

Safeguarding future groundwater use in South Australia

This project will create a modelling tool to predict how aquifers in the south east of South Australia could be used in the future given the demands of a range of industries. This will help prioritise the management of groundwater to avoid stress on this valuable resource.

KEY POINTS

- This project will develop and test a tool that will help optimise water management for aquifers in the Lower Limestone Coast area.
- A decision support framework will be created using modelling, stakeholder consultation and potential scenarios of future water use.
- The participation of people in regional industries will help decision-makers form equitable solutions for future water sharing.
- The framework will also take into account the effects of climate change and climate variability to ensure long-term sustainability is considered.
- Sources of risk to groundwater resources and uses in the region comprise groundwater extraction or interception, climate variability, drought and climate change.

Lower Limestone Coast – Prescribed Wells Area

The Lower Limestone Coast Prescribed Wells Area covers an area of 13,300 km² in the south east of South Australia. It incorporates Mt Gambier as its largest centre.

The study will focus primarily on the upper Tertiary Gambier Limestone Aquifer and the deeper Tertiary Confined Sand Aquifer.

Concerns over groundwater demands

Increasing pressure on groundwater resources is a key issue in the Lower Limestone Coast Prescribed Wells Area. While water allocation is currently within sustainable limits – apart from a number of localised hotspots where water is over-extracted or over-used – increasing demands on the groundwater system will likely exceed capacity in the future.

This could affect the amount of water available for irrigation and forestry uses, and other existing or new industries such as onshore gas, which have some water requirements.



Valuable groundwater resources are likely to face greater pressure in the future

Why a scientific approach is vital

Rainfall, climate variability and climate change, water usage, vegetation and drought all affect groundwater in the Lower Limestone Coast Prescribed Wells Area. Among these, groundwater use and interception by vegetation largely depend on agriculture and forestry, and to a smaller extent industries including pulp and paper mills, onshore gas and mining. Increasing pressures on groundwater resources will require water management strategies to be grounded in science and targetted towards resource efficiency and long-term sustainability.

Scientific evaluation of groundwater use and water balance is central to any decision making about future water management.

Any approach needs to account for the complex nature of the environmental, socioeconomic and hydrological impacts on the aquifers. This project will apply a methodology and tools for such an evaluation. The methodology and tools will be designed to provide the information needed to address critical goals in groundwater management.

Applying the methodology

This study integrates predictive modelling and multi-criteria analysis – analysis of a range of socioeconomic, environmental and hydrological criteria. It will use a baseline assessment of the current state of groundwater resources adapted from one developed in previous GISERA studies *Groundwater balance in gas development regions of south east South Australia*.

Researchers will consult regional stakeholders to help develop scenarios of different levels of groundwater development for irrigation, forestry, onshore gas and other industries. These scenarios will be used to estimate changes in groundwater levels and flows for each aquifer.

Sustainable management strategies for the aquifers, made using the various scenarios, will then be evaluated with input from regional stakeholders.

Developing long-term plans

The researchers will use the period between 2020 and 2050 as a timeframe for planning groundwater use and allocations, and will also consider a longer timespan (2020 to 2100) to assess climate change and the impacts of climate variability.

This ensures that management strategies are long term and that sustainability is considered while evaluating alternative strategies.

What is the project timeline?

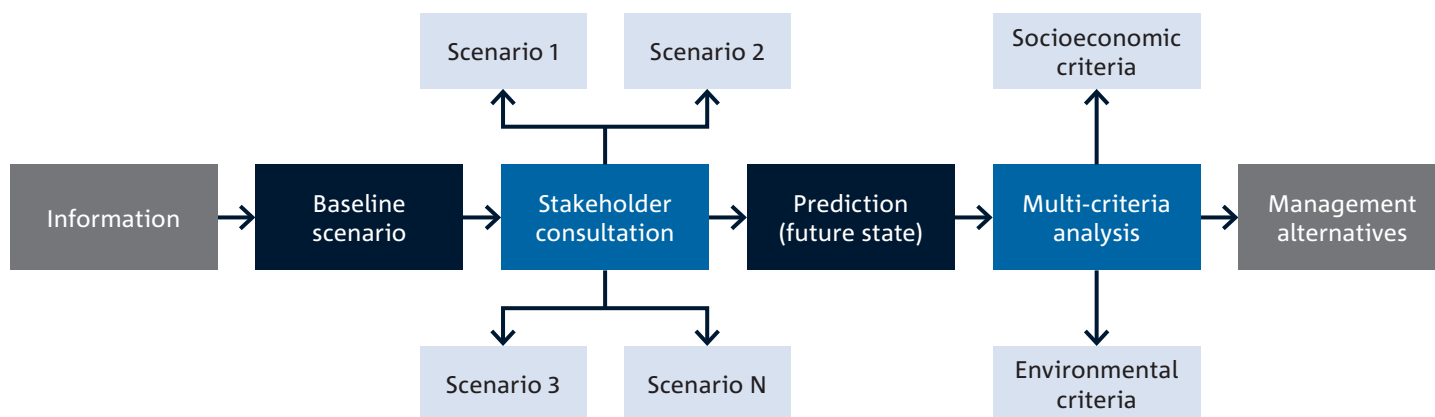
Mid-July 2020 – September 2022

When will the results be available?

Final reporting is expected in September 2022. All results will be published on the GISERA website.

Who is funding this project?

The project is co-funded by the Australian Government, the SA Government and CSIRO.



Proposed process for developing scenarios in the groundwater modelling study

ABOUT GISERA

The Gas Industry Social and Environmental Research Alliance (GISERA) is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research. Visit gisera.csiro.au for more information about GISERA's governance structure, projects and research findings.

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