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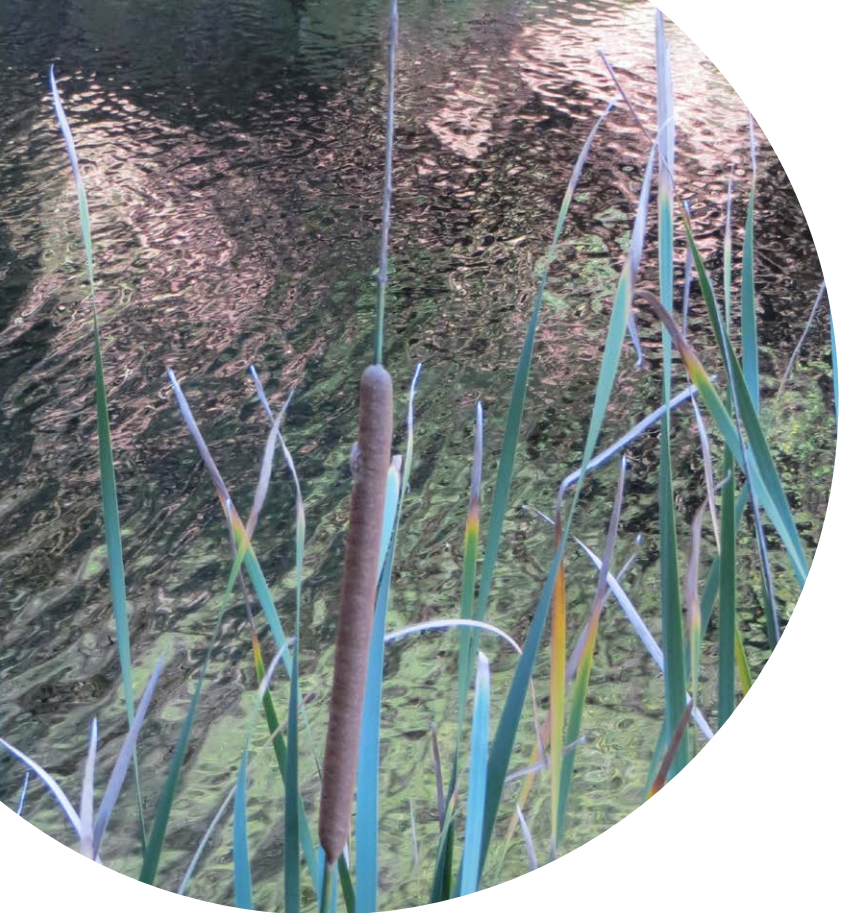
G O Y D E R I N S T I T U T E

Annual Report

for water research



www.goyderinstitute.org



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Key Achievements

NEW FUNDING FOR A FURTHER FOUR YEAR TERM

In the 2015/16 Budget the South Australian State Government committed to a further 4 year term for the Goyder Institute. A reflection that the Goyder Institute has proven its value as an independent expert science advisor to Government on water related issues, having delivered significant research achievements across industry, the environment, urban water security and climate change.

The additional funding will enable the Institute to continue its valuable work and help the State maintain its position as a world leader in water research.

SA CLIMATE READY

One of the most successful Projects for 2014-2015 was the SA Climate Ready Project which produced the most comprehensive set of climate data projections for South Australia through to 2100. The climate change information available through the Government EnviroData website was launched by the Minister for Sustainability, Environment and Conservation, Minister for Water and the River Murray and Minister for Climate Change at the Annual Water Forum in front of over 270 delegates.

STATE AND NATIONAL AWARDS

- The inaugural South Australian Minister's Award for Excellence in Water Sustainability awarded to the Goyder Institute for Water Research for 'SA Climate Ready';
- The National Research Innovation Award at the Australian Water Association (AWA) Awards.
- Australian Water Association (SA Branch) Research Innovation Award.
- The Goyder Institute's Managed Aquifer Recharge Stormwater Use Options (MARSUO) research project was awarded the National Award for Excellence in Research and Innovation by Stormwater Australia.
- Dr Michele Akeroyd, Director of the Goyder Institute, was awarded the inaugural Women in Innovation and Technology SA Award (Environment). The award recognised her innovation in delivering expert science to government in a format which can be used to inform policy and decision making.

'As the Goyder Institute nears the end of its first term we can reflect on a strong record of achievement. From my perspective it has actively fostered cross-institutional partnerships in a way that was rarely achieved previously. It has also provided the environment for the development of innovative ideas that have in turn led to genuinely novel and important solutions to critical problems of water quality and supply. The Goyder Institute represents a bold and successful experiment in collaboration in a vital space.'

Professor Robert S. Hill, Executive Dean, Faculty of Sciences, the University of Adelaide

5 RESEARCH AWARDS

A NEW FOUR-YEAR TERM ANNOUNCED

\$43.69 MILLION INVESTED IN WATER RESEARCH

\$13.55 MILLION OF EXTERNAL RESEARCH CONTRIBUTIONS

57 ORGANISATIONS INVOLVED IN GOYDER INSTITUTE RESEARCH

153 RESEARCHERS WORKING ON SOUTH AUSTRALIA'S WATER CHALLENGES

25 PHD STUDENTS

3 VISITING PROFESSORS

270+ DELEGATES ATTENDED THE 2015 ANNUAL FORUM

15 SEMINARS

12,700+ WEBSITE VISITORS

200+ JOURNAL PUBLICATIONS

53 CONFERENCE PRESENTATIONS

Partners & Associates

GOYDER INSTITUTE PARTNERS

The Goyder Institute for Water Research is a partnership between the South Australian Government through the Department of Environment, Water and Natural Resources, CSIRO, Flinders University, the University of Adelaide and the University of South Australia. The Institute will enhance the South Australian Government's capacity to develop and deliver science-based policy solutions in water management. It brings together the best scientists and researchers across Australia to provide expert and independent scientific advice to inform good government water policy and identify future threats and opportunities to water security.



