



# GOYDER INSTITUTE FOR WATER RESEARCH



Government  
of South Australia

Department of Environment,  
Water and Natural Resources



THE UNIVERSITY  
of ADELAIDE



Flinders  
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University of  
South Australia



ICE WaRM

International Centre of Excellence  
in Water Resources Management

*You are invited to attend the...*

## ***Goyder Institute Roadshow The Lakes Resort, Mt Gambier Tuesday 21 & Wednesday 22 February, 2017***

***This free event will demonstrate the outcomes of the Institute's  
South East research and development program.***

Goyder Institute researchers and partners will showcase issues pertinent to the South East community, including:

- Environmental Water and Wetlands
- Climate Change Data Projections and Applications
- Stormwater
- Water Sensitive Urban Design
- Groundwater
- Modelling of Catchments and Drains

There will be the opportunity to workshop the research and identify issues to be considered in the regional NRM Plan to improve water management and fill knowledge gaps.

You are welcome to register for the entire event or individual sessions but places are limited so please [register here](#) now.

*Please advise of any dietary requirements upon registration.*

# Day One

11am – 12:30pm

## Welcome

*Michele Akeroyd, Director, Goyder Institute for Water Research*

## Environmental Water

### Developing Ecological Response Models and Determining Water Requirements for Wetlands in the South East

*Presenter: Justin Brooks, University of Adelaide*

The South East contains wetlands of high ecological value, with the water regime known to be a principal driver of the health of these wetland communities. To ensure sustainable management of these wetlands into the future, it is therefore imperative to understand the response of wetland communities to altered water regimes. Data obtained from this project was used to create eco-hydrological conceptual models for selected representative wetland types and it provided information on wetland ecosystem response to changes in water quantity and quality (salinity). A classification system for wetlands and vegetation assemblages was developed as a basis for applying conceptual models of different wetland types at a landscape scale. Another project, *Determining Environmental Risks to Ewens Ponds in the South East*, identified potential options to maintain the health of this important environmental system.

### Causes of High pH in South East Wetlands

*Presenter: Rob Reid, University of Adelaide*

The development of alkaline conditions in lakes and wetlands is common but the persistence and drivers of pH values in excess of 10 is not well described. In this study we investigated causes of the seasonal alkalisation of ephemeral wetlands in the South East where pH values around 10 are frequently observed. This research combined field observations, geochemical analysis of wetland sediment and surface water, with mesocosm studies under controlled conditions. The results revealed a complex interplay between a number of different processes, including photosynthesis, rates of diffusion of CO<sub>2</sub> through the water column, and modification of calcium and magnesium concentrations in the wetlands during rapid plant growth.

### Remote Sensing and Spatial Analysis of South East Wetlands

*Presenter: TBA*

The project *Developing ecological response models and determining water requirements for wetlands in the South East* developed conceptual eco-hydrological response models for selected representative wetland types in the region, and applied these at a landscape scale to assist predictions of response to altered water and salinity regimes. Within this project new evidence on water regimes and vegetation history for case study wetlands was derived from various forms of remote sensing. In addition, geographic data was used and analysed to assist in applying wetland classifications and eco-hydrological response models across the South East landscape. These studies demonstrated the utility of remote sensing approaches in providing new understanding of wetland and water regime variability and function, while the GIS analyses allowed landscape-scale application of wetland eco-hydrological models.

12:30pm – 1:15pm

## Lunch

1:15pm – 4pm (incl. afternoon tea break)

## Environmental Water

### Lower South East: Groundwater Research and Regional Model

*Presenter: Juliette Woods, Flinders University/DEWNR*

In the South East, groundwater is used for community water supply, agriculture, industry and the ecology. It also interacts with surface water such as lakes, wetlands, and streams. As such, understanding groundwater is critical for water management in many parts of the South East. This study aimed to improve our understanding of groundwater in the Lower South East. One part of the project focussed on data. Key groundwater information was compiled and reviewed to produce datasets of the stratigraphy, historical extraction from wells, and land use. Methods were developed to estimate the recharge of aquifers from rainfall and other sources, testing these estimates against fieldwork. Another part of the project summarised this and other information in a regional groundwater model. The model simulates large-scale processes, estimating how water flows in and out of aquifers over time. The project also investigated groundwater flow to the sea, the movement of water between aquifers, and the wetting and drying of wetlands.

