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ISSUE 27

FROM THE DIRECTOR	1
OPINION	1
Cr Alice Glachan	
DIRECTOR'S ACTIVITIES	2
CONFERENCES, SEMINARS & WORKSHOPS	2
ADJUNCTS' ACTIVITIES	3
OVERSEAS TRIPS	3
AWARDS & ACHIEVEMENTS	3
STRATEGIC RESEARCH AREAS- UPDATES	
Ecosystem Services	4
Social research for regional NRM	6
Improving rural livelihoods in developing countries	6
Sustainable Water	6
VISITORS	
Prof Cao Lei	7
Prof Ulrich Nissen	
A/Prof Peter Waterman	8
Dr Hem Baral	
Indian visitors	9
IN THE NEWS	11
POST GRADUATES	
Abbie Spiers	11
Andrea Rawluk	12
PhD News	12
PROFILE	
Nikki Scott	13
ADJUNCTS	
Michael Vanderzee	13
PUBLICATIONS	15
GRANTS	16
APPOINTMENTS	16

FROM THE DIRECTOR

By Prof Max Finlayson

THE GLOBAL ENVIRONMENT

The decline of biodiversity in many parts of the world and the links that exist between biodiversity and ecosystem services and the benefits people get from these have been widely espoused in the environmental literature.

There is now more evidence that the maintenance and restoration of biodiversity will play a key role in global efforts to sustain human wellbeing and health and livelihoods by, for example, underpinning food security, providing clean water, and supporting economic development. These issues and more are being addressed in the Global Environment Outlook (GEO-5) being produced by the United Nations Environment Programme.

A team of authors has been gathered to produce draft chapters for publication, and extract a summary for policy-makers. The latter then goes to a plenary session of world governments for approval. This may be an interesting exercise – the authors of the summary for GEO-4 in 2007 withdrew their names after the governments made substantial changes.

I am involved in the biodiversity section of the GEO-5. We are not just producing an assessment of the state and trends of global biodiversity – we are also looking at the fair and equitable sharing of benefits from biodiversity, recognition of traditional knowledge, the impacts of transport and trade on biodiversity, and progress on management responses.

Without making any comment on the final text I have provided a brief outline of some of the important issues that are under discussion.

- The pressure on biodiversity continues to increase with losses and degradation being caused by agriculture and infrastructure development, unsustainable exploitation, pollution, and invasive alien species. And we can add climate change.

(cont. next page)



FEATURE STORY: A WETLAND ON THE ROAD TO RECOVERY. Institute adjunct Michael Vanderzee is passionate about the reinstatement and recovery of Winton Wetlands (formerly Lake Mokoan) in North East Victoria. Read his story and that of a wetlands coming back on page 13.

OPINION

By Albury Mayor, Cr Alice Glachan, Albury WONGA WETLANDS: AN EXAMPLE OF ECOTOURISM ON ALBURY'S DOORSTEP

Albury's Wonga Wetlands is both a must-see tourist destination and a stunning example of environmental management based on lateral thinking.

Formerly a casualty of the damming of the Murray River, the area has been brought back to life using wastewater to recreate natural river flows. The area covers around 80 hectares on a picturesque bend of the Murray River just five minutes drive from the centre of Albury. The Wonga Wetlands project began in 2000 to help restore natural water flows and rehabilitate ecosystems. With a return to natural flow patterns, birds and other wildlife are returning in droves. The area has also been made more accessible to the public and researchers.

Wonga Wetlands has a dreamy, timeless atmosphere that captivates visitors. Standing among the majestic red gums, it's hard to believe that less than a decade ago the wetlands had almost disappeared. The water bringing new life to Wonga Wetlands comes from Albury's award-winning Waterview wastewater treatment facility. During the drier months this water is used to irrigate woodlots. In the wetter months it is redirected to Wonga Wetlands, helping to recreate the original hydrological conditions. (cont next page)

(Below) Wonga wetlands at dusk



FROM THE DIRECTOR (cont.)

- Biodiversity is continuing to decline and recent goals to reduce the rate of loss were not met. There are ongoing losses of populations and species, and degradation of natural habitats.
- The benefits humans get from biodiversity are at risk. Conversion of natural habitats for agriculture has resulted in benefits for human wellbeing, but often with reductions in other services, such as carbon sequestration and flood regulation. Improvements in human well-being and health are threatened by ecological degradation, unsustainable levels of consumption, and large inequities in sharing the benefits from biodiversity.
- There has been an increase in responses to the above mentioned situation, but they have been insufficient – the loss and degradation continues.
- Successful responses include: increases in the designation of protected areas, including more indigenous and community managed areas; policies and actions for managing invasive alien species; regulations for sustainable harvesting, and for reducing pollution; species recoveries and habitat restoration; and some progress in benefit sharing of genetic resources.

The available data shows that there is a long way to go – the world's governments have been challenged by the Strategic Plan for Biodiversity (2011-2020) that includes the Aichi Biodiversity Targets, as well as by the Nagoya Protocol on Access and Benefit Sharing. These provide an opportunity to stop and reverse the decline of biodiversity, if the opportunity is transformed into on-ground outcomes. My view on how I see our response to the opportunities we have in the Murray-Darling Basin will need to wait until a future newsletter.

OPINION (cont.)

Picturesque walking trails wind through the wetlands, with bird hides at intervals. Quiet visitors may be rewarded by the sight of a great egret, white-faced heron, Peron's tree frog, echidna, sugar glider or eastern snake-necked turtle.

Wonga Wetlands draws researchers in areas including hydrology, ornithology and riparian vegetation. Charles Sturt University, La Trobe University, the CSIRO and Monash University have all conducted major research projects here.

The Wiradjuri people have developed a working campsite at Wonga Wetlands which helps visitors understand Wiradjuri culture and hosts meetings and ceremonies. The campsite is set out according to tradition with areas for cooking, sleeping, tool making and rock art and a ceremony and dancing circle.

DIRECTOR'S ACTIVITIES

The beginning of August saw Institute director Prof Max Finlayson very much involved in the visit to Australia by a group of Indian scientists, engineers, foresters and administrators (see full story on their visit, pages 12 & 13).

Max then went to Brazil where he spent three days, August 10 to 12 at Manaus on the Amazon River looking at vegetation succession with local scientists. He then attended a scientific committee meeting of the National Wetlands Science and Technology Program in Cuiaba from August 15 to 17 followed by a day at a local university meeting with a group of indigenous people to talk about the results and implementation of the Millennium Ecosystem Assessment.

From August 24 to 25 he was in Canberra to attend the ILWS organised workshop on ecosystems services in the Murray Darling Basin (see full story page 4 and 5).

It was then back overseas to attend a meeting of the United Nations Environment Program Global Environment Outlook 5 (UNEP GEO5) at Cambridge, in the U.K. from August 30 to Sept. 3, to draft the chapter on biodiversity. (Max is one of two coordinating lead authors of the chapter). He went on to Bangkok, in Thailand, Sept. 4 to 8, to attend a meeting of the entire GEO5 team.

September 12 to 13 he was in the Mt Buffalo National Park and near Kosciuszko National Park identifying peatland study sites with his PhD student Janey Adams. On Sept. 22 he attended a high-level forum on 'Sustaining Australian through an ecosystem services approach' in Canberra.

On Oct 28, Max gave a talk to the Alpine Valleys Community Leadership Program's Environmental Sustainability Seminar on the significance of the Winton Wetlands Restoration Program (see story on page 8 & 9) at Benalla, Victoria.

CONFERENCES, SEMINARS, WORKSHOPS

NORTH EAST GREENHOUSE ALLIANCE

Dr Rik Thwaites was the guest speaker at six workshops held in Wodonga, Benalla and Myrtleford Oct 24 to 26 as part of the North East Greenhouse Alliance's current research project. Rik spoke on what is likely to happen in the north east based on scientific predictions for a variable climate, the implications this has for communities and industry and what can be done to assist regional communities and businesses.

LEARNING FROM LOSERS

Dr Nicole McCasker gave a presentation Australian Society for Limnology 50th congress in Brisbane, Sept 27 to 29 on 'Learning from losers: investigating the sources and severity of mortality in freshwater fish during their early life stages.'

READING THE LANDSCAPE

Institute adjunct Barney Foran attended the "Reading the Landscape— linking biodiversity, research and management" conference held in Dubbo, Oct 11 to 13. Barney gave a presentation on 'Impact of low carbon transition on biodiversity.' ILWS colleague A/Prof David Watson's presentations were on 'Poorer soils yield less food - understanding the basis of woodland bird declines' and 'Mistletoe: scourge or saviour of remnant woodlands. PhD student Ian Cole spoke on 'Restoring Grassy Woodland Communities.' The conference was jointly convened by Central West Catchment Management Authority (CMA) and the Biodiversity Conservation Science Section of the Department of Climate Change, Conservation and Water (DECCW)

TRANSPORT MUSEUMS

Adjunct Associate Professor Ian Gray presented a paper entitled 'Issues of Resources and Relevance for Small Transport Museums' at the annual conference of the Society for the History of Traffic, Transport and Mobility in Berlin on Oct 9. The paper was written by Jim Longworth of RailCorp NSW, Geoff Graham, a director of the Sydney Tramway Museum and Ian. The paper emanated from a discussion held at Junee during the workshop last August to inaugurate the Innovative Perspectives on Energy SRA. Even small transport museums have a role to play in disseminating information about change towards more sustainable energy consumption, but museums which rely entirely on volunteers have particular problems. The paper proposes a means of helping small museums to maintain their focus and work collectively for their common good.

ADJUNCTS' ACTIVITIES

PUBLIC INVESTMENT

Adjunct Professor Dr John Mullen gave a seminar to the School of Economics and Finance, Curtin University, on 'Public investment in agricultural R&D: A sensible policy option' on Sept 9.

This was after running a workshop “Assessing the Impact of DAFWA (Department of Agriculture and Food Western Australia) R&D Workshop, DAFWA, WA, Club Capricorn, Sept – 7. John also had an ABARES report published on public investment in agricultural R & D and extension.

