Australia's National
Science Agency

GISERA | Gas Industry Social and Environmental Research Alliance

Annual Research and Development Plan, Budget and Summary

2024/25

Contents

Cover image: The magnificent Sawn Rocks in Mount Kaputar National Park in New South Wales are one of Australia's best examples of a rare volcanic rock formation called 'organ-piping'. Sawn Rocks provides a fascinating glimpse of the complex volcanic forces that have shaped the Narrabri region landscape, from the mountains to deep below the surface. While mountains may be easy to see, we need the latest science to understand what's happening below the earth's surface. The CSIRO, Australia's national science agency, is looking deeper into the Narrabri region, seeking to improve our knowledge of groundwater systems in the Gunnedah and Surat Basins. CSIRO's previous research in this area has generated important knowledge on the nature of these groundwater systems, and potential for connectivity between primary target seams for coal seam gas (CSG) development and agricultural aquifers. The current research project, funded through CSIRO's Gas Industry Social and Environmental Research Alliance, adopts a multi-disciplinary approach that combines existing data with targeted acquisition of new hydrochemistry, geochemistry, and geophysical survey data. This information will support future water resource management and decision-making in the region. Find out more about this project on the GISERA web site. Credit: Paul Cunningham.

About CSIRO's GISERA

Established in 2011, the CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA) undertakes publicly-reported, peer-reviewed social and environmental research on the impacts and opportunities arising from gas development, nationally.

Aims

The purpose of CSIRO's GISERA is to provide high-quality, independent scientific research and information to communities living in gas development regions. The research focuses on environmental and socio-economic topics including:

- Ground and surface waters
- Biodiversity
- Agriculture
- Social and economic impacts
- Health
- Greenhouse gases and air quality
- Land and infrastructure.

Objectives

GISERA's primary objectives are to:

- carry out independent research, and improve and extend knowledge of social and environmental impacts and opportunities of onshore gas projects, primarily for the benefit of communities living in gas development regions and the broader public
- inform governments, regulators and policy-makers about key issues regarding policy and legislative frameworks for the gas industry
- improve gas industry operations in regions where exploration and production activities are occurring.

Partners

CSIRO's GISERA is a national collaboration and partners with the Australian Government, the Governments of New South Wales, Queensland, South Australia and the Northern Territory.

Members of GISERA now include Australia Pacific LNG Pty Limited, Origin Energy Upstream Holdings Pty Limited, Santos Limited, QGC Pty Limited, Empire Energy Group Limited and Tamboran B2 Pty Ltd.

We also collaborate with universities and research institutes, nationally.

Governance

The GISERA governance model is central to ensuring independence and transparency in the research undertaken by CSIRO. State and Territory-based Research Advisory Committees are critical to GISERA's values and value proposition. With a majority of members who are not affiliated with the gas industry (Figure 1), the committees oversee and approve all research projects within GISERA, which contributes to further ensure CSIRO's independence. In addition, all GISERA research is carried out by independent CSIRO scientists, whose methods and outputs are subject to CSIRO's robust peer-review process.

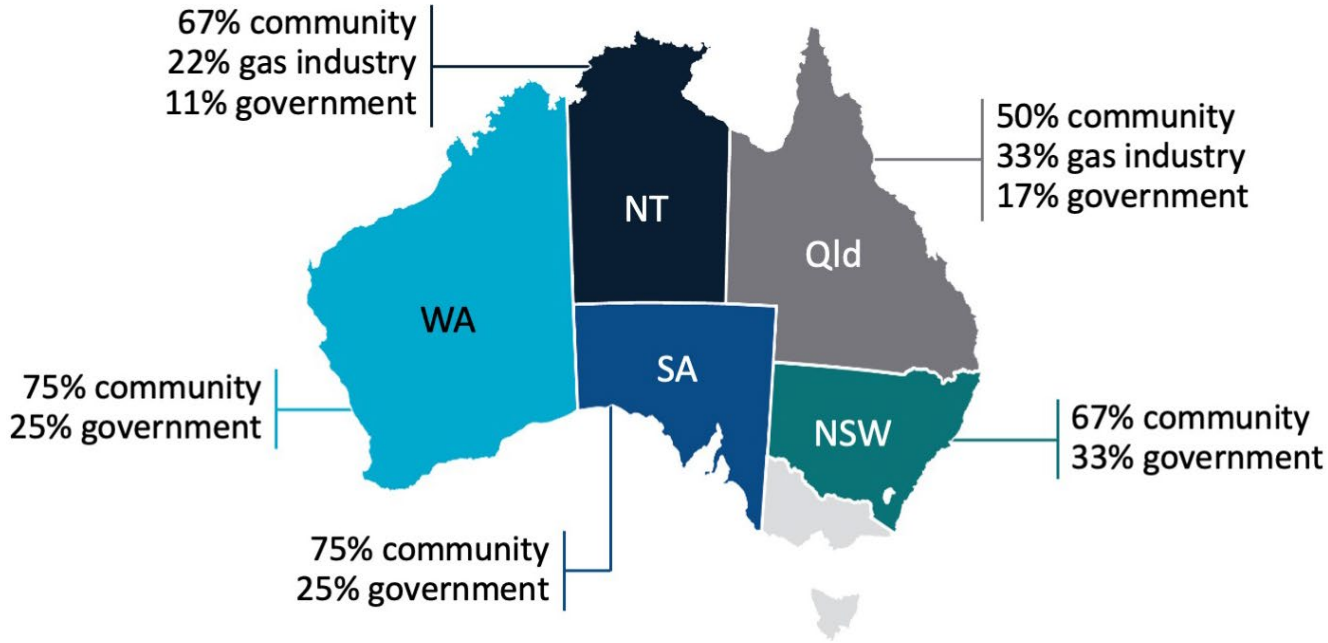

Figure 1 GISERA Research Advisory Committee composition across each of the states and territories

Director's summary

This is the thirteenth Annual Research and Development Plan, Budget and Summary of CSIRO's GISERA. It provides a summary of our research and communication activities and financial performance for the year ended 30 June 2024. It also provides our plan for 2024/25.

The 2023/24 financial year progressed with seven new projects approved taking the total number of GISERA projects to 96 and total research investment to $48,120,367[1] over the life of GISERA.

CSIRO ensures all output and activities during the year contribute to GISERA's ongoing credibility through the open and transparent conduct and communication of its research and synthesis activities. All GISERA results and research outputs, including scientific reports, journal papers and supporting communication products (such as factsheets, communiques and online articles), are available to view and download at www.gisera.csiro.au.

2023/24 At a glance

- 97 CSIRO researchers from 8 business units, across 16 sites throughout Australia delivering science for GISERA
- 42 research project collaborations
- 7 new projects developed, representing a research investment of $4,097,477
- 6 research projects completed
- 7 project reports published
- 83 citations on GISERA-generated scientific publications
- 15,117 website visits and 27,395 page views
- 4,485 video views
- 339 stakeholder engagements
- 17 fact sheets developed.
- 9 GISERA web site news articles
- 2 GISERA e-newsletters (September 2023 and March 2024)
- Deed of Accession executed to admit new partners Tamboran B2 Pty Ltd and Empire Energy Group Limited to GISERA.

[1] This includes CSIRO in-kind contribution.

Looking ahead

There are 28 existing projects currently in progress or planned to commence in 2024/25. Of these, 18 projects are scheduled for completion in 2024/25. The research results will be released with a suite of complementary communication products.

CSIRO, through its GISERA activities will continue to engage with stakeholders in each of the states and territories to learn about new or evolving areas of concern for communities in gas development regions associated with onshore gas development. Plans for the 2024/25 year include the development of the next tranche of research projects that will address the priority areas of concern.

The scale of GISERA research activity in CSIRO continues to increase, with the involvement of more than 243 researchers of the highest distinction and potential, over the life of GISERA and across the following CSIRO Business Units:

- Energy
- Environment
- Mineral Resources
- Agriculture & Food
- Health & Biosecurity
- Manufacturing
- Data61
- National Collections & Marine Infrastructure
- Space & Astronomy.

In 2024/25, we look forward to ongoing and increased research collaboration opportunities across Australia.

1 Research Advisory Committees' activities

1.1 Queensland

The Queensland Research Advisory Committee met in April 2024, resulting in:

- Approval of surface and groundwater project titled 'Understanding controls and constraints of potential microbially induced corrosion in onshore gas wells: microbes and geochemical conditions in aquifers of south-central Queensland'. This project is an extension of the GISERA project 'Queensland CSG well integrity: cements, steels and microbial activity', and aims to better understand the hazard of microbial activity on materials. This project will conduct a sampling campaign in Surat and Bowen basin region; collecting samples from CSG-related, agricultural and domestic aquifers of the region. The resultant data will provide valuable information on which microbes adhere to subsurface materials and their putative activities in south central Queensland. Together with the water chemistry data, this information will provide insights into the potential hazards and risks associated with Microbial Influence Corrosion in wells found in south central Queensland.
- Approval of surface and groundwater project titled 'Sources and mobility of gas in formations below the Walloon Coal Measures, Surat Basin, Queensland'. This project will collate existing data on the prevalence of gas in water supply (e.g. stock, agricultural and town water supplies) and water monitoring bores in aquifers underlying the Walloon Coal Measures to determine the current state of the system. The project will then aim to build on the existing understanding of the groundwater systems in these aquifers, investigate the sources of gas within them, and how they may be affected by non-CSG water extraction and CSG activities. The outcomes will allow for the establishment of a framework for future monitoring to validate whether the presence of gas in groundwater bores is increasing or not, what the source of any such gas is and whether CSG production activities are a contributing factor.
- Approval of surface and groundwater project titled 'Evaluation of beneficial reuse and disposal options for brine from the Surat and Bowen basins, Queensland'. This project will collate existing data and information on produced water and brine generated due to CSG activities in the Surat and Bowen basins, and conduct sampling and characterisation of brine from both basins. Using this data, scientists will review existing and emerging technologies and solutions for beneficial reuse, disposal and management options for brine and analyse technical and economic implications for the options identified.
- Approval of a biodiversity project titled 'Finding and assessing habitat for threatened species in terrestrial environments of the Cooper Basin: the importance of drought refuges'. This project will: use existing information to identify the potential location of drought refuges of focal threatened species; undertake field surveys at potential locations to confirm the presence of the target species; measure habitat attributes at each occupied drought refuge in order to quantify habitat condition; and develop approaches for assessing habitat quality condition for

each species that can be used by the gas industry when assessing potential sites and when monitoring habitat condition over time.

