SEPTEMBER 2010

The Hydrological Society held a workshop on modelling tools for the Murray Darling basin on 1 September which was attended by 70 participants. A summary of the proceedings together with the presentations will be posted on the website.

INSIDE THIS ISSUE

Aqua Australis

NEWSLETTER OF THE HYDROLOGICAL SOCIETY OF SOUTH AUSTRALIA

THE RESILIENCE LENS

Paul Barrat, Environmental Management News, www.emn.net.au

One of the key issues on the Australian national agenda at present is how the nation can respond most effectively to the challenges of climate change. It is also a specific problem that must increasingly engage the attention of the people who plan, design and construct our social and economic infrastructure: how do we plan for the development of long-life infrastructure in an environment of uncertainty?

Climate change is a classic case of what social scientists call a 'wicked problem', combining multi-causality, high levels of independence between a large number of variables, and conflicting goals and objectives within the broader policy problem.

Wicked problems are difficult to define clearly: different stakeholders have different versions of what the problem is, and there is usually an element of truth in each. They hardly ever sit conveniently within the responsibilities of one organisation. Often they are not stable: the nature of the problem is changing even while the attempt is being made to fashion and implement a solution.

Mathematically, they are difficult to model because they are complex, non-linear systems, acutely sensitive to the assumptions made and characterised by tipping points, which can take them unexpectedly to a new state. Everything is connected to everything else, and small changes in one variable can have profound consequences for other aspects of life, in different and sometimes unexpected geographical locations.

Geophysical changes have ecological and economic consequences. Economic conditions affect the technical options that are available to us, and the rate at which they are developed, which in turn affects the growth trajectory of the whole family of greenhouse gas emissions.

The direct consequences of climate change are well understood: sea level rise; storm tracks in both the tropics and the temperate zones pushed to higher latitudes; higher frequency of extreme weather events; higher frequency of hot days and lower frequency of cold nights; warmer ocean surface temperatures; retreating glaciers and more rapid melting of winter snow on high ground, and changes in local ecosystems.

The consequences are stark for our infrastructure over coming decades. Research for the Garnaut Review flagged the likelihood of more landslides on roads and accelerated failure of water distribution infrastructure as the ground under the foundations increasingly swells and shrinks. Bridge structures will experience more frequent inundation and our ports will have to increase preventative spending to mitigate sea level rise. Storm and bushfire will pose more frequent threats to our above-ground electricity assets.

The problem in planning for these changes is compounded by the fact that at this stage we do not know:

- When and to what extent there will be effective international action to mitigate climate change and, as a consequence, the emissions trajectory over the decades ahead;
- The precise relationship between the accumulation of greenhouse gases and global warming and, in particular, the regional manifestation of climate change; and
- The nature, timing and extent of local biophysical impacts in Australia and elsewhere as a result of the extent of climate response.

Accordingly, we cannot be sure to what extent the balance of our effort should be between mitigation of climate change and adaptation to it.

Such uncertainties make problems like climate change enormously difficult for political leaders and the people who elect them, but the people who plan, design and build our social infrastructure – whether it be public buildings, pipes and wires or transport infrastructure – have to try to make some sense of it all in order to continue their work; they must make decisions about technology and design that will be embedded in the fixed infrastructure for periods measured in decades.

The requirement for life to go on in such an environment of uncertainty dictates that all of our decisions must be viewed through a resilience lens. 'Resilience' is often used rather loosely in policy debate, but in its correct technical use, it refers to the capacity of a complex self-organising system to withstand a shock and continue to perform its intended functions – to retain its 'identity'.

(Continued on page 2)

THE RESILIENCE LENS

Paul Barrat, Environmental Management News, www.emn.net.au

(Continued from page 1)

For long-life fixed assets, (infrastructure) resilience thinking teaches us that we must not plan on the basis of a single projected vision of the future because we can never know the future with sufficient precision. This is particularly the case with complex non-linear systems like the national economy, patterns of land-use and settlement, and weather-dependent activities. Accordingly, we must plan for our infrastructure to continue to perform its essential function within the widest range of possible outcomes.

We must also plan for the second order effects of climate change. We must develop adaptive strategies to consider how Australia can be resilient not only to changes in temperature, precipitation and weather patterns, but also to changes in our terms of trade, changes in the economic, social and environmental circumstances of countries in our region, and increasing demand upon the humanitarian capabilities of the Australian defence force and Australian NGOs.

This state of uncertainly demands that flexibility be maintained and options be kept open through the application of a portfolio approach in which no option is ruled out entirely, but a strategy is followed in which all options are entertained (through education, research, training, government and industry intervention in pilot and larger applications), while local and international experience is built and applied to the ongoing refinement of the strategy.

