

What's happening in water research at the University of Adelaide

The continuing drought and water restrictions are generating new and innovative ideas to meet the challenges of managing diminishing water resources, and research on smart water management and use is more than ever in demand. The Water Research Cluster continues to develop partnerships for research projects in water-related fields, and to promote knowledge of current water issues.

This Newsletter details Cluster events which celebrated National Water Week, and the work of the Water Research Cluster and its partners, as well as highlighting key related news items on the context for water management.

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Pelicans and ducks resting on a mud-flat exposed by lower water levels in Lake Alexandrina, near Currency Creek. (Photo: Justin Brookes)

To celebrate National Water Week, the Water Research Cluster hosted two special events, **Water Wednesday** and **Water Pitchfest**. Both events have been podcast, and Pitchfest presentations can be seen on video. Check both events and join blog discussions through links on the Water Research Cluster website www.water.adelaide.edu.au

Water Wednesday on 24 October featured the Minister for the River Murray Karlene Maywald and other invited speakers addressing future water security for South Australia. Minister Maywald gave a compelling and sobering presentation on the state of water sources for South Australia, and the options which are being considered. She spoke about the historically low flows in the Murray Darling Basin which, when coupled with the drought conditions in the Mount Lofty Ranges, threaten water security for the city of Adelaide. On current data, it looks as though Adelaide could run out of water in two years if there is not significant rainfall in both catchments in the next 12 months. (Minister Maywald's powerpoint presentation is available through the web link above.)

Mr Chris Stathy, CEO of Philmac P/L, presented an industry perspective that some of the water security problems facing South Australia could be solved if industry was given a greater opportunity to invest its ideas, energy and capital into clever new solutions. He noted that the current restrictions in water use are causing severe economic hardship for some businesses in Adelaide and suggested that Perth stands out in Australia as the city with best practice in water management.

Assoc Prof David Paton of the Water Research Cluster described the frighteningly rapid decline of birds, plants, fish and invertebrates in the Coorong system, as a result of years of man-made and natural drought conditions. The result is likely to be the extinction of some species in this area, and perhaps will contribute to the complete extinction of the Fairy Tern. The value of the Coorong as a key drought refuge has been compromised, and the dominant water plant *Ruppia tuberosa* can only survive for another two years without inflows from the River Murray to support new germination.

Dr Rod Oliver of CSIRO gave a disturbing presentation on the ecological health of the River Murray. The Council of Australian Governments agreed in 2004 to provide 500 GL pa of water for environmental flows in the River Murray system to protect six ecological systems along the River Murray ("icon" sites). The results of a thorough analysis by CSIRO Water for a Healthy Country shows that so far the governments of Australia have provided zero extra environmental flows for the river. Furthermore, while they have identified 380 GL pa that could be saved for environmental flows, this will not be enough to save ecological systems along the River. The CSIRO analysis found that 2,000 GL pa will be required to protect the six "icon" sites, and that 17% of diverted water needs to be returned to the River to maintain a healthy working river.

Three important messages can be derived from all four talks.

1. While there are some positive things being done to provide extra water sources for Adelaide and South Australia, including water recycling, storm-water capture and recovery and improvements in water use efficiency by individuals and industries, the overwhelming issue is that humans are taking too much water from the Murray Darling System.

The over-extraction of water from the system has led to a dying Coorong, a sick and declining River Murray and wetlands, and water security problems for irrigators and urban residents in much of South Australia. The solution seems to be a wholesale clawing back of water from irrigators who use over 70% of flows in the Murray Darling Basin. The mechanism of how this is done requires some smart thinking. Some suggestions as to how this could be achieved that were put forward by speakers and audience members.

They include:

- buying back all of the water and then selling a lesser percentage at a higher price to those users prepared to pay (including urban users)
- the government making a decision to leave larger volumes of water in the river and allocating a lesser percentage of water to all users under existing licensing arrangements
- buying back licences from irrigators for environmental flows.

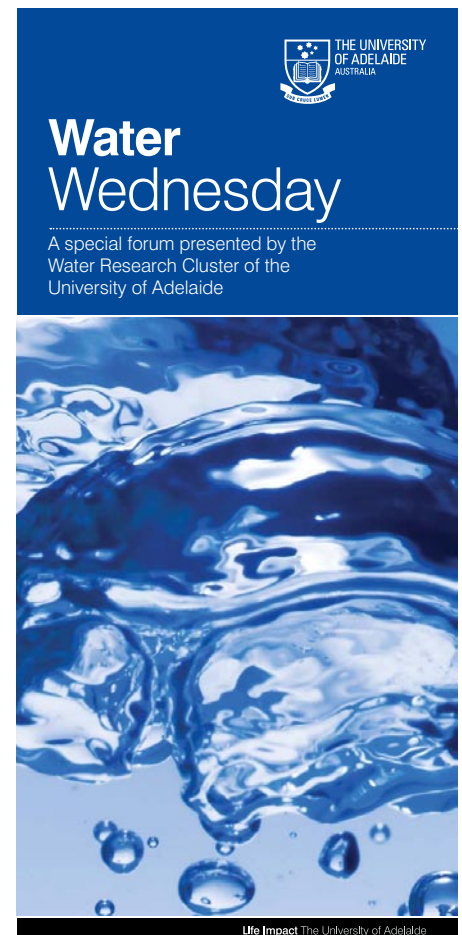
All of these mechanisms create winners and losers; however, under the current arrangements, communities, agriculture and ecosystems in the Murray Darling Basin are all losers.

2. Acts of Parliaments such as the EPBC Act, international compacts such as the Ramsar Convention, and legal agreements such as the Murray Darling Basin Agreement and The Living Murray Agreement have completely failed to protect the riverine environment of the Murray Darling Basin. This should be cause for sober reflection and re-assessment by government as to what it is required to protect environmental assets against legitimate economic interests.

3. Blaming government, irrigators, the media, rice and cotton growers, or even the NSW government, is not going to solve the challenge of protecting the water security for South Australia and its environment. In South Australia we are facing a crisis, if not a catastrophe, right now.

Many irrigators are going to lose their livelihood in the Riverland this year. Businesses in Adelaide have collapsed as a result of water restrictions. The Southern Lagoon of the Coorong is being read the last rites. The wetlands and red gums along the River Murray are dying or dead. Now is a time for government, industry and the community to work together to get through these tough times.