Two projects were completed during this reporting period:

- 'Methane contributions from holding ponds'
- 'Review of cements, steels and microbial activity for Qld CSG wells'

There are twelve projects currently underway or scheduled to commence and 34 projects complete in Queensland.

1.2 New South Wales

Out of session, the New South Wales Research Advisory Committee provided:

- Approval for variation to existing project 'Monitoring wellbeing and attitudes to CSG (pre-construction phase)'. Due to variation in Narrabri Gas Project proponent activities, a variation was approved to have a second survey to focus on likely impacts on wellbeing around the uncertainty of a major gas development in the Narrabri region.
- Approval not to proceed with yet to commence project 'Monitoring community wellbeing and attitudes to CSG in Narrabri (construction phase)' with all funds reversed for reallocation. Given variation in Narrabri Gas Project proponent activities, the NSW RAC decided to cancel this project.

There are six projects currently underway, and eleven projects complete in New South Wales.

1.3 South Australia

There were no South Australia Research Advisory Committee meetings held in 2023/24.

One project was completed during this reporting period:

- 'Microbial degradation of chemicals in aquifers of the Limestone Coast, SA - GISERA'

There are no projects currently underway with all ten projects now complete in South Australia.

1.4 Northern Territory

The Northern Territory Research Advisory Committee met in November 2023, resulting in:

- Stage gate / decision point approval for existing project 'Examination of stygofauna ecosystems of the Beetaloo Sub-basin' to proceed with an option which involved: an extended field campaign (for field trip 3); geophysical logging of cased bores to determine whether bores have intersected karstic features; and no drilling of new monitoring bores.

Three projects were completed during this reporting period:

- 'Fate of hydraulic fracturing fluids and geogenic hydrocarbons'

- ‘Managing impacts to biodiversity from roads and pipelines in the Beetaloo - GISERA’
- ‘Putting land management knowledge into practice - GISERA’

There are six projects currently underway, and twelve projects complete in the Northern Territory.

1.5 Western Australia

The Western Australia Research Advisory Committee met in November 2023, resulting in:

- Approval of a surface and groundwater project titled ‘Baseline groundwater and seismicity of northern Perth Basin.’ This project will monitor the occurrence and distribution of earthquakes (seismicity) and groundwater depths at which the ground is saturated with water across the northern Perth Basin in Western Australia. Scientists will use passive monitoring methods (seismic waves) to detect subtle changes in subsurface rock properties, primarily driven by fluctuations in groundwater depths within alluvial and confined aquifers. Research results will gather data that will distinguish between natural and anthropogenic factors causing variations in groundwater depths and seismic activity, and provide valuable insights that can help to improve water use management for the agricultural community, resources sector and regulators.
- Approval of a land and infrastructure project titled ‘Northern Perth Basin subsurface resources conflicts’. This project will provide a comprehensive framework that will offer valuable scientific advice for resources development in the northern Perth Basin, taking into account the physical, chemical and geological information characteristics of the region. Research results will identify potential conflicts of onshore gas development and any associated carbon capture and storage (CCS) development with groundwater use, other subsurface activities such as mining and geothermal, and land-use for agriculture and renewable energy.

The Western Australia Research Advisory Committee met again in April 2024, resulting in:

- Approval of socio-economic project titled ‘Community wellbeing and attitudes to the energy transition including onshore gas development in the North Perth Basin’. This project aims to provide an in-depth understanding of how energy infrastructure projects in the North Perth Basin region would affect the functioning and well-being of local communities.

There are four projects currently underway or scheduled to commence and two projects complete in Western Australia.

Project modifications and progress reporting

An approved research project consists of a Project Order and Budget that has been approved by the Research Advisory Committee.

During the execution of an approved project, changes and modifications to the Project Order and Budget may be submitted to the Director for consideration. The Director may approve minor modifications to Project Orders that do not significantly alter the proposed outcomes, and do not

have significant financial consequences for the project. The Director may consult the Research Advisory Committee about these modifications.

Major modifications to Project Orders that may involve significant financial consequences or significant change in project scope will be prepared in consultation with the Director and presented to the Research Advisory Committee for approval. Any changes made to Project Orders are available for public perusal on CSIRO GISERA's website www.gisera.csiro.au.

Research updates and progress against project milestones are reported quarterly. Variations, if any, are also included as this allows any variations/modifications to the Project Order to be tracked easily. Summaries of each project's progress against milestones and variations, as well as the original Project Order, are available on the GISERA website: www.gisera.csiro.au/research/.

2 Consolidated Budget

This is the thirteenth *GISERA Annual Research & Development Plan, Budget and Summary* and covers the financial year 2024/25.

The report objectives are to:

- Detail the contribution of each Partner to GISERA.
- Detail the contribution of government departments to GISERA.
- Include the committed research investment and expenditure for existing projects.
- Identify proposed research projects to be considered in the new financial year.

2.1 Consolidated Budget

2.1.1 Contributions and Grants

The committed financial contributions received from membership, in-kind, grants, funding agreements, APPEA and other industry contributions (separate from membership) over the life of GISERA is outlined in Table 2.1, and a summary of contributions by group shown in Figure 2.

Table 2.1 Incoming contributions and grants, by contributor, 2011/12-2023/24

GROUP	PAYMENT TYPE	CONTRIBUTOR	TOTAL
Industry	Membership	Australia Pacific LNG	**$10,900,000**
		QGC	**$1,750,000**
		Santos	**$1,500,000**
		AGL	**$287,500**
		Origin Energy	**$1,050,000**
		Pangaea Resources	**$150,000**
		Tamboran	**$225,000**
		Empire Energy	**$75,000**
	Contribution to project W11 (Air, water and soil impacts of hydraulic fracturing: Phase 1)	Australia Pacific LNG	**$245,670**
	Contribution to project W12 (Air, water and soil impacts of hydraulic fracturing: Phase 2)	Australia Pacific LNG	**$1,285,000**
	Contribution via APPEA to project GHG 1 (Methane Seepage in the Surat Basin)	Australia Pacific LNG, Santos, Arrow Energy & QGC	**$1,121,707**
Government	Grant	Federal Government	**$18,887,000**
		NSW Government	**$1,500,000**
		SA Government	**$1,000,000**
		QLD Government[2]	**$500,000**
		NT Government	**$1,400,000**
	Contribution to project GHG 5 (Baseline measurement and monitoring of methane emissions in the Beetaloo Sub-basin)	NT Government	**$305,297**
	In-kind contribution to project W34 (Baseline groundwater and seismicity of northern Perth Basin)	Geological Survey of WA (GSWA)	**$638,400**
	In-kind contribution to project W25 (Baseline seismic monitoring of the Canning Basin)	Geological Survey of WA (GSWA)	**$1,154,800**
	In-kind contribution to project W25 (Baseline seismic monitoring of the Canning Basin)	Geoscience Australia (GA)	**$300,000**
CSIRO	In-kind	CSIRO	**$17,009,127**

[2] QLD Government's grant to go towards the Health 2 project 'Potential health impacts from CSG'.

GROUP	PAYMENT TYPE	CONTRIBUTOR	TOTAL
Other	In-kind contribution to project L5 (Without a Trace)	University of Southern Queensland (USQ)	**$79,990**
	In-kind contribution to project W18 (Characterisation of the Stygofauna and microbial assemblages of the Beetaloo Sub-basin)	Charles Darwin University (CDU)	**$53,858**
TOTAL			**$61,418,349**

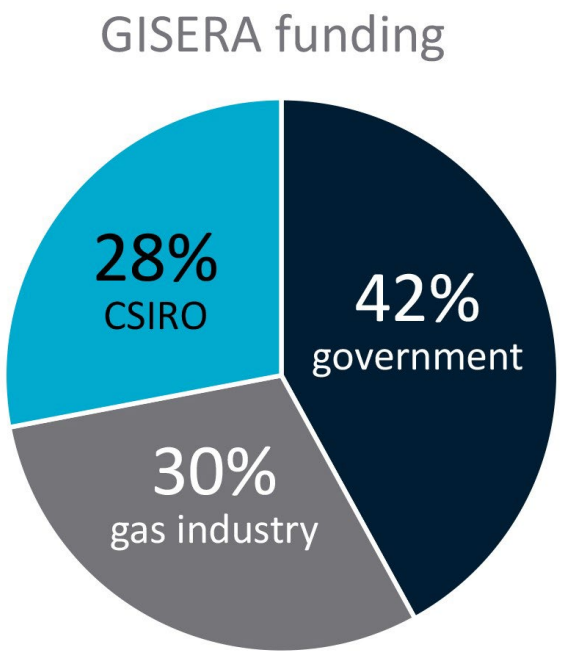

Figure 2 Committed contribution over life of GISERA, by group[3]

[3] The 0.22% contribution from universities has been included in table 2.1, but not included in this pie chart.

2.1.2 Committed Research Investment

The committed budget for projects across all regions for 2011/12-2026/27 now stands at $48,120,367. A breakdown of the committed research budget for the various research subject areas, and each state and territory are provided in Tables 2.2 and 2.3, respectively. Figure 3 shows the portion committed to each research subject area and Figure 4 shows the portion committed to each region.

