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Map courtesy of the National Library of Australia. Goyder's Line enhanced by Alberto Zaniolo.

Surveyor General of South Australia, George W. Goyder, first recognised the importance of water to South Australia when he established 'Goyder's Line' during the severe drought of 1865. He observed the difference in vegetation type as a result of rainfall gradients as he traversed the State. He used this to set a limit beyond which cropping would be unsustainable. His predictions were highly unpopular at the time but he proved to be right. The line (shown in black above) is now called 'Goyder's Line' and was an early example in South Australia of science being used to inform policy.

Welcome



How often have you heard that South Australia is the driest State on the driest inhabited continent on earth? To the people of South Australia, this is not just another cliché, but is in fact a way of life. Since the earliest

days of settlement, when the namesake of our Institute, George Woodroffe Goyder, laid down some of the foundations for water reform in the State and across Australia, South Australia has been recognised as a place where the challenges of sustainable water management need to be addressed and overcome. The recent Millennium Drought clearly exposed the increased threat to the security of water supplies for communities, industry and the environment. South Australia's future economic growth and resilience is dependent on the provision of sustainable water supplies under a variable and changing climate.

This vital importance of water to the quality of life and the economic interests of the people of South Australia was recognised by the South Australian Government in establishing the Goyder Institute for Water Research in July 2010 and the development of a \$50 million, 5-year strategic research plan. We are building a research institute of national and international standing through a partnership model that brings together the State's leading water research capabilities, in collaboration with CSIRO, into a single, comprehensive research institute.

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

As we move forward, the greatest challenge facing the Goyder Institute is delivering the scientific and knowledge needed for independent expert water management advice. This will ensure that the Institute informs good policy and decision-making, identifies future threats to water security and assists in an integrated approach to water management in South Australia and beyond.

A strategic research plan is of course only as good as the outcomes it produces. In the coming years, we will be concentrating on the implementation of our results and communication with end-users, stakeholders and other interested parties. We will also be actively searching for new opportunities to build collaborative partnerships with the water industry and other research providers both nationally and abroad. The key to uptake of our research outcomes by stakeholders is active participation in all phases of project development and execution.

I invite you to read more about the goals and achievements of the Goyder Institute for Water Research in this brochure and via our website. If you feel that your organisation could contribute to our research program, or that you could benefit from the outcomes of our research projects, we would be greatly interested in hearing from you.

Tony Minns
Director, Goyder Institute for Water Research
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Governance

Management Board

The key role of the Management Board is to set the strategic vision and direction for the Goyder Institute and to monitor its implementation and outcomes. It also reviews and approves annual research programs and budgets, and oversees the effective delivery of the research programs.

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

Research Advisory Committee

The Research Advisory Committee (RAC) assists the Director in the development of the Research and Development Plan of the Goyder Institute and ensures that research is of international quality in areas that will ensure that South Australia's science is being most effectively deployed to manage the water issues facing the State. It may conduct periodic reviews of Goyder Institute research project activities and make recommendations about the direction, content and details of future activities.

The RAC is chaired by the Goyder Institute Director and comprises a research coordinator from each research partner, up to two representatives from government agencies as



Willem van Aken, CSIRO Science Image

determined by the State, a representative of SARDI, a representative of the Australian Water Quality Centre, and up to three specialists as agreed by the Management Board.

Research Objectives

Research outcomes will support:

- the delivery of reliable and resilient urban water supplies that meet future needs;
- the ongoing viability of existing water dependent developments and the identification of future sustainable water resource development opportunities;
- the provision of environmental water to achieve optimal outcomes;
- proactive responses to climate change in water resource management;
- effective water management policy and decision making with clear and transparent trade-offs;
- a framework for integrated water resource management;
- training the next generation of water researchers.

Strategic Intent

The Goyder Institute will support world leading water resource management in South Australia through excellent science.





Research Program

Historically, South Australia has relied on three rain-dependent sources of water – the River Murray, Mt Lofty Ranges and groundwater. However, like much of the southern regions of the continent, many areas of South Australia have experienced a decline in surface water flows and groundwater over the past decade compared to long-term averages. This has resulted in an increased threat to the security of water supplies for regional communities, industry and the environment. With projected impacts of climate change indicating a generally drier outlook, the State is facing increased water scarcity.

South Australia's future economic growth and resilience is dependent on the provision of sustainable water supplies.

Water has become one of South Australia's highest priorities. This has led to the State becoming a national leader when it comes to water innovation, including stormwater and rainwater recycling and urban water reuse.

South Australia's unique position at the end of the River Murray system means we have a major interest in the successful implementation of the Murray Darling Basin Plan. The Goyder Institute will help to promote the use of the best available science to underpin the development of the Basin Plan.