We need a concerted effort that involves the energy, innovative ideas, investment and cooperation of all people with an interest in a healthy Murray-Darling Basin system.



Water Pitchfest on 25 October, in conjunction with the Water Industry Alliance, brought water-smart ideas to the attention of potential clients, with a quick 'teaser' presentation of new technologies, followed by demonstrations and information available during an informal networking session.

Pitchfest speakers included:

- Joe Flynn, CEO of the Water Industry Alliance, on the purpose and members of the Water Industry Alliance
- Chris Colby from the University of Adelaide on the costs and processes of desalination
- Lionel Ho from SA Water on inexpensive technologies in biofiltration
- Don Perugini from Intelligent Software Development on the use of artificial intelligence to improve water efficiency
- David Lewis from the University of Adelaide on new technologies in water treatment systems
- Peter Moller from Agrilink on new water sensors in irrigation
- Tim Anderson from Optimatics on the power of optimisation for improved management of water resources
- Paul Dalby on experiments in new media tools on his new website www.liifuse.com.au

The Water Pitchfest format was very energising and positive, and a refreshing change from normal seminar formats. It generated a feeling that innovative solutions can be found to get smarter with our water use. It was great to hear about a succession of real examples of projects which are finding practical ways to change water use habits and to offer consumers clearer choices. In particular, the migration of water sensors from irrigation to golf courses to home gardens is a very exciting innovation, with the incentive of saving significant amounts of garden water. If this can be coupled with the software project exploring options for domestic water trading, we will have practical incentives for a major change in domestic water use patterns. Given that 50% of urban water goes on gardens, this is really worth pursuing!

The Pitchfest was very successful, with many more innovative ideas and opportunities for collaborations in smart water use. Watch this space for the next one! To view the individual presentations, follow the links from the Water Research Cluster website www.water.adelaide.edu.au or the Water Industry Alliance website www.waterindustry.com.au

Water Research Cluster Postgraduate Corner: Coorong & Lower Lakes Tour

Water Research Cluster postgraduates had a unique opportunity to visit the Lower Lakes and Coorong for their final 2007 forum, to see the impacts of the drought at first hand. The tour started with a presentation at Mundoo Barrage by Anthony Jones of SA Water on the particular problems for barrage operations due to the low water levels.

Special permission was granted to travel with Anthony over the length of the barrages, from Mundoo Channel to Pelican Point at the Tauwitwhere end. The trip allowed views of Younghusband Peninsula, Northern Lagoon of the Coorong and the exposed mud flats in Lake Alexandrina, as well as the opportunity to see firsthand the major construction involved in the five barrages. The trip had to be timed to fit into one-way traffic movements by construction traffic working to seal leakage of saline water through the barrages, and the assistance of SA Water was much appreciated in making the trip possible.



Near Meningie, the tour met up with Dr Kane Aldridge to hear about CLLAMMecology research on nutrient cycles and food sources in the Lower Lakes. (Photo: Anne Jensen)

There was also an opportunity to meet Gary Hera-Singh, a professional fisherman on the Coorong who has campaigned for many years to improve the health of this ecosystem. The group completed the circular tour of the Lakes, crossing at the Wellington ferry, and travelling to the Old Milang Schoolhouse Learning Centre to hear from community leader Karyn Bradford, grazier Anne Hartnett and fisherman Henry Jones about the impacts of the drought locally.

Thanks to the Water Research Cluster for sponsoring this tour, which was a special opportunity to understand the complex issues of the end reaches of the Murray system, and the ecological and social impacts of the drought and over-allocation of water.

www.water.adelaide.edu.au/postgraduateforum



Water Research Cluster postgraduates on Mundoo Barrage during their tour of the Lower Lakes (Photo: Anne Jensen)

Discovery Grant Successes for 2008

Professor Emeritus Martin A.J. Williams has three current projects relating to water and climatic change:

1. Environmental impacts of climate change in the Nile basin over the past

30, 000 years. ARC Discovery Project DP0878058.

Prof MA Williams; Dr MR Talbot; Dr JC Woodward; Prof GA Duller; Prof MG Macklin 2008-2010 Total: \$250,000

This project brings together a multi-disciplinary team of internationally recognised research leaders and the resources they command to investigate the environmental impacts of climatic changes in the Nile basin over geologically recent times. The outcome will be a more comprehensive understanding of how a major river system responds to global and regional climate change, and will provide an enhanced conceptual basis for anticipating how drainage systems such as the Murray-Darling could respond to future change.

2. The environmental impact of an extreme event: the Toba mega-eruption, volcanic winter and the near demise of humans. ARC Discovery Project DP0558437. 2007-2010.

3. Establishing a high-resolution climatic record for the Australian arid zone. H&SS Faculty Small Grant 2007.

Associate Prof Dave Chittleborough and Dr Peng Bi have also been successful in winning ARC Discovery grants starting in 2008.

The fate and toxicity of nano-particles in the terrestrial environment

Prof MJ McLaughlin; Dr DJ Chittleborough; Dr JK Kirby; Dr GM Hettiarachchi 2008-2010 Total: \$310,000

This research aims to provide the knowledge needed to understand the fate and effects of new nano-particulate metal products in Australian landscapes. This project will develop techniques to identify manufactured nano-particulate metals in soils, and to determine the potential adverse effects of these products on plants and soil organisms. This will indicate the need, if any, for controls on the disposal or dispersal of nano-sized metal products in the terrestrial environment.

Extreme weather and population health in Australia: risk assessment, prediction of health impacts and disease burden, and adaptive strategy exploration

Dr P Bi; A/Prof P Ryan; Prof P Weinstein; A/Prof DL Pisaniello; Prof KA Parton; Mr JR Moss; A/Prof AJ Braunack-Mayer 2008-2010 Total: \$189,485

This is the first systematic assessment of the effect of heatwaves on daily mortality/hospitalisations/emergency department visits/ambulance callouts, and the burden of disease due to climate change in major Australian cities. It will explore relevant health specific adaptation strategies. The results will also benefit local communities with their attention and behaviour changes for climate change.

There's a Hole in the Bucket: Prof Mike Young Research Tuesdays, University of Adelaide

Southern Australia has become drier and we will all have to learn to live with much less water. That was the stark warning from one of Australia's leading water policy reformers Professor Mike Young at the University of Adelaide's Research Tuesday seminar on 9 October 2007.

