



Distilled

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Welcome to the National Water Commission's eNewsletter. *Distilled* is published monthly and brings you the latest news from the National Water Commission.

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Desalination and Australia's long-term water security

The CEO of the National Water Commission, Ken Matthews, has released a report showing that desalination technologies will play an increasingly important role in securing Australia's water supplies.

[Emerging trends in desalination](#) will inform decisions on the merits of desalination technologies and the part they can play in our suite of water supply options.

Mr Matthews said, 'The Commission believes that all water supply options should be on the table. The public needs to be clear about the potential of desalination, especially in providing more secure water supplies. At the same time, the costs and risks need also to be made clear. This publication does just that.

'Australian governments have to date committed to investing over \$7.5 billion in desalination plants to supplement bulk drinking water supplies and further investments are being considered.

'This Waterlines report indicates that desalination technology is becoming an increasingly competitive water treatment option. It also shows there are good prospects to further reduce environmental impacts and improve energy efficiencies. The Commission encourages research and development in these areas.'

Mr Matthews also welcomed the Australian Government's \$20 million investment to establish a National Centre of Excellence in Water Desalination in Perth, which will develop and commercialise new water technologies.'



'It is important to understand that desalination technology is used for much wider purposes than just removing salt from sea water. Other water treatment applications include recycling wastewater for urban irrigation schemes, treatment of bulk drinking supplies, industrial re-use of water and in-land treatment of brackish waters.'

Emerging trends in desalination is a technical publication commissioned by the National Water Commission from the UNESCO Centre for Membrane Technology. The report reviews the latest research and emerging trends in desalination, including energy minimisation and environmental protection, the economics of desalination, and the merits of various desalination technologies.

New Commissioners meet for the first time



[Commissioners](#) Stuart Bunn, Chloe Munro, Elaine Gardiner, Ken Matthews, Sally Farrier, Chris Davis and Laurie Arthur at their first new Commission meeting.

The induction meeting of Australia's new National Water Commission was held in late September. The new Commissioners met Commission staff and were briefed on the [National Water Initiative \(NWI\)](#), the National Water Commission Act 2004 and given an overview of the Commission's organisational structure, roles, responsibilities and accomplishments. Ms Chloe Munro, as a representative of the outgoing Commissioners, provided new Commissioners with feedback, learnings and suggestions from the previous Commission. The new Commissioners commenced the process of setting work priorities for the three years ahead. Commissioners were also briefed on the [Raising National Water Standards Program](#) and its forward work plan.

The next Commission meeting will be held in November.

National Water Week 2008

The organisers of National Water Week, the [Australian Water Association \(AWA\)](#) used this year's event to call on all Australians to consider where their drinking water comes from, how it's treated, and what happens to it after it goes down the plug.

National Water Week was officially launched in Sydney on Monday 20 October with guest speakers Tammy van Wisse, Dr Christobel Ferguson and Julian Gray. The theme for this year's National Water Week – Clean



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Water: Essential for Life! - drew community attention to the importance of clean water to our health and quality of life.

The Australian Water Association said that it's everyone's responsibility to preserve and enhance their local water environments. Tom Mollenkopf, Chief Executive stated "Communities, government and the water sector need to work together to ensure a clean and secure water future. Water management is everyone's responsibility, and we all have important roles to play. It's not enough to say it's someone's problem, because clean reliable water really is essential for life."

CEO addresses federalism conference

CEO of the Commission, Ken Matthews, recently addressed the Australian Federalism: Rescue and Reform Conference on *Water as a policy challenge for federalism*.

Mr Matthews said that Commonwealth / State relations was the most obvious challenge today in public administration in Australia and that it was time the issues were tackled. Various actions could be taken. Commonwealth/state mechanisms that could be adjusted include funding programs, regulatory arrangements, Ministerial Council machinery, incentive arrangements, role definitions and reform processes.

