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## WATER AND THE ECONOMY

Proposed HYDSOC symposium 16 July 2013  
Bob Newman

South Australia's major water resources are Prescribed and most are fully allocated if not overused. The availability is set to get less with Global Climate Change.

On the supply side, limited additional, albeit expensive, sources of water can be got from interstate trade, desalination and water treatment and recycling. In the mining industry, there is some reliance on mining fossil water.

On the demand side, water can be more efficiently used through improvements in infrastructure to control losses, control wastage as occurs in gas extraction, and product modifications such as genetic engineering.

Water pervades all economic activity, but some activities produce more economic value as measured by State Gross Product (GSP) than others. In order to continue economic growth, the South Australian economy needs to delink its correlation to water use.

The crude sustainability indicator GDP per unit

of water use shows that Australia is in a transition phase, but South Australia is likely to need to transition earlier than most of the rest of Australia.

Whilst a shift in water use from agriculture to industry may occur and appear to increase monetary value per unit of water, much food that is already imported is from countries whose water resources are already being mined, such as India, China and the Mediterranean.

Furthermore, pressures of urban development on agricultural land with local water availability could alienate those water resources from productive use.

Increasingly, economic activity depends on a reliable and constant water supply, which adds to the cost of the water. However, working with natural variability has costs of financial charges for higher risk.

In addition to water scarcity, there are also



Asia-Pacific Region - Water Use Intensity

0 875 1,750 3,500 Kilometers

Robinson Projection  
Central Meridian: 100°02'

Water intensity per \$US, in Asia and the Pacific, for 1998–2002.

Source: United Nations Environment Program (UNEP) p96 [http://www.unep.org/roap/Portals/96/REEO\\_AP\\_CH4\\_Water.pdf](http://www.unep.org/roap/Portals/96/REEO_AP_CH4_Water.pdf)

## WATER AND THE ECONOMY

### Proposed HYDSOC symposium 16 July 2013

Bob Newman

economic impacts of over abundance, particularly flooding of urban areas. Of concern are the economic impacts of designated growth areas in flood plains and the increased drainage infrastructure associated with urban consolidation.

HYDSOC is proposing to run a symposium on these subjects/solutions. The symposium will seek to:

- explore the limits to water availability in South Australia, now and under Global Climate Change, set in the Australian context because of its dependence on interstate flows for its major resources in the Lower

South East, Mallee, River Murray and Great Artesian Basin;

- the use of water for the South Australian economy and assessing the economy for water dependence (such as through GSP water intensity, water footprinting, or alternative metrics);
- economic levers for transitioning the economy from a water based one, such as water trading, water pricing, charging for environmental services, and taxation;
- water management levers such as demand management and supply augmentation;

- legislative levers such as third party access to infrastructure, trade liberalisation;
- economic modelling of the impacts of possible measures (including food security);
- case studies of regional restructuring of water-use dependent economies;
- water for mining

If you would like to join the organising committee, peer review papers, or know of possible speakers or sponsors, please contact the organising committee chairman:

Bart van der Wel, tel/fax (08) 8243 2208; email welb@bettanet.net.au

## AUSTRALIA SETTING THE STANDARD FOR WATER INFORMATION EXCHANGE

A new water information standard has been announced recently by the international standards body Open Geospatial Consortium.

Known as WaterML2.0, the new standard will assist in better management of one of our most valuable natural resources.

CSIRO and the Bureau of Meteorology led the development of the new international water information exchange standard, which has already been adopted by a number of organisations, including the United States Geological Survey, KISTERS, Del-

tares, San Diego Supercomputer Center (University of California) and GeoConnections - Natural Resources Canada.

The chair of the Water ML2.0 Standards Working Group, CSIRO project leader Peter Taylor, said the implementation of the international standard will drive huge improvements in data sharing capability.

"A major barrier to countries fully understanding their available fresh water resources is the broad range of systems that measure and store water information," Mr Taylor said.

exchanging groundwater information across the US-Canada border to improve management of cross-border aquifers, exchanging surface water data between countries along the River Rhine, calculating run-off to oceans and producing real-time water forecasts," Mr Taylor said.