TROPICAL RESEARCH

Adjunct Dr Justin Watson gave two conference presentations at the Australasian Ornithological Conference 2011 in Cairns in Sept. They were – Watson, Lavery & Hitchcock – Conservation of Avifauna in the Torres Strait; and Hitchcock & Watson – Ethno-ornithology in the Torres Strait. Justin, who is based in Brisbane, has also been doing some research work. He went to the Torres Strait in October to do research on islets and cays around Warraber and a community presentation/meeting and in November will be going to the Solomon Islands with a PhD student from the University of Queensland for a study on flying foxes in forests. He has also submitted a proposal to complete studies on nest box efficiency to compensate for habitat loss on Curtis Island, Gladstone.

ECOWISDOM

Adjunct Professor David Mitchell gave a presentation for a panel discussion on “Relationship between Climate Change and Cultural Change in Religious Communities” at a conference entitled “Ecowisdom and Climate Change” at the Centre for Theology and Ministry, Parkville, Victoria on Oct 29.

WATERBIRD CONSERVATION

Congratulations to institute adjunct Dr Mariagrazia Bellio who received her doctor of Philosophy in Biological Science from the University of NSW in September. Mariagrazia’s thesis title was “Agricultural development and impacts on wetlands: trade-offs for waterbird conservation in Sri Lanka.”

OVERSEAS TRIPS

RESEARCH IN AUSTRIA

Back home after three and a half months SSP Leave in Europe is Dr Paul Humphries. Paul first went to Finland to attend an Environmental History Conference in Turku where he presented on a paper on the historical ecology work he has been doing. From there he went to Vienna in Austria where he and colleague A/Prof Hubert Keckeis, from the University of Vienna, taught an undergraduate field-based fisheries subject to students for a week on the Danube River. Paul then flew to London and spent 10 days with Dr Carl Sayer, a palaeoecologist, from the Environmental Change Research Centre, Department of Geography, University College, London. Paul discussed potential collaborative projects on the palaeoecology of floodplains, made a few field trips and gave a seminar. He returned to Austria where he was joined by his family for a month’s holiday. After that he spent six weeks based at the University of Vienna collaborating on a project associated with larval fish dispersal in the Danube and other experimental work with Hubert and his students. The project, which is in collaboration with another university in Vienna, the Boku University, featured in a Viennese newspaper *Der Standard* and the University’s web pages. Paul also gave a second seminar while in Vienna.



(Left). The small town of Hainburg, one of the field sites, which fronts the Danube River. Pic by Paul Humphries

NRM IN THE STATES

Prof Allan Curtis visited Oregon State University as part of his travel through the US Pacific North West in late Jul/ August where he met with a range of stakeholders to explore regional NRM issues, including the impacts of climate change on forest health; expansion in coal and coal-seam gas industries; management of fire at the urban-rural interface; and the impacts of the recession on movement of people into the Pacific North West.

(Right) Marg Curtis, Gary Berglund from Missoula, Montana, and Allan Curtis, exploring the Bitterroot Mountains in Montana.



AWARDS & ACHIEVEMENTS

Congratulations to Institute adjunct Darla Hatton MacDonald and Prof Mark Morrison whose paper—Hatton MacDonald, D. and Morrison, M. (2010). Valuing Biodiversity Using Habitat Types. *Australasian Journal of Environmental Management* 17(4): 235-243.— was awarded the Eric Anderson award for the best article in the *Australasian Journal of Environmental Management* on Sept 28.

Dr Hazbo Skoko, (pictured left with his awards) was awarded the ‘Best Professor in Economics Award’ for excellence in leadership, education and teaching, at World Education Congress, Global Asia Award held in Dubai on Sept 25.



Dr Branka Krivokapic-Skoko received the Best Paper award at British Academy of Management 2011 (Organisational Psychology Track) conference held Sept 13 to 15. Her paper was titled ‘Academics and Breach of Psychological Contracts in the University Sector: Insights from an Australian Business School.’

VICE-CHANCELLOR’S AWARDS 2011

Dr Julie Howitt and **Dr Alek Zander** are members of the Chemistry Teaching Team from the School of Agricultural and Wine Sciences, which won the Vice-Chancellor’s Award for Teaching Excellence. The Inland Living Experience team comprising of ILWS member **Dr John Rafferty** from the Murray School of Education and Peter Jones from the Division of Facilities Management won the Vice-Chancellor’s Award for Excellence in Sustainability.

FACULTY AND DIVISION AWARDS 2011

Dr Karen Bell and **Dr Bill Anscombe** won the Faculty of Arts’ Team Award for Leadership Excellence. **Dr Yapa Bandara** was awarded the Faculty of Business’s Individual Award for Academic Excellence. **Prof Mark Morrison** and **Prof Kevin Parton** were each awarded the Faculty of Business’s Individual Award for Research Excellence and Leadership Excellence. **Dr Peter Spooner** was awarded the Faculty of Science’s Individual Award for Research Excellence. ILWS communications coordinator **Ms Margrit Beemster** was awarded the Deputy Vice-Chancellor (Research)’s Individual Award for Performance Excellence.

STRATEGIC RESEARCH AREAS UPDATES

ECOSYSTEM SERVICES

Led by Dr Roderick Duncan

ACTIVITIES

ILWS WORKSHOP throws spotlight on ecosystems services in the Murray-Darling Basin *By Mark Filmer*

Two international experts in the relatively new and sometimes contentious field of ecosystems services were among the guest speakers at an ILWS-organised workshop in Canberra on 24-25 August.

The workshop, which was attended by about 40 people, was funded by CSIRO, ILWS, and the State Water Corporation (NSW). Prof Robert Johnston of Clarke University in Massachusetts and A/Prof Dolf de Groot of Wageningen University in The Netherlands led a large panel of speakers in a series of presentations which examined the experiences of several overseas countries in the use and valuation of ecosystems services and highlighted some of the challenges of valuing ecosystems services in Australia.

Ecosystems services are essentially the benefits we gain from natural or environmental resources and processes. They have a significant effect on human health and wellbeing, so have an economic and social value. However, differences in opinion sometimes arise when it comes to identifying which benefits to value and then quantifying these values. Although researchers have referred to ecosystems services for many decades, the discipline has only really been formalised and popularised during recent years. It has been a growing area of interest for economists, ecologists and social researchers since the release in 2005 of the United Nations Millennium Ecosystem Assessment (MEA)—a four-year study involving more than 1300 scientists worldwide. This landmark study assessed the condition of the world's major ecosystems, identified the services they provide, outlined the consequences of ecosystem change for human wellbeing and provided a scientific basis for action to conserve and sustainably use these ecosystems.



Prof Johnston, (pictured left) who is Director of the George Perkins Marsh Institute, said economics could provide an important framework when it comes to identifying what to count as ecosystems services, who benefits from these services, and how to quantify the value of the services. He outlined the validity and precision of various methods of valuing ecosystems services. He said valuing ecosystems services could help guide policy development, but it was still an area where there were many pitfalls for stakeholders, particularly when it comes to quantifying benefits.

Assoc Prof de Groot gave a European perspective on the use of ecosystems services, where some countries are beginning to incorporate ecosystems services into their national accounting and reporting frameworks. (see next story)

The other speakers at the workshop were Dr Steve Cork, of Ecolnsights, CSIRO Research Scientist Dr Carmel Pollino, A/Prof Gary Luck (ILWS), CSIRO Stream Leader Coastal Futures Dr Wendy Proctor, ILWS Director Prof Max Finlayson, Prof Pierre Horwitz (Edith Cowan University), Professor Lin Crase (La Trobe University), Dr Rod Duncan (ILWS), CSIRO Senior Research Scientist Dr Neville Crossman, ANU Adjunct Professor Dr Neil Byron, CSIRO Postdoctoral Fellow Shuang Liu, UTS Institute for Sustainable Futures Research Director Dr Roel Plant, ANU Director

of International Programs for the UNESCO Chair in Water Economics and Transboundary Water Governance Dr Jamie Pittock, and The Centre for International Economics, Executive Director, David Pearce.

A major theme of the presentations and two roundtable discussions was the importance of economists, ecologists and sociologists working together to help refine and improve methods for identifying and valuing ecosystems services. To date, inter-disciplinary differences, particularly in approaches to valuing benefits, has resulted in limited inter-disciplinary collaboration. The two-day workshop was held at a time when Australia's Murray Darling Basin Authority is assessing the likely social and economic impacts on local communities of options for its sustainable diversion limits for the basin. Several staff from the MDBA attended the workshop and Tony Webster, the Authority's General Manager Social Economic Analysis, spoke about this assessment process.

ILWS researchers are currently working with the CSIRO to complete a project entitled 'Multiple Benefits of the MDBA Basin Plan', which will include an outline of some ecosystems services benefits to Basin communities.

The workshop was organised by Professors Mark Morrison and Max Finlayson (ILWS) together with Drs Neville Crossman and Darla Hatton MacDonald (CSIRO). It was held at St Mark's Chapel at Charles Sturt University's Australian Centre for Christianity and Culture in Barton.



(Left) Prof Max Finlayson (ILWS), Prof Lin Crase (La Trobe University) and Dr Rodney Duncan (ILWS)

A/PROF DOLF DE GROOT



A keynote speaker at the Ecosystems Services workshop was A/Prof Dolf de Groot, from Wageningen University, The Netherlands who is recognised as an international expert on ecosystem services.

Dolf who made a brief visit to Australia primarily to participate in the workshop, had his first international paper published on the topic more than 25 years ago. His interest in "the dilemma between conservation and economic development" goes back to when he graduated as an ecologist and began collecting data on the ecosystem functions of the Galapagos Islands and the Darien Rainforest, Panama. "No one was really talking about ecosystem services back then," explains Dolf who published a book on the subject *Functions of Nature* in 1992. This was the basis for his PhD, a joint ecological/economic thesis.

Dolf is a member of his university's Environmental Systems Analysis Group, "a research group which looks, in an integrated way, at complex environmental issues like climate change, and the link between changes in biodiversity and ecosystem services, which is my main field." He was heavily involved in the Millennium Ecosystems Assessment process which was finalised in 2005, and a following global study (TEEB) on the economics of ecosystems and biodiversity. He is chair of the Ecosystems Services Partnership (ESP) which was established in 2007 and held its fourth international conference in October this year.