Table 2.2 Committed research investment across all regions, by research subject area, 2011/12-2026/27

RESEARCH SUBJECT AREA	TOTAL RESEARCH INVESTMENT
Surface and groundwater	**$20,927,209**
Biodiversity	**$6,156,096**
Greenhouse gases and air quality	**$6,012,717**
Social and economic impacts	**$5,183,866**
Land and infrastructure	**$3,793,197**
Agricultural	**$3,475,390**
Health	**$2,571,892**
Total	**$48,120,367**[4]

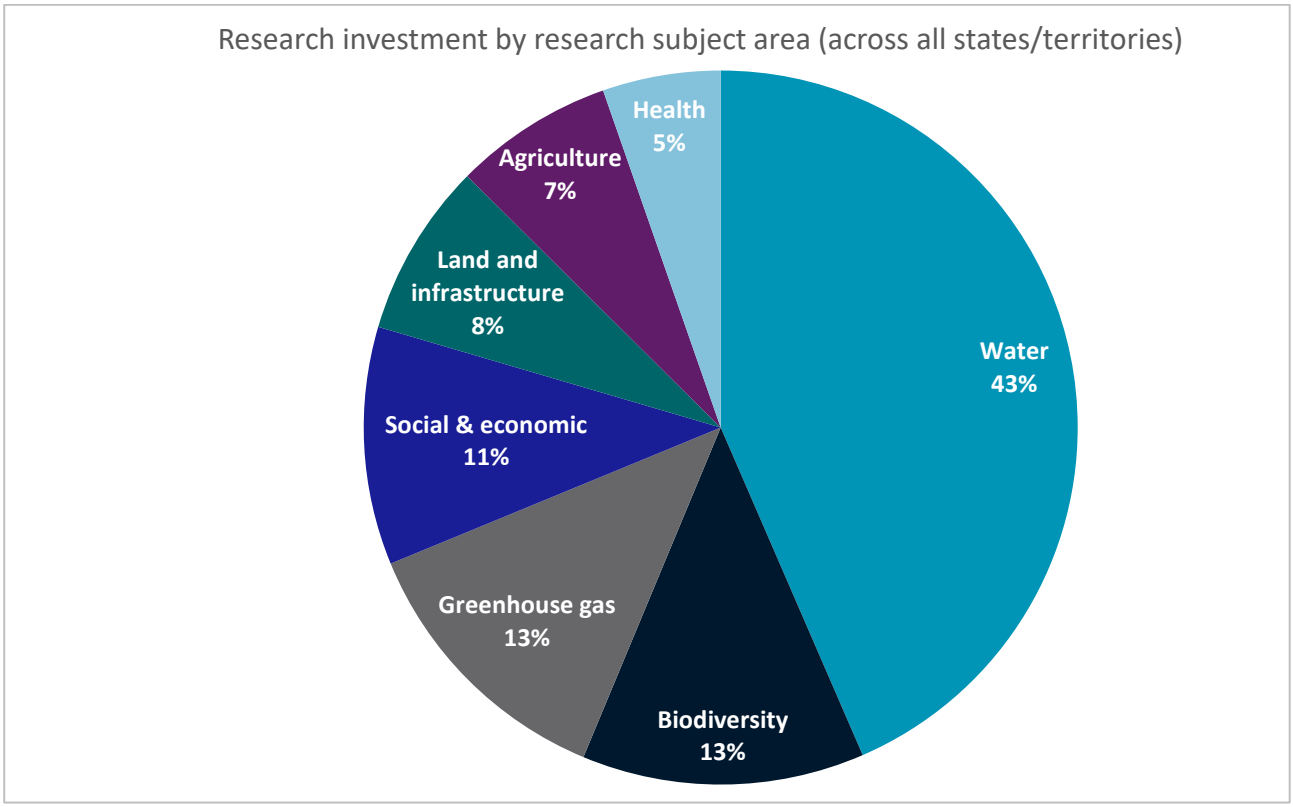

Figure 3 Committed research investment across all states/territories, by research subject area, 2011/12-2026/27

[4] These figures do not include funds for the GISERA Director's office and communications.

Table 2.3 Committed research investment across by state/territory, 2011/12-2026/27

STATE / TERRITORY	TOTAL RESEARCH INVESTMENT
Queensland	**$26,019,379**
Northern Territory	**$8,168,845**
New South Wales	**$7,084,220**
Western Australia	**$4,177,653**
South Australia	**$2,670,270**
Total	**$48,120,367**

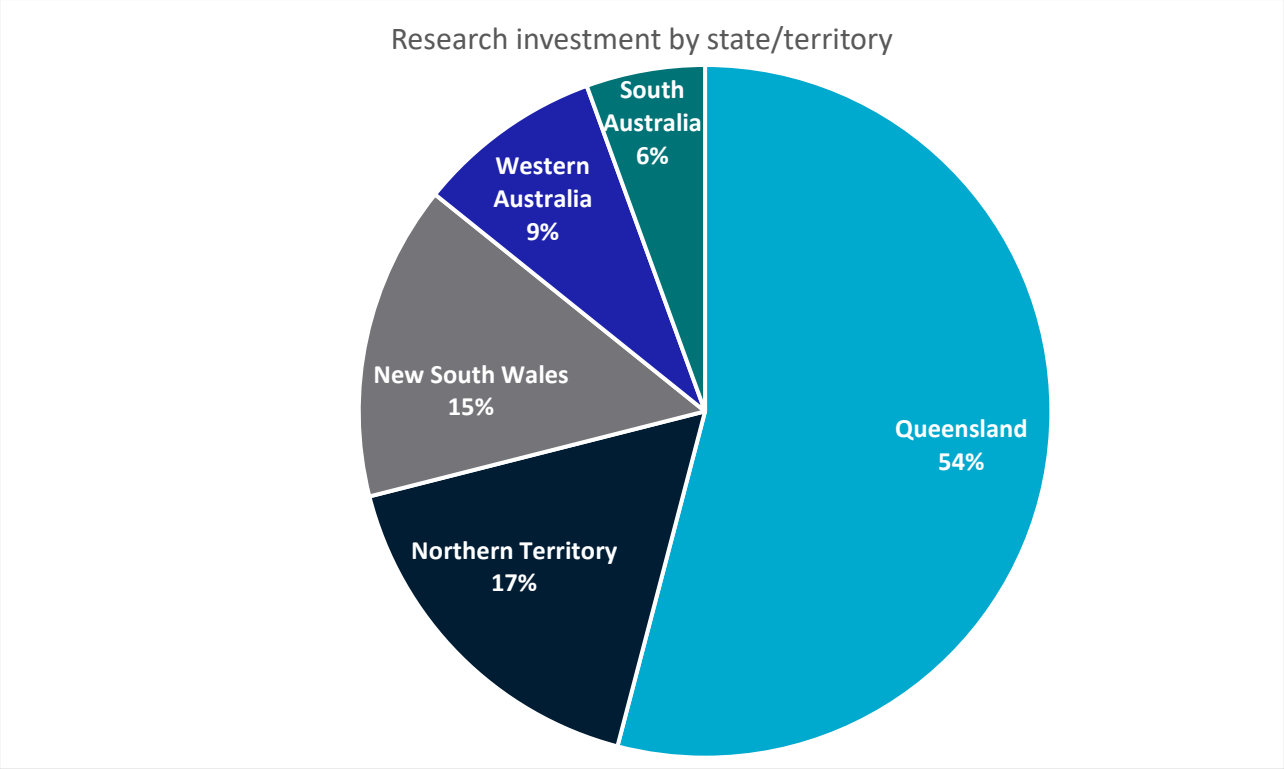

Figure 4 Committed research investment, by state/territory 2011/12-2026/27

2.2 Research projects by region

GISERA's integrated research program and regional focus ensures that its research identifies cumulative impacts from onshore gas developments and informs coordinated responses across industry, community and government.

Figure 5 shows the total number of research projects[5] in each state and territory over the life of GISERA.

Figure 5 Number of research projects in each active state and territory

[5] GISERA's research portfolio comprises a total of 96 projects, which includes a jointly funded QLD and NSW project. The figures presented in this map account for this project in both states.

Table 2.4 Research projects across Australia currently underway or due to commence

RESEARCH AREA	PROJECT
Surface and groundwater	• Review of beneficial reuse or end-use options for brine from the NGP region (NSW) • Microbial communities and their ability to degrade prospective chemicals used in coal seam gas activities (NSW) • Geochemical modelling and geophysical surveys to refine understanding of connectivity between coal seams and aquifers (NSW) • Groundwater modelling and predictive analysis to inform CSG impact assessment, monitoring and management (NSW) • Cooper Creek flood modelling scenarios (QLD) • Examination of stygofauna ecosystems of the Beetaloo Sub-basin (NT) • Environmental baseline characterisation of springs in Hot Springs Valley (NT) • Establishing Baseline Groundwater & Natural Seismicity levels across the northern Perth Basin with Passive Seismic Data (WA) • Understanding controls and constraints of potential microbially induced corrosion in onshore gas wells (QLD) • Sources and mobility of gas in formations below the Walloon Coal Measures (QLD) • Beneficial reuse and disposal options for brine from the Surat and Bowen basins (QLD)
Social and economic	• Monitoring community wellbeing and attitudes to CSG in Narrabri (pre-construction phase) (NSW) • Trends in community wellbeing and attitudes to CSG development – Comparisons across industry phases from 2014 to 2024 (QLD) • Evaluating medium-term socio-economic impacts of onshore gas activity in Southern Queensland (QLD) • Community wellbeing and attitudes to conventional gas development in the North Perth Basin (WA)
Greenhouse gases and air quality	• Methane emissions quantification of well drilling to completion processes in Beetaloo Sub-basin (NT) • Key controls or contributors to methane emissions from CSG water holding ponds (QLD) • Comprehensive survey of methane emissions from Queensland coal seam gas water holding ponds in the Surat Basin (QLD) • Using carbon and hydrogen isotopes to fingerprint sources of methane emissions from the Western Downs Region in the Surat Basin (QLD)
Biodiversity	• Remote sensing and threatened species surveys to better understand risks of forest fragmentation from the Narrabri Gas Project (NSW) • UAV–LiDAR and spaceborne remote sensing for site survey and habitat condition monitoring in the Beetaloo (NT) • Identifying drought refuges for terrestrial species in the Cooper Basin (QLD)
Health	• Exposure assessment of identified chemicals used in CSG activities (QLD) • Analysis of dust near CSG sites to assess potential for respirable crystalline silica (QLD)
Land and infrastructure	• Baseline seismic monitoring of the Canning Basin (WA) • Background Seismicity of Beetaloo Sub-Basin and Seismic Hazard (NT) • Beetaloo basin shale long-term competency after decommissioning (NT) • Assessment of potential conflicts of subsurface resources development in the North Perth Basin (WA)

Details on already completed projects can be found below in each of the state and territory sections.