Bureau of Meteorology Deputy Director – Climate and Water, Dr Dasarath Jayasuriya, welcomed the announcement of Water ML2.0.

"This is a great outcome for the Water Information Research and Development Alliance between the Bureau and CSIRO, and demonstrates the value of collaboration in science.

"In Australia, WaterML2.0 will be used to guide development of the second version of the Water Data Transfer Format, which is designed to help the Australian water industry share data with the Bureau.

"This will enable the Bureau to efficiently ingest and process water data and provide it to the community in a timely manner. Using these standards will significantly improve the quality and comparability of the water data the Bureau publishes," Dr Jayasuriya said.



Water Information standards aid water management. Photo by Ian Overton. Source: <http://www.csiro.au/Portals/Media/Australia-setting-the-standard-for-water-information-exchange.aspx>

"This lack of data standardisation has greatly limited efficient data exchange between water management authorities. This is set to change once major software vendors and government agencies that manage water information adopt WaterML2.0.

"We have explored a number of scenarios that demonstrate the sorts of problems that can be addressed. These included

## REDUCING BARRIERS TO FISH PASSAGE IN THE ADELAIDE AND MOUNT LOFTY RANGES REGION

Belinda Peters, & Geoff Fisher, Australian Water Environments

Australian Water Environments (AWE) recently developed concept designs for works to improve fish passage at ten sites along the South Para, Torrens, and Onkaparinga rivers. SARDI had previously identified 138 sites as posing threats to the passage of aquatic biota, particularly fish. From these, the Adelaide and Mount Lofty Ranges Natural (Resources Management Board (AMLNRMB) identified ten sites where actions were considered highly desirable and feasible (using a triple bottom line approach) in the short term.

Whilst the impediments posed by large weirs and water supply reservoirs are well documented and recognised, the passage of fish can also be hindered by much smaller barriers. These barriers could include building rubble blocking the channel in low flows, the footings of bridges, stream flow monitoring weirs, fords, culverts, or channel armouring works. These apparently small-scale structures can also pose serious obstacles for fish. In fact, free flow of water over a drop in stream bed level, or an unnatural acceleration of water over a smooth surface (e.g. concrete) that creates a fast shallow flow, can be a barrier to fish movement.

The ten sites selected for this investi-

gation were not the large reservoirs or weirs. Rather, the focus was on rectifying some of the smaller scale issues that are thought to be unnecessarily impeding passage between areas of important habitat that exist between the major barriers. Significant improvements can be achieved by addressing some of the smaller scale sites.

At each of the ten sites the individual species likely to require passage were identified, along with their specific requirements, which included the preferred timing for movement, the life cycle stage, agility, and capacity to negotiate fast flowing water. These factors were assessed for each fish species. Fish species included those that move between fresh and marine environments and those that migrate only within fresh water environments.

Each site was inspected by environmental engineer (Belinda Peters) from AWE; AMLNRMB staff (Katharine Ward); and a freshwater fish ecologist (Darren Hicks) from the Australian Water Quality Centre (AWQC).

The hydraulic performance of each barrier was subsequently assessed against the seasonal requirements of each fish species. This provided design parameters that could be

used to guide the development of concept designs at each site.

At some sites it was determined that the potential barrier would not affect fish passage during higher flow periods. Hence, whilst passage in low flows would not be possible, seasonal passage would be practicable when it was most desired by fish. Other sites required the design

of modifications to the infrastructure to make it fish friendly. These modifications varied from formal fish ladder flumes to the informal, but targeted, creation of pool and riffle sequences (refer to photo). In some cases complete removal of the infrastructure was proposed because it no longer served a useful purpose.

The identification of a practical design solution also required recognition of the current uses and users of the infrastructure that was posing an issue. For each site, stakeholders (including landholders, local government, DPTI, DEWNR) were consulted regarding the current purpose and value of each barrier. Through this process, constraints to altering the infrastructure were identified. These stakeholders were also provided with the opportunity to comment on the proposed changes to restore fish passage.

All of the above information was used to support a triple bottom line, multi-criteria analysis approach (including whole of life costing) to assess the proposed designs and recommendations for each site.

