

MAY 2007

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# Aqua Australis



NEWSLETTER OF THE HYDROLOGICAL SOCIETY OF SOUTH AUSTRALIA

## NOTE FROM THE CHAIRMAN

Linton Johnston

After nearly three long years, could HYDSOC members really believe that the drought is finally over? Well, yes and no.

Despite recent rains, southern parts of our state are still classed as being under a severe 12 month rainfall deficit (<http://www.bom.gov.au/climate/drought/drought.shtml>).

Substantial follow up rains will still be needed to get our hydrological systems back into good shape, but at least the HYDSOC newsletters are beginning to flow once again.

With the appointment of a new editor, we are pleased to be reinstating regular communication with and between HYDSOC members. At

this stage, the newsletter will be issued bi-monthly for at least the next year.

Just as HYDSOC is your society, this newsletter is yours to use in sharing ideas and information with other members – I hope you will see it as an opportunity to communicate with the extended membership, as well as a means of keeping yourselves up to date with what is happening in HYDSOC and beyond.

Renae Eden is the new editor (see page 4) and she would be more than happy to receive your input.

Enjoy!

Linton Johnston

## IWCM, WSUD AND OUR NEED TO START PLANNING FOR URBAN WATER SUSTAINABILITY.

Richard Clark

Richard Clark and Associates, Ph: 8362 9265

We are told that climate change will not only deliver us less rain in total, with consequential longer and more severe droughts, but there will also be more violent weather events, including more frequent and damaging floods.

While our hydrological attention is correctly focused on the challenges of our present drought, we would be unwise to overlook the warnings at the other end of the hydrologic spectrum, particularly since we know that many of Adelaide's older suburbs are already flood prone and that this situation is growing worse as the result of ongoing urban consolidation.

An obvious solution option to both the drought and flood problems lies in the provision of more space for decentralised water storage within the fabric of the city. We have an enormous (but as yet largely unassessed) potential for storage in the aquifers beneath the city. We have nibbled at the potential for on-site retention and detention systems and we have some excellent demonstrations of stormwater harvesting via wetlands, but we don't seem to be able to organise ourselves to do a proper analysis of the costs, benefits and implications of putting it all together. Water Proofing Adelaide made a very timid and partial foray into this area, but hardly addressed flooding and ignored the broader longer-term questions of

systems decentralisation and urban planning interactions. As the drought has progressed the project appears to have sunk without trace, with our attention reverting once again to the over-used River Murray and/or to single purpose, energy hungry, big system approaches like seawater desalination.

We know that sustainability must incorporate all of reliable and healthy water supplies, freedom from flooding, healthy and bio-diverse natural environments, greenhouse gas neutrality, efficiency, affordability and equity in the distribution of costs and benefits. We know that this is a complex area requiring inputs from many areas (including hydrology!). In the old days (when things were admittedly much less complex) getting this input together fell to the State Water Plan. But who now do we have to do this job, develop the models that can address the desired sustainable outcomes in an integrated manner, collate the data, bring the interests and concerns together and do the investigations that the public is crying out for? Planning SA has recently taken up the development of regulations for WSUD, but this again appears to only be nibbling at the edges so that we will still have no means for investigating the full potential that in-depth integrated water cycle

(Continued on page 3)

## QUENCHING DATA THIRST

### THE FIRST STEP TO WATER SECURITY

Helen Beringen

Communications, Water for a Healthy Country Flagship & CSIRO Land and Water

When it comes to Australia's most precious natural resource, water, most authorities agree that reliable monitoring is integral to its long-term management.

As an increasingly scarce and highly contested commodity, there is obvious potential for disagreements over water access and use.

To address this, a CSIRO-led Water for a Healthy Country Flagship research project is developing information technologies to help water managers better understand the status and trend of our national water resources, to facilitate better planning and investment in water infrastructure and to maximise the value of the resource.