3 Queensland R&D Plan & Budget

3.1 Queensland Investment profile

3.1.1 Committed research investment for 2011/12-2025/26

The committed budget for projects in Queensland for 2011/12-2025/26 now stands at $26,019,379. A breakdown of the committed research budget across the various research subject areas is provided in Table 3.1 and Table 3.2 shows the investment committed by contributor.

Table 3.1 Committed research investment in Queensland by research subject area, 2011/12-2025/26

TOPIC	TOTAL RESEARCH INVESTMENT
Surface and groundwater (36%)	**$9,261,169**
Biodiversity (17%)	**$4,529,609**
Greenhouse gases and air quality (16%)	**$4,137,490**
Agriculture (11%)	**$2,809,166**
Social & economic (10%)	**$2,606,884**
Health (9%)	**$2,299,368**
Land and infrastructure (1%)	**$375,693**
Total	**$26,019,379**

Table 3.2 Committed research investment in Queensland by contributor, 2011/12-2025/26

CONTRIBUTOR	CONTRIBUTION TYPE	TOTAL RESEARCH CONTRIBUTION
Australia Pacific LNG (43.4%)	GISERA Membership	**$9,477,089**
	Contribution via APPEA to project GHG 1 (Methane Seepage in Surat Basin)	**$280,427**
	Contribution to project W11 (Air, water and soil impacts of HF: Phase 1)	**$245,670**
	Contribution to project W12 (Air, water and soil impacts of HF: Phase 2)	**$1,285,000**
QGC (6.8%)	GISERA Membership	**$1,494,157**
	Contribution via APPEA to project GHG 1 (Methane Seepage in Surat Basin)	**$280,427**
Santos (1.1%)	Contribution via APPEA to project GHG 1 (Methane Seepage in Surat Basin)	**$280,427**
Arrow Energy (1.1%)	Contribution via APPEA to project GHG 1 (Methane Seepage in Surat Basin)	**$280,427**
Origin (0.9%)	GISERA Membership	**$228,763**
Federal Govt (16.2%)	Grant	**$4,210,524**
Qld Govt (1.9%)	Grant	**$500,000**
CSIRO (28.3%)	In-kind	**$7,376,478**
USQ (0.3%)	In-kind contribution to project L5 (Without a Trace)	**$79,990**
Total		**$26,019,379**

3.1.2 Queensland Current Research Portfolio

A summary of all approved research projects in Queensland is provided in Table 3.3

Table 3.3 Approved Queensland Research Projects

RESEACH AREA	PROJECT	STATUS
Surface and groundwater	Geochemical responses to re injection - understand and quantify aquifer reactions occurring due to re-injection of CSG water, and their impacts on water quality.	Completed
	Re-injection of CSG water - understand, quantify and manage clogging of injection wells during re-injection of CSG water permeates, brines and blends.	Completed
	High performance groundwater modelling - determine the feasibility of large scale re-injection schemes.	Completed
	Isotope and geochemical groundwater baseline study - characterise the baseline geochemistry of groundwater and formation water prior to and during initial stages of development to understand groundwater age and origin.	Completed
	Hydrocarbons in groundwater, Surat and Bowen basins - review and assess the presence of organic compounds in groundwater found in the Surat and Bowen basins using existing open source and company held data.	Completed
	Constraining water flows in the Surat Basin - measuring and modelling specific chemicals called environmental tracers to gain a better understanding of the speed and direction of groundwater flow.	Completed
	Groundwater contamination risk assessment - assess the likelihood of groundwater contamination from hydraulic fracturing and wellbore damage.	Completed
	Air, water and soil impacts of hydraulic fracturing (Phase 1) - to design an intensive monitoring campaign that will measure the air, water and soil impacts of hydraulic fracturing of production wells in the Surat Basin.	Completed
	Air, water and soil impacts of hydraulic fracturing (Phase 2) - undertake a comprehensive monitoring campaign to measure the air, surface water groundwater and soil impacts of hydraulic fracturing of gas production wells in the Surat Basin, Queensland.	Completed
	Cooper Creek flood modelling scenarios - to deliver outputs from targeted flood modelling scenarios developed in response to on-going engagement with stakeholders in the Cooper GBA region.	Near completion
	Microbial activity in the subsurface - understanding controls and constraints of potential microbially influenced corrosion in onshore gas wells in the Surat and Bowen basins, Queensland.	To commence in 24/25
	Sources and mobility of gas in formations below the Walloon Coal Measures - investigating the potential impacts of CSG production in the Surat Basin in southeast Queensland on important water supply aquifers that underlie the target coal seams in the Walloon Coal Measures.	To commence in 24/25

RESEACH AREA	PROJECT	STATUS
Surface and groundwater	Beneficial reuse and disposal options for brine in Queensland - review beneficial reuse and disposal options for brine produced from CSG operations in Queensland's Surat and Bowen basins	To commence in 24/25
Social and economic	Monitoring regional transition - synthesise existing knowledge on the nature of rural socio-economic transitions occurring as a result of resource developments, and track the social impacts of regional economic change.	Completed
	Community functioning and well-being - identify principal indicators of community function and well-being, the resources and strategies necessary for enabling and enhancing community responses, and how communities respond to major developments in their region.	Completed
	Economic assessment and forecasting project -understand future impacts on regional economies and how local businesses can respond.	Completed
	Understanding community aspirations - identify community aspirations and their overlaps and/or disparities with existing resources, industry, and policy trajectories. Specifically, to understand how different community segments see the future of the region and how these reflect the economic and policy avenues for the region.	Completed
	Community function and well-being survey 2 - conduct a community well-being survey to measure the changes since the end of the construction and start of the operations phases and compare results with the Survey 1 in 2014.	Completed
	Trends in community wellbeing and attitudes to CSG development – Survey 3 - monitoring and communicating the changes and trends in community wellbeing, resilience and attitudes to CSG development across different phases of industry operation in south west Queensland, and identifies how these vary between the construction, post-construction, and operations phases of development.	Completed
	Community wellbeing and attitudes to CSG development - 2014 to 2024 – Survey 4 - Identifying trends in community wellbeing and attitudes to CSG development in south-west Queensland - from the construction phase to a fully operational phase.	Underway
	Evaluating medium-term socio-economic impacts of onshore gas activity in Southern Queensland - study a range of potential positive and negative social, demographic and economic impacts that are commonly linked to onshore natural gas extraction activity, across the regions of the Surat and Bowen basins, in southern Queensland.	Near completion
Greenhouse gases and air quality	Methane seepage in the Surat Basin - detect and measure methane seeping from underground in the Surat Basin, and identify sources of methane to provide a baseline of methane emissions on a regional scale.	Completed
	Greenhouse gas emission assessment of the Surat Basin Gas Reserve - analysis of the whole of life cycle GHG emissions, including extraction, transportation and usage of CSG in the Surat Basin.	Completed

RESEACH AREA	PROJECT	STATUS
Greenhouse gases and air quality	Ambient air quality in the Surat Basin - comprehensive assessment of air quality in the Surat Basin region in Queensland using air quality measurement network and modelling.	Completed
	Methane contributions from holding ponds - A desktop study to identify emissions potential and controls in CSG holding ponds and aquatic systems in Queensland	Completed
	Addressing knowledge gaps on key controls or contributors to methane emissions from CSG water holding ponds in the Surat Basin, Queensland - the data will focus on the role that methane generating and eating microbes, algae, brine and sediment play in the methane emission contributions of water holding ponds.	Underway
	Comprehensive survey of methane emissions from Queensland coal seam gas water holding ponds in the Surat Basin - select multiple representative CSG holding ponds to accurately quantify methane emissions, in both summer and winter, using rigorous sampling methods to minimise known methane measurement limitations.	Underway
	Using carbon and hydrogen isotopes to fingerprint sources of methane emissions from the Western Downs Region in the Surat Basin, Queensland - conduct isotopic fingerprinting of methane at various sites (including gas industry, agricultural, wastewater treatment, swamps, natural seeps, landfills).	Underway
Agriculture	Preserving agricultural productivity - assist in the preservation of agricultural productivity during land use change.	Completed
	Shared space - understand how farmers from a range of production systems (extensive grazing to intensive cropping) perceive and value CSG developments on their and others' farms.	Completed
	Gas farm design - understand how to design farms for a new mixed land use.	Completed
	Making tracks, treading carefully - understand the direct and indirect impacts of tracks and traffic on invasive species and erosion in agricultural landscapes.	Completed
	Without a trace - identify the nature and likely extent of damage to agricultural soils, and methods for avoiding and improving soils.	Completed
	Telling the story - Share understanding of changes on farms and in towns during CSG development in the Surat area.	Completed
	CSG and Livestock – Inside the Herd - monitoring grazing land with CSG infrastructure to better understand the impacts of CSG infrastructure, traffic and dust on animals and pastures.	Completed
Biodiversity	Priority threat identification, management and appraisal - identify and understand the broad range of existing and new threats to biodiversity across a CSG development region.	Completed