Department of Environment,
Water and Natural Resources



THE UNIVERSITY
of ADELAIDE



University of
South Australia



Flinders
UNIVERSITY

GOYDER INSTITUTE ASSOCIATES

Goyder Institute Associates typically contribute expertise and capabilities in areas outside of those contributed by the Goyder Institute Partners. Associates may participate in capacity building, knowledge exchange and/or specific research projects, and invest in the Goyder Institute Research program with in-kind commitments in the same manner as Goyder Institute Partners. The following Associate organisations have contributed the outcomes of the Goyder Institute in 2014-15



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— MESSAGE FROM THE CHAIR —

Dr Ian Chessell

As the Goyder Institute reaches the end of its first five years, it is useful to reflect as to whether we have achieved our purpose. The Institute was established after extensive consultation with Government and research organisations in 2010 with the aim of bringing together the best water science in the State to meet the needs of Government. We were established to build an arrangement for the SA Government to access expert, independent and timely advice on water policy and management in a highly effective and efficient way. The need for demonstrable independence was a fundamental property of Goyder that in the event served Government well in negotiations on the Murray Darling Basin Plan. The Goyder has facilitated the bringing together of the very best science and has clearly delivered superior value to the State in its first five years, an external audit showed value generated well in excess of 30 times the Government investment.

It has been a most rewarding time for me as the founding Chair and I wish to express my gratitude to the Government for the opportunity to contribute and my congratulations and thanks to all who have participated in the scientific work that has contributed to our success. I particularly wish to thank all members of the Board for their willing assistance and wise counsel. I thank each of our participating Research Organisations for the cooperative spirit that has developed in Goyder which has been key to its success. I thank the Research Advisory Committee Members for the important contribution they have made in planning and evaluating our research programs. And finally of course I thank our Director,

Dr Michele Akeroyd, for her outstanding leadership, direction and hard work which has made the Goyder Institute a success.

Dr Ian Chessell
Chair Goyder Institute for Water Research

THE GOYDER INSTITUTE MANAGEMENT BOARD

The Management Board meets quarterly to set the strategic vision and direction for the Goyder Institute and to monitor its implementation and outcomes. The Board reviewed and approved annual research programs and budgets, and monitored the effective delivery of the research projects.

The Board comprises an Independent Chair, the Director of the Goyder Institute, two representatives from CSIRO, two representatives from the State Government, and one representative from Flinders University, the University of Adelaide and the University of South Australia.

The Members of the Goyder Management Board from July 2014 - June 2015 were:

Dr Ian Chessell - *Independent Chair*

Dr Michele Akeroyd - *Director, Goyder Institute*

Prof David Day - *Flinders University*

Prof Simon Beecham - *UniSA*

Prof Bob Hill - *The University of Adelaide*

Dr Paul Bertsch - *CSIRO*

Mr Tim Goodes - *Dept. Environment, Water and Natural Resources*

Mr Scott Keyworth - *CSIRO*

Mr Kym Winter-Dewhirst - *Dept. Premier and Cabinet*



Photo Dale McNeil

— MESSAGE FROM THE DIRECTOR —

Michele Akeroyd

The fifth year of Institute operations has been extremely rewarding with a further four year term of the Goyder Institute being announced by the South Australian Government in June 2015. The Institute also received a number of awards during the year, reflecting the high quality of our research and its impact in water policy and management.

One of the key achievements during the year was the launch of SA Climate Ready at the Annual Water Forum in February. By working with communication experts, decision makers and the private sector, we were able to tailor the research outcomes from the Institute's downscaling climate change projections project to ensure the data was publicly available in an easy to access manner, with a range of supporting technical and non-technical documents for decision makers and the general public. The Annual Water Forum also showcased the five years of Institute research to well over 200

delegates with a great diversity of presentations over two days and two concurrent sessions. This was combined with the Water Industry Alliance Members Night on the first night, which provided a great opportunity for research to connect with the water industry.

It has been very rewarding to be part of the collaborative spirit that has developed between the Institute partners. The positive research culture that has grown within and between the research teams, state and local government staff and non-government stakeholders has been pivotal in shaping the relevant, high impact research program. Without this level of commitment to the Goyder Institute model and its objectives, the successes of the Institute would not have been realised.

I would like to thank the Management Board, in particular the Chair Dr Ian Chessell, for their leadership and direction over the

past five years. I would also like to recognise the Research Advisory Committee for their valuable and expert contributions in ensuring the quality and relevance of the research program. Behind the scenes the Goyder Institute office staff are the backbone of the Institute operations, none of the activities and successes over the past 12 months would have been possible without the team of Neil Power, Danni Oliver, Alison Bowman and Claire Punter.

The next 12 months will see many changes for the Institute, a change in administrative operations, development of new collaborations and establishment of the next phase of the Institute's research program to 2019. I look forward to sharing this journey with you.

Michele Akeroyd
Director, The Goyder Institute for Water Research

GOYDER INSTITUTE RESEARCH ADVISORY COMMITTEE (RAC)

The RAC met three times in 2014-15 to advise the Management Board on progress, milestones and implementation of Goyder Institute research activities, and to consider the strategic direction for the research projects into the next years of the Institute. It reviewed and approved several reports for inclusion in the Technical Report Series and formulated recommendations to the Board regarding the direction, content and quality of project plans and expressions of interest for various research activities proposed by Goyder Institute research partners.

The RAC is chaired by the Goyder Institute Director and comprises a research coordinator from each research partner, up to two representatives from agencies as determined by the State, a representative of SARDI and a representative of SA Water.

The members of the RAC from July 2014 - June 2015 were:

Dr Michele Akeroyd - *(Chair), Goyder Institute*

Mr Neil Power - *DEWNR*

Ms Sandy Carruthers - *DEWNR*

Prof Okke Batelaan - *Flinders University*

Prof Chris Saint - *UniSA*

Prof Justin Brookes - *The University of Adelaide*

Assoc Prof Mike Burch - *SA Water*

Prof Jim Cox - *SARDI*

Dr Dirk Mallants - *CSIRO*

Photo Dale McNeil



— ABOUT THE GOYDER INSTITUTE FOR WATER RESEARCH —

The Goyder Institute

The Goyder Institute was established in 2010 for an initial term of 5 years as a partnership between the South Australian Government, CSIRO, the University of Adelaide, Flinders University and the University of South Australia to deliver expert advice to support water policy and management in South Australia.