"It is now clear to all that the reliability of South Australia's water supplies has declined," Professor Young said. "The bad news is that the situation is worse than many realise. We are now borrowing from the future and we will have to live with much less water."

Mike argued the need for urgent change: "The more we delay planning to live in this new regime, the greater the costs of changing will be," he said. South Australia, he said, has the opportunity to embrace this "new emerging reality" and take a lead as Australia's "most water savvy State".

But to emerge as the international leader in water management, the State and its businesses, researchers and communities would need to adopt a series of permanent policies and measures that provide incentives to reduce consumption by all, and increase the effectiveness of our water use and storage.

The podcast is available from the University of Adelaide Research Tuesday podcast channel on i-Tunes.

Stradbroke Island Research Project Completed

Water Research Cluster members Assoc Prof Peter Gell, Dr Jennie Fluin and Dr John Tibby recently submitted a report to the Queensland Department of Natural Resources and Water on their Stradbroke Island Research (see *July 2007 Newsletter*).

As a result of this project, a diatom and plant macrofossil record covering c. 7400 years has been derived from the sediments of Blue Lake, North Stradbroke Island. Based on diatom-based reconstruction of lake pH, a variety of statistical measures and comparison with other sites, it appears that water quality and lake level have been relatively stable in Blue Lake over the past 7400 years. There has been little or no detectable change in the diatom community or lake sedimentation rates following European settlement.

This situation is, to the best of our knowledge, unprecedented in Australia. Blue Lake appears to represent a site true "reference" site where the impact of European land use has been minor. On this basis, it could form the focus of limnological and ecological studies for many years.

In terms of further research, the hypothesised stability in the lake could be tested using both additional cores and other proxies (indicators). For example, cores closer to the margin of the lake could be examined for evidence of lower lake levels, such as the presence of remains from the fringing macrophyte *Lepironia articulata*.

Furthermore, the core charcoal record could, if determined at higher resolution, provide important information about fire history, while pollen analysis would provide useful information about past vegetation and climate variability.

Lastly, a "local" data set of modern diatom samples representing a range of water quality and habitats would enable more precise inferences to be made about the past water quality in Blue Lake.

Tibby, J., Fluin, J. and Gell, P. (2007). Palaeolimnology of Blue Lake, North Stradbroke Island. Geographical and Environmental Studies, The Water Research Cluster and the Research Institute for Climate Change and Sustainability, University of Adelaide.

CLLAMMecology update – Flow requirements and resource delivery to the Lower Murray Lakes and Northern Lagoon, Coorong

Postdoctoral Fellow Dr Kane Aldridge

This project is funded by Land and Water Australia with SA Water, and aims to develop a 3D hydrodynamic-ecological model for predicting resource processing within the Lake Alexandrina and Lake Albert under various flow scenarios. The model will be capable of predicting resource outputs to the Coorong and will provide an understanding of how these resources fuel food-webs within the Coorong.

Water Droplets

Prof Mike Young and Jim McColl continue to produce their series of Droplets, which are short discussion papers on water management issues. Droplets explore ideas and propositions which, if developed further, might improve water use.

Droplet No 8 asks 'Is there a place for an across-the-board purchase of water?' in order to achieve the targets for return of water to the river system. It points out that the current water trading market cannot supply the volumes of water needed.

There is also a warning that investment must aim to modernize irrigation effectively, and avoid prolonging inefficient practices.

There is major benefit from a buy-back scheme in that all irrigators would then have funding to make choices about where their future lies.

Droplet No 9 considers 'Speeding up the Reform Process'. It talks about the need to define ownership unequivocally, and discusses what features would be needed in a new planning, entitlement and register system for water trading.

An option for an electronic trading system is considered, and other ways to make the system consistent, fair and accessible.

Earlier Droplets on urban water trading, water governance, water interception, water accounting, water trading, stormwater management and new legislative arrangements can be read at www.myyoung.net.au

Comments are welcome.

The aim is to encourage people to think differently about water management. If you would like to subscribe to the Droplet list, send an email to droplets@adelaide.edu.au or go to the website at www.myyoung.net.au.

Paul Dalby has started a blog on this droplet: <http://blog.litfuse.com.au/2007/10/10/droplet9/>

Mike Young is Professor of Water Economics and Management School of Earth & Environmental Sciences, University of Adelaide and CSIRO Water for a Healthy Country Flagship

The project is being run in conjunction with CLLAMMecology and involves a team from the University of Adelaide (Justin Brookes, Brian Deegan and Kane Aldridge), CSIRO (Sebastien Lamontagne, Perran Cook and Ian Webster) and the Centre for Water Research (Matt Hipsey).

Since the project began in the middle of 2006 it has been progressing very well. We have developed a nutrient budget for the Lower Lakes based on historical data. It showed that the lakes have been a consistent sink for FRP, TP, NO_x and Si and a slight source of TKN. Overall, the lakes acted to convert inorganic nutrients into organic forms and increase the N:P ratio of material entering the lakes from ~12 to ~30. We have also completed the initial set-up of the model, which even in initial stages is predicting all parameters fairly well. We will be continually improving the model as we develop more comprehensive data.

We have also been busy in the field, obtaining data that will feed into the model. We have been logging water temperature at 5 depths at 4 sites since December 2006; examining the spatial variation in sediment characteristics across the lakes; and investigating the influence of sediment re-suspension on nutrient release from the sediments. Since January this year we have also been conducting water quality surveys every 2 months at 20 sites across the lakes. We are told we are the only people to have conducted offshore sampling in the lakes since Mike Geddes in the late 1970's. Kane visited the Max Planck Institute in Germany to investigate the impacts of drying and reflooding on nutrient dynamics and bacterial communities in Lake Alexandrina. This visit was funded by ICE WaRM and the Water Research Cluster.

Due to the current drought and the extremely low inflows into the lakes from the Murray River, we have been expanding the focus of the project to investigate salt intrusions into the lakes. While over recent months there has been reduced salinity in the lakes due to local rain inputs, the salinity remains elevated and we expect it will rise considerably over the coming months. During last autumn, conductivities were close to that of seawater in bottom waters, upstream of the barrages.