"As the name suggests we wanted to provide a platform for both scientists working in this field to get better data and information, and to engage with stakeholders, NGOs, policy makers etc. to discuss how best to turn the science on ecosystem services into practice," says Dolf. "The underlying motive is to stop the loss of biodiversity and create a more sustainable planet which still has some space for Nature and all the services we get from Nature." He expects that when the newly formed Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) starts a new assessment or has a need for data it will need partners, globally, to provide input which is where ESP will come in.

Dolf who is editor-in-chief of the journal *Biodiversity Science Ecosystem Services and Management* was in Australia at the invite of colleague Dr Neville Crossman from CSIRO whom he is working on a number of projects with. While here he caught up with one of his Masters students Ms Hiyoba Ghirmay who is from Eritrea but is currently living in Australia and working for CSIRO Ecosystem Sciences (Adelaide).

One of the messages in his presentation was that it is better "to be roughly right rather than precisely wrong" when it comes to quantifying the importance of ecosystems to human well being. He questions the cost-effectiveness of lengthy detailed studies to determine the precise economic value of particular economic services. "We should make use of the knowledge we have already in the database that the Ecosystem Services Partnership has set up – we already have 1300 value points in there," says Dolf. For more information see the website of the Partnership: www.es-partnership.org



DR JAMIE PITTOCK
One of participants and presenters at the Ecosystem Services workshop, which was focussed on the Murray Darling Basin, was Dr Jamie Pittock, a researcher with ANU's Crawford School of Economics and Government.

Jamie, whose research is focused on conflicts and synergy between policies on water, energy, climate

change and biodiversity, has been at ANU since 2007. Before that he worked for the environmental organisation WWF from 1994 to 2007, in Australia, and then internationally and eventually led WWF's international engagement with the Ramsar Convention. He first worked with Prof Max Finlayson when Max was an Australian Government representative for the Convention. Since being at ANU Jamie has collaborated extensively with CSU on the questions of maintaining the ecological character and the governance of Ramsar wetlands. An additional collaborative project "Climate Change Adaptation in the Coorong, Murray Mouth and Lakes Alexandrina and Albert" for the National Climate Change Adaptation Research Facility (NCCARF) is being finalised.

"The question there was are there limits to which climate change impacts could be adapted to in terms of societal, economic, technical and physical limits," says Jamie. "Some of our findings are that there are very few hard limits as such, that society could continue to adapt, but there are some very hard choices and there would be different services from these wetlands. For example, the

major adaptation that would keep the system healthier is to have more environmental flows coming down the Murray Basin."

He says other benefits from the system, such as commercial fishing, would suffer in a transitional phase but would resume, possibly in a different way, after the major impacts of climate change. "Currently the commercial fishing industry in the Coorong and the Lakes is a freshwater fishery," says Jamie. "If during the period of climate change impacts the lakes dry up as they did in the millennium drought that's very bad news for the fishing industry. But if sea level rise were to overtop the barriers and flood the Coorong lake system then there would be a fishing sector again but it would be a saltwater fishery with different species."

Re the Ecosystems Services workshop Jamie says: "The question here is what are the aspects of the environment in the Murray Darling Basin that people value and should be favoured, maintained and restored with water as part of the development of the Murray Darling Basin Plan. "I and many others believe that the Government has failed to properly consider the full range of benefits that people get from the environment in the Basin when it drafted the Guide to the proposed Murray Darling Basin Plan which was released in October, 2010. It ended up focussing almost entirely on irrigated agriculture versus the environment and I think in so doing it has overlooked a lot of other benefits that are terribly important."

These benefits included production values such as cattle graziers being able to raise more cattle on floodplain pastures that receive beneficial flooding; flushing salt out of the system to the sea; sustaining river fisheries and in the Coorong and the lakes; and recreational values. "My concern is that the Government has failed to properly assess the full range of benefits to make clearer some of the trade-offs in how water is used," says Jamie. "It's partly about providing the information so society can make more informed choices."

Jamie says there are a silent majority in the Basin, and in the rest of Australia, who benefit from services provided by the river ecosystems and that it is "too late" in the water reform process to provide information about the benefits people get from the environment in the Basin. "The history for many of the natural resources reform processes we've seen in Australia, whether it's forestry, marine fisheries... is that it's been a half-baked compromise that falls apart after five to 10 years and Governments have to come in and redo it," says Jamie. "I think here we have an opportunity to have a better go at getting it right up front but perhaps it will take two or three more reform cycles to get it right. The danger of not getting it right now is creating uncertainty for regional communities, particularly those that depend on water for irrigation."

He says, for these communities, the uncertainty caused by delays in introducing the MDB Plan, is affecting values of businesses, houses, community confidence and so on. "I think we would be better off making more transparent choices and perhaps some harder reform choices now in order to buy some longer term certainty," says Jamie. "I'm of the view that more water should be reallocated from irrigated agriculture to other uses than the Government is currently considering because I believe that will generate a more diverse range of benefits for society."

The Guide to the propose MDB Plan talked about re-allocating between three and four thousand gigalitres a year back to the environment. "The Murray Darling Basin Authority and the Federal politicians are now clearly considering something substantially less than 3000 gigalitres," says Jamie. "That means some values will be lost, they will die. At 4000 gigalitres a year reallocation it would only be possible to maintain around 75% of the red gum forests for example. There is a conscious choice there, to kill off a quarter of the red gum forests. If we are now talking about less than 3000 gigalitres, even more of the red gum forests will die. Those sorts of trade-offs need to be made transparent; society needs to be explicitly told about what services these forests currently provide and won't provide in the future so we can make a choice."

(cont next page)

DR JAMIE PITTOCK (CONT.)

As Jamie explains the Murray Darling Basin Plan is part of the Federal Government's obligations under the Water Act. "The Federal Government gets its constitutional mandate for the Water Act from implementing the Ramsar Convention," he says. "The key principle of the Ramsar Convention is maintaining the ecological character of big wetlands in the Basin like the Barmah-Millewa Forest and the Coorong and Lower Lakes. Maintaining ecosystem services is a key part of maintaining that ecological character. If the Federal Government is to faithfully implement this treaty and the Act it has to maintain the ecosystem services. This workshop is partly about helping the Government identify more precisely what these ecosystem services are. If the government's Basin Plan doesn't faithfully implement Australia's Ramsar Convention obligations by maintaining the ecological character of designated wetlands then the Plan could be challenged in the courts."

SOCIAL RESEARCH FOR REGIONAL NATURAL RESOURCE MANAGEMENT

Program leader Prof Allan Curtis

PROJECT UPDATE

As part of the National Centre for Groundwater Research and Training (NCGRT) research program, Prof Allan Curtis and Dr Emily Sharp are working with project partners from Australian National University and the University of Western Australia on a project called *Integrated assessment of the social, economic and ecological impacts of changes in policy and climate on water availability in the Namoi Valley*. The team have recently completed a mail survey of all groundwater irrigators in the Namoi Valley, gathering social data as well as data for our project partners at ANU and UWA. The survey achieved a 54% response rate which surprised their research partners who thought it would be difficult to get these landholders to respond given the extent that they have been surveyed in the past and that many are angry/ disappointed with severe cuts in water allocations over the past 10 years. Preliminary data analysis has shown that irrigators are undertaking a range of adaptations in response to the cuts in allocations but do not feel they could readily adapt to further cuts. Irrigators have also shown considerable support for Managed Aquifer Recovery using large flood events for multiple benefits, a topic which will be the subject of Andrea Rawluk's PhD and further research being developed with project partners at ANU and the University of New South Wales. Complementing the survey work in the Namoi valley, Dr Emily Mendham is also undertaking research in the area to better understand the social construction of risk related to coal seam gas and other issues facing landholders.

ACTIVITIES

Prof Alan Curtis chaired and presented to a one-day workshop in Canberra for the National Centre for Groundwater Research and Training "Groundwater for Decision Makers" on Sept 1. The workshop was attended by 24 participants from government and private industry who received updates from hydrologists, economists, lawyers and social researchers working within the NCGRT. Allan was also an invited Keynote speaker at NSW State Landcare Conference in Parkes on Sept. 7 where he spoke on "Contribution of social research to regional NRM."

IMPROVING RURAL LIVELIHOODS AND ENVIRONMENTS IN DEVELOPING COUNTRIES

Program Leader Dr Joanne Millar

ACTIVITIES

A workshop was held at the Thurgoona campus on 30-31 August 2011 to explore research ideas and collaboration opportunities for the new SRA. Thirty one people attended the workshop including 14 academic staff and 14 PhD students from Bathurst, Wagga, and Albury campuses. There were three invited academic guests from the University of Sydney and Nepal. Keynote speakers included

Dr Robert Fisher, an anthropologist with over 25 years researching livelihood and environment issues in Asia. Dr Richard Callinan also from the University of Sydney spoke about his research in Indonesia working with government agencies and smallholder aquaculture farmers. Other presentations covered integrated research on community forestry, disaster management, foreign aid effectiveness, role of tourism and community development in Asia primarily. A range of research needs and ideas were generated in an open discussion on the second day. Four potential research themes were identified around entrepreneurship and culture, commercialisation approaches and impacts, global carbon policy and local livelihoods and the role of integrated research in improving outcomes in developing countries. Plans are underway to develop these themes into projects, either PhD studies or general research projects. The workshop was a wonderful opportunity for economists, social scientists, ecologists and agricultural scientists to discuss research issues they are dealing with overseas. It also brought together international PhD students across different schools and faculties, and gave them a chance to meet a variety of academic staff at CSU.



(Above) Participants in the workshop at Albury

SUSTAINABLE WATER

Led by A/Prof Robyn Watts

PROJECT UPDATE

One of the group's major projects for the year, "Monitoring the ecosystem response to the delivery of environmental water" is well underway. The project, led by Dr Skye Wassens, has been funded by the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) and is focussed on measuring ecosystem responses to a managed release of Commonwealth environmental water in the mid-Murrumbidgee catchment. Several rounds of sampling for the project, which commenced in June, have already been done with the first report to SEWPAC sent. Surveys for frog, fish, waterbirds and aquatic vegetation response to the environmental watering (including frog recruitment response) will continue through summer.

