From the Director

It has been another outstanding year for the Water Research Centre. Our members have secured more than $3.5 million worth of new funding from a diverse range of International, National and State funding sources. This will enable us to attract new staff and add to the impressive array of skills that we bring to address water related issues.

One of our great initiatives this year was the establishment of our Early Career Research leadership program. Eight of our ECRs worked on a development program with Paul Dalby and Karilyn Fazio. It is rewarding for me to observe this group develop and realize their leadership potential as they build their careers and research capacity.

Our partnerships and collaborations continue to offer opportunities and provide motivation for our work. We have five joint appointments with DEWNR, which provides an excellent opportunity for the young researchers to apply their knowledge to some of the big water issues facing the state. It also serves to ensure rapid knowledge exchange from lab-bench to policy and keeps the research relevant.

Thank you for your continued support of the Water Research Centre. We are planning several workshops next year to explore some new concepts in water management. I hope some of you will be available to participate in these.

In the mean time I hope you enjoy yourselves in the lead up to Christmas.

Justin Brookes
Director, Water Research Centre

News you may have missed!

Congratulations to Professor Dmitri Kavetski from the School of Civil, Environmental and Mining Engineering who was named as one of the winners of the South Australian Young Tall Poppy Awards for Hydrological and Environmental Modelling.

Professor Dmitri Kavetski’s research focuses on understanding and modelling the water cycle. Given the significance of water in human society, and in natural ecosystems, modelling the behaviour of catchments is an integral part of environmental science, engineering and management. Dmitri’s work draws on advances in many fields of physical, mathematical and statistical sciences to build more accurate and reliable hydrological models for use in applications as broad as water resources planning, flood prediction and climate studies.


Congratulations to Professor Angus Simpson from the School of Civil, Environmental Engineering, whose 2001 paper on pipe flow friction modelling has been named by the Journal of Hydraulic Research as one of the 10 most influential papers in its field in the past 50 years.

Assoc. Prof. Ivan Nagelkerken, from the Marine Program, was recently announced as a winner of a Future Fellowship for funding commencing in 2012 by the Australian Research Council. Ivan’s project title is ‘Ocean acidification and rising sea temperature: What happens to the fish?’ His project will look at how fish populations worldwide are currently suffering unprecedented stress. Ocean biodiversity and ecosystem viability are clearly being threatened by climate change. He will study the behaviour, physiology, and competitive ability of selected fish species subjected to these stressors and develop models that can more realistically predict changes in local biodiversity and the dynamics of marine populations.

NRM Research and Innovation Network Newsletter

If you would like to be in the mailing list for the newsletter contact Jennie Fluin Jennie.fluin@sa.gov.au

This edition edited by Julie Francis.  Articles for future newsletters email: julianne.francis@adelaide.edu.au  Phone: 8313 5691
Information about the Water Research Centre’s structure and members, and other Water Links, can be found at:
WRC website: http://www.adelaide.edu.au/environment/wrc/
Leadership Development Program

Early Career Researchers Leadership Development program

Initiated by WRC senior Executive to build capacity and the next generation of leaders, participants Bayden Russell and Zoe Doubleday (Marine Program), Davina White and Ken Clarke (Landscape Futures), Todd Wallace and Kane Aldridge (Freshwater group) Seth Westra and Matt Gibbs (CEME) participated in a leadership program designed by Paul Dalby. The program was designed around time and energy management, ideas on self promotion using social media and collaboration with each other and government. Bob Hill provided funds for executive training by Karlyn Fazio, an executive coach from Impetus Training. She ran a 2 day workshop followed by a ‘Dragons Den’ where the group presented their proposal they had developed, “To future proof wetlands by management with possible future water scenarios” to Kerry Jaeger (Exec Office UofA), Andrew Johnson (DEWNR) and Tony Minns (Goyder).

The group are involved in the Executive and attend meetings with senior leaders of the WRC. The WRC will continue this groups development and extend this program to PhD’s in the future.