Mr Matthews said that the means of Influencing the states and territories towards shared national priorities include public discussion, benchmarking states' reform performance, conducting independent assessments of reform progress, and subsidising the costs of reform. It would also be possible to offset revenue losses from reforms or introduce incentive payments for reforms. Other options included 'trading' one reform for another concession, engaging States in designing reforms, negotiating national strategies or plans, legislating reforms, and encouraging competitive bidding by states for conditional funding.

Mr Matthews then outlined the models for Commonwealth/State relations including the National Competition Policy (NCP) model and the National Partnerships Program. He posited a potential third way in which the Commonwealth could unilaterally specify the reforms it seeks, set a "price" for each reform, and then challenge jurisdictions to take the opportunity on or to miss out. This scheme would be voluntary and would enable national policy leadership.

According to Mr Matthews, the muddying of federalism meant that all levels of government now have some role in important policy areas such as transport, roads, health and water. He said that Australian governments need to re-establish clear and respective roles and responsibilities, and then set out the eight core responsibilities of Governments in water:

- > set and enforce health and safety regulations
- > set and enforce environmental protection standards
- > set and regulate water market arrangements including property rights, transparency, "weights and measures" (water resource accounting and metering)
- > establishing necessary institutions such as environmental water managers, water market registries, water market and pricing regulators, water data and information custodians
- > regulating prices where markets fail and the benefits of intervention outweigh the costs
- > harmonising cross-border arrangements to eliminate distortions
- > urban planning, regional planning, NRM planning, water system planning, and long term planning, and
- > introducing equity where markets don't.

Mr Matthews said that inevitably choices must be made, which led to the question of why politics can't be taken out of water. In making informed choices, science, knowledge and data are essential – but ultimately the choices made are social and thus political. For example, someone has to decide which environmental assets should be nurtured, how large a redgum forest should be, how often a hatching or nesting event should occur, how resilient we want our ecosystems to be, and what levels of risk are acceptable.

Decisions on such issues should be science-based, but not science determined. Choices, judgments and trade-offs will always be required.

Mr Matthews then set out an agenda for making federalism work including:

- > re-establishing respective responsibilities and roles of the respective levels of government
- > agreeing policy and reform objectives and timelines
- > building the right institutions and processes for collaboration
- > coordinating program expenditure
- > publishing progress assessments, and
- > utilising COAG.

World's largest wetlands survey

The largest ever survey of the health of Australia's vital wetlands is currently being undertaken with environmental researchers from the University of New South Wales conducting a special aerial survey of waterbirds in Australia's wetlands.

This is the first time that all of the nation's wetlands have been assessed together in this way and is the largest and most ambitious research project of its type ever attempted.

Under the [National Water Resource Assessment Using Waterbirds: ecosystem health and conservation importance of water dependent ecosystems and rivers project](#) funded by the Commission, Professor Richard Kingsford will lead a survey team that will fly at low altitude to count the number and species of waterbirds living in the wetlands to assess their relative health.

'This important project is a world first,' says Professor Kingsford. No resource is more vital to Australia than its fresh water and no other country has yet used waterbirds as an indicator of the health of its wetlands.

'But it makes sense to do so because it is relatively quick and efficient. Wetlands with large numbers of waterbirds are likely to be in a good condition - supporting fish breeding and diverse aquatic life.'

'The project will make a significant contribution to the National Water Initiative (NWI), Australia's blueprint for water reform, by helping environmental water managers, state and territory governments, and scientists to better monitor and manage environmental water delivery.'

Funding from the Australian Government of more than \$950,000 was provided by the Commission through the [Raising National Water Standards Program](#) with further in-kind funding from the States and Territories and the University of New South Wales.

The survey results are publicly available through a [dedicated website](#).

Groundwater Technical Advisory Committee - update

The Commission's Groundwater Technical Advisory Committee (GTAC) was established to advise the Commission on groundwater research directions and investment strategies to ensure that the [National Groundwater Action Plan](#) delivers outputs consistent with the NWI.

GTAC has predominantly a skills-based membership which includes a number Australia's leading groundwater experts, groundwater managers, and the Chairs of both the National Groundwater Working Group and the Australian Chapter of the International Association of Hydrogeologists.