ACTIVITIES

Members attended and presented papers at the Australian Society for Limnology 50th congress in Brisbane, Sept 27 to 29. Dr Julia Howitt gave a presentation on 'Droughts and Flooding Rains: water quality changes associated with natural flooding events in the Wakool/Yallakool river systems', Dr Skye Wassens on 'Little frogs need big floods: the response of frog populations to floods of different magnitudes' and A/Prof Robyn Watts on 'Dilution flows: responses to the delivery of environmental water via irrigation canal escapes' Following on from this Robyn has been invited to present the outcomes of the Commonwealth environmental watering in the Edward Wakool in 2010/2011 to the SEWPAC at the next Environmental Water Advisory committee meeting in November. She was also invited to meet with and advise the federal Coalition's Dams Taskforce on Oct 25 during its visit to the NSW-Victoria border region on sustainable dam planning and operations. Robyn, Skye, Keller Kopf and Julia in collaboration with Murray CMA, Monash University and the Wakool Rivers Association have applied for funding to monitor and assess the ecosystem responses to Commonwealth environmental watering in the Edward-Wakool 2011/2012. This is part of a larger collaborative bid submitted by MDFRC to SEWPAC.

VISITORS

It's been a busy few months for Institute visitor-wise, as the following pages show-



PROF CAO LEI

The first thing that strikes you about Visiting Prof Cao Lei from China is her delightful enthusiasm for all things Australian.

The second, when she begins to talk about her research, is her concern for the environmental degradation and the loss of waterbirds in her homeland. Lei, who leads the Waterbird and Wetlands Ecology Group of the University of Science and Technology of China's School of Life Science, spent three months in Australia from July to September,

dividing her time between Charles Sturt University (Albury-Wodonga campus) and Deakin University. She was in Australia at the invite of Institute Director Prof Max Finlayson whom she first met when he was in China last year as a member of an international scientific team which assessed the proposed Poyang Lake dam, and again earlier this year when Max visited Lei's University and the wetlands she has been studying in the Yangtze Basin.

As a child, Lei grew up in the middle of China's Yangtze Basin very close to a large river that feeds one of that country's biggest freshwater lakes, Dong Ting Lake. There she had the opportunity to be close to and experience a natural environment which led to her choosing to study biology for her first degree at Hunan Normal University, Changsha. After teaching at a high school for two years, she worked as a technician and taught in the laboratory at the University of Science and Technology of China in Hefei, Anhui for 10 years until 2005. Meanwhile, in 2002, she began her PhD with Lanzhou University, in the western part of China, in animal ecology, studying the population ecology of the Red-footed Booby, a seabird resident in the South China Sea.

Since completing her PhD in 2005 Lei has been teaching at the university where she leads a small research group comprising of a post-doc, two visiting professors (shorebird ecologist Prof Mark Barter from Australia, who began working in China in 1996, and waterbird and wetland ecologist Prof Anthony Fox from the Institute of Bioscience, Aarhus University in Denmark), three PhD students and seven Masters students.

In 2004 and 2005, Lei, as part of a WWF project team, surveyed for waterbirds in the Yangtze River floodplain. "This was the first time it had been done," says Lei. "The idea was that we had a baseline so we could study the impact of the Three Gorges Dam on the waterbirds in the floodplain." (The dam, the world's largest, was fully operational by 2006). Because of the lack of information about wintering waterbirds in China, she and Mark surveyed for waterbirds in Eastern China in January and February (the coldest months when the birds are most concentrated) each year with the help of students. As this is a huge area, it took over five years to do. "Basically we recorded the numbers and distribution, and found an estimated population of more than two million water birds, of which one million were *Anatidae* (ducks, geese, swans) with 80% occurring in the Yangtze Basin, and one million were shorebirds, eighty per cent of which occurred in coastal regions," says Lei. "This is about 90 per cent of the total wintering waterbirds in China."

What Lei is particularly concerned about is the future of the *Anatidae* in China which, compared to shorebirds, are not as widely dispersed, under great threat especially from habitat degradation and hunting, and do not get as much attention from scientists and study groups. "We believe their numbers have dropped by 75% over the last 25 years," says Lei. "They are so important but they

get little attention."

In 2008, she and Mark selected two areas in the Yangtze basin as case studies - Dong Ting Lake, the single most important wintering site for the globally threatened Lesser White Fronted Goose, and Shengjin Lake, an important winter feeding ground for the globally threatened Swan Goose, Hooded Crane, and the Tundra Swan, which migrate there from North East China, Russia and Mongolia. "We found there had been big changes in tuber feeding birds, such as Swan Geese and Hooded Cranes, at Shengjin Lake," says Lei, "with numbers dropping dramatically from 2005 to 2008; the system had collapsed." Her group believe this has occurred because the tubers that the birds feed on, from the submerged plant *Vallisneria*, have disappeared probably because of pollution (from increased nitrogen and phosphorous). Their hypothesis is the increased pollution facilitated the growth of the aggressive floating water plant, water chestnut, which has more than doubled in area on the lake, greatly reducing photosynthesis by shading previously rich areas of *Vallisneria*.

"This is bad news for both vegetation and birds, and also for the people who rely on the lake for their water and food," says Lei. "Even worse we suspect there are other lakes in the region suffering the same fate so we are using remote sensing to determine how many other lakes in the Yangtze flood plain are in a similar situation."

While she was in Australia, Lei worked on a cooperative project proposal with Max, other members of the Institute and Dr Daryl Nielsen (Murray Darling Freshwater Research Centre) on a model for wetland restoration and management in China. Also, as Lei has the opportunity to set up ecology as a major field of study at her university, she looked at how that subject is taught here. She is particularly impressed with CSU's Green Campus concept and is hopeful of increasing public awareness in China in that regard. Lei is looking forward to hosting members of Max's group in China next northern winter to get the cooperative project started.

PROF ULRICH NISSEN



Prof Ulrich Nissen had some interesting messages on accounting for energy costs to convey to academics, and business and industry representatives during his brief visit to the Albury-Wodonga campus on August 3.

Prof Nissen, who is a professor of Management Accounting & Business Orientated Energy Management from the University of Applied Science in Giessen, Germany, was near the end of a six month visit to Australia as a visiting academic with the

University of Southern Queensland. "We are facing a tremendous above inflation energy price rise world-wide which means that, compared with the past, the energy cost share for companies will rise," says Prof Nissen who has been a member of the environmental management committee of the German Standardization Body (DIN) for 18 years.

"How high we don't know but from my experience, and this has happened in Germany, there is some kind of 'activation' threshold when accountants [and companies] start to seriously consider energy costs. I'm not talking about companies that want to be 'green', they have different motivations, but the majority of companies that want to continuously improve their profitability." Prof Nissen says the only driver for these companies is cost. "The higher the cost the earlier they start doing something," says Prof Nissen who is the author of 42 publications on environmental and management accounting issues. (cont next page)

PROFESSOR ULRICH NISSEN (CONT.)

"In the past the energy costs were too low in order to activate people." However two or three years ago, as energy costs started to increase, companies began calling on Prof Nissen and others at his university, for help. "They were offering the possibility of being involved in projects together because their energy costs were at a certain point where it 'hurt'," says Prof Nissen. "They wanted to do something but didn't have the knowledge and expertise to do it on their own."

What Prof Nissen and his colleagues observed was that, as companies reached their individual energy cost share thresholds, directors would try to find someone in the company "who could do something about it, someone to be responsible." "Because it is a cost-management matter they would go to the company's accountant but what we found was that accountants weren't usually qualified in this area and the process stops," says Prof Nissen. "In my experience they [accountants] don't want to even talk to the engineer who might be able to come up with energy saving solutions."

Prof Nissen says the solution is for universities to give accountants the knowledge and training they need to be able understand and deal with the issue of rising energy costs. "Energy costing is a new topic for accountants and different to the other types of costings that accountants have dealt with in the past," says Prof Nissen who has introduced the subject into accounting courses at his university. Prof Nissen says current energy costs in Australia were about half of what they are in Germany. Consequently, many companies have not yet reached that 'activation' threshold. His advice is that now is an ideal time to start preparing our accountants for what they can expect in the future.

"It sounds a little weird," Prof Nissen says, "but high energy prices can generate a strategical advantage for a whole country. It does not have to be a negative to have high energy prices. In Germany, for example, the high price level for energy (plus suitable legislation) has made the country the world market leader in the utilisation of photo voltaic systems although the solar radiation is comparatively low (on average about 900 kWh/m² per year in Berlin/Germany compared with 2,200 kWh/m² in Brisbane). And this is – no doubt about it – among other renewable sources, the energy supply technology of the future. High resource prices have always been a driver for improving efficiency and drastic energy efficiency improvements will be needed in the future.

"Further more, the higher the energy prices are, the more intellectual capacity is built in terms of exploiting efficiency potentials in production companies and experience within consultancy firms. Germany has understood it. As a country that has always suffered from depending on energy exporting countries, it has found a step-by-step pathway to get rid of fossil energy. And since Fukushima there is only one direction: renewable energy sources."

Prof Nissen is astonished that Australia does not make use out of its enormous potential (particularly solar and wind energy). "Now is the right time to begin the transition because the global competition for energy efficiency has only just started," he says. "But it seems Australia has got stuck (at least at the moment) because of its fear of losing wealth without coal. In the short run, this attitude may make sense. But in the long run, this will surely turn out to be an error."

A/PROF PETER WATERMAN

Other visitors to the Institute in August were A/Prof Peter Waterman from the University of the Sunshine Coast, Queensland, where he is involved in applied research and post-graduate program development in climate change adaptation, and Peter Henderson, communications director of Environmental Management Services, ACT.

The two were on their way back from the La Trobe Valley in South Gippsland where they had convened and co-facilitated a workshop

for Brown Coal Innovation Australia, a joint Federal and Victorian Government initiative. They were visiting Institute Director Prof Max Finlayson whom Peter has known since 1994 when both men worked on projects for the Office of the Supervising Scientists in Kakadu which evolved to become the Environmental Research Institute for Supervising Scientists (ERISS) based in Darwin. The two worked together on coastal vulnerability and the effects of climate change on coastal wetland systems.