Research vessel "Thalasia" in the Narrows, which connects Lake Alexandrina and Lake Albert. (Photo Justin Brookes)

While it is going to make for an interesting scientific study, the impacts on native freshwater biota and on the livelihoods of the surrounding stations and irrigators are likely to be devastating.

Further information:
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Kane Aldridge collecting an integrated water sample from Lake Alexandrina, between Goolwa and Clayton. (Photo: Brian Deegan)



Water issues continue to dominate news, with constant changes and political announcements, so only brief summaries are given here, and some key reports have been posted along with the Newsletters on the Water Research Cluster website <http://www.water.adelaide.edu.au/newsletters/>

Labor Party Water Policy

The election of a Labor government on 24 November opens up new possibilities in the water arena. The new government has included urgent action on water issues in their work agenda.

Their election material included the following statement:

'The first phase of our new water plan will tackle five important outstanding issues. A Federal Labor Government will:

- Invest in urban water infrastructure;
- Set a national target of recycling 30% of wastewater by 2015, and provide support to achieve that target;
- Offer loans of up to \$10,000 to help Australian families invest in rainwater tanks and other energy and water efficiency projects;
- Properly implement the 2004 National Water Initiative and make sure water trading commences; and
- Maximise the purchase of over-allocated water entitlements in the Murray Darling Basin from willing sellers.'

Labor policies can be viewed at www.alp.org.au

Farmers trade water to survive drought

The Australian, Asa Wahlquist, November 19, 2007

Water trading has helped farmers survive the drought but there is still strong opposition to the resource being traded permanently out of a community. The Economic and Social Impacts of Water Trading report has found. The report also found water trading gave farmers greater flexibility and offered a means of managing risk and cash flow, especially in dry times.

Brian Peadon manages the Water Exchange, which is essentially a stock exchange for water trading. "In the last two months, we had traded \$90 million worth of water. Our whole season last year was just under \$70 million. That is reflecting the value: it is worth five or six times as much as last year. With the scarcity of water, prices have gone to unsustainable levels. The average this season is probably over \$1000 (a megalitre, for a temporary trade) and has traded as high as \$1200/ML, which is pretty ridiculous."

Vic refusing to roll over on Murray Darling plan

ABC News, November 26, 2007

The Victorian Premier, John Brumby says he will not be pressured into agreeing to a national takeover of the Murray Darling river system by a Federal Labor government. Mr. Brumby has welcomed the new era of co-operative federalism promised by Prime Minister-elect Kevin Rudd. But Mr Brumby says that does not mean his government will back down over the Murray Darling. "There's a great opportunity to work nationally, providing it's the right plan and over the next few months we'll be working with the Federal Government on this to ensure that we can get a better national approach to water," he said. "But it's got to be a plan that doesn't involve ceding state rights."

Drought causing collapse of Macquarie Marshes wetland

An aerial survey by University of NSW researchers has revealed that the drought has caused waterbirds to vanish from the northern reaches of Macquarie Marshes wetland, north of Dubbo. The researchers have concluded the on-going drought and long-term effects of over-allocating water for irrigation are causing catastrophic changes to the rivers of the Murray-Darling Basin. The latest finding is the worst in the 25-year history of annual aerial waterbird surveys of eastern Australia done by UNSW scientists. The Macquarie Marshes wetland is unique to Australia because of its large colonies of breeding ibis and egrets. "This year we didn't find a single bird in Marshes' northern region. It was heart-breaking," says UNSW river and waterbird expert Richard Kingsford. "In the 1980s we averaged 20,000 waterbirds from more than 20 species in the Marshes," Professor Kingsford says. "In the 1990s that figure dropped to 5,000 birds from 13 species and since 2000 we have averaged around 600 birds from just nine species." Occurring in October each year, the survey counts waterbirds in eastern Australia on about 2,000 wetlands. It is one of Australia's most important long-term data sets on the health and biodiversity of our river and wetland environments, and one of few like it in the world.

Source: [Enviroinfo](http://www.environment.gov.au) 16 November

Living with less water

Prof Peter Cullen, delivering the Schultz Oration at Flinders University in Adelaide, said that we need to plan for a future with about half the current volume of water available for consumption.

This will include a shift to greater farm crop diversity and more annual crops, which could include cotton and rice, and a shift to bigger farms using less water. Cities will need to widen their range of water sources, to develop a diversity of sources of water, including recycling and desalination.

He said more work needs to be done on river health and water security, and that these questions need to be addressed urgently.

Prof Cullen said the National Water Initiative needs to be implemented much more quickly. Each state needs to lift its game and Victoria needs to be on board to make things happen.

The funding in the National Plan for Water Security should not be spent propping up failing infrastructure and perennial crops as water becomes more scarce.

Paul Dalby has started a blog on this presentation: <http://blog.lifuse.com.au/2007/11/29/peter-cullen-at-the-schultz-oration/>

Source: ABC 'The World Today' 16 November

Murray-Darling water report gives 'bleak' outlook

A new report by the Murray-Darling Basin Commission reveals that current water availability is the lowest it has been in 116 years of modelling. The report shows low rainfall and high temperatures for August and September have caused water levels to drop by 150 GL in one month.

The Bureau of Meteorology has reported this is the first time in their records that an El Nino drought in the basin has not been followed by above-average rainfall.

The Commission's chief executive, Wendy Craik, says it is just a dim picture all round. "I mean the Bureau is saying today that the rainfall in September is the lowest September rainfall they've got for the basin in their records since 1900. Storages are at record lows, and we're really having to run the river in a way that we never have before."

Source: ABC Oct 5, 2007

Independent senator wants Murray action

Australia's new independent senator-elect Nick Xenophon says he is determined to use his power in the Senate to bring water back into South Australia's Riverland. "The Murray River irrigators are in dire straits and it's important that we have a national water plan to ensure that those along the Murray River can survive and that's one thing I'm working very hard on." He said there were billions of dollars of plantings at stake in the Riverland and it was in the national interest to help the growers.

Source: *The Age*, November 26, 2007

Murray red gums dying of thirst

Seventy per cent of red gum forest along the Murray River is in poor health and deteriorating, according to two new reports painting a grim picture of Australia's greatest waterway.

The most comprehensive analysis of Victorian Murray River red gums undertaken shows 54 per cent of the forest is in a deteriorating state, while 16 per cent is rated poor to dead. The report says rainfall and flooding levels are insufficient for gums to stay healthy west of Yarrawonga, in northeast Victoria.