GTAC met in Adelaide this month to consider new project proposals and to inspect innovative Managed Aquifer Recharge (MAR) installations at the Grange Golf Course, the Salisbury Council Parafield site and Northgate reserve. MAR is a technique to recharge water to aquifers for subsequent reuse and in the cases inspected is combined with wetland treatment to aid stormwater reuse for irrigation of recreational



areas.



Members of GTAC inspecting MAR sites in South Australia

On the first evening GTAC also received a presentation from the South Australian Arid Lands Natural Resource Management Board on the Raising National Water Standards (RNWS) funded project, [Allocating Water and Maintaining Springs in the Great Artesian Basin](#). This project is investigating the hydrogeology and ecology of the springs along the western margin of the Great Artesian Basin.

The GTAC Committee Meeting considered the technical merits and alignment with NWI objectives of a number of new projects proposals that had been submitted by external agencies or developed by Commission staff. The GTAC recommendations will be considered at the next Commission Meeting in November, prior to recommendations being made to the Minister for Climate Change and Water, Senator Penny Wong.

Commission provides funding for five new groundwater projects.

The National Water Commission recently provided funding of \$925 000 for five new groundwater projects under the [National Groundwater Action Plan](#).

[The Assessment of inter-aquifer leakage in the Great Artesian Basin project](#) has received funding of \$200 000 and will be conducted by Queensland Department of Natural Resources and Water. It will study the inter-aquifer leakage in the Great Artesian Basin (GAB) where the condition of many bore casings in the Queensland segment of the GAB is deteriorating due to corrosion and inadequate construction. Previous scoping studies have indicated that in some areas over 60% of bores may have corroded casings. To date, groundwater experts have attempted to assess and understand the extent of inter-aquifer leakage by analysing the geophysical logs and bore hydrographs, and using pressure testing. These results will now be



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extrapolated over the whole Basin, using desktop and field studies, to quantify the true extent of the problem.

The [Development of a method to correct for hydrostatic pressure changes on adjacent aquifer responses project](#) will receive funding of \$160 000 to develop a method to correct for hydrostatic pressure changes in adjacent aquifers. In many areas of Australia, and especially in the Murray-Darling Basin, groundwater is pumped from a deep confined aquifer, while the overlying shallow unconfined aquifer is not exploited - typically because of poor water quality. Large-scale groundwater extractions across the deep aquifers of the Murray Basin Riverine Plain since 1995 have led to reduced groundwater levels in these aquifers. However, it is possible that some proportion of the overall decreases in deep aquifer pressure could also reflect reductions in weight of overlying shallow water tables (defined as 'unloading') due to drought and decreased irrigation. This project will contribute to better understanding of the connections between deep and shallow aquifers, by investigating aquifer pressure reductions and subsequent level changes and developing a method to correct for hydrostatic pressure changes on adjacent aquifers. This project will study the range of possible deep confined aquifer pressure responses as a result of the unloading of the shallow water table.

[A new approach to accounting for groundwater dependent ecosystems \(GDEs\) and surface water systems when building management plans project](#) will receive funding of \$300 000 and will be conducted by the Victorian Department of Sustainability and Environment. The project will develop a new approach to accounting for groundwater dependant ecosystems (GDEs) and surface water systems when developing water management plans.

Funding of \$55 000 will lead to the production of a [Waterlines Discussion Paper on Coal seam methane gas co-produced water](#). The recent increase in interest in coal seam methane gas (CSMG) by large international energy companies is expected to lead to increased CSMG production across Australia; predominately in Queensland. The project will produce a National Water Commission Waterlines discussion paper, which will consider both national and international experiences and also examine the use of waste water from the onshore oil and gas industry. The discussion paper will report on the current and future extent of the CSMG waste water issue, examine how this waste water is dealt with under jurisdictional legislation and other policy and management issues, examine the consistency of this activity with the National Water Initiative, examine the potential for productive uses for the water and outline the possible impacts that need to be considered by policy makers and water managers.