"In fact Max was one of the people who helped formulate the approach and course structure for a Masters of Climate Change Adaptation which has been running at the University of the Sunshine Coast since 2007," says Peter. "The proposal I have put to Max is that we look at using this university, [CSU as a whole] because it is positioned so solidly in the Murray Darling Basin, to be the hub of an innovative new program in professional development and research training in climate change adaptation."

Peter says CSU is ideal as it has multiple campuses; it services a core area of adaptation in the irrigation and agricultural industries; and it could come to grips with the core adaptation needs of inland communities to 'changing climatic conditions.' He and Max see the market for this professional development and research training being local government, catchment management authorities, other researchers, community groups etc.

Another party interested in being involved is the International Centre for Excellence for Water Resources Management which is based in Adelaide but has a special focus on the Murray Darling Basin. "I'm interested in how we can build a stronger link between the research and the training or professional development in climate change adaptation that is particularly relevant to local communities in regional Australia," says Max.



(Left) Peter Henderson, Prof Max Finlayson and A/Prof Peter Waterman

DR HEM SAGAR BARAL

Another visiting academic in August was Dr Hem Sagar Baral from Nepal who was based at the Albury-Wodonga campus at Thurgoona for five weeks.

Hem, a wildlife ecologist, is a long-term friend and colleague of ILWS member Dr Iain Taylor, from the School of Environmental Sciences. For the last two years Hem has been one of the tutors for groups of students from the School who visited Nepal with Iain to study its environment and culture. While here Hem gave a number of lectures on the wildlife of the Himalayas and Nepal but also took the opportunity to study some of Australia's wildlife.

"Birds are my core business but I tend to get involved in a variety of things back home, for example mammal ecology, nature conservation, the establishment of new protected areas..." says Hem who started his working life as a bird guide in the eco-tourism industry in Nepal nearly 25 years ago. Realising he needed an academic qualification for his work to be recognised "more widely than just amongst your friends," he went to the Tribhuvan University in Kathmandu where he completed his Bachelor of Science and his Masters.

"But I kept on studying the birds and wildlife of the country," says Hem who also had the opportunity to do a PhD at the University of Amsterdam in The Netherlands. His PhD, which he completed 10 years ago, was on the ecology of grassland birds in Nepal. He then returned to Nepal where he did more research on the country's birds, and in particular on the threatened vultures of south Asia.

"Many of our vulture species are declining because of a veterinary drug called *diclofenac*," says Hem who was at the forefront of vulture research and conservation in Nepal. He successfully lobbied the Nepalese government to ban the drug and, at the time, established a captive breeding centre for vultures. He also established the first community managed vulture restaurant where the locals provided safe food for the vultures to eat. In this project community stewardship was promoted and some economic incentives to locals were given by running ecotourism activities centred at the restaurant. "All research is important but for Nepal and south Asia, research that provides practical conservation outcomes is most important," says Hem.

He lists another achievement as helping popularise the study of birds amongst younger students which has resulted in a much larger body of knowledge. Hem says he has done much of his research independently but did work for Birdlife Nepal for four years. Concerned little was known about Nepal's smaller mammals, Hem and a university colleague wrote a book *Field Guide to the Wild Mammals of Nepal* which was published in the Nepali language with species description also in English. This book was published in 2008 and managed to authenticate the presence of 26 additional species for Nepal, bringing the total number of species to 207. "It was to promote the knowledge to the local people because, after all, they are the ones who have to conserve the species," says Hem.

With his extensive knowledge of the local bird and wildlife, Hem was able to develop itineraries that were popular with tour operators outside Nepal and therefore help increase the country's tourist numbers. Where there were no structures/facilities for tourists to stay, he helped establish small eco-lodges. By the mid-1990s, he had managed to increase the number of tourists visiting Nepal especially to watch birds and wildlife by nearly 10 fold. Twelve years ago, Hem set up Himalayan Nature, a not-for-profit organisation which works on emerging issues related to the conservation of natural resources, and the improvement of living conditions of people in the Himalayan region. Hem is on the organisation's board and is its chief technical advisor. Himalayan Nature now employs 12 people.

In 2008 he set up another not-for-profit organisation, AutismCare Nepal, because he found that, having a family member with autism, there was no support for autistic people or their families in Nepal. The organisation is growing rapidly and now employs 10 people. While at CSU Hem met with representatives from the School of Community Health to discuss possible ways it could be more involved including student visits. In 2009, he with other Nepali colleagues established a scientific organisation, Nepalese Ornithological Union, to carry out research work on Nepal's birds.



(Left) Dr Hem Sagar Baral and Dr Iain Taylor

INDIAN VISITORS

It's all about sharing knowledge. From August 1-8, the Institute hosted 14 scientists, engineers, foresters and administrators from India who were investigating how Australia is managing the wetlands and water resources at the basin level to address the sometimes conflicting uses for limited water resources.

The group, who were from Loktak in Manipur state and Chilika in Orissa State, attended a specially-organised three day workshop at the Albury-Wodonga campus before going on a three day field trip to visit surrounding natural and artificial wetlands. "Indian wetland managers face competing interests for water resources, such as hydro-electricity, irrigation, domestic supply, and the environment, which we are also addressing in the Murray Darling Basin," says ILWS director, Prof Max Finlayson. "This visit was a great opportunity for both countries to learn how we can more effectively manage our water resources for all our users."

During the workshop at the campus the Indian visitors heard presentations from Institute researchers (Prof Max Finlayson, A/Prof Robyn Watts and Prof David Mitchell) as well as presentations by Dr Daryl Nielsen, Murray-Darling Freshwater Research Centre, Dr Jamie Pittock, Australian National University, Patricia Bowen, Murray Catchment Management Authority, Dr Maria Bellio, University of NSW, Prof Cao Lei, University of Science and Technology of China, John Foster, DSEWPC, Dr Carmel Pollino, CSIRO, Dean Ansell, MDBA, Judy Frankenberg, Murray Wetlands Working group. A range of topics covered including wetlands and dam re-operation, managing wetlands in the future-coping with global change, and integrated river/wetland management – dams, energy and climate.

Two of the visitors, **Ritesh Kumar**, from Wetlands International-South Asia WISA), and **Ajit Kumar Pattnaik**, from the Chilika Development Authority, gave presentations. Ritesh's presentation was titled 'Integrating conservation and wise use of Loktak Lake into River Basin Management' and Ajit's was 'Case study of Chilika Lake Restoration Program. Both Loktak (freshwater inland lake) and Chilika (coastal lake) are Ramsar sites, that is, wetlands of international importance.

Planning for the visit was initiated at the behest of **Th. Ibobi Singh**, project director for the Loktak Development Authority as a part of the ongoing efforts for conservation and management of the Ramsar site. As Ibobi explains the visit to Australia fulfils the requirement of capacity building of the officials engaged in implementation of the Loktak conservation plan. He says, on the advice of WISA, the group chose to come to Australia, and in particular the Murray Darling Basin, as it is known as one of the best managed river basins.

"Even though we are working on Loktak Lake as a wetland manager, our project [which began in 2009] is to link with the management of the entire Manipur River Basin which covers about 6800 sq kms," explains Ibobi. This will require an integrated approach working with many different Government departments, authorities and communities. "In terms of managing water and wetlands, even though some of the issues we face in our country are quite different to those faced in Australia and the Murray Darling Basin, quite a few are very common such as how to manage the water; how to share the water with different stakeholders; and how to take care of the biodiversity," says Ibobi. "I think something that will be very useful to us is your institutional management for wetlands and monitoring mechanisms."

A seemingly big difference in comparing the Manipur River Basin (Manipur is in the north-east of India bordering Myanmar) with the Murray Darling Basin is that the Indian basin has a much higher rainfall. However, as Ibobi says : "Even though we are in a high rainfall area we have to improve the water management practices. And it has become all the more important to achieve equitable sharing of water given the impacts of climate change are becoming more pronounced." (cont next page)

VISITORS (cont.)



(Left) Ritesh Kumar, Ibobi Singh, and Ajit Pattnaik

“Basically Manipur is a biodiversity ‘hot spot, with a very high percentage, 78%, of forest cover, mostly in the hilly terrain,” says Ibobi adding that Manipur is starting to experience some of the effects of climate change with summers getting warmer over the past five to 10 years, the onset of winter is later, and rainfall is becoming more erratic. “This has been a very useful training exercise for us,” says Ibobi of the visit.

The visit was coordinated at the Indian end by **Ritesh Kumar**, Conservation program manager with Wetlands International-South Asia (WISA). Wetlands International is a global non-profit organisation dedicated to the conservation of wetlands world-wide. It is one of the few NGOs dedicated to just one ecosystem. It has 19 officers world-wide that work in over 100 countries.

Ritesh is a colleague of Institute director Prof Max Finlayson whom he first met in 1999 when he went to Kakadu for the field work part of a wetland managers’ training program held in Darwin. Like Max, Ritesh is on the Science and Technical Review Panel of the Ramsar Convention. Ritesh, who is based in New Delhi, says WISA’s association with the Loktak Development Authority goes back more than 12 years when it started the conservation process by defining the wetland’s inventory needs and a monitoring plan. “But it was more than a base line assessment,” says Ritesh. “It went on for seven years. We also tested some management strategies in small pilot studies.”

In 2005 WISA drafted a management plan for the Loktak Development Authority. This plan was the basis for the authority’s successful bid in 2008 for US\$80million from the Indian national government to implement the plan. “We are now helping the authority monitor this project, provide strategic review and are also helping them design the water allocation process,” says Ritesh. “This one of the few projects in the country where wetland conservation is being funded through a development sector budget.”

WISA is now doing a strategic review of the original plan’s implementation and helping develop a future plan. WISA’s association with the Chilika Development Authority (CDA) goes back to 1996 when it monitored changes to the lake after the authority dug a canal from the sea to the lake after the original mouth silted up. “The biggest contribution we have made to Chilika was the social and economic component of an Environmental Flows Assessment in 2004,” says Ritesh. “Basically that was about pushing for the integration of Chilika Lake into an integrated river basin management plan. Currently we associate technically with the Chilika Development Authority on several issues including invasive species. We are working with the authority to develop their management plan and beyond that we are also promoting certain new ideas such as how to develop a capacity building centre in Chilika. One of the ideas of getting Ajit to Australia was to share experiences on design and implementation of a wetland training course. CDA has the requisite infrastructure which is being supported with necessary training curricula.”