Since that time, partners have jointly invested \$50m to undertake a portfolio of research projects to address key priorities for water management in South Australia. This investment has generated many significant outcomes for the management of water and the advancement of science in South Australia.

Key to the Institute's success is the ability to bring together a critical mass of water experts together with policy and water resource managers to scope and deliver timely and relevant research programs that seek to address the priority water resource challenges facing this State. This model provides the South

Australian Government with an informed, one-stop shop to engage a coordinated research effort across multi-disciplinary sectors, including the physical sciences, law, economics and social research.

The Goyder Institute's research directly drives water management decisions for the benefit of South Australia and is well placed to remain a water research provider due to its:

- Capacity to provide independent advice;
- Targeted research approach, focusing on water research in South Australia;
- Flexibility to respond to Government policy priorities and outcomes;
- Role as a broker between various other water research institutions using a collaborative approach.

The demonstrated success of the collaborative model of the Goyder Institute is the basis for the State Government's commitment to a new four year term. A new Strategic Research Plan for 2015-2019 will shortly be released, following consultation with government, academic and non-government stakeholders. The new Research Plan will address specific water management issues that have been identified as crucial to future policy plans for State development and will make a significant contribution to South Australia's social, economical and environmental vitality for many decades to come.

Partnerships

RESEARCH PARTNERS

CSIRO
The University of Adelaide
Flinders University
UniSA
PIRSA-SARDI
Australian Water Quality Centre

GOVERNMENT PARTNERS

Department of Environment, Water and Natural Resources
Department of Premier and Cabinet
Department of State Development
Department of Primary Industries and Regions SA
Department of Planning, Transport and Infrastructure
Renewal SA
Environmental Protection Authority
SA Water

STATE ORGANISATIONS

Natural Resource Management Boards:
• South East
• Adelaide Mt Lofty Ranges
• Murray Darling Basin
• SA Arid Lands
• Eyre Peninsula
• Alinytjara Wilurara
City of Adelaide
City of Holdfast Bay
City of Marion
City of Salisbury
Local Government Association
South East Drainage Board
Outback Communities Authority
The Arabana Aboriginal Corporation

NATIONAL ORGANISATIONS

University of Sydney
National Centre for Groundwater Research Training
National Centre for Excellence in Desalination Australia
Australian Water Recycling Centre of Excellence
National Water Commission
Water Research Australia
Australian Water Association
Australian and New Zealand School of Government
Murray Darling Basin Authority
International Centre of Excellence in Water Resource Management
Lake Eyre Basin Scientific Advisory Panel



INDUSTRY

Water Industry Alliance
Exploration Industry
Adelaide Resources
Uranium SA Ltd
Archer Exploration
Lincoln Minerals
Marmota Energy
Monax Mining
Musgrave Minerals Ltd
Pepinnini Minerals Ltd
Uranium One
Cameco Ltd
Callabonna Uranium
Stellar Resources

INTERNATIONAL ORGANISATIONS

University of Central Florida
University of Oxford
University of Waterloo
University of Idaho
University of Durham





— **RESERCH THEMES** —

The Strategic Research Plan

The Goyder Institute Strategic Research Plan 2011-2015 details the long-term strategic outcomes for the Goyder Institute research programme, which is designed to align the research investment to the South Australian government water management priorities to help ensure that the water resources of the state are sustainably managed for economic, social and environmental benefits. The Strategic Research Plan links the ongoing and proposed research activities to these outcomes through four research themes that each have detailed Roadmaps linking the research activity to water resource policy and management outcomes for the State. The combined investment in research activities across the four research themes, encompassing seven roadmaps, is over \$43 million dollars. This investment has developed knowledge and capability in water resource management in South Australia.

Roadmap	Goyder Institute Investment	External Research Support	Number of projects	Completed projects
Climate Change Theme				
Climate Change Downscaling	\$7,261,255	\$144,212	1	1
Environmental Water Theme				
River Murray	\$7,259,256	\$1,073,571	17	11
Surface water, groundwater and wetlands	\$5,648,492	\$568,954	7	5
Water for Industry				
Water Allocation Planning and Water Quality	\$8,746,125	\$4,992,479	8	3
Outback Water	\$6,567,385	\$1,588,542	6	2
Urban Water				
Water Sensitive Urban Design	\$2,035,904	\$57,000	3	2
Water Resources Mix	\$6,172,329	\$5,128,979	4	3

Climate Change

GOYDER INSTITUTE RESEARCH ADVISORY COMMITTEE (RAC)

'The Goyder project has delivered vital information and knowledge to government agencies, ground land managers, industry and long term decision makers, in the field of CLIMATE CHANGE. Making decisions in all areas of human endeavour, going forward, increasingly relies upon understanding the science surrounding the "Greenhouse Gas" driven changes to our planet's atmosphere. The Goyder Institute's collaboration and work around observations and projected trends, give us access to up to date, knowledge and information that is locally relevant, to make sound effective decisions going forward. Critical work, informing our future!'

Brian Foster (Member Premiers Climate Change Council, Independent Chair Eyre Peninsula Climate Change Agreement Committee (EPICCA))

CLIMATE CHANGE DOWNSCALING

One of the key drivers affecting future water availability in South Australia will be climate change, which will place new pressures on water use and threaten supply. The SA Climate Ready project was launched at the Water Forum in February 2015 by the Minister for Climate Change, the Hon. Ian Hunter MLC. The data and supporting information, the most comprehensive set of climate projections ever available in the State, is available on the State Government Enviro Data SA website. These projections align with the eight Natural Resource Management (NRM) regions in South Australia so it is directly relevant to regional scale climate change adaption planning in South Australia.

Environmental Water

'The Goyder Institute displayed strong leadership to draw together the South Australian science community to discuss the science behind the Sustainable Diversion Limits (SDL) adjustment assessment framework.

The opportunity to detail the work which was done, and the extensive testing and peer review, proved to be very effective in developing greater stakeholder confidence in the approach to operating the SDL adjustment mechanism.'