The outcome of the project has been a thorough assessment of the highest priority "small scale" impediments to fish passage in three of Adelaide's major watercourses. This assessment has included the development of practical concept designs that, once implemented, will significantly improve the passage of aquatic biota between important habitat areas along each river.

The authors would like to acknowledge the significant contribution to the project made by the project Steering Committee which consisted of Katharine Ward (Steering Committee Chair) (AMLNRMB), Peter Shultz (Ecologist), Kevin Medlow (Nova Systems on behalf of SA Water), David Schmarr (SARDI), and Frank Mangeruca (DEWNR).

The project was funded by the AMLNRMB



Pool and riffle structure installed by the City of Burnside and AWE in Michael Perry Reserve

### Ian Laing Prize 2012 Nomination

The Ian Laing Prize nominee for 2012 is Daniel Miller from Adelaide University. Daniel's Honours Thesis was entitled *Diatom biomonitoring and pH transfer function development: North Stradbroke Island, south east Queensland*.

The assessment committee saw considerable merit in his project in its significance to a wide range of disciplines including the biological, geological and ecological sciences.

They were also impressed by Daniel's concise responses at interview which demonstrated good understanding of his field of study and advanced interpersonal skills.

Daniel will present his honours work to a technical meeting of the Society in the new year, when he will also be presented with his prize.

## HYDSOC ANNOUNCEMENTS

### HydSoc Appoints Mr. William Lipp a Life Member

Our esteemed Treasurer, Bill Lipp, has been honoured as a Life Member of the Hydrological Society.

Bill has served on the Society's committees for the past 24 years making him the longest serving member of the Society to date, and that, by a fair margin.

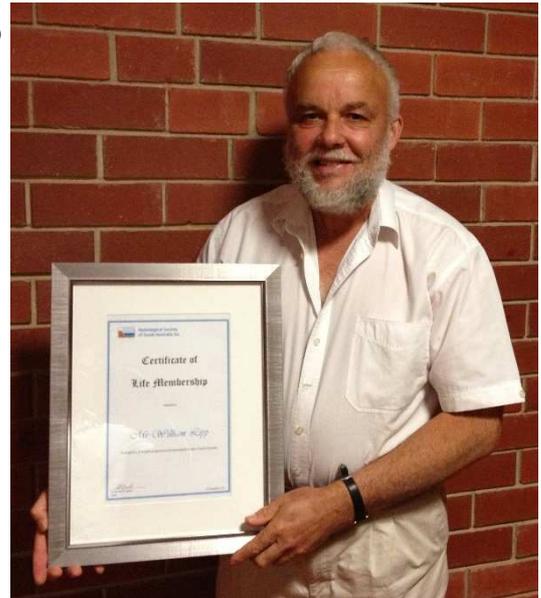
For 23 of those 24 years Bill has shouldered the significant duties of Treasurer and Memberships Officer.

In addition, over the years, Bill's knowledge of matters constitutional has made him a highly valued resource with regards to questions of rules and regulation which invariably arise

with the running of the Society.

At the June meeting of the Society, while Bill was absent on holiday, the motion to appoint our Treasurer a Life Member was passed unanimously.

Congratulations and thank-you, Bill.



## SUSTAINABLE COASTAL MANAGEMENT AND CLIMATE ADAPTATION EXAMINED IN NEW BOOK

Sustainable management of Australia's much-loved coast is complex and challenging. Much is already known about coastal environments, but to date, coastal management has had limited success; in some cases management decisions have made problems worse.

Many CSIRO researchers have contributed to a new book, *Sustainable Coastal Management and Climate Adaptation: Global Lessons from Regional Approaches in Australia*, launched at the Coast to Coast conference in Brisbane.

Australia's coast is shaped by severe events such as cyclones and floods, and climate change is increasing their number and intensity. This book examines past, present and possible future coastal management and research, based on real cases.

CSIRO's Wealth from Oceans Flagship Acting Science Director, Dr An-

dreas Schiller, says that our coastal populations are growing, increasing social, environmental and economic vulnerability to these hazards.

"This book explores the evolution of coastal management in Australia and provides critical insights into contemporary experience and understanding," Dr Schiller said.