A national Water Resources Observation Network (WRON) will provide a consistent distributed, web-based approach to sharing water resource data, and supported by a range of specific tools and applications, will allow end-users to access data quickly and easily.

WRON technologies are being developed to:

- allow better anticipation of changes in water availability and demand;

- better define allocations to users and the environment; and inform new infrastructure decision-making.

Fundamental to WRON's success is the ability to collaborate and work in partnership with the many agencies and water authorities around the country.

CSIRO's Dr Stuart Minchin says CSIRO has made a serious commitment to WRON and industry is becoming more and more convinced of the value of getting involved.

WRON technologies have already been used to improve data delivery in an Australian Dam Levels Monitor project where an automated process was developed to harvest information from multiple websites.

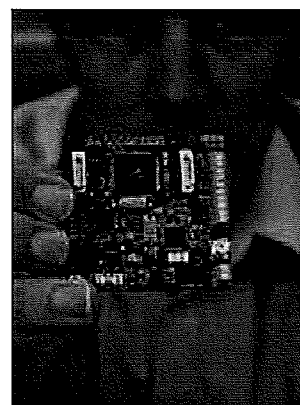
"Information is collated from web sites around the country and then published as an online web service to end-users. This superceded the lengthy process of navigating many web sites to retrieve the information manually", Dr Minchin says.

"Once you have done the hard work of making the data accessible using a standards-based interface, the ways in which this consumer data

can be presented are unlimited, and can be tailored for specific uses," he says.

WRON technologies are also delivering on projects that raise the potential for future problem-solving applications.

One such example is the Fleck-based Sensor Network being established in the Burdekin Delta in Queensland, with the aim of helping manage saltwater intrusion.



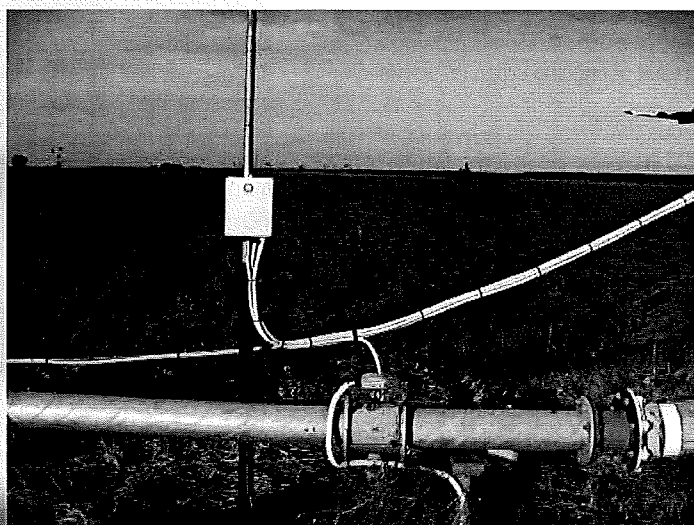
FLECK SENSOR MEASUREMENT NODE

The wireless sensor network provides an ability to monitor how much water is being pumped, the salinity and groundwater levels at specific pumping sites, at relatively low cost. The information is then distributed directly to the North Burdekin Water Board via the internet. It can then be used by farmers to assist in maintaining farm productivity by informing them when water quality is low, so not to irrigate and by the board to assist in developing strategies for improved management of this valuable groundwater system.

It has the potential to be particularly useful in regional areas, where pumping sites may be spread out across hundreds of kilometres and may be located in remote areas.

For more information visit [www.wron.net.au](http://www.wron.net.au)

*"Information is collated from web sites around the country and then published as an online web service"*



FLECK SENSOR NETWORK IN USE IN THE BURDEKIN DELTA

## PRESENTATION SUMMARY OF TECHNICAL MEETING HELD ON THURSDAY 22 FEBRUARY 2007

Bill Lipp

**Rainfall-Runoff Flood Estimation beyond the 1987 edition of Australian Rainfall and Runoff (ARR87)**

Rory Nathan from Sinclair Knight Merz (SKM) gave an informative presentation on the use of RORB as a vehicle to make some useful advances in flood estimation available to the wider engineering community. RORB has been chosen for this task as it has been widely used for the past 20-30 years, it is applicable to a wide range of flood conditions in both urban and regional catchments, the majority of regional design information relates to RORB and modifications to the program can be distributed as free-ware.