RESEACH AREA	PROJECT	STATUS
Biodiversity	Fire ecology of grassy woodlands - determine the sensitivity of the region's flora and fauna to changed fire regimes, and the thresholds at which changed fire regimes cause substantial ecological impact.	Completed
	Habitat selection by two focal species - study two species, the Golden-tailed gecko and Glossy black-cockatoo, to assess the range of impacts from CSG development in south-west Queensland on their habitat.	Completed
	Ensuring biodiversity offset success: the right kind of seed for a rare daisy - Identify genetic and demographic factors that may limit the success of establishing a rare daisy (*Rutidosis lantana*) in a new location.	Completed
	Guidelines for offset population sizes - improve the understanding of how ecological and biological traits of rare species of plants, commonly encountered in restoration projects, and different environmental factors determine viable population sizes by using computer models.	Completed
	Sustaining turtles and their homes - understand how sediments from dredging and discharges affect seagrass and turtles.	Completed
	Identifying drought refuges for terrestrial species in the Cooper Basin - applying knowledge from aquatic environments to better manage terrestrial environments during natural gas exploration and development in the Cooper Basin, Queensland	To commence in 24/25
Health	Potential health impacts from CSG - establish processes and governance to ensure research quality, define the project boundary, conduct hazard identification and exposure pathways, and screen data.	Completed
	Exposure assessment of identified chemicals used in CSG activities - screen and appraise the ~50 chemicals, and conduct microbial degradation trials to identify persistent chemicals requiring further in-depth assessment. Undertake a comprehensive sampling campaign at specific wells and surface water bodies to determine the presence or absence of these COPCs.	Underway
	Analysis of dust near CSG sites to assess potential for respirable crystalline silica - assess current composition of dust and size distributions of the different constituents in the study area to determine the abundance of RCS. Results will be compared against samples collected at the same time from reference sites which are not impacted by the CSG operation.	Underway
Land and Infrastructure	Review of cements, steels and microbial activity for Qld CSG wells - bring together current and historic information on steels, cements and microbial processes that may impact CSG well integrity.	Completed

3.1.3 Queensland Research Progress and Expenditure

The committed Queensland research budget, expenditure and milestones completed for each project is provided in Table 3.4 (* = completed projects).

Table 3.4 Committed research investment, expenditure and progress in Queensland, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[6]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Surface and groundwater	Geochemical responses to re-injection*	$1,061,242	$1,126,356	106%	100%
	Re-injection of CSG water*	$1,039,989	$1,085,085	104%	100%
	High performance groundwater modelling*	$928,215	$1,024,173	110%	100%
	Isotope and geochemical groundwater baseline study*	$667,053	$709,848	106%	100%
	Hydrocarbons in groundwater, Surat & Bowen basins*	$257,694	$568,722	221%	100%
	Constraining groundwater flow models*	$588,957	$732,651	124%	100%
	Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction*	$290,624[7]	$293,542	101%	100%
	Air, water and soil impacts of hydraulic fracturing (Phase 1)*	$330,795[8]	$351,433	106%	100%
	Air, water and soil impacts of hydraulic fracturing (Phase 2)*	$2,111,055[9]	$2,153,095	102%	100%
	Cooper Creek flood modelling scenarios	$503,797	$294,492	58%	50%
	Microbial activity in the subsurface	$365,332	$0[10]	0%	0%
	Sources and mobility of gas in formations below the Walloon Coal Measures	$857,550	$0[11]	0%	0%
	Beneficial reuse and disposal options for brine in Queensland	$447,770	$0[12]	0%	0%

[6] Any expenditure exceeding 100% represents an additional CSIRO contribution.

[7] This is a jointly funded QLD and NSW project. The figures presented in this table are for 'total project costs' and not split by region.

[8] This includes $245,670 contribution from APLNG (separate from membership).

[9] This includes $1,285,000 contribution from APLNG (separate from membership).

[10] This is a newly approved project. Expenditure will be incurred in 2024/25.

[11] This is a newly approved project. Expenditure will be incurred in 2024/25.

[12] This is a newly approved project. Expenditure will be incurred in 2024/25.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[6]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Social and economic	Monitoring regional transition*	$376,088	$404,084	107%	100%
	Community functioning and well-being*	$417,438	$457,314	110%	100%
	Economic assessment and forecasting project*	$296,508	$299,971	101%	100%
	Understanding community aspirations*	$342,692	$341,821	100%	100%
	Community function and well-being survey 2*	$180,479	$190,269	105%	100%
	Trends in community wellbeing and attitudes to CSG development - survey 3*	$240,474	$243,795	101%	100%
	Community wellbeing and attitudes to CSG development – 2014 to 2024	$462,426	$142,073	31%	40%
	Evaluating medium-term socio-economic impacts of onshore gas activity in Southern Queensland	$290,779	$286,767	99%	80%
Greenhouse gases and air quality	Methane seepage in Surat Basin*	$2,015,937[13]	$2,293,692	114%	100%
	Greenhouse gas (GHG) emission assessment of the Surat Basin Gas Reserve*	$241,708	$318,256	132%	100%
	Ambient air quality in the Surat Basin*	$541,771	$605,517	112%	100%
	Methane contributions from holding ponds (Phase 1)*	$112,504	$112,504	100%	100%
	Key controls or contributors to methane emissions from CSG water holding ponds (Phase 2)	$419,771	$60,698	14%	0%
	Methane emissions from CSG water holding ponds in Queensland (Phase 2)	$325,411	$66,541	20%	15%
	Sources of methane emissions from the Western Downs Region	$480,388	$104,600	22%	20%
Agriculture	Preserving agricultural productivity*	$547,756	$538,532	98%	100%
	Shared space*	$140,445	$138,805	99%	100%
	Gas farm design*	$651,329	$626,057	96%	100%
	Making tracks, treading carefully*	$564,089	$578,197	103%	100%
	Without a trace*	$339,990[14]	$339,990	100%	100%

[13] This includes $1,121,707 combined contribution from APLNG, QGC, Santos and Arrow (separate from membership).

[14] This includes $79,990 in-kind contribution from USQ.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[6]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Agriculture	Telling the story*	$332,224	$329,234	99%	100%
	CSG & Livestock- Inside the herd*	$233,333	$239,628	103%	100%
Biodiversity	Priority threat identification, management and appraisal*	$945,400	$995,144	105%	100%
	Fire ecology of grassy woodlands*	$789,042	$840,016	106%	100%
	Habitat selection by two focal species*	$167,432	$204,990	122%	100%
	Ensuring biodiversity offset success: the right kind of seed for a rare daisy*	$198,055	$225,232	114%	100%
	Guidelines for offset population sizes*	$198,630	$200,326	101%	100%
	Sustaining turtles and their homes*	$1,693,199	$1,802,905	106%	100%
	Identifying drought refuges for terrestrial species in the Cooper Basin	$537,852	$0[15]	0%	0%
Health	Potential health impacts from CSG*	$1,124,423	$1,128,787	100%	100%
	Exposure assessment of identified chemicals used in CSG activities	$597,742	$520,795	87%	50%
	Analysis of dust near CSG sites to assess potential for respirable crystalline silica	$577,203	$329,395	57%	20%
Land and infrastructure	Review of cements, steels and microbial activity for Qld CSG wells*	$375,693	$379,894	101%	100%
TOTAL ALLOCATED BUDGET		**$26,019,379**			

**These projects have been completed and their reports are available at* www.gisera.csiro.au

[15] This is a newly approved project. Expenditure will be incurred in 2024/25.

3.2 Queensland research ideas being discussed for 2024/25

The following project ideas (Table 3.5) are being discussed but are yet to be ratified and are subject to review by the relevant Research Advisory Committee. Over coming months further stakeholder consultation will occur aiming to prioritise these research ideas in relation to other community issues.

Table 3.5 Future research ideas in Queensland for 2024/25

RESEARCH AREA	IDEA	BASIN	ESTIMATED COST
Land and Infrastructure	This project would extend on the findings of the 'Queensland CSG well integrity: cements, steels and microbial activity' project to look at the time dependent integrity of cement used in well completion in the Surat and Bowen Basins in Queensland.	Multiple	$350K

4 NSW R&D Plan & Budget

4.1 NSW Investment profile

4.1.1 Committed research investment for 2016/17-2025/26

The committed budget for projects in New South Wales for 2016/17-2025/26 now stands at $7,084,220. A breakdown of the committed research budget across the various research subject areas is provided in Table 4.1 and Table 4.2 shows the investment committed by contributor.

Table 4.1 Committed research investment in NSW by research subject area, 2016/17-2025/26

RESEARCH AREA	TOTAL RESEARCH INVESTMENT
Water (65%)	**$4,558,343**
Social & economic (18%)	**$1,296,738**
Biodiversity (11%)	**$801,252**
Health (4%)	**$272,524**
Greenhouse gas and air quality (2%)	**$155,363**
TOTAL	**$7,084,220**

Table 4.2 Committed research investment in NSW by contributor, 2016/17-2025/26

CONTRIBUTOR	CONTRIBUTION TYPE	TOTAL RESEARCH CONTRIBUTION
Federal Government (55.4%)	Grant	**$3,927,053**
NSW Government (12.8%)	Grant	**$908,143**
CSIRO (24.2%)	In-kind	**$1,712,658**
Santos (4.4%)	GISERA Membership	**$315,229**
AGL (3.1%)	GISERA Membership	**$221,137**
TOTAL		**$7,084,220**

4.1.2 NSW Current Research Portfolio

A summary of all approved research projects in NSW is provided in Table 4.3

Table 4.3 Approved NSW Research Projects

RESEACH AREA	PROJECT	STATUS
Surface and Groundwater	Impacts of CSG depressurization on Great Artesian Basin flux - improve the understanding of the GAB groundwater flow in the Pilliga region through integration of existing information from models, hydrochemical data and environmental tracers.	Completed
	Spatial design of groundwater monitoring network in the Narrabri Gas Project area - analysis and design of groundwater bore networks for optimal groundwater monitoring and early detection of changes.	Completed
	Improving groundwater models to better represent coal seam gas extraction impacts in the Namoi region - develop more representative models for estimating the groundwater impacts from coal seam gas well fields.	Completed
	Groundwater contamination risk assessment - Assess the likelihood of groundwater contamination from hydraulic fracturing and wellbore damage.	Completed
	Assessment of faults as potential connectivity pathways - improve understanding of sub-surface structures and potential fault zones that may act as pathways between target coal seams and shallow aquifers or surface water systems, and by helping to further improve the accuracy of future groundwater models in the Narrabri region.	Completed
	Microbial communities and their ability to degrade prospective chemicals used in coal seam gas activities - this research will help improve understanding of the fate of chemical compounds used in coal seam gas (CSG) activities in the region if these compounds were to come into contact with the environment.	Near completion
	Geochemical modelling and geophysical surveys to refine understanding of connectivity between coal seams and aquifers - this project will further improve our knowledge of groundwater systems in the Gunnedah and Surat Basins in the Narrabri region and refine the conceptual understanding of potential for hydrogeological connectivity pathways between shallow aquifers.	Underway
	Groundwater modelling and predictive analysis to inform CSG impact assessment, monitoring and management - this project will undertake independent groundwater modelling and predictive analyses to inform coal seam gas groundwater impact assessment and regulatory monitoring and management in the Narrabri Gas Project area.	Underway
	Review of beneficial reuse or end-use options for brine from the Narrabri Gas Project region - collate existing data on brine and salt management in the region; review existing and emerging technologies and solutions; analyse the costs and benefits of brine reuse and end-use options.	Near completion

