Department of Employment, Economic Development and Innovation (Queensland)
- Department of Primary Industry, Fisheries and Mines (Northern Territory)
- Department of Sustainability & Environment (Victoria)
- Department of Territory and Municipal Services (ACT)
- Department of Water (Western Australia)
- Department of Water and Energy (NSW)
- Department of Water, Land & Biodiversity Conservation (South Australia)
- Fisheries Research & Development Corporation
- Forest and Wood Products Australia
- Forest Products Commission
- Grains Research & Development Corporation
- Grape & Wine Research & Development Corporation
- Horticulture Australia
- LiveCorp Ltd
- Meat and Livestock Australia
- NSW Department of Primary Industries
- Primary Industries & Resources South Australia
- Rural Industries Research & Development Corporation
- Sugar Research & Development Corporation

Program duration

2007-08 to 2009-10

Expected program outcomes

An online full-text digital repository of research relevant to agriculture and natural resources to assist the national management of agriculture and natural resource management.

Total expenditure budget for program

\$1.733 million

Expenditure budget for 2009-2010

\$0.426 million (Land & Water Australia funding \$0.009 million, partners \$0.417 million)