A second report, by the Murray-Darling Basin Commission, found only five per cent of vegetation was healthy in the national park at Hattah Lakes, near Mildura, while 76 per cent was in a poor to degraded condition.

The reports were Commissioned by the Department of Sustainability and Environment (DSE) and four northern catchment management authorities. They come weeks after Premier John Brumby rejected draft recommendations by the Victorian Environment Assessment Council to flood the Murray with billions of litres of water.

Australian Conservation Foundation healthy ecosystems program manager Paul Sinclair said the reports highlighted the lack of political will to return water to the river, despite rhetoric at federal and state levels.

"Have we got a crisis or not? The Murray is world's best practice environmental disaster unfolding before our eyes, and our nation and state leaders are refusing to take the action required to fix the problem," he said.

Source: *Sydney Morning Herald*, November 14, 2007

Water to drop 10% in Border Rivers area

The CSIRO, which has been commissioned by the federal and state governments to prepare a series of water availability estimates, has released a pessimistic outlook for water availability in the Border Rivers region of the basin for the next 25 years. The report says without management changes, projected increases in groundwater use would be unsustainable in the long term. The report will be used to develop the new sustainable diversion limit for the river systems in the basin which was a requirement of new federal laws.

The region - which straddles the NSW-Queensland border on and to the west of the Great Dividing Range - is facing a 10 per cent decline in water availability, with extreme estimates ranging from a 28 per cent reduction to a 20 per cent increase in average annual run-off. The region covers four per cent of the total area of the Murray-Darling Basin and supports 50,000 people, including those living in Glenn Innes, Tenterfield, Inverell and Goondiwindi. It also includes the nationally-significant wetland Morella Watercourse, near Goondiwindi.

Source: *The Age*, November 13, 2007

Irrigation costs soar

Irrigators in the Murray Darling basin are paying thirteen times as much for water than they did just over a year ago. The price hit almost \$780 a megalitre in September. At the start of the last financial year, the figure was just under \$60. The South Australian Murray Irrigators group have been lobbying for long-term low interest loans from the Commonwealth. Mr Tim Whetstone says the industry can not afford the luxury of ongoing negotiations and it is time for action. "We need things to happen and they need to happen very very quickly otherwise it is going to be too late."

Source: *ABC News* Oct 3, 2007

Rice Mills Close

The rice crop in the Riverina has been reduced to just 1% and Sunrice is closing the Deniliquin and Coleambally rice mills. General security water licences remain at 0%, and there is not enough water to be delivered to growers who carried over water from the previous year.

Source: *Asa Walquist, The Australian*, 10 November, 2007

ATSE releases urban water report

There are serious gaps in water supply planning in some parts Australia that must be addressed if water supplies are to be adequately maintained in the face of uncertainties about future water availability and demand, according to a recent study by the Australian Academy of Technological Sciences and Engineering.

The study reviewed water supply planning by Australia's non-metropolitan urban water utilities and provides a snapshot of the status of long-term urban water supply planning by these water utilities. It found that there is variance between the quality of water planning in the different states and territories, with significant aspects of one or both of two key elements of water supply planning – institutional support and technical rigour – largely absent in some states and territories. The report can be found at <http://www.atse.org.au/index.php?sectionid=128>

Source: *Enviroinfo* 18 October

Wetlands crisis dire

South Australia's wetlands are in extreme crisis with their future threatened by irrigation and inaction, the Australian Conservation Foundation says. The ACF says the risk is so severe that the internationally-significant Coorong wetlands at the Murray Mouth could be lost within two years if nothing is done. ACF healthy rivers campaigner Amy Hankinson said action was needed urgently to buy back 500 gigalitres of water to improve environmental flows down the Murray River.

The Foundation also called for a salt interception scheme and for the removal or modification of infrastructure along the river to ensure the effective passage of fish and to maximise flooding. Without that action the last 10 per cent of SA's wetlands, including the Coorong lakes and the Chowilla floodplains, could become just a memory, the ACF said. "Hundreds of much-loved species will face extinction including the Murray cod, little tern, Murray hardyhead, regent parrot, the Australian bittern and southern bell frog, to name a few," Ms Hankinson said. The ACF said that only 5 per cent of the federal government's proposed \$10 billion plan to save the Murray would be spent addressing the over-allocation of water.—AAP

Source: *Indaily* 29 October

Australia hotting up: CSIRO

Temperatures are likely to rise by one degree Celsius across Australia by 2030, but could increase by up to five degrees in some parts of the nation by 2070, climate experts say.

The CSIRO's Penny Whetton, co-author of the new Climate Change in Australia report produced by the Bureau of Meteorology and CSIRO, said the probability of warming exceeding one degree was 10 to 20 per cent for coastal areas of Australia, and more than 50 per cent for inland regions.

Dr Whetton said the modelling done in the report showed rainfall was also expected to decrease in parts of Australia, particularly in the south-west.

"Decreases in rainfall are likely for southern Australia, particularly through the winter, and in southern and eastern parts of Australia through the winter and the spring," she said.

The report confirms a pattern of rainfall change leading to drought, which the CSIRO had earlier identified, Dr Whetton said.

Results from the report indicate that some areas of Australia will experience heavy rainfall events, days of higher fire danger, more intense tropical cyclones affecting northern parts of Australia, and more coastal flooding caused by seas associated with storms.—AAP

Source: [Indaily 2 October](#)

Murray irrigators will struggle

Farmers along the River Murray in South Australia face a bleak summer with almost no prospect of extra water allocations. Some fruit trees would be allowed to die while others would be kept alive by water trucked in, as the state government today said allocations would remain at 16 per cent during the 2007-08 season.