The establishment of the Goyder Institute is enabling investment that is focussed across four enduring Research Themes:

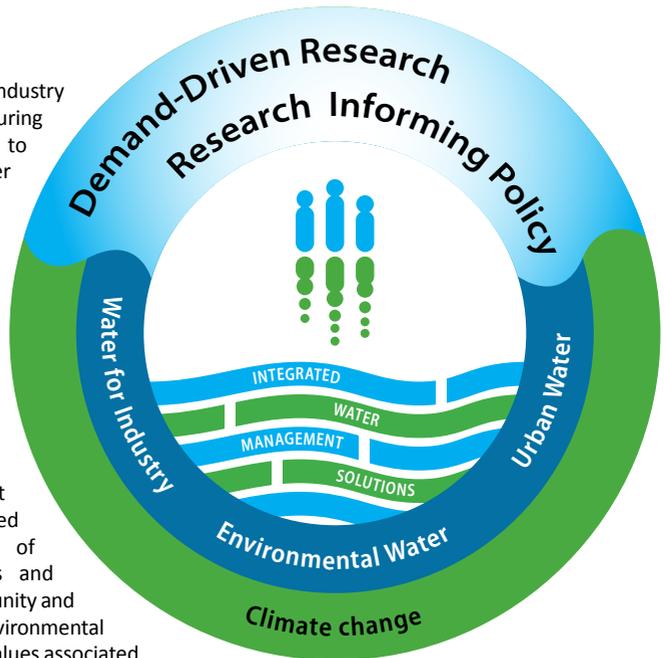
- Urban Water;
- Water for Industry;
- Environmental Water;
- Climate Change.

The Goyder Institute Strategic Research Plan 2011-2015 details the long-term strategic outcomes for a research program that will help ensure the water resources of the State are sustainably managed for economic, social and environmental benefits.

A copy of our Strategic Research Plan can be downloaded from our website at: <http://www.goyderinstitute.org>

Desired outcomes that support policy have been identified by Government Agencies and other stakeholders. The research is carried out by the Goyder Institute partners. The ongoing development of our research program and associated strategic roadmaps takes place in consultation with research partners, stakeholders, and the water industry to identify existing expertise, ongoing strategic developments, and any gaps-in-knowledge that need to be addressed in order to arrive at desired outcomes.

In the Water for Industry theme we are endeavouring to develop techniques to promote equitable water sharing in multi-use catchments and in remote regions of the state. The objective is to develop sustainable water management practices for communities and industries (e.g. forestry, wine, food and mining) that are heavily reliant on safe and secure water supplies. Initial project work has concentrated on the characterisation of regional water resources and identification of the community and mining water needs, environmental water needs and cultural values associated with water.



The Urban Water theme aims at supporting the development of an Integrated Water Plan for Greater Adelaide, and will help to ensure that Water Sensitive Design forms an integral part of any current and future urban design. We are examining the use of alternative water sources for fit-for-purpose water supplies. This also includes options for stormwater harvesting, wastewater recycling and desalination. The Goyder Institute has made several contributions to-date to the development of the South Australian Stormwater Strategy and to the Urban Water Blueprint.

Outback Water Solutions

Planned and potential mining and energy development in South Australia's far north is set to have significant consequences for the water resources of the region. The scale of the planned developments and the potential from current exploration programs will result in a substantial increase in infrastructure requirements, and will require access to water resources and Aboriginal lands for exploration and potential mine developments. This is facilitated by the South Australian Government through the Plan for Accelerated Exploration (PACE) program.

The Goyder Institute G-FLOWS project will increase our knowledge about the character and variability of groundwater resources, the sustainability of the resources and the relationship to environmental and cultural assets. The outcomes of this project will enable prudent decision making and policies regarding water allocation, accounting, licensing, and sustainable yields whilst ensuring the protection of groundwater-dependant ecosystems and environmental assets.



Michele Akeroyd

The South East of South Australia

The water resources of the South East need to be managed as an integrated system recognising the interconnection between surface water and groundwater. Groundwater supports the economic base of the South East through irrigation, town and industry water supplies. The aim is to maximise the economic and social benefits of the regional water resources and to provide adequate environmental water to the region's wetland systems, natural discharge processes and contributions to the Coorong.

Water allocation entitlements should take into account recharge and discharge processes, water quality, connectivity with surface water and provision for environmental water requirements for significant environmental assets or dependencies.

We are investigating how water can be delivered to wetland systems in the Upper South East through the South East drainage system. Furthermore, we are helping to develop a revised management approach for the high value (low salinity) groundwater resources of the Lower South East.

The Climate Change theme is aimed at developing a set of downscaled climate projections for South Australia to support pro-active responses to climate change and to ensure a consistent cross-government approach to water resource planning and management. Progress to-date has led to an increased understanding of the primary climate drivers of the observed climate change and variability over South Australia.

In the Environmental Water theme we are concentrating on developing a detailed understanding of the ecosystems of our major water resources like the River Murray and the groundwater-fed system of wetlands in the South East of South Australia. These systems contain several Ramsar wetlands of international importance that require a robust integrated management approach to maintain the environmental values, while also achieving social and economic outcomes. The Goyder Institute has made significant contributions to public debate and government policy development through its reviews and assessments of likely outcomes of the proposed Murray-Darling Basin Plan.



Partners of the Goyder Institute for Water Research



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