New features introduced that are consistent with ARR87 are:

- automatic storm generation ie once ARR87 rainfall parameters are specified, design storms are automatically generated for the specified range of durations and average recurrence intervals (ARIs)
- automatic determination of critical duration ie determines which storm duration gives the highest peak flow
- interactive parameter fitting ie the ability to change model parameters and then visually access how well calculated hydrographs

fit observed hydrographs

- distributed parameter sets ie the ability to vary loss and routing parameters spatially across a catchment
- variable loss parameters ie the ability to vary loss parameters with ARI to try and ensure probability-neutral transformation of rainfall to floods

New features introduced that are departures from ARR 87 are:

- non-uniform areal distribution of rainfall over the catchment for use in situations where it makes more sense to use non-uniform rainfall eg large catchments or steep topography
- revised areal reduction factors based on research by the CRC for Catchment Hydrology ie better data than the US based ARR87 recommendations
- filtering of temporal patterns to remove the possibility of the ARR87 temporal patterns containing "embedded" bursts of shorter duration rainfalls of a higher ARI than the ARI being used

**Joint Probability Analysis**

The main conceptual advance incorporated in RORB is the joint probability treatment of losses and temporal patterns, which will be an approach advocated in the current revision of ARR. The current "Design-Event" approach

implicitly assumes that it is probability neutral ie the application of a design rainfall of a particular ARI gives a flood of the same ARI. Ideally this assumption should be validated on each catchment where this approach is used. Even if validated there is still a risk of being wrong when extrapolating beyond the observed range.

While continuous simulation techniques can be used a better approach to estimating floods for engineering design is to use a Monte-Carlo simulation approach. This approach requires the same models and similar design information to that used in traditional design event approach. It mimics nature by holding certain model inputs such as model configuration and routing parameters constant while varying, in accordance with predefined probability distributions, the rainfall depth, rainfall initial loss and temporal patterns over many thousands of runs in order to determine the highest peak flow for a particular ARI.

**Conclusion**

The revised RORB is referred to as RORB-5 and is a freeware tool for estimating floods using Australian design information. New features can be selectively introduced to assess impacts and there is an emphasis on automation to remove tedium.

*"...It mimics nature by holding certain model inputs such as model configuration ..."*

## IWCM, WSUD AND OUR NEED TO START PLANNING FOR URBAN WATER SUSTAINABILITY.

*"...the public deserves much more from its water professionals than we have given over the past 25 years..."*

(Continued from page 1)

and urban planning could deliver if criteria for sustainability were identified up-front and made central to the outcomes.

In the August 2003 edition of *Australis* I suggested that there might exist to the adequate undertaking of the Water Proofing Adelaide project.

It has been recently stated that 'sustainability' as an up-front stated goal, seemed to offer some hope, but had not yet been commenced. These were that:

- no basic criteria for sustainability were attached to the project brief,

nor appeared to be required as part of the initial investigations, and

- the appointment of SA Water as the lead agency for the project, with its emphasis on its narrow bottom line, did not augur well for any in-depth, considered investigations of alternative, broader, multi-objective, integrated, non-fragmented systems

I suggest time has shown my concerns to be justified. I suggest that with climate change now breathing down our necks, the public deserves much more from its water professionals than we have given over the past 25 years since ESD first emerged as

an issue. As a minimum I suggest we must confront three major challenges as a matter of great urgency, ie:

- reach a consensus on what sustainable water systems should achieve,
- develop models, collate data and investigate the feasibility, costs and benefits of alternative systems approaches compatible with the desired outcomes
- fall in behind a 'champion' organisation able to lead the investigations with sufficient authority and credibility to gain the full cooperation of the many agencies, disciplines, interests and concerns that water necessarily involves.