Colin Mues, Acting Executive Director,
Environmental Management Division, Murray Darling Basin Authority



THE RIVER MURRAY

A suite of projects on the River Murray are addressing a range of issues for this critically important water resource. This includes a detailed examination of the ecological responses to flooding; an assessment of the current understandings of environmental watering needs; understanding riverbank collapse and the risk management frameworks required; development of ecological objectives and targets for the River Murray; providing eco-hydrology advice on the development of sustainable diversion limits; and modelling floodplain salt dynamics to assess the different management options for delivering environmental water and managing salinity. These research initiatives are contributing to the implementation of the Murray Darling Basin Plan.

Further research has been undertaken in the Lower Lakes and Coorong to inform management of environmental water as well as developing approaches to integrate Ngarrindjeri knowledge into these strategies.

Through the Chowilla Environmental Operations projects, the Murray Darling Basin Authority blackwater model has been further developed. This tool was shown to assist rapid assessment of dissolved oxygen concentrations from different operating regimes for infrastructure on the South Australian floodplains. The information will assist state agencies to assess blackwater risk associated with different operations, and the combination of operations, along the South Australia River Murray.



SOUTH EAST

A suite of projects have been running including the SE Urgent Monitoring Program, Wetlands and Groundwater Research, Regional Groundwater Balance and Modelling of Catchments and Drains. Groundwater in the South East is one of the major factors affecting the viability of agriculture and industry, and ecosystem health. Effective management of surface water and groundwater availability and quality requires the capability to model the groundwater system and its interactions.

The second phase of this project involved the construction of the regional water balance model, a detailed assessment of recharge and modelling as well as modelling of groundwater – wetland connectivity.

Another project in the region has assessed the environmental risk facing the South East region and examines the causes of high alkalinity in water moving through the SE drainage system and draining into Ramsar wetlands. Management guidelines will be developed and actions identified to reduce the risks of elevated alkalinity and nutrients in drainage water in the region and Ewen's Ponds.

The outcome of this research will be used to inform future water allocation planning and management strategies regarding directing water to wetlands through drainage and floodway systems.

Urban Water

The urban water theme has delivered tools, knowledge and capability that is enabling rigorous assessment of the social, economic and environmental outcomes in developing an integrated urban water plan and policies for the State.

The outcomes from the suite of urban projects include the development of an optimisation tool to assess and test different water supply scenarios to identify social, economic and environmental outcomes. This enables testing different management and infrastructure scenarios to identify the costs and benefits of each to inform management and planning.

'The research undertaken by the Goyder Institute and the ability to engage with researchers across a multitude of disciplines has been fundamental for shifting policy in the urban water sector from an inherent focus on conservation toward intergrated and innovative ways to maximise the economic, social and environmental outcomes from our urban water sources.'

Steve Morton, Manager Water Planning,
The Department of Environment, Water and Natural Resources

WATER RESOURCES MIX

The Managed Aquifer Recharge Stormwater Usage Options project assessed a range potential uses of stormwater including via managed aquifer recharge. The project addressed the health risk assessment of uses for public open space irrigation, third pipe non-potable supplies to households and industry and for drinking water supplies. The project's catchment risk assessment approach was adopted by the Water Proofing the South and Water Proofing the West projects and developed a risk assessment methodology for the development of management plans for stormwater use.

The 'Optimal Water Mix' project provides foundational knowledge to inform the development of policy and planning for integrated urban water management in metropolitan Adelaide. A key product of this project is the development of methods for determining trade-offs between the multiple objectives of water security, economic efficiency and environmental benefits of water supply options that are consistent with the city's social values.

WATER SENSITIVE URBAN DESIGN

Research to support implementation of Water Sensitive Urban Design has been a key focus of the Institute since its inception. Working with local councils, the WSUD research team have documented WSUD schemes across South Australia, including the type of scheme, location and purpose. These are documented on the Water Sensitive SA website (www.watersensitivesa.com) where the information is freely available. Additional analysis investigating the economics, impediments and opportunities are contributing to the integration of WSUD into local stormwater plans.

The Targeting stormwater interventions to support integrated urban water management that delivers improved coastal water quality project brings together the knowledge of WSUD schemes into a "urban-catchment-to-coast" computational model. This modelling capability enables assessment of urban catchment interventions and their impact on the amount of stormwater derived sediments entering Adelaide's coastal waters. These analyses will contribute to better understanding of stormwater and coastal interactions to inform the development of integrated urban water management plans in Metropolitan Adelaide and improve coastal water quality.

Water For Industry

The background image shows a large-scale industrial quarry or processing site. A massive, layered rock face dominates the upper half of the frame. In the foreground and middle ground, there are various pieces of heavy machinery, including conveyor belts, crushers, and a yellow excavator. The ground is covered in grey gravel and crushed rock. The sky is clear and blue.

'The project undertaken by SARDI and project partners is an excellent example of well planned and executed science with real industry relevance.

The results of the South Australian rainfall redirection trials with grapes and almonds grown on recycled water have implications for industries in Australia, but are also likely to have significance for similar drought impacted agriculture sectors in California and elsewhere.'

Mark O'Donohue MSc PhD,
Chief Executive Officer, Australian Water Recycling Centre of Excellence Ltd



WATER ALLOCATION PLANNING

Building on the existing knowledge, management and monitoring systems in the Mt Lofty Ranges, the Water Allocation Planning project has improved the understanding of environmental water needs, patterns of flow and water quality within the Mount Lofty Ranges. The tiered risk assessment of Mt Lofty Ranges water quality data is contributing to the prioritisation of investment in stream monitoring and catchment management.

Demonstrating the economic and environmental value of water recycling to Australia's agri-food industry was a key research focus in the Recycled Water and Salinity project. The research team in collaboration with local viticulture and horticulture businesses has tested different approaches to redirecting rainfall to increase soil flushing and reduce the salinity pressure on vines and almonds that are supplementing water use with recycled water. These trials are being further extended through the South Australian River Murray Sustainability Program.