Dr Ajit Kumar Pattnaik, chief executive of the Chilika Development Authority, was the only representative of that authority on the trip. However, as he explains, like the Loktak Development Authority his authority has been working with WISA for many years, with WISA facilitating networking between the two authorities. “We share our problems and there is mutual learning and sometimes technology transfer,” says Ajit who first met Max in 2000 when Max, as a member of Ramsar’s STRP, headed an advisory team which came to assess Chilika Lake.

“Based on the team’s recommendation Chilika was removed from the Montreux Record.” (The Montreux Record is a register of wetland sites on the List of Wetlands of International Importance where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution or other human interference.) In 2005 the authority hosted the Asian Wetland Symposium at which Max gave a keynote address. Max also visited Chilika Lake again earlier this year to look at weed issues in the lake and present a talk on risk assessment as a part of management planning.

“We are developing a management plan for Chilika Lake and want to incorporate all of the Ramsar guidelines,” says Ajit. “At the same time we want to make it an integrated management plan which is why I am in Australia, to learn about the processes involved in developing the Murray Darling Basin Plan.” Ajit says the authority is keen to develop a long term formal association with Charles Sturt University so that students from CSU are able to work with the Chilika Development Authority on certain projects, and students from India, sponsored by the authority, are able to come and study here in Australia. “We are also interested in cooperative research projects,” says Ajit, who met with CSU’s Dean of Science, Prof Nick Klomp, while he was here. Ajit says the series of lectures presented at the workshop exceeded his expectations.

DIARY OF THE TRIP .

(by Simone Engdahl who organized the Australian end of the trip)

Monday August 1, Day 1 arrival of the group into Melbourne. The flight arrived around midday and based on my calculations the group should have passed through customs and immigration to be met by the bus driver and on their way by 1.30pm. At 2pm I get a phone call from the bus driver concerned that some members of the group had dropped off their luggage and gone walkabout at the airport. Fun job trying to find 5 people you don’t know. The drive to Albury was to include a stop off at Winton Wetlands to meet with the STAG committee (Scientific and Technical Advisory Group) for afternoon tea. A few phone calls to let them know the bus was running behind schedule and a promise to update their time of arrival ensued. Alas, a breakdown of the new bus 30 minutes out of Melbourne (somebody had pinched the hubcaps and loosened the lug nuts the night before, and as the axel and wheel started to part ways the bus came to a halt.) While the safety mechanism was very effective, the problem meant a delay while a new bus was delivered. Sadly due to the delays the Winton Wetlands stopover did not happen.

Tuesday to Thursday Days 2 – 4 consisted of a workshop on Integrated Wetland Management at CSU, facilitated by Prof Max Finlayson. Tuesday night included a tour of the Wonga Wetlands followed by an Indian banquet dinner under the stars. Mayor Cr Alice Glachan welcomed the group to Albury and spoke of the history of the Wonga Wetlands and the close relationship between Albury City and the CSU. Head of Albury-Wodonga campus Sue Maloney welcomed the group to CSU and Prof Nick Klomp, Dean of Science, spoke of the importance of developing international links and sharing of knowledge.

Friday to Sunday, Days 5-7. The group set off on a three day tour of wetlands to see first-hand conditions in the field. On Friday the itinerary included a visit to the Fivebough Wetlands with Mike Schultz, the Leeton sewerage treatment plant, the Narrandera Fisheries Centre and an evening presentation on Lake Cowal by Mal Carnegie, Projects manager of the Lake Cowal Foundation.

The talking point of the day was carp. It was incomprehensible to the group that the carp that infest our waterways is considered inedible. Carp is one of the most important commercial fish in Loktak lake. If only we could find a way to eliminate the muddy taste we would have a huge market for the fish. At the fisheries centre we learnt that the carp had hybridized. European and Japanese fish have produced a new super carp with superior breeding and survival abilities and that this wet year has been a boom year with incredible numbers of baby carp.

(Below) The group at Lake Cowal – pic Simone Engdahl



A repeated request to see kangaroos was satisfied on Saturday during our trip to Lake Cowal and the conservation centre. On cue and totally scripted for the best photographic opportunities a mob of about 15 hopped alongside the coach for 500 metres before jumping over the fences and into the bush. Lulled by the most perfect early warm spring weather earlier in the week many were unprepared for the cold wet day of our tour of the lake. Mal Carnegie treated us to a delicious lunch of bbq salmon and a great presentation on communication, education, participation and awareness (CEPA) and the role of CEPA in wetland management at the education centre. This day was a great success and very happy people boarded the bus for our trip to Narrandera for the night. Dinner at the local pub was a great experience. Seated at the bar, chatting to the locals and enjoying country hospitality the group experienced real Australia. Sunday we travelled to meet Prof Max Finlayson and Prof Cao Lei and Prof David Mitchell at Barmah Forest for a river cruise tour with Keith Ward from Goulburn Murray CMA.

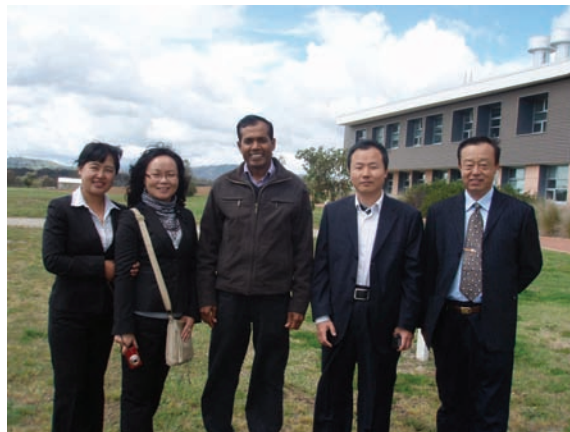
Rain did not dampen the interest or enthusiasm and it was great to see the birdlife, including a Musk duck diverting our interest away from his nest. A point of curiosity was in the difference between our environmental management strategies. On the drive to the forest I was asked why we have some much timber being wasted rotting on the ground, as fallen branches and trees are left where they fall. My answer obviously unsatisfactory, the question came up again on the boat trip. Keith commented to me in an email "I was particularly interested in one gentleman's question over his concern that we allow large trees to over-mature and to rot when they fall. The protection of ecosystems is obviously different between our countries and life experience."

After lunch at the Barmah Pub the tour officially ended, with speeches and thanks to Max and others we parted ways. The group then travelled onto Echuca overnight and spent Monday shopping and sightseeing in Melbourne before boarding a plane to return to India. A very successful tour with the group delighted at the lectures and field trip experiences, feeling they learnt much more than expected to take back to assist with their management of the Loktak Catchment.

CHINESE VISITORS

In a research funded by AusAID for the project "Sustaining economic growth in China" which is led by Profs Kishor Sharma, John Hicks and Dr Yapa Bandara, four Chinese scholars from Jilin University of Finance and Economics, Tianjin University and Yunnan

University of Finance and Economics visited CSU from 1 Set-1 Oct, 2011. The Faculty of Business has a long teaching and research relations with these Universities. In the first half of this period, they attended a training session on Input-Output technique conducted by Tom Murphy of the Western Research Institute in Bathurst and completed research in the areas of (i) Sustainability and Rationality of China's Fast Export Growth, (ii) Vertical Specialisation of China's exports, and (iii) Impact of regional Tourism in Chinese economic growth. In the second half of their stay, they spent the time at the Wagga Wagga campus and continued working on their research projects, and presented seminars in Wagga, Albury and Bathurst campuses. They ended their stay in Wagga having tasted some CSU Wine and Cheese at the Cellar door at that campus.



(Left to right) Dr Yan Li, Ms Quin Sun, Dr Yapa Bandara, Prof Wei Wang, Prof Yutian Shi. Pic by Wes Ward

IN THE NEWS

Institute adjunct Barney Foran's views on the OECD Green Growth Strategy released May 25 to 26 feature the September issue of CSIRO's ECOS magazine. Read more at <http://www.ecosmagazine.com/paper/EC11044.htm>

Details of In the News at : <http://www.csu.edu.au/research/ilws/news/inthenews/in%20the%20news%20index.htm>

POST-GRADUATES

ABBIE SPIERS

With a mother and a sister who have both completed their PhDs, new ILWS PhD scholarship recipient Abbie Spiers says she knows who to call on when she needs 'that extra bit of support.'



"My sister Zoe has just finished hers so I'm sure she can give me plenty of advice," says Abbie, an Australian who lives in Wellington, New Zealand with her husband and four young children aged nine to four. Abbie began her PhD

in July with supervisors Prof Max Finlayson and Dr Rosy Black. At this early stage her broad topic is "Ecosystems health – the perception and the reality".

"I'm interested in looking at this in New Zealand but may, perhaps, have some case studies in Australia or an interest in applying it to Australia later," says Abbie who is doing her PhD by distance. That's something that doesn't faze her, as, as she says, almost all of her education has been by distance. (cont. next page)

POST-GRADUATES (cont.)

"I like the independence and flexibility and being able to work from home," says Abbie who, as her father was a park ranger, grew up in national parks in South Australia. In 1986 the family moved to Kakadu National Park where Abbie did her early years of highschool in Jabiru with Years 11 and 12 by correspondence. In her last summer school holidays, she got a three month contract "looking after fish tanks really" in the Office of the Supervising Scientist's Biological Monitoring Laboratory in Kakadu, with some field work in the beautiful national park. When she finished year 12 she was offered another contract to work in Biological Monitoring with Dr Chris Humphrey, a job she continued with for five years while she did her Biology Degree (part-time, external) with Central Queensland University before completing her degree with a year full-time at what was the Northern Territory University (now Charles Darwin University).

While working at the lab, she met Max who had returned to the Office of the Supervising Scientists after three years overseas. Max soon had her helping on a research project which provided an opportunity for Abbie to try her hand at writing, something she really enjoyed. Abbie ended up working with Max, first when he headed the Office's Wetland Management Section, and then he became director of the Environmental Research Institute for the Office of Supervising Scientists (ERISS) which was based in Darwin, for seven years. Her tasks included coordinating a global review of wetland resources; coordinating study tours for wetland managers from Vietnam, and for Aboriginal communities; spending a month in Papua New Guinea helping with a fish monitoring program in the Fly River; and organising the Australian Society for Limnology Conference in Darwin in 2000.