This may not be as efficient as investing in the 'ultimate' system (if it was known at this stage), but avoids confronting potentially dislocating failures in ill-informed and incorrect investments. In this sense, ensuring future resilience has a price, but that price is likely to be much smaller than committing to premature and catastrophic mis-investment.

WATER RELEASE THROUGH GOOLWA BARRAGE WILL BENEFIT THE ENVIRONMENT

Freshwater is flowing though the Goolwa Barrage and into the Coorong for the first time in four years, providing significant benefit to native fish, birds and the local environment.

Minister for the River Murray Paul Caica said it was possible to release the water because local inflows from the Finniss River and Currency Creek have rapidly increased water levels in Goolwa Channel to 70cm above sea level.

Regulators were constructed in the Goolwa Channel, near Clayton, and in Currency Creek to increase water levels in the channel and protect the area from acid sulfate soils.

"Water hasn't flowed over the Goolwa Barrage since 2006 and this has led to a significant reduction in habitat for birds and native fish in the Coorong estuary and increased salinity in the Goolwa Channel,'' Mr Caica said.
"Water will be released progressively to allow the environment downstream of the barrage to adjust to the changing salinity conditions, initially through one section of the barrage located between the vertical slot fishway and Hindmarsh Island.

"With further rain forecast over the Eastern Mount Lofty Ranges this weekend, the water levels in the Goolwa Channel may increase further.''

The Choke at the Coorong in 2009. *Photo: David Mariuz* Source: The Age

Mr Caica said the freshwater mixing with the seawater on the Coorong side of the barrage will stimulate the ecology of the region by rejuvenating the Coorong mudflats, which are essential for the lifecycle of birds and fish.

"Over the coming weeks, the environmental flow releases through the barrage will also utilise fish passages, meaning native fish species will be able to move freely between the Goolwa Channel and the Coorong to breed,'' he said.

"Fishers are reminded that a 150-metre fishing exclusion zone exists around the Goolwa Barrage. The environmental release of water through the Barrage is critical for the restoration of the Coorong estuary, and for the survival of threatened fish species.

"Additional sections of the barrages will be operated once the water level in the Goolwa Channel reaches 80cm above sea level. This will ensure that the pool level in the Channel does not exceed 85cm above sea level. A further benefit of the releases will be reduced salinity in the Goolwa Channel.

"The Murray-Darling Basin Authority has made the decision to release the water in consultation with the South Australian Government."

UPCOMING EVENTS

Dam Decisions: Past Experiences, Future Challenges

3-5 November, Hotel Grand Chancellor, Hobart, Tasmania

www.ancoldconference.com.au

The conference theme is intended to challenge all involved in the dams industry to consider how asset management can be embraced as a comprehensive and structured approach to the long-term management of dam related assets to improve stewardship, communications and relationships, risk management and financial efficiency.

All of us contribute in some way to the life cycle of dam related assets and as such we are constantly challenged to deliver required 'levels of service' for dam related assets at minimum life cycle cost. By coming together and sharing past experiences and understanding the differing challenges that we all face, the opportunity exists for us to collectively help 'close' the asset life cycle loop and embrace a culture of continual improvement.

A two day post conference tour will take place between 6 and 7 November and will incorporate an overnight stay. In keeping with the theme of the conference the tour will incorporate a mix of historical sites, recently constructed works and upgrades currently underway and is sure to be of interest to both delegates and partners alike.

The Stormwater Industry Association is proud to be staging the first ever National Stormwater Conference, bringing delegates together to hear more than 80 industry experts talk about the latest developments in stormwater and the future of stormwater in Australia.

The Conference will provide an excellent opportunity for practitioners from across the industry to gather, network and learn about the myriad of cutting edge projects and research that is being generated by this dynamic and rapidly growing industry sector.

Everything is on the agenda - stormwater for potable use, stormwater for micro climate management, stormwater for communities—all underpinned by world leading research and advanced policy.

The Conference program includes a series of practical, skills based pre conference workshops, three days of multi-stream conference sessions and a final technical tour day visiting some key stormwater projects in Sydney.

A co-located trade exhibition showcasing the latest in product innovation, suitable for all stormwater industry professionals including engineers, asset managers, landscape architects, sustainability managers, policy development practitioners, politicians and advisors at all levels of government.

http://www.groundwater2010.com/

This nationally significant event is being organised by the International Association of Hydrogeologists and the Geological Society of Australia.

The conference focuses on the sustainable management of groundwater resources in Australia, and has attracted over 350 papers, offering a unique opportunity for groundwater scientists, water managers and planners from across the country to meet, present, and discuss critical groundwater management issues, particularly the challenges posed by extreme drought and future climate change.

To facilitate interaction, the conference program has been structured with science, management and policy streams supported by workshops and forums designed to activate discussion on specific groundwater challenges. There are four major themes for the conference:

- Water Policy Environment (National, State, Regional);
- Challenges and threats to groundwater management;
- Future opportunities; and
- Capacity building.