"In light of the dire outlook, I urge all irrigators to not delay making decisions on how to best manage this situation for their own properties," said River Murray Minister Karlene Maywald. Ms Maywald said increased water allocations to growers were unlikely over summer with the drought conditions expected to continue. "The Bureau of Meteorology is forecasting that there is only a 50:50 chance of receiving above-average rain over the next three months and a 65-70 per cent chance of experiencing above-average maximum temperatures." —AAP

Source: [Indaily 30 October](#)

Capital City Water Storages

At Water Wednesday, Minister Maywald pointed out that Adelaide can only store enough water for one year's supply, while other capitals have several years' supply. This means that comparisons which appear in the press showing Adelaide at 81% capacity compared to Melbourne at 40% are not valid comparisons. This led to a search for comparable data, which proved elusive in that particular form. In summary, Melbourne has storage capacity of 1,773 GL and uses 438 GL annually, thus 4 years' supply. Sydney can store 2,000 GL and uses 528 GL, giving 3.5 years' supply. The table below highlights the very limited storage available in large dams across the whole state of South Australia, compared with total capacity in large dams in other states (data from National Water Commission). South Australia has just 258 GL of storage, only 0.3% of total Australian storage, reinforcing our reliance on River Murray flows.

Total State Storage (Large Dams)	Total Storage (GL)	Relative storage to SA Total
New South Wales	24,629	95.2 times
Victoria	12,109	47.2 times
Queensland	10,657	41.3 times
Western Australia	12,148	47.1 times
Tasmania	23,652	91.7 times

Limited MDB Irrigation Allocations in SA

The Minister for the River Murray, Karlene Maywald, increased irrigation allocations to 22% for South Australian irrigators from 1 December. This is far less than the 48% minimum required for maintenance of permanent plantings such as orchards and vines, and growers face the prospect of losing more than half of their plantings.

Allocations are currently being managed under special sharing rules, which divide the limited volumes available from storages equally between South Australia, Victoria and New South Wales. The allocations will be updated each month, as outlined in the Drought Water Allocation Policy.

The daily flow to South Australia in November averaged 3,400 ML/d, compared to the normal entitlement flow of 6,000 ML/d for November if the minimum annual entitlement of 1850 GL is received. Salinities continue to climb below Weir No 1 at Blanchetown, with the Lower Lakes now above 2,500 EC, causing problems for irrigators.

Further details are available in the River Murray Water Resources Report <http://www.dwlbc.sa.gov.au/murray/drought/wrr.html>

Inadequate Monitoring of Environment Leading to Inefficiency

Australia's spends billions of dollars managing its biodiversity, yet little is known about the effectiveness of this investment because of inadequate long-term monitoring, according to a leading scientist from The Australian National University (ANU). Landscape ecologist Professor David Lindenmayer from ANU's Fenner School of Environment and Society says that the Federal Government's claim about wise economic management is empty rhetoric when it comes to assessing the returns of its massive natural resource management investments. He is calling for the creation of Long-Term Ecological Research (LTER) networks to fill the gap. "While countless federal and state government management plans specify the need for monitoring, it is almost never put in place. Sustained funding for monitoring programs is rare, and even if adequate funds are initially provided, the majority of programs are subsequently starved of financial and logistical resources. "As a result we have no way to properly assess the effectiveness of the billions being spent on revegetation and river-restoration programs, weed and feral animal control, the reserve system for conserving biodiversity and prescribed burning programs." Professor Lindenmayer believes the Federal Government should make the establishment of LTER sites a priority.

Source: [Enviroinfo 16 November](#)

http://www.nwc.gov.au/publications/newsletter/nwc_newsletter_23.html

Biennial report of National Water Initiative released

The First Biennial Assessment of Progress in Implementing the National Water Initiative has been released by the National Water Commission, highlighting deficiencies in urban water management and recommending that a supplementary set of NWI actions be developed as a priority to improve urban water supply security in light of the current and emerging water challenges in Australia.

The assessment finds that despite the need for acceleration of some key areas, the NWI's policy prescriptions continue to be widely accepted as the right ones for Australia and that governments have made considerable progress in implementing the NWI over its first two years.

It concludes that NWI reforms are providing the tools and flexibility needed by water managers and users to better handle the challenges presented by drought and ongoing competing demands for water. This is especially true of improved water trading.

The assessment confirms the vital role of the NWI as Australia's blueprint for water reform as governments, industry and communities adapt to change and improve the management and use water.

For a full list of recommendations and key priorities, go to http://www.nwc.gov.au/publications/newsletter/nwc_newsletter_special_biennial_assessment.html

Source: Enviroinfo 1 November

Peak water groups endorse national water reform agenda

The National Water Commission (NWC) held its third Stakeholder Reference Group meeting on 26 September 2007 in Canberra.

Peak water, industry, business, farming, local government and environment groups attending the meeting identified key issues and national water reform priorities.

In a roundtable discussion, various members raised the need for:

- a more collaborative and cooperative approach to water reform among Federal and State governments
- a shared understanding across Australia of what over-allocation means
- stronger compliance and enforcement activities
- more sophisticated science and planning to underpin groundwater management and interception
- focus on urban water reform objectives including water pricing, supply security and performance reporting.

All the stakeholder groups represented expressed their resolve to continue to publicly advocate the water reforms embedded in the NWI.

The current drought and evidence of climate change made progress under the NWI more important than ever, although these circumstances also raise issues about the capacity of industry and communities to make changes in times of environmental, economic and social stress.

Water trading assists with drought survival

The Economic and Social Impacts of Water Trading, a new report identifying the changes in water use in rural Australia occurring as a result of water trading, has been jointly released by National Water Commission CEO Mr Ken Matthews, Rural Industries Research and Development Corporation Managing Director Dr Peter O'Brien, and Murray Darling Basin Commission Chief Executive Dr Wendy Craik.

"Water trading is a centrepiece of the National Water Initiative. The National Water Commission has pressed hard to open up trade," Mr Matthews said.

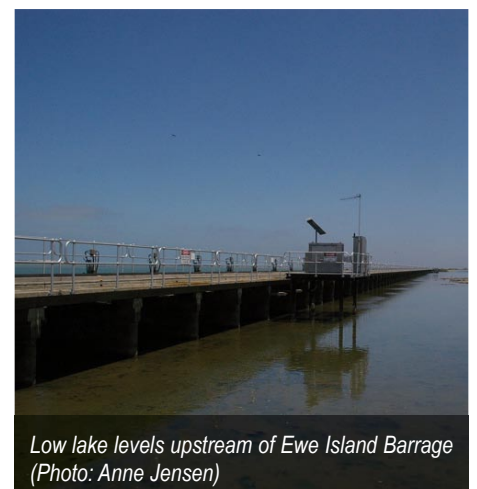
Dr O'Brien said that the research found that it is extremely difficult to untangle the effects of trade from a background of drought, commodity markets and rural adjustment.