With the birth of her first child Abbie resigned from ERISS and retrained as a mediator. She then worked for five years as a consultant NT WorkSafe mediator. During that period she had three more children and did a Grad. Dip in Professional Communications, majoring in public relations, by external studies. In 2008 the family moved to Auckland in New Zealand, for her husband's work, for a year. Abbie, who has always liked creative writing, wrote a manuscript "to give myself something to do."

Her husband was then offered a position based in Wellington where the family have lived since mid 2009. In October last year Abbie began working for Max again reviewing Inter-governmental Panel for Climate Change (IPCC) publications pertinent to wetlands in Australia, New Zealand, and Small Islands, and reviewing information for a vulnerability assessment of Sydney Olympic Park. "In the middle of all that the application for the ILWS scholarship came up," says Abbie, 38. "I hadn't thought of doing a PhD now; it was something I thought I would do when I was 50 when the kids were older, but then I thought it might be good timing because my little fella starts school next year."

Abbie says one of the reasons she chose her topic was "as an Australian going to New Zealand, you have an impression of New Zealand linked to the 'pure' New Zealand that they market quite strongly. When I got to New Zealand and spent some time there I was very surprised at the difference between the reality and what my perception had been, and I'm interested in whether or not that is other people's experience in NZ." Abbie's research project will integrate ecological science with social science. "I'm also interested in how science is communicated," she says. "The ILWS scholarship appealed to me because it was for integrated research, integrating different disciplines."

ANDREA RAWLUK

When Canadian Andrea Rawluk applied to do a PhD in Australia with the National Centre for Groundwater Research and Training (NCGRT) she had no idea she would end up with Charles Sturt University at its Albury-Wodonga campus.

But now that she has, Andrea, who started her PhD with supervi-

sors Prof Allan Curtis and Dr Emily Sharp in August, is enjoying the opportunities available in the region including being able to pursue one of her passions, training horses. "There's just so much space for horses here," says Andrea, 28. "Back home the horses are all stabled and everything is much more intense."

Andrea, who grew up in Toronto, did her undergraduate degree in renewable resource management at McGill University in Montreal with a focus on community resource management. For her Honors degree she looked at the environmental outcomes of environmental policy legislation over the last 100 years in two watersheds (catchments) in the province of Quebec, Canada, as well as farmer decision making in terms of their soil nutrient management. "In Quebec, we have intensive livestock production," says Andrea. "As a result, there are more nutrients produced in the province than the natural system can absorb. In turn, there are often problems with eutrophication of the waterways. Nutrient management is a critical area of research."

A five month research internship with an indigenous NGO in Panama (in Ukupseni in the territory of Kunayala) looking at community visioning in terms of resource management and community values followed. "That got me interested more in the community and social dimensions of resource management," says Andrea who then started her Masters (which she has almost finished) with the University of Alberta in Edmonton, Alberta, studying community resilience in the Canadian Arctic. "Community based resource management at various levels, in particular water management, has always interested me," explains Andrea as to why she answered a call from the NCGRT for researchers in this area. For her PhD Andrea will be looking at the social dimensions of a technology called aquifer storage and recovery (or Managed Aquifer Recovery).

"Why I was so drawn to come to Australia to study this is because I think Australia is something of the 'canary in the coalmine' in groundwater management as you are dealing with such strong climatic changes here," she says. "But I think we will be seeing these changes back home quite soon as well. To experience it and learn some of the lessons here will be beneficial to my home country as well as to countries world-wide."

PHD NEWS

Dr Chris Harrington (recent PhD supervised by Prof Curtis and Dr Black) has been appointed as a Post Doc working with Dr Michael Lockwood and others at University of Tasmania.

In August PhD student **Gillian Earl** who is supervised by Prof Allan Curtis, Dr Catherine Allan (ILWS) and Dr Vivienne Turner (DSE) submitted her thesis on "Can we apply a duty of care to improve biodiversity outcomes at a regional scale?"

Also submitting in August was **Wendy Minato** who is supervised by Prof Allan Curtis, Prof Tony Jakeman (ANU) and Dr Catherine Allan (ILWS). Her thesis is titled "Assessing the relative influence of policy instruments and demographic change on improvements in native vegetation".

Maggie Watson gave a talk at the Australasian Ornithology Conference held in Cairns, Sept 28 to Oct 1 on 'Ontogeny of the avian immune system: a case study in a long-lived seabird'. Her poster 'Using leukocyte profiles in wild birds: the fallacy of the H/L ratio' was awarded first prize for a student poster.



George Lukacs, from James Cook University, has been appointed president-elect of the international organisation, the Society of Wetland Scientists. George, who is a Senior Principal Research Scientist with the Australian Centre for Tropical Freshwater Research, is doing his PhD by distance with supervisors Prof Max Finlayson and Institute adjunct and deputy secretary general of the Ramsar Convention on Wetlands Secretariat Prof Nick Davidson.

Congratulations to **Dr Kylie Eklom** who has been awarded her doctorate for her PhD on 'Vegetation structure and food resources in drought affected semi-natural grasslands: implications for the nationally vulnerable Plains-wanderer (*Pedionomus torquatus*). Kylie was supervised by A/Prof Gary Luck and Ian Lunt.

PROFILE



NIKKI SCOTT

Nikki Scott's new role as the Institute's business manager is certainly a long way from her first experience working in industry.

"Back in 1989 as part of my chemical engineering course I spent six months working in industry," recalls Nikki, who started with the Institute in September. "I went to ICI in England and worked in the lab as an

organic chemist synthesising the polymers used in the tiles for the American space shuttle."

Nikki, (whose real name is Veronique) comes from Toulouse in the south of France "which is rugby country." She gained her qualifications "somewhere between a Degree and a Masters" from the French engineering school, CPE Lyon. After her stint with ICI, Nikki stayed on in England working for an international plastics company, W.R. Grace, as an applied research chemist. One of her projects was working on the polymers used for plastic bottle tops. After three years she was transferred to company's technical research centre in The Philippines (30kms from Manila) as a technical manager for two years where she was given the name 'Nikki' by the local Filipinos. "That was in 1994 and I've been called Nikki ever since," she explains.

Nikki then moved to Singapore, eventually landing a job with an American company, Nalco, (which produces water treatment chemicals for industries for pulp and paper, mining and waste treatment applications, as an applied research chemist. It wasn't long before she was trouble-shooting for the company, travelling throughout the Asia-Pacific region. In the process she met her Australian husband-to-be, Roger Scott, who was working for the same company as a sales engineer, based in Melbourne. After three years, Nikki changed direction work-wise and went into marketing for the company. In 2001 she and Roger, still with Nalco, relocated to Sydney, but in 2002 left and moved to Albury where they built a new home.

Nikki, who has two young children, Killian, 4, and Angelina, 6, has had a few different jobs since being in the region. She first worked as an Economic Development Officer for Albury City for three months on a casual basis; then spent four years with VicRoads for the Albury Wodong Hume Freeway project as a project monitoring and communications officer; and most recently was the executive officer of the North East Green House Alliance, a consortium of six councils, the North East Catchment Management Authority and Wodonga TAFE.

As she says, the four years with VicRoads gave her experience in finance and project management and even though it wasn't strictly part of her job, input into the technical side of building the freeway. "I have a habit of getting involved in things where people may not

think I have an interest," says Nikki who intends to be involved in the research ILWS is doing in some capacity. In her recent job with the Green House Alliance, Nikki says she was successful in obtaining \$2.5million in grants over three years. "The aim of the alliance was to get projects happening in the region with a climate change focus," says Nikki.

Nikki, who describes herself as a "big picture kind of person" sees her new position with ILWS as an opportunity to make good use of her skills "especially in the grant, project and contract management side of things. And maybe also help position the Institute with the stakeholders I already know." She concludes: "I'm not about to change everything. I intend to observe and learn and then consult when making decisions but I am going to try to simplify processes for the benefit of all members."

ADJUNCTS

MICHAEL VANDERZEE



A WETLAND ON THE ROAD TO RECOVERY

Standing on Green's Hill as you look across the spread of water interrupted by the skeletons of red gums to the distant hills you can well understand Michael Vanderzee's passion for the recovery of Winton Wetlands in North East Victoria.

Here is an opportunity and a challenge that is incredibly exciting; a chance to reinstate a

large wetland system that, for nearly 50 years, had been inundated to create Lake Mokoan, an off-stream water storage designed to provide water to the Goulburn-Broken and Murray irrigation areas. "It's something that as far as I am aware has never been attempted before on this scale anywhere in the world," says Michael, CEO for the Winton Wetlands Committee of Management. "It's like a giant experiment. While a number of dams have been decommissioned elsewhere in the world, they were usually on-stream storages, on rivers, nothing like this."

The Institute, through its Director Prof Max Finlayson and ecologist A/Prof Ian Lunt, is playing an important advisory role in the restoration of the 8750ha Winton Wetlands Reserve to a 'naturally-functioning ecosystem'. Both are members and Max is the chair of the Scientific and Technical Advisory Group (STAG) established by the Winton Wetlands Committee of Management to guide and advise it on the ecological restoration of the Winton Wetlands.

It's been only just over a year since the 7.5km dam wall built to create Lake Mokoan was breached but already there are plenty of signs of new life in the wetlands - the wetland plants such as cane grass, bull rushes, reeds, sedges and red milfoil are returning as are the frogs, birds (including the migratory Latham's Snipe, and the endangered Grey-crowned babbler) and other wildlife. An excellent season has certainly helped.

Early in 2010 before it was decommissioned, Lake Mokoan was actually "bone-dry" with a 500ha wildfire in Greens Swamp in January. By September the 3000 ha wetlands had filled back to its former level (27 gigalitres) and by December it was 150% full (45 gigalitres) and over-flowing. (*cont. next page*)

A WETLAND ON THE ROAD TO RECOVERY (CONT.)



Currently it is at 120% and spilling over. Where Lake Mokoan used to be primarily filled via an earthen channel from the Broken River and Lake Nillahcootie, the water for the wetlands is now coming from the original catchment, that is the surrounding Warby Ranges, Lurg Hills and Chesney Vale Hills. With inflows again filtered by local swamps, the water in wetlands is now much clearer and cleaner than it used to be in Lake Mokoan. "It's really interesting to see what is coming back naturally," says Michael who is also an ILWS adjunct. "The wetland [pictured above] is beginning to restore itself."