WRC Events

Water Wednesday

Did you miss the Water Wednesday on “Optimisation of Urban Water Supply Systems: A Pipe Dream? “ on 19th September with three international experts who spoke about recent developments in the optimisation of urban water supply systems and prospects for further developments in this field? You can hear the podcasts of Professor Graeme Dandy, School of Civil, Environmental and Mining Engineering, University of Adelaide, Professor Dragan Savic, Professor of Hydroinformatics and Head of Engineering, University of Exeter, UK and Asst. Professor Dominic Boccelli, School of Energy, Environmental, Biological and Medical Engineering, College of Engineering and Applied Science, University of Cincinnati, USA on the Water Research Centre’s website http://www.adelaide.edu.au/environment/wrc/event/2012/waterwed/sep2012/

Postdoctoral Profile

Dr Ken Clarke

Spatial information Group

Ken is interested in using remote sensing (satellite imagery and aerial photography) and spatial science to improve our understanding and management of natural and built systems at broad scales. Prior to working at the University of Adelaide, he worked as a remote sensing analyst, studying seagrass and native vegetation mapping for the South Australian Department of Environment and Heritage.

After completing his PhD 4 years ago on the remote sensing of biodiversity degradation in outback South Australia, he has worked as a Post Doctoral Research Associate at the University of Adelaide, primarily working with South Australian government departments (DWLBC, DENR and DFW) to inform and improve environmental management. In 2011, after completing an ARC-Linkage project with DEWNR, “Spatial and temporal monitoring of soil erosion risk with satellite imagery”, Ken was awarded both the South Australian and Asia-Pacific Spatial Excellence Awards for Environmental Sustainability. A subsequent project for DFW, in 2012, changed Ken’s focus from land to water, utilising remote sensing to characterise the inundation regime of Lake Hawdon wetlands in the south east of South Australia.

This year, as part of his role as the South Australian Terrestrial Ecosystem Research Network (TERN) AusCover Adelaide node officer, Ken is helping to make remotely sensed products freely available to government and private users alike. The coming year, 2013, holds exciting large-scale collaborative work, with Ken’s involvement on a Goyder Institute funded project which aims to analyse and understand “water requirements for wetlands in the south east of South Australia”.

Four in 40

The WRC held 4 ‘Four in 40 Forums’ in collaboration with DEWNR and SA Water this year. These forums connect researchers from the University with colleagues in DEWNR and SA Water. Four in 40’s are four short 10 minute presentations from 2 speakers from the University and 2 from either SA Water or DEWNR. The podcasts are available on our website: http://www.adelaide.edu.au/environment/event/2012/fourin40/

The four we have held this year are:
23 Jul Managing carbon in catchments
16 Aug More efficient management of water supply infrastructure
25 Oct Catchment to Coast
12 Nov Flood Modelling and Management

New WRC Website

Our website has also had an update, so check out some of our new researchers. http://www.adelaide.edu.au/environment/wrc/
Spatial Information Group

Satellite Sleuths

Spatial information research by the Spatial Information Group at the University of Adelaide.

The Spatial Information Group at the University of Adelaide includes a diversely skilled group of research scientists and postgraduate students, whose focus is environmental monitoring and management utilising the powerful tools of satellite and aerial remote sensing and photography, Geographic Information Systems (GIS) and spatial analysis.

Our study areas are varied and include Australia’s vast arid lands, the productive South Australian wheat belt, wetlands, native vegetation and fauna habitats in a range of bioregions, as well as urban environments. They even extend to the tropical forests of Laos and food bowl of Bangladesh.

Despite the diversity of settings, some common themes run through these projects. Many assess and map natural resource condition (e.g. soil erosion, vegetation distribution and composition, invasive species, land clearance, revegetation, habitat suitability, riverbank collapse), developing and testing new methods using the wealth of information in imagery and spatial data. We also detect and monitor change over time, using time-sequences and past images to provide objective records of changes in land cover and management, water regimes and the effects of climate change. Through these studies we aim to provide spatially-comprehensive, objective information to assist land and natural resources decision-making.

Several of our current and recent projects relate to wetland and aquatic systems, and demonstrate the potential of remote sensing for understanding these important ecosystems. A highlight is the use of advanced remote sensing methods to give new insights into the distribution and dynamics of South Australia’s mound springs, which are fed by outflows from the Great Artesian Basin. The report of this work will be published by the National Water Commission early in 2013. In the south-east of South Australia we used time-series of satellite images and aerial photographs to delve back through history to examine vegetation community change since 1958 and changes in wetland inundation since 1989. Focus on the south-east will continue with our involvement in a new multi-disciplinary Goyder Institute project that is developing ecological response models and determining water requirements for wetlands.