## MEDIA WATCH

Minister for the Environment & Water Resources Malcolm Turnbull has announced \$6.19 million Water Smart Australia funding for the Brookdale WATER CYCLE project which will save up to 2 GL/yr, part of the urban water reform element of the National Water Initiative. Full article available at <http://www.environment.gov.au/minister/env/2007/pubs/mr18apr07.pdf>

**H2O Today** is an online Radio Program in MP3 format which will play in most common MP3 compatible programs including Windows Media Player, iTunes and Real Player. H2O Today features water, environmental & sustainable industry news and information

## UPCOMING EVENTS

**CSIRO Land and Water**, Adelaide, presents regular, free public seminar series at the CSIRO Land and Water Seminar Room, Waite Road, Urrbrae. Entry via Gate 4, Waite Road.

### Wednesday May 30

Primary production in aquatic systems (Full title pending)  
*Rod Oliver*

### Wednesday June 27

Aquatic Ecotoxicology (Full title pending)  
*Anu Kumar*

### Wednesday July 25

Lower Murray Landscape Futures  
*Neville Crossman*

More info available at <http://www.clw.csiro.au/division/adelaide/seminars/>

### Water Industry Alliance - Awards Program 2007

The Awards will be presented at a Gala Industry Lunch, on Friday 25th May, 2007 12 pm - 2.30 pm, at the Adelaide Convention Centre Hall E. For more information please contact Jenny Brown, Marketing Manager, Phone 08 8463 3493 or email [admin@waterindustry.com.au](mailto:admin@waterindustry.com.au)

<http://www.h2otoday.com.au/online-program.html>

### Looking back on Australasian water policy from 2027

Mike Young, Research Chair, Water Economics and Management, The University of Adelaide, made a presentation to the recent 17th April 2007 AWA members' night. A copy of his presentation is available online at [http://www.waterindustry.com.au/artman/uploads/m\\_young\\_presentation\\_april\\_07.pdf](http://www.waterindustry.com.au/artman/uploads/m_young_presentation_april_07.pdf)

Minister for the River Murray Karlene Maywald says there is unlikely to be any water available for allocation to South Australian irrigators at the start of the 2007-08 water year unless there is significant rainfall over the next six weeks. Full article available

Coast from July 16-20, 2007. The event includes 15 courses in water, wastewater treatment and environmental management. Courses include:

- Wastewater Treatment
  - Water Treatment
  - Water Re-use
  - Membrane Technology
  - Air Quality
  - Odour Management
  - Risk Assessment
  - Water Trading
  - Integrated Urban Water Management
  - Environmental Toxicology
- <http://www.iwes.com.au/pdf/iwesGC07int.pdf> for more details.

### Rainwater & Urban Design 2007.

Incorporating the 13th International Rainwater Catchment Systems Conference and the 5th International Water Sensitive Urban Design Conference. 21-23 August 2007. Sheraton on the Park Hotel, Sydney. <http://www.rainwater2007.com/>

### Bourke Conference 2007

The 63rd Murray Darling Association Conference and AGM will be held over the 12th to 15th of September, 2007 in Bourke, New South Wales. For more information go to [www.mda.asn.au](http://www.mda.asn.au)

online at <http://www.premier.sa.gov.au/news.php?id=1498>

**Water Efficiency 2008 - AWA's 3rd National Water Efficiency Conference** will be held 30 March - 2 April 2008 on Queensland's Gold Coast and will aim to achieve a common understanding on the best way forward to improve the implementation and evaluation of water efficiency programs and how customers and technology play an important role in reducing water consumption. Flyer available online at [http://www.awa.asn.au/Content/NavigationMenu2/Education/NationalInterestEvents/bApr08bWaterEfficiency2008/Efficiency\\_Call\\_for\\_Abstracts.pdf](http://www.awa.asn.au/Content/NavigationMenu2/Education/NationalInterestEvents/bApr08bWaterEfficiency2008/Efficiency_Call_for_Abstracts.pdf)

**Hydsoc meeting—Drought & Adelaide Water Supply** will be held on Wednesday June 20th. Contact Hydsoc for further details.