RESEACH AREA	PROJECT	STATUS
Social and Economic	Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations - identify current levels and trajectories of economic, social and demographic variables in CSG regions within NSW and analyse whether or not the CSG industry could change the trajectory of these variables.	Completed
	Social baseline assessment of the Narrabri region of NSW in relation to CSG development - Understand and measure attitudes, perceptions and expectations that exist within the community with respect to CSG development, and current levels of community wellbeing and community resilience.	Completed
	Decommissioning pathways for CSG projects - Review regulatory frameworks in relation to principles derived from international literature and consider social concerns with regard to decommissioning of wells and well pad infrastructure.	Completed
	Assessing and projecting on-shore gas effects on regional economic activity - this project will analyse the influence of the NSW on-shore gas industry on regional economic and social indicators, and use economic models to generate descriptions of potential future effects for NSW.	Completed
	Monitoring community wellbeing and attitudes to CSG in Narrabri (pre-construction phase) - this project will monitor any changes in local community wellbeing and attitudes to coal seam gas (CSG) during the pre-construction phase of the Santos Narrabri Gas Project in NSW.	Underway
Greenhouse gases and air quality	Regional Methane Emissions in NSW CSG Basins - this project will identify and quantify methane emission sources such as CSG infrastructure, feedlots, coal mining, legacy bore holes in the Pilliga region.	Completed
Health	Potential human health effects of coal seam gas (study framework) - review current information to design a study on the health effects of CSG activities based on community stakeholder, governmental, expert consultation group, and industry input.	Completed
Biodiversity	Remote sensing and threatened species surveys to better understand risks of forest fragmentation from the Narrabri Gas Project - determine how fragmentation resulting from NGP land clearing activities will add to the existing impacts from prior land use fragmentation on biodiversity in the region.	Underway

4.1.3 NSW Research Progress and Expenditure

The committed New South Wales research budget, expenditure and milestones completed for each project is provided in Table 4.4 (* = completed projects).

Table 4.4 Committed research investment, expenditure and progress in NSW, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[16]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Surface and groundwater	Impacts of CSG depressurisation on the Great Artesian Basin flux*	$429,859	$429,859	100%	100%
	Data- worth analysis and spatial design of groundwater monitoring networks in the NGP area*	$216,218	$217,613	101%	100%
	Improving groundwater models to better represent CSG extraction impacts in Namoi region*	$301,295	$301,834	100%	100%
	Water contamination risk assessment on hydraulic fracturing in unconventional gas extraction*	$290,624[17]	$293,542	101%	100%
	Assessment of faults as potential connectivity pathways*	$234,930	$235,462	100%	100%
	Microbial communities and their ability to degrade prospective chemicals used in CSG activities	$545,271	$534,666	98%	70%
	Geochemical modelling and geophysical surveys to refine understanding of connectivity between coal seams and aquifers	$1,124,719	$762,422	68%	50%
	Groundwater modelling and predictive analysis to inform CSG impact assessment, monitoring and management	$1,194,385	$502,601	42%	30%
	Review of beneficial reuse or end-use options for brine from the NGP region*	$322,760	$319,029	99%	100%
Social and economic	Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations*	$103,694	$103,694	100%	100%
	Social baseline assessment of the Narrabri region of NSW in relation to CSG development*	$272,292	$320,467	118%	100%
	Decommissioning CSG Wells*	$298,876	$299,012	100%	100%

[16] Any expenditure exceeding 100% represents an additional CSIRO contribution.

[17] This is a jointly funded QLD and NSW project. The figures presented in this table are for 'total project' and not split by region.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[16]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Social and economic	Assessing and projecting onshore gas effects on regional economic activity*	$258,883	$258,882	100%	100%
	Monitoring community wellbeing and attitudes to CSG in Narrabri (pre-construction phase)	$362,991	$125,150	34%	40%
Greenhouse gases and air quality	Regional methane emissions in NSW CSG basins*	$155,363	$155,363	100%	100%
Biodiversity	Remote sensing and threatened species surveys to better understand risks of forest fragmentation from the NGP	$801,252	$499,325	62%	30%
Health	Human Health effects pf Coal Seam Gas Activity Study Design*	$272,524	$317,002	116%	100%
TOTAL ALLOCATED BUDGET		**$7,084,220**			

4.2 NSW research ideas being discussed for 2024/25

Approximately $0[18] cash remains available for new project proposals to be initiated in FY 2024/25.

Should additional funding become available in New South Wales, research issues will be addressed in relation to priorities established through community and key stakeholder consultation. There are currently no priority issues identified.

[18] This figure is total GISERA funding for New South Wales, less $7,084,220 already committed to research (tables 4.1 and 4.2) and less anticipated costs for the Director's office/Communications for the remaining life of GISERA.

5 South Australia R&D Plan & Budget

5.1 South Australia Investment profile

5.1.1 Committed research investment for 2018/19 - 2023/24

The committed budget for projects in South Australia for 2018/19-2023/24 now stands at $2,670,270. A breakdown of the committed research budget across the various research subject areas is provided in Table 5.1 and Table 5.2 shows the investment committed by contributor.

Table 5.1 Committed research investment in South Australia by research subject area, 2018/19-2023/24

RESEARCH AREA	TOTAL RESEARCH INESTMENT
Water (56%)	**$1,484,564**
Social & economic (28%)	**$759,310**
Agriculture (16%)	**$426,396**
Total	**$2,670,270**

Table 5.2 Committed research investment in South Australia by contributor, 2018/19-2023/24

CONTRIBUTOR	CONTRIBUTION TYPE	TOTAL RESEARCH CONTRIBUTION
Federal Government (46%)	Grant	**$1,225,787**
SA Government (29%)	Grant	**$782,607**
CSIRO (25%)	In-kind	**$661,876**
Total		**$2,670,270**

5.1.2 South Australia Current Research Portfolio

A summary of all approved research projects in South Australia is provided in Table 5.3.

Table 5.3 Approved South Australia Research Projects

RESEACH AREA	PROJECT	STATUS
Surface and Groundwater	Onshore gas and water contamination: causes, pathways and risks - investigate potential groundwater contamination causes, pathways and vulnerability to understand onshore gas water quality impacts for southeast SA.	Completed
	Groundwater balance in gas development regions of South East South Australia - improve groundwater balance models in the onshore gas development regions of south east South Australia.	Completed
	Microbial degradation of chemical compounds used in onshore gas production in the SE of South Australia - understand the biodegradation of certain chemical compounds used in onshore gas production in the south-east of South Australia.	Completed
	Microbial degradation of chemicals and fluids in aquifers of the Limestone Coast, SA - demonstrate the potential for microbial degradation of chemicals used by the onshore gas industry across the Tertiary Limestone Aquifer (TLA) in the Limestone Coast region of south east South Australia.	Completed
	Decision support framework for future groundwater development scenarios in the southeast SA - develop and test a decision support framework to improve management of groundwater resources. Research outcomes will consider probable future groundwater use scenarios, taking account of climate change and various future water use patterns for irrigation, forestry, onshore gas and other industries in the south east of South Australia.	Completed
Social and Economic	Community wellbeing and attitudes to conventional gas development in the South East of South Australia - measure levels of perceived risk, benefits, knowledge, and other underlying drivers of trust and social acceptance of conventional gas development in South Australia's south east, and develop baseline data on community values, well-being and future expectations.	Completed
	Assessing the value of locally produced conventional gas in SA's South East - develop a profile of the gas industry and its role within the regional economy and develop scenarios for how the local gas industry may evolve.	Completed
	The role of gas in South Australia - clarify the role of natural gas in meeting the state's renewable energy, security, emissions and energy pricing goals.	Completed
Agriculture	Gas impacts and opportunities on primary industries - analyse possible impacts and opportunities from gas development for rural areas in South Australia's south east.	Completed
	Perspectives on risk to local markets and industries - explore potential market impacts and associated concerns relating to the value of place of origin labelling and branding arising from conventional gas development in the south east of SA.	Completed

5.1.3 South Australia Research Progress and Expenditure

The committed South Australia research budget, expenditure and milestones completed for each project is provided in Table 5.4. (* = completed projects).

Table 5.4 Committed research investment, expenditure and progress in South Australia, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[19]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Surface and Groundwater	Onshore gas and water contamination: causes, pathways and risks*	$277,550	$280,170	101%	100%
	Groundwater balance in gas development regions of south east South Australia*	$326,036	$327,994	101%	100%
	Microbial degradation of chemical compounds used in onshore gas production in the south east of South Australia*	$240,604	$244,834	102%	100%
	Microbial degradation of chemicals and fluids in aquifers of the Limestone Coast, South Australia*	$273,502	$274,329	100%	100%
	Decision support framework for future groundwater development scenarios in the southeast South Australia*	$366,872	$366,264	100%	100%
Social and Economic	Community wellbeing and attitudes to conventional gas development in the south east of South Australia*	$198,500	$198,606	100%	100%
	Assessing the value of locally produced conventional gas in SA's South East*	$238,480	$238,667	100%	100%
	The role of gas in South Australia*	$322,330	$323,573	100%	100%
Agriculture	Gas impacts and opportunities on primary industries*	$175,133	$178,089	102%	100%
	Perspectives on risk to local markets and industries*	$251,263	$251,263	100%	100%
TOTAL ALLOCATED BUDGET		**$2,670,270**			

[19] Any expenditure exceeding 100% represents an additional CSIRO contribution.