The [Quantifying surface water/groundwater exchange using thermal and chemical measurements project](#) will receive funding of \$210 000 to develop the field equipment and a methodology to quantify the exchange of surface water and groundwater in river beds. This project, to be conducted by the University of New South Wales, will help quantify the exchange of surface water and groundwater in river beds and will improve the mapping of connections and interactions between surface and groundwater. The tools developed through the project will then also be able to be applied to dams, lakes, rivers and wetlands. The project is being co-funded by the National Plan for Sustainable Irrigation and will result in improved knowledge and understanding of a process that can, in turn, inform policy development and water allocation decisions.

Busy year of progress in national water reform

The Commission has released its [2007-08 Annual Report](#) and the CEO of the Commission, Ken Matthews, has said that as drought and climate change continue to challenge us, national water reform is more vital and urgent than ever.

'Our first biennial assessment of progress under the NWI and a 2008 update report on future water reform priorities outlined the strengths and weaknesses of water reform to date. Many of the issues we identified are influencing the future reform agenda.

'In response to the Commission's recommendations for a coordinated research effort to advance groundwater knowledge and reforms, the Australian Government allocated funds for a comprehensive \$82

million National Groundwater Action Plan that is now being managed by the Commission.

'Another highlight was the joint release with the Water Services Association of Australia of the second national performance report for urban water utilities, together with the Commission's first national performance report on rural water service providers.

'The Commission's Annual Report also outlines our contributions to improved water management around Australia through a range of projects administered under \$1.6 billion Water Smart Australia Program and the \$200 million Raising National Water Standards Program.

'Through its Waterlines series of reports and position statements on major reform challenges, the Commission has made a special effort to improve information on important water issues and enhance the quality of debate.

Position statements included those on groundwater, water planning and urban water pricing.

Tiwi Islands Water Allocation Plan

The Australian Government is contributing funding of \$300 000 from the [Raising National Water Standards Program](#) to the Northern Territory Government to employ an [Indigenous water planner](#) for two years. The water planner will develop a water allocation plan for the Tiwi Islands where there are forestry and groundwater extraction pressures on the resource.

The Tiwi Islands water plan will be the first developed for a water system entirely within aboriginal land. The methodology and processes developed will provide lessons for other plans in Indigenous lands and also for areas where there is a mixture of land tenure and ownership.

The Tiwi Islands water allocation plan will also be a case study for the development of tools and guidelines for water planning that will be developed in the separately funded *Water Planning Processes: Lessons, gaps and adoption* project.

This investment will enable the Northern Territory Government to undertake the development of the Tiwi Islands water allocation plan immediately. It provides an opportunity to develop tools and guidelines that support other Indigenous water allocation plans and other water sharing plans that recognise Indigenous access to water resources. This project will be one of the first steps into the water planning profession for Indigenous people in Australia.

Subsurface groundwater-dependent ecosystems

The Waterlines report [Subsurface Groundwater-dependent Ecosystems: a review of their biodiversity, ecological processes and ecosystem services](#) is now available on the NWC website.

The report was prepared for the Commission by the University of New England and forms part of a series of Waterlines papers designed to explore issues relating to aquatic ecosystems in Australia and identify significant current gaps in knowledge associated with environmental water management.

The review summarises what is known about biodiversity in groundwater, the ecological processes in groundwater environments and the ecosystem goods and services provided by subsurface groundwater dependent ecosystems in Australia. The report also matches current knowledge with the knowledge needs of national policy on environmental management and identifies directions for research.

Australian Society for Limnology 2008 Congress

The [Australian Society for Limnology](#) held its 47th annual congress in Mandurah WA from 29 September to 3 October 2008. The Commission's Water Science Group General Manager, Matt Kendall, gave a presentation on NWI implications for aquatic scientists and environmental managers.