**Water Down Under 2008**, Adelaide Convention Centre, 15-17 April 2008. Pre-Conference workshops are scheduled for 14 April and a number of post-Conference field trips 18 April.

The proposed Conference themes and sub-themes are:

- Climate, Rainfall and Surface Water Variability
- Hydrological Modelling, Data and Forecasting
- Water Management and Sustainability
- National and International Water Issues and Case Studies
- Groundwater Systems

The first call for abstracts is now open. Closing date for call for abstracts, 29 June 2007; Notification of acceptance 3 August 2007; Submission of full paper 2 November 2007.

On-line registration of interest is now available! <http://www.waterdownunder2008.com/welcome.htm>

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<http://www.hydsoc.org>

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## INTRODUCTION TO THE EDITOR

*Hi! My name is Renae Eden, I am an environmental consultant for Delta Environmental Consulting, and the new editor for the HYDSOC newsletter 'Aqua Australis'.*

*Over the past three years, I have been involved with a wide range of projects, including water quality assessments, stygofauna surveys for ASR projects, recreation plans for vernal pools and estuarine restoration. I am a member of the International Society of Salt Lake Research, and the Barker Inlet Port Estuary Committee.*



*If you would like to know more about me, or Delta Environmental Consulting, you can look us up at [www.deltaenvironmental.com.au](http://www.deltaenvironmental.com.au).*

*I will be producing a newsletter 6 times per year. Submissions are welcome from all HYDSOC members and interested parties. The HydSoc newsletter will contain articles addressing hydrological science, engineering, policy, planning, research and education issues. There will be sections containing discussion, current affairs, articles on Government or private sector activities, media and news items, and links to useful information sources.*

*If you have an idea for an article, but don't know if it would fit, please give me a ring and discuss it. I can be contacted via the details provided in the list on this page. The next edition is due out in early July, the due date for submissions being the 27th of June, but I will send out a reminder email closer to that time.*

*I look forward to hearing from you!  
Renae Eden.*

## SCHOLARSHIPS & PRIZES

### Ian Laing prize

The Hydrological Society of SA offers the Ian Laing prize for the best student work in water related studies, for an amount of \$750. Students eligible for the academic prize will undertake their final year of an ordinary or honours degree course or post graduate diploma course which involves some study of hydrological and related sciences or water resources management. The prize will be awarded on the basis of:

- ◆ overall academic record
- ◆ performance in subjects or units specifically related to water studies
- ◆ a demonstrated interest in water studies

The successful applicant will preferably, but not necessarily, be undertaking research or project work in a field of study embraced by the Prize, including hydrology, hydraulics, meteorology, hydrogeology, marine or freshwater ecology, aquatic chemistry, geomorphology, oceanography, water law, water resources planning and management. **Applications will close on October 31, 2007**

Apply to Mr Ken Schalk,  
c/- Tonkin Consulting,  
5 Cooke Terrace,  
Wayville SA 5034;  
fax (08) 8273 3110

### La Trobe University

There are Scholarships and Awards for Civil Engineering students at La Trobe University available. There are many university and industry supported scholarships available for both commencing and continuing civil engineering students. These scholarships provide financial support, paid vacation work, access to career mentoring advice from practising engineers and guaranteed post graduation employment. Totals are estimated assuming completion of course in four years and typical paid work experience rates and time. In addition, each commencing student who has been awarded a scholarship is guaranteed a place in the University residences if she/he requests it.

[http://www.latrobe.edu.au/ceps/ce/s\\_ships.htm](http://www.latrobe.edu.au/ceps/ce/s_ships.htm)