OUTBACK WATER

The Water for Industry theme has covered a broad range of research areas including groundwater assessment, mining, agriculture, outback water supplies, water allocation planning and the Lake Eyre Basin.

A key study in this research area focused on five outback communities representative of the current diversity of water supply in remote areas. It examined the communities' capacity and willingness to pay for a secure water supply; the development of decision criteria as a basis for the South Australia Government to consider; and evaluated governance and service delivery arrangements for water supplies in remote communities.

The Adelaide Plains Groundwater Resources project has delivered a thorough assessment of the groundwater resources beneath Adelaide, and the impacts of current and future extraction and climate change. One of the key outcomes has been an upgraded and improved groundwater model capable of predicting impacts of current and future extraction, and uncertainties surrounding these predictions. It is the first study to provide an integrated assessment of the groundwater resources of the entire Adelaide metropolitan region. This information is a critical aspect in the planning and development of the Northern Adelaide region in particular. The Institute has

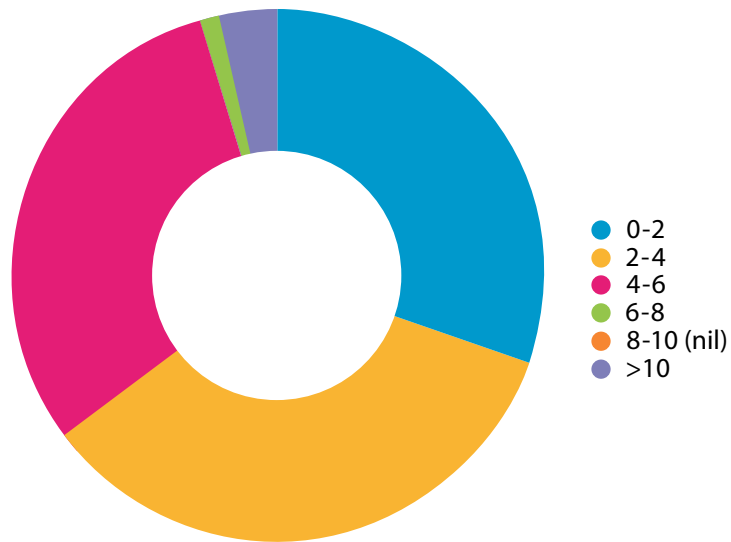
commenced a water stock take of the Northern Adelaide Plains where the inputs from the other Institute research (such as the Adelaide Plains Groundwater Project) are providing new knowledge and data to support sustainable development of the region.

The northern part of the Eyre Peninsula is recognised as a priority area for mineral exploration and potential mining development. Goyder FLOWS Stage-2 worked towards improving broad knowledge about the location and interaction between groundwater resources in this priority area. G-FLOWS Stage-2 builds on the approaches for conceptualising the hydrogeology of remote regions developed during the G-FLOWS Stage 1 project, further refining and developing the techniques for converting airborne geophysics data to highly valuable information providing potential locations of water resources and providing better understanding of groundwater processes, particularly regarding the connectivity of groundwater flow systems. It also adds to the activity undertaken in the Department of Environment, Water and Natural Resources (DEWNR) FLOWS Initiative and the Department of State Development (DSD) PACE 2020 Program.



— PUBLICATIONS JOURNAL IMPACT FACTORS - JULY 2015 —

Science Excellence



In 2014-15 Goyder Institute Projects have produced:

- 70 Journal Papers
- 58 Technical Reports
- 13 National Conference Papers
- 11 International Conference Papers
- 18 model Metadata Reports

Journal Impact Factor is a metric of journal quality

Major Awards

The Goyder Institute has been the recipient of a number of Awards during 2014-15, recognising the quality and impact of the Institute's research program and the successful collaborative model linking science to policy. Development of modelling has been an important capability focus of the Goyder Institute activities. To capture this knowledge, model documentation has been prepared for all of the Research Themes and is available on the Goyder Institute website.



WINNER AUSTRALIAN WATER ASSOCIATION 2015 RESEARCH INNOVATION NATIONAL AWARD

WINNER AUSTRALIAN WATER ASSOCIATION 2014 RESEARCH INNOVATION SA BRANCH AWARD

FINALIST AUSTRALIAN RESEARCH & INNOVATION ADELAIDE INNOVATION CHAMPION AWARDS 2014

URBAN WATER



Projects in the Urban Water theme have produced:

- 13 journal papers and
- 9 technical reports

Awards

Winner - Stormwater Excellence Award 2014 (State & National), Stormwater Australia for the MARSUO

WATER FOR INDUSTRY



Projects in the Water for Industry theme have produced:

- 4 journal papers and
- 14 technical reports

Awards

Finalist in Australian Mining Prospect Awards 2014 (Innovative Mining Solutions) for G-FLOWS

ENVIRONMENTAL WATER



Photo: Mellissa Nursey-Bray

Projects in the Environmental Water theme have produced:

- 8 journal papers and
- 27 technical reports

Awards

Nomination for the 2015 Australian Riverprize for "Indigenous engagement in environmental water planning, research and management: Innovations in South Australia's Murray-Darling Basin Region"

CLIMATE CHANGE



Photo: Prof. Simon Beecham

The SA Climate Ready project has produced:

- 19 journal papers and
- 7 technical reports
- 11 of the papers have been in high impact journals.

Awards

Winner – Award for Excellence in Water Sustainability 2015, Water Industry Alliance for SA Climate Ready

Capacity Building

The Goyder Institute supports building new capability in water management through its PhD supplement program and attracting international expertise through its ANZSOG–Goyder Institute Visiting Professors program. These initiatives are growing our capability base and extending our thinking towards the complex water management issues facing the State.

OVER THE LIFE OF THE GOYDER INSTITUTE:

- **3 VISITING PROFESSORS**
- **25 PHD STUDENTS**
- **43 JOURNAL PAPERS BY STUDENTS**
- **2 BOOK CHAPTERS**
- **30 CONFERENCE PAPERS BY STUDENTS**



— CAPACITY BUILDING —

Visiting Professor Program

Flinders University, the Australia and New Zealand School of Government and the Goyder Institute have created a Visiting Professor Program aimed at developing the nation's knowledge and skills base in the policy and management of finite resources, particularly water resources. The program's main focus is on the role of public policy and public sector management in maximising opportunities for collaboration in the use and re-use of finite resources. In 2014/15 Professor Barbara Cosens was the third Visiting Professor.