5.2 South Australia research ideas being discussed for 2024/25

Approximately $0[20] cash remains available for new project proposals to be initiated in FY 2024/25.

Should additional funding become available in South Australia, research issues will be addressed in relation to priorities established through community and key stakeholder consultation. There are currently no priority issues identified.

[20] This figure is total GISERA funding for South Australia, less $2,670,270 already committed to research (tables 5.1 and 5.2) and less anticipated costs for the Director's office/Communications for the remaining life of GISERA.

6 Northern Territory R&D Plan & Budget

6.1 Northern Territory Investment profile

6.1.1 Committed research investment for 2018/19 - 2024/25

The committed budget for projects in Northern Territory for 2018/19-2024/25 now stands at $8,168,845. A breakdown of the committed research budget across the various research subject areas is provided in Table 6.1 and Table 6.2 shows the investment committed by contributor.

Table 6.1 Committed research investment in Northern Territory by research subject area, 2018/19-2024/25

RESEARCH AREA	TOTAL RESEARCH INVESTMENT
Surface and Groundwater (54%)	**$4,366,604**
Greenhouse gases and air quality (21%)	**$1,719,864**
Land and Infrastructure (11%)	**$874,230**
Biodiversity (9%)	**$774,011**
Agriculture (3%)	**$239,828**
Social & economic (2%)	**$194,308**
Total	**$8,168,845**

Table 6.2 Committed research investment in Northern Territory by contributor, 2018/19-2024/25

CONTRIBUTOR	CONTRIBUTION TYPE	TOTAL RESEARCH CONTRIBUTION
Federal Government (51%)	Grant	**$4,167,163**
NT Government (13%)	Grant	**$1,090,924**
CSIRO (22%)	In-kind	**$1,820,213**
Santos (6%)	GISERA membership	**$504,161**
Origin (5%)	GISERA membership	**$409,088**
Pangaea (2%)	GISERA membership	**$123,438**
Charles Darwin University (1%)	In-kind contribution to project W18 (Characterisation of the Stygofauna and microbial assemblages of the Beetaloo Sub-basin)	**$53,858**
Total		**$8,168,845**

6.1.2 Northern Territory Current Research Portfolio

A summary of all approved research projects in Northern Territory is provided in Table 6.3.

Table 6.3 Approved Northern Territory Research Projects

RESEACH AREA	PROJECT	STATUS
Surface and Groundwater	Baseline monitoring of groundwater properties in the Beetaloo Sub-basin, NT - understand the geochemical properties, recharge rates and recharge mechanisms of groundwater.	Completed
	Environmental monitoring and microbial degradation of onshore shale gas activity chemicals and fluids - better understand how typical onshore gas chemicals biodegrade in relevant aquifers and soil types in the Northern Territory.	Completed
	Improved approaches to long-term monitoring of decommissioned onshore gas wells - investigate options for long-term monitoring of well integrity in decommissioned onshore gas wells in the Northern Territory, including assessment of well decommissioning practices and monitoring techniques and technology, in the context of Northern Territory regulatory requirements	Completed
	Onshore gas water lifecycle management options framework - design an options framework and decision criteria for water and wastewater management for Northern Territory onshore gas development.	Completed
	Fate of hydraulic fracturing fluids/chemicals and geogenic hydrocarbons in surface facilities and in the subsurface - provide a systems-based approach to understanding chemicals and their lifecycle during hydraulic fracturing, in flow-back water produced after fracturing, and in tanks and ponds in industry facilities in the Northern Territory.	Completed
	Characterisation of the stygofauna and microbial assemblages of the Beetaloo Sub-basin, NT - To undertake a broad spatial pilot-scale survey of water bores in the Beetaloo Sub-basin, using direct sampling and DNA-based approaches to determine the distribution and abundance of stygofauna and characterise subterranean groundwater-dependent ecosystems.	Completed
	Examination of stygofauna ecosystems of the Beetaloo Sub-basin - this research aims to build an understanding of the extent to which stygofauna present in bores reflect their presence more widely within aquifers. It also aims to understand the physical and chemical drivers that may determine where stygofauna exist and how communities may be connected.	Underway
	Environmental baseline characterisation of the springs in Hot Springs Valley, NT - conduct a field campaign to collect detailed data on the geology, hydrogeology and ecology of the Hot Springs Valley to augment data collected in previous surveys.	Underway
Social and Economic	Mapping future transport passages and volumes for improved planning and operation - Using scenarios of both construction and operational phases of gas	Completed

RESEACH AREA	PROJECT	STATUS
	development, this project will analyse road and rail freight costs, flows and impacts for identified sites and regions in the Beetaloo Sub-basin in the NT. It will also test a range of interventions that may increase road safety while reducing costs and impacts on the environment and local communities.	
Greenhouse gases and air quality	Baseline measurement and monitoring of methane emissions in the Beetaloo Sub-basin - Understanding of the natural methane levels, over the various seasons, a baseline for accurately quantifying any future onshore gas impacts.	Completed
	Mitigating Fugitive Gas Emissions from Well Casings - review current industry practice and conduct experimental investigations to evaluate techniques and assess new materials designed to minimise fugitive methane emissions leaking from microfractures and gaps in gas well cement casing	Completed
	Offsets for Life cycle Greenhouse Gas Emissions of Onshore Gas in the NT - seek feasible options to offset life cycle greenhouse gas (GHG) emissions emitted in Australia associated with scenarios of new production and Australian consumption of onshore gas extracted from the NT Beetaloo Sub-basin.	Completed
	Methane emissions quantification of well drilling to completion processes in Beetaloo sub-basin - use autonomous emissions monitoring stations to quantify fugitive methane emissions from well construction and completion activities from unconventional shale petroleum exploration in the Beetaloo sub-basin. Results from this study will compare actual measured results with estimated results to verify the adequacy of existing calculated emission estimates.	Underway
Agriculture	Putting land management knowledge into practice - develop high-quality spatial data to help landholders, regulators, and the gas industry to evaluate design and placement of gas infrastructure, protect surface water and vegetation, and reduce erosion, soil damage and dust.	Completed
Biodiversity	Understanding and managing impacts to biodiversity from roads and pipelines in the Beetaloo - investigate how roads, pipelines and other linear transport infrastructure may impact biodiversity in the Beetaloo Sub-basin during the development of an onshore gas industry.	Completed
	UAV–LiDAR and spaceborne remote sensing for site survey and habitat condition monitoring in the Beetaloo - develop a scalable approach for monitoring the structural condition of vegetation in the Beetaloo Sub-basin.	Underway
Land and Infrastructure	Background Seismicity of Beetaloo Sub-Basin and Seismic Hazard – this project will establish long-term background seismic data to characterise the current natural seismic activity in the Beetaloo Sub-basin in the Northern Territory. This baseline data can then be used to distinguish any possible increases in seismic activity resulting from future gas development and operations in the region.	Underway
	Beetaloo basin shale long-term competency after decommissioning – this project aims to quantify the self-sealing competency of shales in the Beetaloo basin that sit between the target natural gas seams and the shallow Cambrian Limestone Aquifer.	Near completion

6.1.3 Northern Territory Research Progress and Expenditure

The committed Northern Territory research budget, expenditure and milestones completed for each project is provided in Table 6.4 (* = completed projects).

Table 6.4 Committed research investment, expenditure and progress in Northern Territory, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT [21]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Surface and Groundwater	Baseline monitoring of groundwater properties in the Beetaloo Sub-basin, NT*	$410,550	$410,550	100%	100%
	Characterisation of the stygofauna and microbial assemblages of the Beetaloo Sub-basin*	$346,890[22]	$346,909	100%	100%
	Improved approaches to long-term monitoring of decommissioned onshore gas wells*	$352,436	$356,346	101%	100%
	Environmental monitoring and microbial degradation of onshore shale gas activity chemicals and fluids*	$291,964	$297,923	102%	100%
	Onshore gas water lifecycle management options framework*	$393,945	$393,945	100%	100%
	Fate of hydraulic fluids/chemicals and geogenic hydrocarbons in surface facilities and in the subsurface	$821,200	$826,571	101%	100%
	Examination of stygofauna ecosystems of the Beetaloo Sub-basin	$1,064,155	$854,091	80%	50%
	Environmental baseline characterisation of the springs in Hot Springs Valley, NT	$685,463	$189,913	28%	10%
Greenhouse gases and air quality	Baseline measurement and monitoring of methane emissions in the Beetaloo Sub-basin*	$305,297	$311,931	102%	100%
	Mitigating fugitive gas emissions from well casings*	$238,249	$239,557	101%	100%
	Offsets for Life cycle Greenhouse Gas Emissions of Onshore Gas in the NT*	$417,884	$430,023	103%	100%
	Methane emissions quantification of well drilling to completion processes in Beetaloo Sub-basin	$758,434	$647,768	85%	35%

[21] Any expenditure exceeding 100% represents an additional CSIRO contribution.

[22] This includes $53,858 in-kind contribution from CDU.

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT [21]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Agriculture	Putting land management knowledge into practice*	$239,828	$239,828	100%	100%
Biodiversity	Understanding and managing impacts to biodiversity from roads and pipelines in the Beetaloo*	$319,520	$320,685	100%	100%
	UAV–LiDAR and spaceborne remote sensing for site survey and habitat condition monitoring in the Beetaloo	$454,491	$191,604	42%	0%
Social and Economic	Mapping future transport passages and volumes for improved planning and operation*	$194,308	$194,450	100%	100%
Land and Infrastructure	Background Seismicity of Beetaloo Sub-Basin and Seismic Hazard	$451,882	$344,626	76%	50%
	Beetaloo basin shale long-term competency after decommissioning	$422,348	$355,935	84%	80%
TOTAL ALLOCATED BUDGET		**$8,168,845**			

6.2 Northern Territory research ideas being discussed for 2024/25

The following project ideas (Table 6.5) are being discussed but are yet to be ratified and are subject to review by the relevant Research Advisory Committee. Over coming months further stakeholder consultation will occur aiming to prioritise these research ideas in relation to other community issues.

