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UPCOMING EVENTS

Challenges in Environmental Science & Engineering Conference
26 Sept – 1 Oct, Cairns

Climate change and wetland...
A workshop on “Adaptation options for wetlands in the Murray–Darling Basin” was held on 12–13 July 2010 at CSIRO in Canberra to consider future challenges in managing wetlands of the Murray Darling Basin. The workshop was organised by the Institute for Land, Water and Society (ILWS) at Charles Sturt University, and the NCCARF Water Resources and Freshwater Biodiversity Network. Wetlands in the Basin are already under intense pressure from past and current management practices, climate change is expected to exacerbate these issues and further complicate how we manage wetlands across large parts of the Basin, particularly in the south–east, which is expected to be warmer and drier in the future.

The workshop included representatives from the Murray Darling Basin Authority, the Department of the Environment, Water, Heritage and the Arts, NSW Department of Environment, Climate Change & Water, and CSIROs Water for a Healthy Country Flagship. Among those attending was the Deputy Secretary General of the Ramsar Convention, Dr Nick Davidson, who is based at the organisation’s headquarters in Geneva, Switzerland.

The workshop considered three key overarching issues – scale, variability and risk – which need consideration in climate adaptation planning. The workshop also looked at what sorts of future climate scenarios are the most appropriate to use for management purposes.

The workshop recommended that the experience of the adaptation approaches used and being developed for the Murray Darling Basin be prepared as a “case study” for the Ramsar Convention on managing wetlands for global change, including with a changing climate, and particularly in periods of water stress and shortage. This action is being taken forward by Dr Davidson of the Ramsar Convention.

Further information about the workshop can be obtained from Professor Max Finlayson, Director ILWA, Charles Sturt University, Albury, mfinlayson@csu.edu.au.
members with the aim of producing a synthesis of issues and opportunities in this area. It will canvass members' research interests and activities, perspectives on Australian water governance and input into the direction of the network. Two further workshops are planned for this year including a planning workshop to be held in Victoria in October, to be followed by a National Water Governance Workshop in Canberra in mid-November.

For further information, please email Phil.Wallis@msi.monash.edu.au.

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**South Australian Regional Node Workshop**

Current Developments in Climate Change Research were discussed at a workshop held on 25 June 2010 in Adelaide. Assoc Prof Justin Brookes, Director of the Water Research Centre and Leader of the NCCARF Water Resources and Freshwater Biodiversity regional node, hosted the workshop. Key questions addressed at the workshop included:

- What is the vulnerability of water resources and freshwater biodiversity to existing and predicted climate change conditions at various spatial scales, considering average and extreme weather conditions?
- How can change-of-state and step-change thresholds for species, communities and ecosystems be identified in light of the inherent uncertainty in climate projections?

Prof Mike Young, Executive Director of the Environment Institute at the University of Adelaide, set the scene with a thought-provoking presentation on the latest predictions for increased population and the increasing gap in available water supply. He made the key point that we know a lot about climate change and are planning for it. He illustrated the impact of declining run-off on water availability, emphasising the need to keep water in rivers for transmission and function, before water can be diverted for consumption. This could mean that the volume of water available for extraction could be reduced by more than 50%. He suggested that environmental allocations need to include estuaries, and that environmental water should be separated from conveyance (transmission) water. He came to the sobering conclusion that not all rivers can be maintained at their current status on predicted available water. Mike suggested that allocation of environmental flows should be similar to agricultural allocations, based on ecological outcome per drop (cf ‘more crop per drop’). He emphasised the need for long term budgets and self-adjusting plans which include automatic responses to evolving conditions.

Dr Thomas Prowse, of the Climate and Ecology Group in the Environment Institute, presented details on climate variability and the impacts of climate change in
South Australia. He provided a comparison of the different elements contributing to the three major drought periods of the Federation drought (1895–1902), the World War II drought (1937–1945) and the ‘Big Dry’ (1996–2008). Three weather systems are affecting rainfall patterns in southern Australia – ENSO, IDO and SAM. Rainfall has declined 48 mm since 1958 in the latitudes south of 30º, correlated to SAM in the positive phase and the southward movement of the sub-tropical ridge shifting low-pressure systems to miss catchments.