Mr Kendall said that a fundamental aim of the National Water Initiative is to restore over-allocated surface



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and groundwater systems to environmentally sustainable levels of extraction. "Striking a balance between water for consumptive use and water for river and wetland health is integral to that aim, with water planning being the fundamental means for achieving this balance."

"The NWI requires the identification of specific environmental outcomes for water systems in each jurisdiction, and also calls for management practices and institutional arrangements that will achieve those outcomes."

Recognising the importance of good science to underpin robust policy and decision making, Mr Kendall outlined that the Commission has provided significant funding to fill knowledge gaps and promote science to support improved environmental water planning and management.

According to Mr Kendall, improved knowledge alone will not ensure that improved environmental outcomes are achieved. "There is an important role for scientists to ensure that the outcomes of their work transcend the science-policy interface. This will be essential to help policy makers and water managers meet their NWI commitments, such as:

- determining environmentally sustainable levels of extraction
- identifying over-allocated and stressed ground and surface water systems
- monitoring river and wetland health for adaptive management of environmental water, and
- improving the effectiveness and security of environmental water."

Also at the conference, ASL 2008 medallist and new National Water Commissioner, [Professor Stuart Bunn](#), led a session on climate change impacts and environmental flows. The conference also featured a tribute session to former Commissioner, the late Professor Peter Cullen. A range of conference papers covered topics including acid-sulphate soils, river and wetland health assessment, environmental flows and environmental monitoring and management.

Murray Darling team win top CSIRO award

The team of scientists who developed [The Murray Darling Basin Sustainable Yields Project](#) has been awarded the 2008 CSIRO Chairman's Medal. The team, led by Water for a Health Country Flagship Director, Dr Tom Hatton, delivered the world's first water resource assessment of its scale for the groundwater and surface waters of the Murray-Darling Basin, reporting on current and future climate scenarios and possible land management changes.

The Sustainable Yields project is funded by the Commission under the [Raising National Water Standards Program](#).

The award recognises the success of the team in increasing the knowledge which is fundamental to the sustainable management of one of Australia's most important regions, the Murray-Darling Basin. "I am delighted to see a project with such beneficial influence on the management and use of our nation's resources be recognised in this way," said CSIRO Chairman Dr John Stocker.

In March 2008, the Council of Australian Governments expanded the Sustainable Yields project to provide a comprehensive scientific assessment of water yield in all major water systems across the country to allow a consistent analytical framework for water policy decisions across the nation. Regions currently being studied as a part of this expansion are Northern Australia, South-West Western Australia and Tasmania.

NWC Science Seminar Series

The Commission hosted three water science seminars during October.

Mr Bernard Morrison, Australian Bureau of Statistics

Mr Bernard Morrison from the Australian Bureau of Statistics presented on the ABS Publication, [Water and the Murray-Darling Basin: A Statistical Profile 2000/01 – 2005/06](#).



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Water and the Murray Darling Basin presents a range of water, social, environmental and economic statistics relating to the Murray-Darling Basin covering the period from 2000-01 to 2005-06.

Using statistics, this seminar answered questions about the Murray-Darling Basin including:

- > Why is the Murray-Darling Basin known as the nation's food bowl? How has agricultural production changed from 2001 to 2006?
- > How intensive is irrigation in the MDB compared with the rest of Australia?
- > What water sources are used for agricultural production?
- > Who are the major water users in the basin?
- > How has annual Agricultural water use changed from 2001 to 2006?
- > Which irrigation practices are undertaken?
- > What is the economic benefit is achieved as a result of irrigation? How has this changed from 2001 to 2006?
- > What are the major industries of employment in the MDB? How has Agricultural employment changed from 2001 to 2006?

Development of an index of Groundwater Condition, Mr Chris Smitt and Mr Adrian Piani, Hyder Consulting

Chris Smitt and Adrian Piani from Hyder Consulting presented on Development of an Index of Groundwater Condition. Hyder Consulting has recently completed a world first study to develop and trial an Index of Groundwater Condition (IGC). The IGC is an integrated measure of the environmental condition and human values supported by aquifers. It provides a consistent process to compile and report data on groundwater condition that is meaningful to scientists, resource managers, policy makers and the public. It also enables benchmarking and monitoring of aquifer condition over time.