The Spatial Information group has been recognised for its leading spatial information research, winning multiple Surveying and Spatial Sciences Institute (SSSI) and Asia-Pacific Spatial Excellence awards in recent years. We also host the South Australian node of AusCover, the facility within the national Terrestrial Ecosystem Research Network (TERN) that is providing remote sensing and land-cover products for researchers across Australia.

For more information, please contact Assoc. Prof. Megan Lewis (megan.lewis@adelaide.edu.au) or Assoc. Prof. Bertram Ostendorf (bertram.ostendorf@adelaide.edu.au).
Examples of Projects Funded in 2012

Water Research Centre

- Comprehensive assessment of the impacts of climate change on reservoir water quality in a range of climatic regions. Mike Burch & Leon van der Linden (SA Water), John Little (Virginia Tech), Tsair-Fuh Lin (NCKU), J Brookes. Water Research Foundation (USA)
- Enhanced Powder X-ray Diffraction Capabilities for South Australia. C.Sumby, A.Pring, D.Chittleborough. ARC LIEF
- Bad tastes, odours and toxins in our drinking water reservoirs: are benthic cyanobacteria the culprits? JD Brookes, AR Humpage, MD Burch, PT Monis, Tsair-fuh Lin. ARC LP120200587
- Root distribution and salinity and soil water dynamics in a chenopod shrubland: implications for restoration ecology. JM Facelli, JR Watling, DJ Chittleborough. ARC LP120200637
- A new strategy for design flood estimation in a non-stationary climate. A Sharma (UNSW), R Mehrotra (UNSW), S Westra. ARC DP120100338
- Resilience in biogeochemical pathways along a catchment-to-coast continuum. MR Hipsey, JD Brookes, DP Hamilton, P Hanson, Cheng-Chien Liu. ARC DP130104078

Darling River Pulse Flows Assessment. T Wallace MDBA
Salt, nutrients, phytoplankton, transport to Murray Mouth. K Aldridge CEWH
Coorong phytoplankton. K Aldridge CEWH
Statistical forecasting and downscaling tools for hydrology. Willem Vervoort (USyd) – Dr Seth Westra is an unlisted participant. AusAID (Public Sector Linkage Program)
Investigation of climate extreme impacts caused by multiple climatic processes: understanding risk to inform adaptation. S Westra, M Leonard CSIRO Adaptation Flagship Collaboration Fund
Drain L & M Water Management and Diversion Rules. Brookes, Reid, Gibbs, Lewis, Clarke, Nichols, Hipsey, Baldwin. DWLBC
Pike Monitoring Strategy. T Wallace DEWNR
Chowilla Joint Appointment. T Wallace DEWNR
Eckerts Creek EBRA. T Wallace DEWNR
DfW - Chowilla Soils Assessment. T Wallace DEWNR
A research program to support the sustainable management of water in the South East, South Australia – Phase1 M Gibbs, H Maier, G Dandy, A Simpson, H van Delden, M Lewis, Q Ye & J Nicol (SARDI), Overton & Harrington (CSIRO), P Cook (FU) Goyder Institute
River Torrens Amenity Flow. J Brookes, K Aldridge Goyder Institute
Goyder wetlands. J Brookes, K Aldridge, M Lewis, B Ostendorf. Goyder Institute
Goyder_expert panel. T Wallace, K Aldridge Goyder Institute
Goyder_peer review. T Wallace Goyder Institute

PhD Profile

Ms Sanaz Orandi,
School of Chemical Engineering
Sanaz is a PhD candidate in the School of Chemical Engineering who in the past year has published three journal papers in highly cited Environmental journals, was awarded the Young Investigator Award at the Bio-Processing Network Conference, won the best poster prize in the Asia-Pacific Conference on Algal Biotechnology (APCAB) 2012, and the best paper presentation in International Mine Water Association (IMWA) 2012 Conference.
Sanaz's investigations aim is to exploit naturally occurring micro-organisms to participate in the development of novel wastewater treatment and recovery technology. An informed selection of microorganisms will be undertaken to develop a biofilm, which will help to find a long-term, cost-effective acid mine drainage (AMD) remediation techniques with the potential to possibility recover precious elements through biomass harvesting.
http://chemeng.adelaide.edu.au/staff/postgraduates/soran01.html