Professor Barbara Cosens - January 2015 – April 2015
University of Idaho College of Law, (USA)

Barbara was born and raised in the Sierra Nevada Mountains of California. She is currently a professor with the University of Idaho College of Law and the interdisciplinary Waters of the West Graduate Program. She coordinates the Natural Resources and Environmental Law Program at the University of Idaho.

Barbara's research interests include the integration of law and science in education, water governance and dispute resolution; adaptive water governance and resilience; and the recognition and settlement of Native American water rights. Barbara is currently co-chair of a project made possible through support from the NSF funded National Socio-Environmental Synthesis Center (SESYNC): Adaptive Governance in Regional Water Systems to Manage Resilience in an Era of Changing Climate. It is the application of the results of this project to the Lake Eyre basin in Australia that she brings to the Visiting Professor Program.

— CAPACITY BUILDING —

PhD Seminar Series

The Goyder Institute for Water Research supports outstanding PhD candidates to undertake research which builds South Australia's water research capacity and facilitates knowledge exchange and collaboration.

The PhD Seminar Series gives the opportunity for candidates to present their work. In 2014/5 the following presented their work which ranged from 'New methods for measuring total water storage', 'Seawater intrusion in fractured coastal aquifers', 'Connection and Continuity: Reassembling archaeology for the past, present and future of Waltowa Wetland' to 'Energy flow pathways in response to flow variability in a dryland floodplain river, River Murray':

- Robert Andrew, Flinders University
- Eva Beh, University of Adelaide
- Michael di Matteo, University of Adelaide:

- Chaturangi Wickramaratne, University of Adelaide:
- Chris Stokes, University of Adelaide
- Jonathan Cohen, University of South Australia
- Kayla Gilmore University of Adelaide
- Megan Sebben Flinders University
- Matthew Knowling Flinders University
- Shiv Umapathi, University of South Australia
- Sanjina Upadhyay, University of Adelaide
- Harriet Whiley, Flinders University
- Mostafa Razzaghmanesh, University of South Australia -
- Sithara Gamage, University of South Australia
- Kelly Wiltshire, Flinders University

All presentations were recorded and are available through the Goyder Institute website.

Science Communication



The Goyder Institute has and organised and participated in a range of events in the past twelve months, to showcase and communicate research results with partners, key stakeholders and the general public.

12,700+ WEBSITE VISITORS

23,300+ WEBPAGE VIEWS

15 SEMINARS AND EVENTS

50+ CONFERENCE PRESENTATIONS

30+ MEDIA ARTICLES AND INTERVIEWS



— SCIENCE COMMUNICATION —

Showcasing The Institutes Science

SA Climate Ready Launch

The SA Climate Ready project was launched during the Annual Conference in February 2015. Minister for Sustainability, Environment and Conservation, Minister for Water and the River Murray and Minister for Climate Change, Hon Ian Hunter MLC, opened the conference officially launching the results of the climate change projections data that is available at data.environment.sa.gov.au

Goyder Institute Annual Conference

The Goyder Institute Annual Conference – a Water Research Showcase highlighted the achievements of researchers across the four research themes. Sixty-two presentations were delivered to over 270 delegates, in two days demonstrating the diverse research portfolio of the Institute. The event was combined with the Water Industry Alliance members' night at the end of the first day.

Murray Darling Basin Sustainable Diversion Limit (SDL) Adjustment Mechanism Forum

A briefing for South Australian scientists and managers outlined the development, review and application of the SDL adjustment mechanisms and as well as an overview of research activities in the southern connected Basin from leading science organisations.

Australian Business Week in India

Led by the Hon Andrew Robb AO MP, Minister for Trade and Investment, the Goyder Institute took part in Australia Business Week in India, Australia's largest ever trade mission to India, with a week-long series of events designed to enhance investment, education and tourism ties with India.

Part of a 450 strong delegation, a 52-member Australian water delegation focused on ways in which Australia can work with

India. The delegation visited Delhi and Mumbai. Participation in India Water Week was a component of the business week with the Director presenting on water recycling in South Australia as part of the session on integrated wastewater management.

A Hypothetical Forum >> Fast Forward to 2050>> Water Scenarios for South Australia's Future

Held during National Water Week, in conjunction with the Adelaide Mt Lofty Ranges Natural Resources Management Board, Australian Water Association, DEWNR, University of Adelaide, Flinders University and University of South Australia, the event was attended by over 220 water industry professionals.

A panel of experts on water management, climate change, health, agriculture, business and government policy were engaged in lively discussion of future scenarios for Adelaide to 2050 and beyond.



— SCIENCE COMMUNICATION —

Showcasing The Institutes Science

2015 Science Seminar Series

The Goyder Institute Science seminars have been held regularly to share emerging knowledge from research projects and to give project staff (PhD students in particular) the opportunity to present to industry peers.

Nine seminars were held with twenty-seven presenters, covering projects across all four research themes. Recordings of these seminars are available at goyderinstitute.org

Rangelands Conference, Alice Springs

The Institute was the Silver sponsor of the “Water Sharing” session at the 18th Biennial Conference of the Australian Rangeland Society: Innovation in the Rangelands. Presentations delivered:

- Understanding environmental condition for the strategic adaptive management of Lake Eyre Basin waterways, Dale G McNeil and David W. Schmarr

- Non, je ne regrette rien: what do four years of LEBRA monitoring tell us? David W.Schmarr, Dale G McNeil, Angus Duguid and Bernie Cockayne
- Reading the signs: Arabana, water and country Dr. Melissa Nursey-Bray

Science Alive! 2014

At the 2014 year’s Science Alive! event, the Goyder Institute hosted an exhibition booth with DEWNR, SARDI, SA Water and National Centre for Groundwater Research and Training to showcase the range of water careers to attract the next generation of scientists into the sector. Science Alive! is part of National Science week.