The IGC enables scientists, groundwater users and managers to assess aquifer naturalness, and the human values they support, and to determine what management actions could be undertaken to protect or improve aquifer health. The four key areas analysed and reported on within the IGC are groundwater quality, groundwater quantity, environmental support and physical assessment/characteristics.

The Department of Sustainability and Environment in Victoria (DSE) managed the project with funding provided by the National Water Commission. The first step in the project was to develop a preliminary concept for the Index (Stage 1), based on a literature review, a survey of recognised groundwater experts, and discussions with groundwater managers. The results and recommendations from Stage 1 provided enough insight to develop ideas regarding a framework and process which could provide an overall integrated assessment of aquifers.

Stage 2 of the project which has just been completed involved groundwater sampling, developing and refining the assessment, scoring and reporting process, using real data to calculate a score at trial sites and workshops with groundwater managers and recognised experts for peer review.

Stage 3 of the project would develop an IGC for all major Victorian aquifers and create an automated web based program to manage and report data.

Coorong Lower Lakes and Murray Mouth Ecology, Dr Justin Brookes, the University of Adelaide

Dr Justin Brookes, the University of Adelaide, Leader CLLAMM Ecology Research Cluster presented on the Coorong/Lower Lakes. Dr Brookes presented the research outputs from a large collaborative research program - [Coorong, Lower Lakes and Murray Mouth Ecology research program \(CLLAMMecology\)](#) - on the Lower lakes and Coorong.



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The aim of CLLAMMecology is to understand how the region could look later this century from an ecological point of view. The major challenges that the region will encounter is reduced environmental flows, climate change and sea level rise.

The major findings were as follows:

- > there is an absence of a formerly-dominant seagrass species and key food source for birds, *Ruppia megacarpa*, in much of the lower Coorong
- > another important seagrass, *Ruppia tuberosa* is also contracting in distribution, with no plants flowering in the South Lagoon in spring 2007
- > most species of invertebrates, a significant food source for fish and birds, are disappearing from the southern part of the Coorong's North Lagoon and from the South Lagoon
- > only a small number of one fish species, small-mouth hardyheads, are currently found in the hyper-saline South Lagoon, and even these are unable to survive summer conditions in the South Lagoon
- > the bird community naturally changes along the length of the Coorong but has also changed significantly since the 1980s. While birds are not directly affected by salinity, they have now nothing to eat in many parts of the Coorong
- > biodiversity reduces with increasing salinity and there is a progressive loss of redundancy in the food web as one moves down the Coorong threatening ecosystem collapse, and
- > the Lower lakes are also in a poor state and under threat from receding shorelines, increasing salinity and acid sulphate soils.

Dr Brookes said that management intervention is required in this system and that to simply not act and wait for freshwater flows risks losing some of the key attributes from this internationally significant system. Many management solutions are proposed for this system but the restoration of freshwater flow is the only sustainable solution in the long term but we are running out of time to act. Pumping hyper-saline water from the Southern Lagoon of the Coorong is a serious option to enable the system to recover to a point that it will benefit from freshwater flow from the River Murray. Whatever management action is decided upon for the Coorong or Lower Lakes it must not compromise the long-term future of this unique environment.

In Brief

Have your say on Groundwater Knowledge and Capacity Building.

- > Under the Groundwater Action Plan the Commission is undertaking a Knowledge and Capacity Building Stakeholder Analysis using consultant Rob Mercer from *instinct and reason*. *instinct and reason* will identify where there are knowledge gaps and capacity building needs for groundwater and determine how to best improve groundwater awareness and management of groundwater issues. *instinct and reason* will undertake the survey of groundwater managers, users and other stakeholders in November. The survey results will be used to inform the Knowledge and Capability Strategy and its communication strategy. Please register your interest in participating in the survey by sending an email to rm Mercer@instinctandreason.com

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