In his role as CEO of the Winton Wetlands Committee of Management, Michael was appointed by the Committee in 2009 "to make it happen." He acknowledges it is a very practical, on the ground role, quite different to his previous roles with the Victorian Government. Born in Holland, Michael came to Australia as a five years old. His early memories, as the family travelled to the Bonegilla migrant centre, were of wide open skies and red gum plains. He grew up in the Eastern suburbs of Melbourne before moving to inner Melbourne. At 28 years of age old, he decided to study biological sciences at the University of Melbourne, majoring in plant ecology and geomorphology. His honours was on the ecotone between phragmites and white mangrove in the Albert River, South Gippsland. He then tutored at Melbourne University while undertaking a PhD on the role of salt marsh vegetation and mangroves in the evolution of islands in Corner Inlet, north of Wilson's Promontory. He hadn't quite finished his PhD when he got a job with the Department of Conservation, Forests and Lands in Victoria. Initially he worked on marine park establishment in South Gippsland before moving to Melbourne to work on coastal management at a state wide level.

From 1992 to 1997, he worked for the Great Barrier Reef Marine Park Authority in Townsville on environmental impact assessments. He returned to Melbourne to work for the Department of Natural Resources and the Environment where he helped to set up CoastCare before being appointed a senior policy advisor with the Department, dealing with national environmental issues on behalf of the Victorian Government including the restoration of environmental flows to the Snowy River. Michael was also involved in setting up some of the Victorian Government's early water saving projects. In 2002, he helped set up Water For Rivers, a company owned and funded by the Commonwealth, NSW and Victorian Governments to undertake water savings projects and to purchase water for environmental flows, mainly for the Snowy but also the Murray River. He later worked on setting up the Living Murray Initiative.

The opportunity to take up the position of CEO for the Winton Wetlands Committee of Management came at a time when Michael was 'looking for a change and wanting to work in regional Victoria on something practical with a community focus after years of working at a State and national level.' Michael's interest in the

wetlands stems back to when he was working on the early Victorian water savings projects. "It was the first time in Australia where a major water storage was proposed to be decommissioned. While there were significant water savings to be gained, the project was quite controversial and caused a lot of concern in the local and regional community," he says. "I saw the role of CEO with the Winton Wetlands Committee to restore the Winton Wetlands as a great opportunity to work with the local and regional community to deliver the vision that had been developed as part of the Lake Mokoan Future Use Strategy with the \$20 million committed by the Victorian Government to fund its implementation.

"The Winton Wetlands Committee of Management has been appointed as a skilled community based body to work with the local and regional community to restore and develop the Winton Wetlands to create a project of national scientific, cultural and environmental significance. That is what makes it such an exciting challenge for me personally." The 8750ha Winton Wetlands Reserve is now the largest Crown land reserve in the state managed by a community-based committee rather than by a government department, something that isn't usual.

"This very much a community-based exercise," says Michael. "We are showing that it can be done, that you can create something new. No one has ever tried this before. In some ways, it is like a huge experiment not only in terms of the restoration of the wetland but also the on-going management of the Winton Wetlands Reserve. That's why the Committee is so keen to involve the local and regional community, and that includes the education and research community to help us to restore, manage and develop the Winton Wetlands Reserve. Our aim is not only to restore the Winton Wetlands but also to ensure that its management is financially sustainable in the long run."

To that end, a master plan for the development of the reserve is underway which will include a landscape design, location of facilities and a business case behind the provision of those facilities. "We need to make sure that we can put a management regime in place that will generate enough income to keep everything going once the \$20 million runs out," says Michael. The Lake Mokoan Future Land Use Strategy identified a range of improvements such as bike tracks, bird hides, low scale camping, a research/educational facility and possibly eco-tourism style accommodation.

"The site is also very significant from an Aboriginal cultural heritage point of view. Recent archaeological survey work undertaken with Aboriginal Affairs Victoria and members of the local Aboriginal community have supported existing knowledge of the importance of the Winton Wetlands," says Michael. "We are working with the Yorta Yorta Nations and the various Indigenous groups around the area and are keen to get them involved in the protection, management and interpretation of the cultural heritage values and in the management of the wetlands."

The Committee recently released its Restoration and Monitoring Strategy Plan to guide the future ecological restoration of the Winton Wetlands. Members of the Committee's Scientific and Technical Advisory Group, chaired by Prof Max Finlayson played a key role in advising on its development. While the wetland areas are returning and beginning to restore themselves, the management of the more than 5000ha of remnant grassy woodlands and former farmland presents a significant challenge. As part of the former Lake Mokoan, up to 7000ha of the now 8750ha Winton Wetlands would have been regularly inundated. The remaining areas were licensed to adjoining landholders for grazing.

"Following the decommissioning, these areas are likely to require significant active management to control fuel loads, fire and weeds and that is where we will be calling on A/Prof Ian Lunt's expertise," says Michael. "It is likely that grazing for environmental and ecological purposes will play a significant role in the future management and restoration of these ecosystems."

The Committee currently has grazing licenses with adjoining landholders over 1200ha of the reserve and works with them closely to manage fire risk and pest plants and animals. The committee will also be calling on Prof Max Finlayson's expertise in wetland management and Ramsar guidelines. "If the wetlands at Winton had not been dammed in the early 1970s to create Lake Mokoan, it is highly likely that they would now be one of Victoria's major wetland systems," says Michael. "We have the opportunity to restore many of the attributes that could again make it a wetland of national and international significance. It may not come back to what it used



to be but nonetheless, at 3000ha it will again be a significant wetland in the Murray Darling Basin."

(Left. View from Near the breach in the dam wall at the Winton Wetlands)

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Cohn, J.S., Lunt, I.D., Ross, K.A. & Bradstock, R.A. (2011). How do slow-growing, fire-sensitive conifers survive in flammable eucalypt woodlands? *Journal of Vegetation Science* 22, 425-435

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far-western New South Wales. *Australian Zoologist* 35, 781-7

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Rawsthorne, J., Watson, D.M., Roshier, D.S. (2011) Implications of movement patterns of a dietary generalist for mistletoe dispersal. *Austral Ecology*, 36 (6), 650-655

Burns, A.E., Cunningham, S.A., & Watson, D.M. (2011) Arthropod assemblages in tree canopies: a comparison of orders on box mistletoe (*Amyema miquelii*) and its host eucalypts¹, *Australian Journal of Entomology* 50, 221-230

CONFERENCE PAPERS/PROCEEDINGS

Boylan, C. (2011) Promoting rural education: the role of the Society for the Provision of Education in Rural Australia (SPERA), presented at the SUMMIT 2011 Conference at Flinders University, Adelaide, Sept 21- 23

Krivokapic-Skoko, B., O'Neill, G., and Dowell, D. (2011) Academics and Breach of Psychological Contracts in the University Sector: Insights from an Australian Business School, British Academy of Management, Aston Business School, Birmingham, UK, Sept. 13-15

Pawar, M and Huh, T. (2011) Korean Responses to Environmental Challenges: Origins, Drivers and Impacts of Green Growth on Development presented at 5th Seoul ODA International Conference: Making international cooperation effective: Lessons from the Korean Development experience, on Oct 13, Seoul, Korea

Sharma, K. (2011) Foreign aid and development in Nepal at the International Economic Association, 16th World Conference, July 4-8, Tsinghua University, Beijing

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Culas, R. J (2011): Deforestation and Forest Transition: Implications for Reducing Emissions from Deforestation and Forest Degradation (REDD), Nova Science Publishers, Inc. New York, USA

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Revenga, C. & Finalyson, M. (2011). Life waters: wetlands and climate change. In 2010-2011 State of the World – A Global Portrait. Wildlife Conservation Society, Island Press, Washington, pp 160-166

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Gitay, H., **Finlayson, C.M.** & Davidson N.C. (2011) A framework for assessing the vulnerability of wetlands to climate change. Ramsar Technical Report No. 5/CBD Technical Series No. 57. Ramsar Convention Secretariat, Gland, Switzerland & Secretariat of the Convention on Biological Diversity, Montreal, Canada.

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Sheng, Yu, Gray, E.M., **Mullen, J.D.** and Davidson, A., 2011, 'Public investment in agricultural R&D and extension: an analysis of the static and dynamic effects on Australian, broadacre productivity', ABARES research report 11.7, Canberra

OTHER

Crichton, M. and **Strong, C.** (2011). Editorial, *Energy and rurality: Socio-historical perspectives on changing production and consumption (Special Issue)* Rural Society, Volume 20 Issue 3. It included an article by Toni Darbas, Rachel Williams and **Sonia Graham** 'Green-changing: a research-based collaboration with a tree-changed rural community'.

A/Prof David Watson ("Dr Dave"...) is the "face" to a new series of school curriculum packages, an initiative of the Murray Darling Association and the Burrumbuttock Primary School. The first in the series is on Box-Gum grassy Woodlands and includes a DVD, fact sheets with activities, a booklet, stickers and a poster.

GRANTS



Institute adjunct **Dr Justin Watson** has received a CSU small grant to undertake a preliminary study in Solomon Islands on avifauna and logging.

Millar, J, Robinson (2011 –2015) **Social Study of Impact of Fish Passageway in Laos.** ACIAR (in collaboration with NSW Industry and Investment) \$58,560

From left, Dr Lee Baumgartner (ACIAR Project Leader and fish scientist, NSW I&I) Dr Joanne Millar (CSU social scientist), and Julie Bindakos (NSW I&I fisheries research officer).

Howitt, J. (2011) **Oyster Shell Structural Anomalies: investigating association with metal deposition**, AINSE. \$856 towards an existing project.

Finlayson., M. (2011) **Analysis of Ramsar and other related wetlands guidelines**, Ramsar Secretariat, \$2740

APPOINTMENTS

Dr Angela Ragusa was appointed to the Wagga Wagga City Council Environmental Advisory Committee, Aug 24

Institute director **Prof Max Finlayson** has been elected president of the Australasia chapter of the Society for Wetland Scientists.

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