Financial Summary

GOYDER INSTITUTE FINANCIAL SUMMARY TO 30 JUNE 2015

Financial Summary

GOYDER INSTITUTE FINANCIAL SUMMARY TO JUNE 2015

Research Program

The 2014/15 financial year was the fifth and final full year of the inaugural Goyder Institute for Water Research. The first term of the Institute will be finalised late in the 2015 calendar year with a second, slightly smaller version of the Institute commencing sometime soon thereafter.

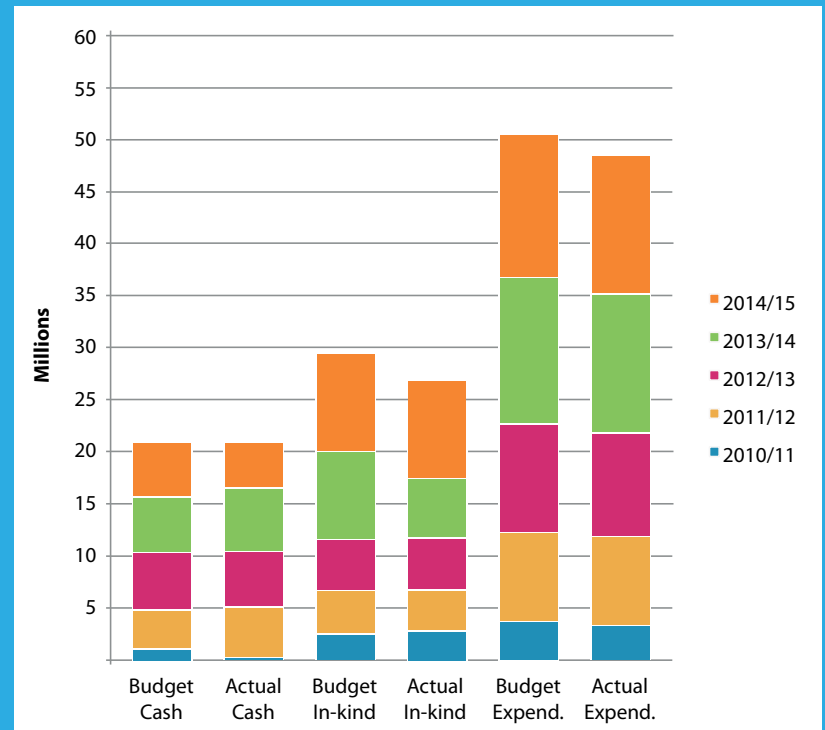
As at 30 June 2015, the South Australian Government has invested \$20.96m cash to research projects with in-kind contributions totalling \$22.73m provided by research partners CSIRO, Flinders University, University of Adelaide and University of South Australia as well as State research providers SARDI and AWQC. Collective life-to-date investment across the 45 approved research projects now stands at \$43.69m.

Administration Program

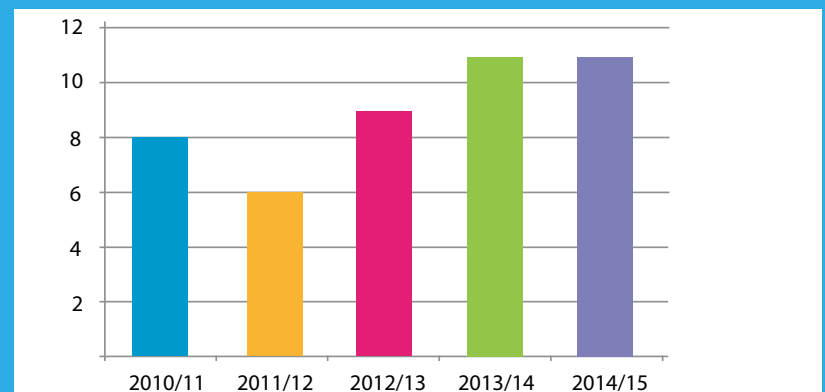
The total budget for Institute administration for 2014/15 was capped at its usual \$1.00m. The administration program is funded in accordance with the agreement with the South Australian Government contributing all the cash and each of the research partners contributing matching in-kind based on their participating interest. The Universities contribution is in the form of PhD students and the CSIRO contributes the Director's salary expenses.

Total expenditure in 2014/15 was \$0.96m which compares favourably with the budget. The administration program has tracked very close to budget during the life of the Institute.

OVERALL BUDGET BY YEAR



PROJECT APPROVALS BY YEAR



Financial Summary

Research Projects

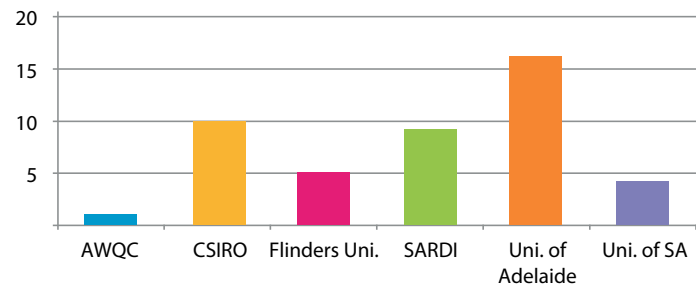
Eleven new research projects commenced in the 2014/15 financial year which contributed to bring whole of life actual expenses to \$40.99m compared to a budget of \$43.69m. Similar to previous years, the underspends are generally caused by several factors associated with project initiation and completion.

As a result of the delays, research cash payments fell from the 2013/14 high of \$5.77m to \$3.79m in 2014/15. Payments included initial payments for new projects, scheduled milestone payments for existing projects and delayed milestone payments from the previous year for some of the older projects.