### Improved Modelling of the Catchments and Drainage Network in the Upper South East for Management Outcomes

*Presenter: Matt Gibbs, University of Adelaide/DEWNR*

This project investigated a range of approaches to provide predictions of flow in Drain M one month ahead of time. The approaches included: rainfall runoff models that used groundwater data to change the relationship between rainfall and runoff, data driven models that deduced the relationship for runoff generation from a wide range of input data, and a combination of the two. Methods to determine the uncertainty in the model predictions were also developed. Finally, a water balance model of the Mosquito Creek/Drain M system was developed, to allow Lake George water level and salinity changes to be assessed based on different drain flow, Bool Lagoon release and REFLOW diversion scenarios.

# Day Two

9:15am – 10:30am

## Climate Change

### SA Climate Ready: Climate Change Projects and Applications

*Presenters: Graham Green & Claire Harding, DEWNR*

With the availability of the Goyder Institute's SA Climate Ready climate change projection datasets, South Australia is now better able to proactively plan for the impacts of climate change. The regional climate change projections enable the South Australian government, business and community to access consistent and high quality information at the relevant scale for their decision-making needs and assist regions to undertake climate change adaptation planning by providing regionally specific climate data. This presentation will provide an overview of the SA Climate Ready datasets, with a focus on the data provided for the South East NRM Region, and will explain the types of data available, how to access the datasets, and provide examples of how the climate projection data has been used to provide information for NRM and infrastructure planning. Finally, a local case study will be presented, illustrating how the climate data has been used to understand the risks of projected future climate to the ecological health of a significant wetland in the South East.

10:30am – 11am

## Morning Tea

11am – 1pm

## Urban Water

### Managed Aquifer Recharge & Stormwater Use Options (MARSUO)

*Presenter: Joanne Vanderzalm, CSIRO*

The MARSUO research project assessed the technical, social and economic feasibility of harvesting stormwater to augment urban water supplies. This research evaluated in depth the quality of stormwater generated in the city of Salisbury, the treatment requirements and risk management measures necessary to assure safe water quality for public open space irrigation, third pipe reticulation to homes and for potential drinking water supplies. Studies of satellite sites in Australia and overseas, including Mount Gambier, were undertaken to compare stormwater quality and treatment requirements for potable use. Risk-based management plans were developed for existing non-potable uses of Parafield-harvested stormwater, and for existing potable use of Blue Lake groundwater recharged by stormwater drainage wells in Mount Gambier. These are the first stormwater managed aquifer recharge (MAR) risk-based management plans under the Australian Guidelines for Water Recycling, and serve as templates for other sites.

### Water Sensitive Urban Design: Targets, Impediments & Opportunities

*Presenter: Baden Myers, UniSA*

This presentation will include a brief introduction to what Water Sensitive Urban Design (WSUD) is. This will be followed by an overview of the kind of targets that were developed for SA, and what may be applied in Mt Gambier, SA and interstate. The practical benefits of WSUD for runoff volume and flow management will then be described based on the results of continuous simulation modelling by the Goyder Institute for Water research. This component of the presentation will include a brief overview of why continuous simulation is important for assessing the performance of storage-based measures such as WSUD.

1pm – 1:45pm

## Lunch

1:45pm – 4pm (incl. afternoon tea break)

## Workshop

### Future Opportunities / South East Issues Identification

*Presenters: Tim Bond & Neil Power, DEWNR*

This workshop will aim to identify issues to be considered in the Regional NRM Plan to improve water management and fill knowledge gaps.

*The Goyder Institute is a partnership model that brings together South Australia's leading water research capabilities through collaboration with the SA Government, led by the Department for Environment, Water and Natural Resources (DEWNR), CSIRO, Flinders University, the University of Adelaide, UniSA and ICE WaRM (The International Centre of Excellence in Water Resources Management).*