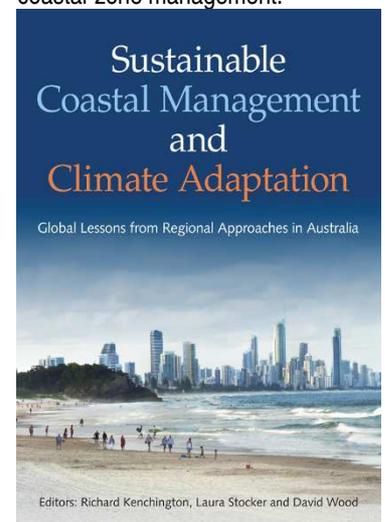
"It draws on contemporary theory and lessons from case examples to highlight the roles of research and community engagement in coastal management.

"The book concludes with a chapter of recommendations, which can help guide coastal management and research around the world."

The book is produced by the Coastal Collaboration Cluster, which includes researchers from CSIRO, Curtin University of Technology, Deakin University, Flinders University, the

University of Adelaide, University of the Sunshine Coast, University of Tasmania and University of Wollongong.

The Cluster encourages better collaboration between scientists and decision-makers, so that research outcomes can be more easily used in coastal-zone management.



## UPCOMING EVENTS

# ASIA PACIFIC WATER RECYCLING CONFERENCE

1 – 4 July 2013, Brisbane, Australia

## CALL FOR PAPERS

This is your chance to share and learn about new technologies and innovations, improving public acceptance, project delivery and leadership. As the need for climate resilient water sources becomes crucial and the region experiences unprecedented growth and urbanisation, global leaders in water from across Australia and the Asia Pacific will gather to explore the diversity of water recycling solutions.

### PROGRAM OUTLINE

- 1 Jul: Pre-conference workshops and welcome drinks
- 2 Jul: Keynote and platform presentations and conference dinner
- 3 Jul: Keynote and platform presentations
- 4 Jul: Optional offsite technical tours

### ABSTRACT SUBMISSION GUIDELINES

Short abstracts (500 words) to be submitted through [www.awa.asn.au/recycling13](http://www.awa.asn.au/recycling13)

Abstract submissions close Friday, 25 January 2013

The Program Committee is seeking oral and poster presentations on the following themes:

#### Guidelines and Application

- Risk management
- Case studies
- Future directions

#### Engagement and Education

- Public perception
- Stakeholder engagement
- Community education

#### Sustainability

- Greenhouse gas emissions
- Assessment and optimisation
- Waterway health and flows

#### Economics and Investment

- Economic viability
- Pricing structures
- Quantifying externalities

#### Knowledge Management

- Data access
- Integration
- Interpretation and application

#### Technology and Innovation

- Management of waste streams
- Innovative treatment processes
- Resource recovery and energy efficiency

#### Water Sources and Integration

- Decentralisation
- Stormwater treatment and reuse
- Industrial water reuse



<http://www.awa.asn.au/EventDetail.aspx?id=4294976196>

Organiser/Enquiries: Australian Water Association T: +61 2 9436 0055 F: +61 2 9436 0155 [events@awa.asn.au](mailto:events@awa.asn.au) [www.awa.asn.au/recycling13](http://www.awa.asn.au/recycling13)

**ozwater'13**  
7-9 may 2013 • perth • australia

## 'Competing for water in a climate of change'

<http://www.ozwater.org/>

AUSTRALIA'S INTERNATIONAL WATER CONFERENCE & EXHIBITION

Ozwater is Australia's leading international water conference and trade exhibition hosted annually by the Australian Water Association. In 2013, the event will be held in Perth – Australia's city of the great outdoors.

The Australian water sector has been at the forefront of reform and adaption for many years, but cannot rest on its laurels.

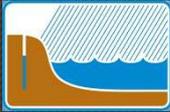
New challenges constantly emerge and the sector is now particularly tested as it grapples with climate change, extreme events, competition for scarce water resources and capital,

skills shortages, and community issues such as indigenous water rights and concern over rising water prices.

We believe it is now more essential than ever that effective communications and knowledge sharing take place so that we can effectively achieve the best outcomes for the industry, our stakeholders and customers.