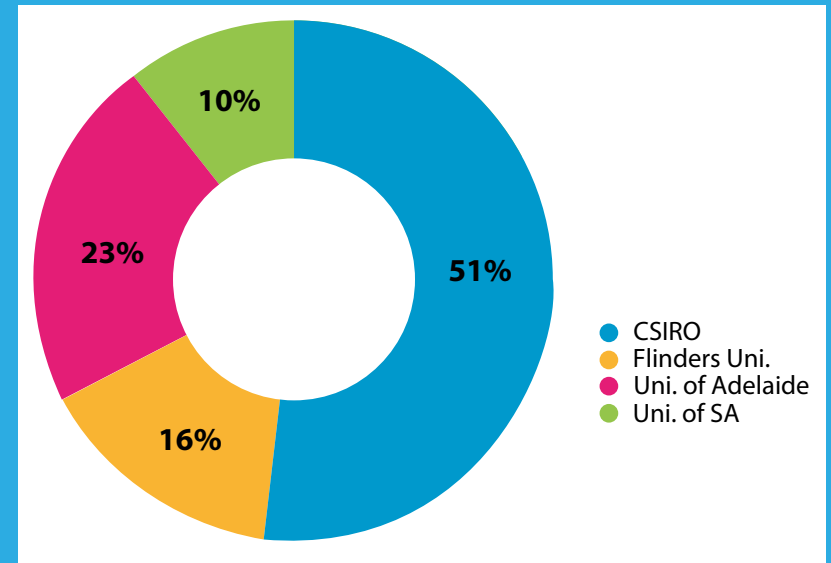
Alliance Trust Account

The closing balance of the Trust account at 30 June 2015 was \$4,071,907.17. During the course of the year, the Trust received \$5,000,000 in cash from the State Government and earned \$226,652 in interest. The Trust paid \$777,302 of Administration and Knowledge Management expenses, paid \$3,879,746 to the research participants (which included PhD supplements of \$80,000) and paid \$82,409 to the ANZSOG/ Goyder Visiting Professor Program.

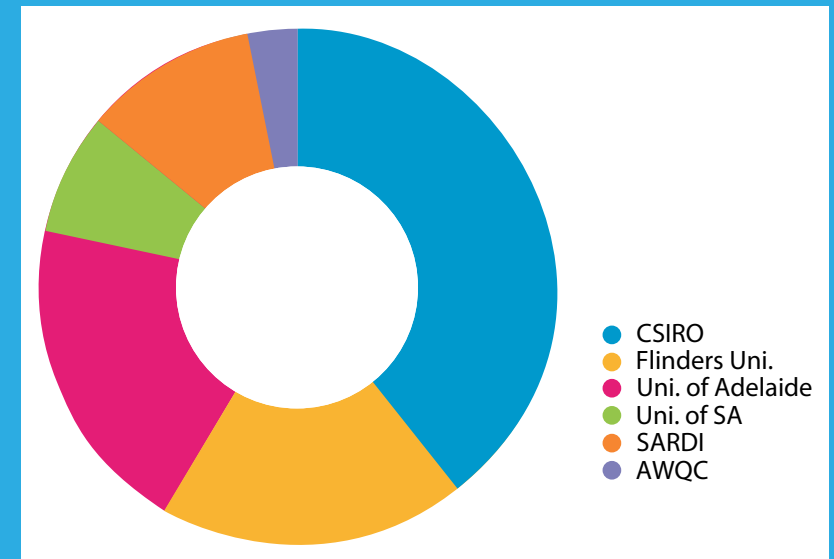
PROJECT LEADS



WHOLE OF LIFE RESEARCH ALLOCATION - PARTNERS



WHOLE OF LIFE RESEARCH ALLOCATION - ALL PARTICIPANTS



Our People

INSTITUTE OFFICE

Michele Akeroyd, Director
Alison Bowman, Marketing and Communications Manager
Danni Oliver, Research Manager
Neil Power, Director State Research Coordination, DEWNR
Claire Punter, Executive Assistant

PROJECT LEADERS 2010-2015

Kane Aldridge, Adelaide University
Okke Batelaan, Flinders University
Simon Beecham, UniSA
Justin Brookes, University of Adelaide
Jim Cox, SARDI
Sue Cuddy, CSIRO
Peter Dillon, CSIRO
Deborah Furst, Adelaide University
Matt Gibbs, Adelaide University
Mat Gilfedder, CSIRO
Nikki Harrington, Flinders University
Steve Hemming, Flinders University
Mark Jaks, Adelaide University
Stephen Mayfield, SARDI

Jennifer McKay, UniSA
Tim Munday, CSIRO
Michael O'Neil, SA Centre for Economic Studies
Tim Pitt, SARDI
David Pezzaniti, UniSA
Karen Rouse, SA Water
Ashok Sharma, CSIRO
Todd Wallace, University of Adelaide
Eileen Willis, Flinder University
Juliette Woods, Flinders University
Qifeng Ye, SARDI
Brenton Zampatti, SARDI

ANZSOG-GOYDER INSTITUTE VISITING PROFESSORS

Professor Barbara Cosens, Idaho
Professor Bruce Mitchell, Waterloo
Professor Steve Rayner, Oxford

PHD STUDENTS

Saeedeh Gharib Choobary
Kayla Gilmore
Sanjina Upadhyay
Megan Sebben

Jonathan Cohen
Chaturangi Wickramaratne
Matthew Knowling
Alaa Ahmed
Robert Andrew
Mostafa Razzaghmanesh
Kelly Hill
Premila Semanada
Shiv Umapathi
Michael Di Matteo
Harriet Whiley
Jessica Liggett
Saskia Noorduijn
Sithara Gamage
Hamideh Nouri
Eva Beh
Kelly Wiltshire
Sina Alaghmand
Deborah Furst
Chris Stokes
Mamunur Rashid

We would like to acknowledge the contributions of those involved in the Institute's steering committees and project committees, who volunteer their time to ensure the quality and relevance of Goyder Institute research. The input and commitment from these stakeholders is fundamental to the success of the Goyder Institute in delivering demand driven research relevant for decision makers. Thank you.



Photo: Iain Bond



GOYDER
INSTITUTE
FOR WATER RESEARCH

www.goyderinstitute.org



Government
of South Australia
Department of Environment,
Water and Natural Resources



THE UNIVERSITY
of ADELAIDE



University of
South Australia



Flinders
UNIVERSITY

The Goyder Institute for Water Research is a partnership between the South Australian Government through the Department of Environment, Water and Natural Resources, CSIRO, Flinders University, the University of Adelaide and the University of South Australia.