Mr Andrew Watson, SA Regional Director of the Bureau of Meteorology, presented the latest information on predictions for climate change in South Australia. He provided further evidence that south-east Australia is drying more quickly, particularly in autumn, with raindays decreasing. Records from Snowtown cover 1889–2009 and show this downward trend, particularly in the crop growing season. High pressure systems are stronger and further north, centred over Adelaide, while there are fewer low-pressure systems. Over the period 1990–2030, temperature has increased 0.8–1.2ºC and rainfall has declined ~3%.

Prof Alan Cooper, ARC Future Fellow and Director Australian Centre for Ancient DNA (ACAD), talked about using DNA to understand past climates, and accurately assess current biodiversity. Genomic approaches allow high precision resolution which produces the equivalent of instant biodiversity surveys by examining the DNA sequence of all species in a sample. Water can be analysed to identify all DNA in a catchment. This tool will be able to measure change quickly, without needing to identify individual species. An interesting item was the information that there is a genetic diversity bottleneck in Australia at ~100,000 BP, with very low diversity suggesting previous extinctions.

Dr Michelle Bald, Team Leader Aquatic Ecology in the Department of Water, Land and Biodiversity Conservation, talked about Managing Climate Change in government. Michelle outlined the frameworks for understanding risks to surface water, groundwater and biodiversity, as a basis for developing technical and policy interventions for the future. A key instrument is the National Water Initiative umbrella. She emphasized the need to link research to policy frameworks and instruments for implementation, and the importance of considering scales, both ecosystem and management. A current key project is modeling risks to water-dependent ecosystems. Management cycles to consider include 5 yearly reviews of water allocation plans, and annual reviews of water allocations against entitlements.

Mr Brenton Zampatti, SARDI Aquatic Sciences, presenting information on what responses to climate change are we seeing in fish, asked the question 'do fish need to grow legs?' Brenton emphasised the importance of flow events to fish, and demonstrated...
the severe reduction of flows in the past 10 years. He presented evidence that callop would have spawned every year from 2000–2009 under natural flows, in contrast to the very restricted flows which have not been suitable for spawning. Research in the Chowilla system of anabranches and creeks has highlighted the importance of flowing habitats for native fish, particularly cod, which have been found to spawn annually in these creeks, even in low flows. With the mainstream now more like a wetland habitat, bony herring and fly-specked hardyhead are thriving, while other species are declining. Environmental flows will need to be delivered as a water regime, which includes connectivity to the floodplain and backwaters.

Dr John Tibby and Cameron Barr, of the Geographical and Environmental Studies at the University of Adelaide, described what natural responses to climate change have been detected in palaeo–cores from wetland systems. They have found that similar boundary conditions to today existed 6,000 years BP, based on palaeo–indicators. There is evidence that biota in Lake Alexandrina reflect freshwater run–off from local catchments, and there is no evidence of marine incursions. Evidence from the Blue Lake on North Stradbroke Island suggests that it has been resilient to climate change but would be vulnerable to water extraction. Evidence from western Victoria suggested that the current drought is less severe than palaeo–droughts, such as one event in 700 AD. Palaeo records suggest a persistently wet period 1500–1880, which means that settlement in Australia has been in a drying period following an extended wet era.

Discussion

It was noted that climate change is linked to many other drivers which all contribute to the vulnerability of ecosystems. The science is known but gets forgotten, and needs to be re–publicised. The new Water Allocation Plans and the Murray–Darling Basin Plan are using more science in their development and justification of management measures.

The need for social science to assist with encouraging change and facilitating implementation was discussed. It was stated that just because science is true, it doesn't mean that action will follow. More effort is needed to sell the science and the argument for changed management. However, caution should be used with negative messages, and there should be a message of hope and possibilities for effective action.

All participants were encouraged to continue dialogue with each other, to facilitate communication and to develop future research partnerships.