The report also found that change can be difficult and that communities in regions exporting water can experience reduced populations and spending. Conversely, communities in regions importing water can experience increased populations without necessarily having the infrastructure and services to properly accommodate new arrivals. The primary recommendation of the report was that when considering the impacts of water trading, it is important to take into account both temporary and permanent trading and to acknowledge the context of the observed changes in water use—which is a context of rural change and structural adjustment. Any approach implying that all impacts associated with changes in water use facilitated by trading are attributable to or caused by trading would be misleading and unhelpful for policy development.

Download report: *The economic and social impacts of water trading* (PDF 4.3MB)



*Receding shoreline of Lake Alexandrina at Ewe Island Barrage
(Photo: Anne Jensen)*



*Low lake levels upstream of Ewe Island Barrage
(Photo: Anne Jensen)*

Conference & Seminar Diary

(sources include EnviroInfo Newsletter)

2nd International Salinity Forum Salinity, Water and Society – Global issues, local action

Adelaide Convention Centre, Adelaide, 31 March – 3 April 2008

For further information visit the forum website www.internationalsalinityforum.org

'Water Down Under 2008'

The 'Water Down Under 2008' Conference will be held in Adelaide, South Australia, from 15–17 April 2008, co-hosted by ICE WaRM and Engineers Australia. All professionals with an interest in Hydrology, Water Resources and the Environment are invited to attend.

Professor Graeme Dandy of the Water Research Cluster is Organising Committee Chair. Partners include ICE WaRM, Engineers Australia, SA Water, The University of Adelaide, the University of South Australia, Flinders University, Adelaide City Council, Tonkin Consulting and the Bureau of Meteorology. For further information, please visit the conference website: www.waterdownunder2008.com

8th INTECOL International Wetlands Conference

'Big Wetlands, Big Concerns'

20-25 July 2008, Cuiaba, Pantanal, Brazil

40 Symposium topics are sorted into 5 groups:

- Geographical and geomorphological aspects
- Biogeochemical aspects
- Ecosystem services and biodiversity
- Management threats and conservation
- Tools for analysis and management.

Workshops and abstracts can be submitted to 8thintecol@coppantanal.org.br

More information is available at the conference website <http://www.coppantanal.org.br/intecol>

The deadlines for submission:

Abstracts 1 May 2008.

Workshops 1 June 2008



Threatened species Cape Barren Geese use the Murray Mouth islands as a summer refuge, grazing on samphires and pastures. (Photo: Anne Jensen)

Who is the Water Cluster?

www.water.adelaide.edu.au

University Research Clusters build relationships between thematic, cross-disciplinary interested groupings of researchers. The Water Research Cluster coordinates water research across the University of Adelaide. The Water Research Cluster has a strong culture of collaboration and support of teams, and has a particular focus on supporting early career researchers.

The Water Research Cluster has specific strengths in the following fields of research:

- Integrated Catchment Management
- Managing Water in Arid Areas
- Managing Wetlands and Rivers
- Sustainable Irrigation
- Wastewater Treatment and Management
- Water Management in Urban Areas.

Leadership Panel

A Panel of academics from across the disciplines and schools of the University provide strategic direction and management of the Cluster. The current members of the Leadership Panel are:

- Graeme Dandy (Civil and Environmental Engineering) - Champion
- David Chittleborough (Geology and Geophysics) - Champion
- Angus Simpson (Civil and Environmental Engineering)
- Marcus Lane (Geography)
- David Jones (Architecture)
- Peng Bi (Health)
- David Lewis (Chemical Engineering)
- Mike Geddes (Environmental Biology)
- Justin Brookes (Environmental Biology)
- Mike Young (Environmental Biology)
- Peter Gell (Geography and Environmental Studies)
- Don McMaster (Research Branch).

Advisory Board

- Dr John Radcliffe (Chair)
National Water Commissioner and Chair, Centre for Natural Resource Management
- Mr John Johnson
Managing Director, SA Murray-Darling Basin Integrated Natural Resources Management Board
- Mr Fraser McLeod (delegate for CEO Rob Freeman)
Director, Knowledge and Information, Dept of Water, Land & Biodiversity Conservation
- Mr Tony Smith, Board Member, Water Industry Alliance
- Mr John Ringham, Chief Operations Officer, SA Water
- Dr Rod Oliver, CSIRO Land & Water
- Mr Tony Lines, Business Development Manager, United Water

Cluster Coordinator

Dr Paul Dalby

For more information relevant to water science and management, visit the Cluster website <http://www.water.adelaide.edu.au>

If you would like to advertise or send material for the Newsletter of the University of Adelaide Water Research Cluster, please contact Paul Dalby on 0401 122 204 or paul.dalby@adelaide.edu.au

Water Information Links

Useful information on water-related topics can be found in the electronic sources listed below.

Australian Water Resources Assessment 2000

Surface water and groundwater - availability and quality

http://audit.ea.gov.au/ANRA/water/docs/national/Water_Content.html

Water Resources Observation Network

<http://wron.net.au/teasers.html>

EnviroInfo Newsletter

EnviroInfo is a fortnightly eNewsletter for professionals in the natural resources and environment management fields. You can obtain a subscription by sending an email to info@envirocentre.com.au with the words 'Subscribe EnviroInfo' in the subject line.

Land and Water News is Australia's only independent, comprehensive digest of news and developments in the natural resource management sector. <http://halledit.com.au/publications/lawn.htm>

CLLAMMecology Newsletter is circulated electronically. If you wish to receive a copy, contact Julie Francis at julianne.francis@adelaide.edu.au

Distilled is the newsletter of the National Water Commission. To subscribe, go to <http://www.nwc.gov.au/> and follow the links.

EcoVoice environmental newspaper is available online at www.ecovoice.com.au

News Splash

News Splash is a regular information email from the Water Research Cluster with a series of short articles of a few lines with links to further information. To register, send an email to paul.dalby@adelaide.edu.au with the words Register News Splash in the subject heading. To Unsubscribe, enter the words. Unsubscribe News Splash in the subject heading. Send any submissions for News Splash to Paul Dalby at paul.dalby@adelaide.edu.au

International Riverfoundation

has re-launched their website www.riverfoundation.org.au. Their aim is to develop the website into a content rich Internet portal that becomes a practical online resource and gateway for river management and restoration. They will also commence distributing their new monthly e-newsletter RiverConnect Online shortly.