Ozwater has held a strong reputation for being the 'must attend' event on the calendar for water industry professionals and those with a commercial interest in water, delivering:

- World-class keynote speakers and presentations from Australia and across the globe
- A forum to discuss the relevant 'hot topics' in water
- A multi-streamed program – platform presentations, interactive workshops and electronic posters
- The largest trade exhibition showcasing the latest water industry science, technology, products, services and innovation ever seen in Australia
- Unlimited personal and corporate profile building opportunities



[www.hydsoc.org](http://www.hydsoc.org)

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## MEDIA WATCH

### Bipartisan backing for Murray water amendments

Water Act amendments creating an adjustment mechanism for the Murray-Darling Basin plan have passed the House of Representatives with bipartisan support. They will allow the Federal Government to recover an additional 450 gigalitres for the Basin environment.

<http://www.abc.net.au/news/2012-10-31/murray-water-amendments/4343840>

### River Murray agreement to waterproof SA may turn out to be a castle built on sand

THE recent Commonwealth Bill is unlikely to guarantee an extra 450GL for the River Murray, says John Williams.

<http://www.adelaidenow.com.au/news/opinion/river-murray-agreement-to-waterproof-sa-may-turn-out-to-be-a-castle-built-on-sand/story-e6frea13-1226515318394>

### A \$30 million upgrade and expansion of Southern Water's Huon Valley water supply infrastructure will provide a reliable and sustainable drinking water supply to local communities.

The Australian Government has invested \$12 million in the Huon Valley Regional Water Scheme, which will significantly improve the region's long-term water security and return nearly one billion litres of water to the environment.

<http://www.environment.gov.au/minister/farrell/2012/mr20121107.html>

### Public servant lets the cat out of the bag over 3200 gigalitre water promise

ONE of Tony Burke's top public servants admits there are no consequences if the Government fails to send 3200 gigalitres to the River Murray.

<http://www.adelaidenow.com.au/news/south-australia/public-servant-lets-the-cat-out-of-the-bag-over-3200-gigalitre-water-promise/story-e6frea83-1226515434869>

### Innovative Nyrstar stormwater project saves water and reduces impacts on Derwent River

Senator Don Farrell, Parliamentary Secretary for Sustainability and Urban Water, joined Senator for Tasmania Carol Brown to announce the Australian Government's \$2.9 million funding contribution to the Integrated Water Cycle Management Project at Nyrstar Hobart.

<http://www.environment.gov.au/minister/farrell/2012/mr20121107a.html>

### New model for State and Indigenous agreements

The South Australian Government's commitment to environmental restoration of the Coorong Lower Lakes grows out of a new model for agreements between governments and Indigenous people that is attracting national and international attention, according to two Flinders University academics.

<http://blogs.flinders.edu.au/flinders-news/2012/06/19/new-model-for-state-and-indigenous-agreements/>

### 'Passion' aired for sustainable Eyre Peninsula water

A member of a parliamentary inquiry into Eyre Peninsula's underground water supplies says he is becoming more convinced that action is needed to ensure sustainability.

<http://www.abc.net.au/news/2012-11-09/passion-aired-for-sustainable-eyre-peninsula-water/4363196>

### Moon's water may have come from the Sun

Particles from the Sun may be responsible for the presence of water recently detected in lunar soil, a new study has found.

<http://www.abc.net.au/science/articles/2012/10/15/3608804.htm>

### Two 'ugly' pipes on Glenelg jetty could be covered after community backlash

The pipes are being installed along the jetty's southern side, as part of its Living Beaches strategy to help move sand from Glenelg to southern beaches.

<http://www.heraldsun.com.au/news/national/two-ugly-pipes-on-glenelg-jetty-could-be-covered-after-community-backlash/story-fndo471r-1226505188919>

### SA asked to cough up more water

SOUTH Australia is being pressed for an additional 83 gigalitres a year in environmental flows under the Murray-Darling Basin Plan

<http://sj.farmonline.com.au/news/state/agribusiness-and-general/general/sa-asked-to-cough-up-more-water/2632900.aspx>

### New report shows the dollar value of preserving underwater assets

SOUTH Australian marine parks are worth at least \$22.8 million a year, a new report shows.

<http://www.heraldsun.com.au/news/national/new-report-shows-the-dollar-value-of-preserving-underwater-assets/story-fndo471r-1226500964591>