We believe that these themes and event structure will provide a stimulating environment for the conference, with long term benefits for water management in Australia.

CONTACT HYDSOC

http://www.hydsoc.org

PO Box 6163, Halifax Street
ADELAIDE SA 5001

Executive Committee

Chairperson
Bob Newman
Phone: 8382 2312
Email: bobnewman@ozemail.com.au

Vice Chair
Sébastien Lamontagne
Phone: 8303 8713
Email: sebastien.lamontagne@csiro.au

Treasurer
Bill Lipp
Phone: 8343 2508
Email: bill.lipp@saugov.sa.gov.au

Secretary
David Seeliger
Phone: 8273 3100
Email: david.seeliger@tonkin.com.au

Committee

Ken Schalk
Phone: 8273 3100
Email: ken.schalk@tonkin.com.au

David Trebilcock
Phone: 8463 7980
Email: David.Trebilcock2@sa.gov.au

John McRann
Email: mccrannj@ap.aurecongroup.com
Phone: 8237 9755

Annette Barton
Email: a.barton@bom.gov.au
Phone: 8366 2669

There are currently vacancies for two committee members

Editor

Renae Eden
Phone: 8308 9226
Email: renae.eden@yahoo.com.au

MEDIA WATCH

'Smart' water quality sensor network wins iAward
A smart sensor network that is monitoring the quality of drinking water in south-east Queensland has earned CSIRO one of the Australian ICT industry's highest accolades.
http://www.csiro.au/news/smart-water-quality-sensor-network-wins-iAward.html

Lower Lakes to be Reconnected
Minister for the River Murray Paul Caica said the Lower Lakes will be reconnected for the first time in more than two years, with the partial removal of the Narrung Bund.
http://www.ministers.sa.gov.au/images/stories/mediareleasesSEP10/nurrung%20bund.pdf

Climate change hits SE Australia fish species
Scientists are reporting significant changes in the distribution of coastal fish species in south-east Australia which they say are partly due to climate change.
http://www.csiro.au/news/Climate-Change-Hits-Fish.html

Water Wars along the River Jordan
The mighty River Jordan, which divides Israel, Jordan and Syria is the only source of water for many of the people who live along its banks and agricultural areas further afar. But today this famous river is but a trickle of its former self due to the effects of climate change and over usage and abuse.
http://www.primarywater.com.au/water-wars-along-river-jordan

Water storage levels respond to rainfall
Levels at water storages across Northern Victoria have risen dramatically in the past week, with runoff continuing to flow into the storages.
http://www.g-mwater.com.au/news/media-releases/2010_media_releases/mrwaterstoragelevelsrespondtorainfall.html

At Lake Hindmarsh there's an ecological revolution under way
As a rare surge of water spreads across this 13,000-hectare maze of sand and saltbush, birdwatchers like Jonathan Starks are noticing some rather multicultural sounds of life
http://www.smh.com.au/environment/water-issues/at-lake-hindmarsh-theres-an-ecological-revolution-under-way-20100917-15gec.html

Victorian desal plant costs blow out
The Victorian Government is under fire over reports that the state's controversial desalination plant is going to cost much more than originally predicted
http://www.abc.net.au/worldtoday/content/2010/s3014747.htm

Amazon shrinks as drought grips Brazil
A severe drought parching northern Brazil this year has shrunk the mighty Amazon River - the world's longest - to its lowest level in 47 years
http://www.abc.net.au/news/stories/2010/09/16/3013250.htm

Melting sea ice forces walruses ashore in Alaska
Tens of thousands of walruses have come ashore in north-west Alaska because the sea ice they normally rest on has melted.
http://www.smh.com.au/environment/conservation/melting-sea-ice-forces-walruses-ashore-in-alaska-20100914-15aml.html

Release date for Guide to the Proposed Basin Plan announced
The Murray-Darling Basin Authority has announced that the Guide to the Proposed Basin Plan will be publicly released on 8 October. The Guide is the first part of a three-stage process consisting of the Guide, the Proposed Basin Plan and the Basin Plan.
http://www.mdba.gov.au/communities/latest-news/release-of-guide-to-proposed-basin-plan

Great Darling Anabranch to receive much-needed environmental flows
The Great Darling Anabranch will receive 47 GL of environmental water, which will see it reach the River Murray for the first time in nearly a decade
http://www.mdba.gov.au/media_centre/media_releases/great-darling-anabranch-to-receive-much-needed-environmental-flows

Diamonds in the rough: Coast coral reefs get clean bill of health
Amid gloomy forecasts for the future of the Great Barrier Reef due to global carbon emissions, coral reefs just north of Brisbane have received a clean bill of health from scientists.
http://www.smh.com.au/environment/diamonds-in-the-rough-coast-coral-reefs-get-clean-bill-of-health-20100917-15g4a.html