Drought information is available from the following links, including an e-newsletter Drought e-news:

http://www.pir.sa.gov.au/pirsa/drought/programs_and_services/e-newsletters/subscribe_to_drought_e-news

<http://www.pir.sa.gov.au/pirsa/drought>

LitFuse

www.litfuse.com.au is Paul Dalby's website that anyone can use to post information, seminars, podcasts, blogs and other stuff on water and natural resource management.

Water Organisation Links

The **International Centre of Excellence in Water Resources Management** produces the ICE WaRM eNewsletter.

You can subscribe at <http://www.icewarm.com.au/mailman/listinfo/eneews>

The South Australian Water Industry Alliance, consists of over 190 organisations in water-related businesses in South Australia, delivering water solutions to global markets. Visit www.waterindustry.com.au

Australian Water Association

AWA has a national coordinating committee under way now, to help in the areas of professional development, training and tertiary education for water.

Visit <http://www.awa.asn.au/> and view the calendar and weekly newsletter there.

Land & Water Australia

Land & Water Australia provide significant sources of water-related research information and funding for projects. Their website is www.rivers.gov.au with access to many publications.

eWater Cooperative Research Centre

The eWater CRC is a joint venture between 47 water, catchment and research organizations. For more information see www.ewatercrc.com.au



Lake Albert has receded far out from its jetties and boat ramps, making boat access very difficult for researchers like Dr Kane Aldridge (Photo: Anne Jensen)

Water Research Cluster postgraduates on Mundoo Barrage with the Northern Lagoon of the Coorong in the background (Photo: Anne Jensen)



Water Research Links – Funding Opportunities

Watch for new funding opportunities on the Research Branch website <http://www.adelaide.edu.au/rb/funding/opps.html>

The comprehensive Grant Opportunities page on the Research Branch website provides access to all ARC and NHMRC opportunities as well as the rural and natural resources R&D corporations. In addition, you can also access the myriad of other funding opportunities. Applications should be submitted to the Research Branch before the sponsor's closing date (1 week for Australian funds and 2 weeks for international funds). Visit <http://www.adelaide.edu.au/rb/funding/> for instructions on submitting applications.

ARC 2009 Discovery Grants

The ARC Discovery Projects Funding Rules for funding commencing in 2009 are now available from the RB website: <http://www.adelaide.edu.au/rb/arc/DiscProj.html>

Eligibility Exemption Ruling Requests will need to be received by Monday 14 January 2008. The internal closing date for full Research Branch review will be Monday 18 February 2008. Please direct any queries to the Research Branch ARC Grants Team (arcgrants@adelaide.edu.au)

Grants for Field Research -- Earthwatch

Closing Date: Ongoing

Purpose: To create an opportunity for public involvement in significant research that addresses scientific, environmental and policy problems and issues.

Website: <http://www.earthwatch.org/research/index.html>

Contact Details: Mr Jason Alexandra,
Director, Earthwatch Australia
Email: JAlexandra@earthwatch.org.au
Telephone: (03) 9682 6828

U.S. Army Research Office proposals for Basic and Scientific Research

The U.S. Army Research Office (ARO) solicits proposals for basic and scientific research in mechanical sciences, environmental sciences, mathematical and computer sciences, electronics, computational and information sciences, physics, chemistry, life sciences, and materials science.

This is an apply any-time grant, runs until 2011.

<http://www.grants.gov/search/search.do?oppld=11441&mode=VIEW>

International Water Research Workshop

The German Research Foundation (DFG) will host an international water research workshop on 2-3 June 2008 in Berlin. It will involve researchers from the US, Canada, Germany and the Netherlands.

The DFG would like to invite Australian participation if we have some relevant experience in this field. They are specifically looking for experience of networks in the field of water research.

All expressions of interest should be directed to dvcr@adelaide.edu.au

21st Century Collaborative Activity Awards - Complex Systems

The James S McDonnell Foundation offers Collaborative Activity Awards to initiate interdisciplinary discussions on problems or issues, to help launch interdisciplinary research networks, or to fund communities of researchers/practitioners dedicated to developing new methods, tools, and applications of basic research to applied problems.

The Complex Systems program supports scholarship and research directed toward the development of theoretical and mathematical tools that can be applied to the study of complex, nonlinear systems. There are no deadlines for this funding opportunity.

<http://www.jsmf.org/apply/collaborative/index.htm>

JSMF is particularly interested in projects attempting to apply complex systems approaches to real world problems. Proposals attempting to apply tools and models to problems where such approaches are not yet considered usual or mainstream are encouraged.

Macquarie Bank Foundation Grants

The Macquarie Bank Foundation's funding criteria are flexible and open. Funding is focused on the core areas of education, health care and research, welfare, the environment and the arts. Internal Closing Date: accepted through year (approx 6 months turnaround for applications)

http://www.macquarie.com.au/au/about/macquarie/macquarie_in_the_community.htm

Australia-China Council General Funding Grants

The Australia-China Council invites individuals and organisations to submit applications for funding to support projects that are designed to strengthen and enhance the relationship between Australia and China and that project a positive image of Australia in China.

<http://www.dfat.gov.au/acc/guidelines.html#app>

National Geographic Research Grants

The National Geographic Society awards grants for scientific field research and exploration through its Committee for Research and Exploration. All proposed projects must have both a geographical dimension and relevance to other scientific fields and be of broad scientific interest. In addition the committee is emphasizing multidisciplinary projects that address environmental issues (e.g., loss of biodiversity and habitat, effects of human-population pressures).

This grant program does not pay educational tuition, nor does it offer scholarships or fellowships of any kind. While grant amounts vary greatly, most range from U.S. \$15,000 to \$20,000. Committee grants tend to act as seed money and are given for one year's research.

The Water Research Cluster newsletter is published once every two months.

The latest version is uploaded to the Water Research Cluster website (<http://water.adelaide.edu.au>).

To receive a copy of the newsletter in printed form, send an email to paul.dalby@adelaide.edu.au with the words Subscribe Newsletter in the Subject heading.

To receive a notification that the newsletter has been uploaded to the website, write the words Subscribe e-Newsletter in the Subject heading.