The workshop was facilitated by Dr Mark Siebentritt.
Workshop

The Climate Change and Western Australian Wetlands and Waterways Symposium, organised by Jane Chambers (Water Resources and Freshwater Biodiversity WA node/Murdoch University), Frances D'Souza (Department of Water, WA) and Michael Coote (Department of Environment and Conservation, WA), was held in Perth on the 6th of July 2010. Keynote presentations stimulated panel discussions for an audience of over a hundred invited participants with key knowledge of current and potential impacts of climate change on different aspects of aquatic systems in WA. Questionnaires and sticky notes were used to capture the audience knowledge of climate change impacts, adaptation research, knowledge gaps, policy and management practices and barriers.

At a workshop on the following day, 30 people analysed this information to identify and prioritise major impacts, adaptive measures and knowledge gaps for rivers, estuaries, wetlands and groundwater dependent ecosystems across WA. This was then used to produce integrated project proposals which address knowledge, management and policy needs for each of the aquatic ecosystems. Over the next few months all of this information will be used to develop a 'state of current knowledge' report on how climate change will impact on aquatic ecosystems across Western Australia and outline priorities for future research, management and policy.

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Review of Wetland Information from the UNFCCC Copenhagen Conference – authors sought

The Scientific and Technical Review Panel (STRP) of the Ramsar Convention on Wetlands is undertaking a review of the information on wetlands contained in presentations, documents and outcomes from the 15th session of the Conference of Parties to the UN Framework Convention on Climate Change. For information on the conference see http://unfccc.int/meetings/cop_15/items/5257.php

Authors will work through the official documents and subsequent reports to extract information related to wetlands and compile this as an information paper for wetland managers and policy makers. One topic that may require further attention is REDD – Reducing Emissions From Deforestation and Forest Degradation in Developing Countries (http://www.un-redd.org/) – given the importance of many forested wetlands for
carbon storage and other ecosystem services.

For more details, please contact Max Finlayson, Institute for Land, Water & Society, Charles Sturt University, Albury, NSW (mfinlayson@csu.edu.au)

Review of Wetland Information in the 4 Assessment Report of the IPCC – authors sought


At this stage we are seeking authors to assist with one or other section of the report as well as feedback on the outline – keeping in mind that we need to extract the information from the IPCC reports and hence can not stray into areas they did not cover. Having said that once we have reviewed the IPCC documents we will then look at whether or not we should add further important information and provide an update.

Authors are being sought to extract and summarise information from allocated parts of the IPCC report and submit for compilation etc. The timescale – first draft available by 25 December 2010, and then submitted to the STRP meeting 14–14 February 2011.

Information from Max Finlayson, Institute for Land, Water & Society, Charles Sturt University, Albury, NSW (mfinlayson@csu.edu.au)

IPCC AR5 Writing Team

Congratulations to Professor Stuart Bunn, network convenor, and Dr Francis Chiew (CSIRO Land & Water) who have both accepted roles as lead authors on chapters for Working Group 2 in the IPCC’s fifth Assessment Report (AR5). For more information about the review process and a full list of authors, see http://www.ipcc.ch/.
Synthesis & Integration Projects

Several Synthesis & Integration Projects have recently commenced and are being led by network members. These include the Coastal Ecosystems Responses to Climate Change Project, led by Wade Hadwen at the Australian Rivers Institute, and Limits to Adaptation in the Macquarie Marshes led by Kim Jenkins and Richard Kingsford at the University of New South Wales. More information about these synthesis projects can be found at http://www.nccarf.edu.au/node/483.

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Websites of Interest

REFRESH is an EU-funded project that is investigating adaptive strategies to mitigate the impacts of climate change on European freshwater ecosystems: http://www.refresh.ucl.ac.uk/

BioFresh is an EU-funded project that is building an international data portal and meta-data catalogue on the global status of freshwater biodiversity: http://www.freshwaterbiodiversity.eu/index.php/index.html

EcoAdapt and Island Press have recently launched CAKE – the Climate Adaptation Knowledge Exchange – see www.CAKEX.org

A climate change and water blog: http://climatechangewater.org

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Publications of Interest


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NCCARF: Water Resources and Freshwater Biodiversity Adaptation Research Network. General Enquiries: climate.water@griffith.edu.au