Table 6.5 Future research ideas in Northern Territory for 2024/25

SUBJECT AREA	IDEA	BASIN	ESTIMATED COST
Surface and Groundwater	An integrated project to understand surface water features of the Beetaloo region and potential connections with shallow groundwater systems that support them. The project would consider environmental significance of these water features, and the potential for interaction with unconventional gas activities.	Beetaloo	$500k
Socio-economic pathways	This project would look at desirable outcomes for local communities (such as employment and infrastructure) if the development of an onshore gas industry in the Beetaloo region occurs.	Beetaloo	$400k
Waste Water Injection	This project will investigate the potential for hydraulic fracturing wastewater reinjection in the Beetaloo region and provide new knowledge and scientific evidence for use in assessing associated risks.	Beetaloo	$300k
GHG Emission Source Inventory	The goal of this project is to provide an inventory of activities in onshore gas developments and the emissions sources that may be associated with them. The inventory will include activities across all stages of the development lifecycle (exploration to production and decommissioning) up to the delivery of gas to market (domestic gas pipeline or LNG plant). The inventory will characterise potential emissions sources by considering what the activity involves, current technologies and practices and how emissions could occur. The results of this project will provide an independent inventory of potential emissions sources that stakeholders can use as a reference point when evaluating emissions abatement plans for onshore gas developments in the NT.	Multiple	$300k

7 Western Australia R&D Plan & Budget

7.1 Western Australia Investment profile

7.1.1 Committed research investment for 2020/21-2026/27

The committed budget for projects in Western Australia for 2020/21-2026/27 now stands at $4,177,653. A breakdown of the committed research budget across the various research subject areas is provided in Table 7.1 and Table 7.2 shows the investment committed by contributor.

Table 7.1 Committed research investment in Western Australia by research subject area, 2026/27

RESEARCH AREA	TOTAL RESEARCH INVESTMENT
Land and Infrastructure (61%)	**$2,543,274**
Water (30%)	**$1,256,529**
Social & economic (8%)	**$326,626**
Biodiversity (1%)	**$51,224**
Total	**$4,177,653**

Table 7.2 Committed research investment in Western Australia by contributor, 2026/27

CONTRIBUTOR	CONTRIBUTION TYPE	TOTAL RESEARCH CONTRIBUTION
CSIRO (19%)	In-kind	**$802,543**
Federal Government (31%)	Grant	**$1,281,910**
Geological Survey of Western Australia (43%)	In-kind contribution to project W25 (Baseline seismic monitoring of the Canning Basin)	**$1,154,800**
	In-kind contribution to project W34 (Baseline Groundwater and Seismicity of northern Perth Basin)	**$638,400**
Geoscience Australia (7%)	In-kind contribution to project W25 (Baseline seismic monitoring of the Canning Basin)	**$300,000**
Total		**$4,177,653**

7.1.2 Western Australia Current Research Portfolio

A summary of all approved research projects in Western Australia is provided in Table 7.3.

Table 7.3 Approved Western Australia Research Projects

RESEACH AREA	PROJECT	STATUS
Surface and Groundwater	Groundwater baseline study of the Canning Basin, Western Australia – explores and summarises the current state of knowledge of groundwater systems in the Canning Basin, Western Australia.	Completed
	Baseline groundwater and seismicity, northern Perth Basin – improve understanding of seismic activity and groundwater in the northern Perth Basin in Western Australia	Underway
Social and Economic	Community wellbeing and attitudes to the energy transition in the North Perth Basin - provide an in-depth understanding of how energy infrastructure projects in the North Perth Basin region would affect the functioning and well-being of local communities.	To commence in 24/25
Biodiversity	Baseline assessment of the biodiversity of the Canning Basin, Western Australia - assess the current state of knowledge about the biodiversity of the Canning Basin in Western Australia.	Completed
Land and Infrastructure	Baseline seismic monitoring of the Canning Basin, WA - establish a long-term baseline of seismic monitoring data that will characterise the current natural seismic activity and cultural seismic noise within the Canning Basin in Western Australia.	Underway
	Northern Perth Basin subsurface resources conflicts - Helping communities, government and industry understand and resolve potential resource conflicts in the northern Perth Basin in Western Australia	Underway

7.1.3 Western Australia Research Progress and Expenditure

The committed Western Australia research budget, expenditure and milestones completed for each project is provided in Table 7.4. (* = completed projects).

Table 7.4 Committed research investment, expenditure and progress in Western Australia, by project

RESEARCH SUBJECT AREA	PROJECT	ALLOCATED BUDGET	EXPENDITURE	PERCENTAGE OF BUDGET SPENT[23]	PERCENTAGE OF MILESTONES COMPLETED
			UP TO 30 JUNE 2024		
Surface and Groundwater	Groundwater baseline study of the Canning Basin, Western Australia*	$99,275	$104,338	105%	100%
	Baseline groundwater and seismicity, northern Perth Basin	$1,157,254[24]	$309,606	27%	20%
Social and Economic	Community wellbeing and attitudes to the energy transition in the North Perth Basin	$326,626	$0[25]	0%	0%
Biodiversity	Baseline assessment of the biodiversity of the Canning Basin, Western Australia*	$51,224	$51,221	100%	100%
Land and Infrastructure	Baseline seismic monitoring of the Canning Basin	$2,138,181[26]	$1,702,246	80%	25%
	Northern Perth Basin subsurface resources conflicts	$405,093	$130,828	32%	40%
TOTAL ALLOCATED BUDGET		**$4,177,653**			

[23] Any expenditure exceeding 100% represents an additional CSIRO contribution.

[24] This includes $638,400 in-kind contribution from GSWA.

[25] This is a newly approved project. Expenditure will be incurred in 2024/25.

[26] This includes $1,154,800 in-kind contribution from GSWA and $300,000 in-kind contribution from GA.

7.2 Western Australia research ideas being discussed for 2024/25

Approximately $0[27] cash remains available for new project proposals to be initiated in FY 2024/25.

Should additional funding become available in Western Australia, research issues will be addressed in relation to emerging priorities established through community and key stakeholder consultation.

[27] This figure is total GISERA funding for Western Australia, less $4,177,653 already committed to research (tables 7.1 and 7.2) and less anticipated costs for the Director's office/Communications for the remaining life of GISERA.

8 Proposed management and communication budget for 2024/25

Table 8.1 shows GISERA's actual management and communications expenditure during 2011/12 to 2023/24 financial years and the proposed management and communications budget for 2024/25. Table 8.2 summarises actual and planned partner contributions to management and communications for past and current years.

Table 8.1 Proposed management and communications budget, 2024/25 with actual expenditure for 2011/12-2023/24

ITEM	ACTUAL EXPENDITURE	PLANNED EXPENDITURE	TOTAL
	2011/12 - 2023/24	2024/25	
Director, Deputy Director and State Leaders (salary & overheads)	$3,656,921	$269,346	**$3,926,267**
Communication & Engagement team (salary & overheads)	$3,733,063	$456,611	**$4,189,674**
Admin & Executive Officer support (salary & overheads)	$2,742,356	$272,996	**$3,015,352**
Contractors	$407,163	$15,000	**$422,163**
Travel & accommodation	$488,935	$56,000	**$544,935**
Communication collateral (e.g., factsheets, brochures, infographics, videos & animations)	$203,129	$96,000	**$299,129**
Website update (redesign and rebrand)	$22,810	$0	**$22,810**
Conferences	$120,461	$31,000	**$151,461**
Annual Symposium/Stakeholder & RAC meetings	$90,739	$13,000	**$103,739**
General Expenses & Annual report	$90,733	$9,400	**$100,133**
Public information sessions	$65,803	$20,000	**$85,803**
Media and other training	$29,929	$4,000	**$33,929**
Printing	$25,213	$1,400	**$26,613**
Office supplies	$13,605	$1,300	**$14,905**
Vodcasts	$3,000	$0	**$3,000**
Auditor	$0	$10,000	**$10,000**
TOTAL	**$11,693,861**	**$1,256,053**	**$12,949,914**

Table 8.2 Partner contributions to management and communications, with actual expenditure for 2011/12-2023/24 and proposed for 2024/25

COMMS & MNGT COSTS CONTRIBUTIONS	ACTUAL CONTRIBUTION	PLANNED CONTRIBUTION	TOTAL
	2011/12 - 2023/24	2024/25	
CSIRO	$4,649,292	$1,042,524	**$5,691,816**
Federal Govt	$4,074,524	$0	**$4,074,524**
NSW Government	$591,857	$0	**$591,857**
SA Government	$217,392	$0	**$217,392**
NT Government	$171,983	$37,682	**$209,665**
APLNG	$1,162,815	$37,682	**$1,200,497**
Santos	$273,376	$37,682	**$311,058**
QGC	$229,402	$12,561	**$241,962**
Origin	$224,059	$37,682	**$261,740**
AGL	$66,409	$0	**$66,409**
Pangaea	$26,607	$0	**$26,607**
Tamboran	$4,552	$37,682	**$42,233**
Empire	$1,593	$12,561	**$14,154**
TOTAL	**$11,693,861**	**$1,256,053**	**$12,949,914**

9 Communication

9.1 Overview

As gas exploration and development continues in regions around Australia, information about the impacts of the onshore gas industry is increasingly being sought by local communities, governments, land-use industries, environmentalists and the wider public. GISERA's accessible and transparent research outcomes are well placed to contribute constructively and objectively to this need.

CSIRO's GISERA plays an important role in providing trusted information about the challenges and opportunities associated with the onshore gas industry. Communication of CSIRO research conducted through GISERA has occurred using a range of traditional and online media channels to reach wider community audiences.

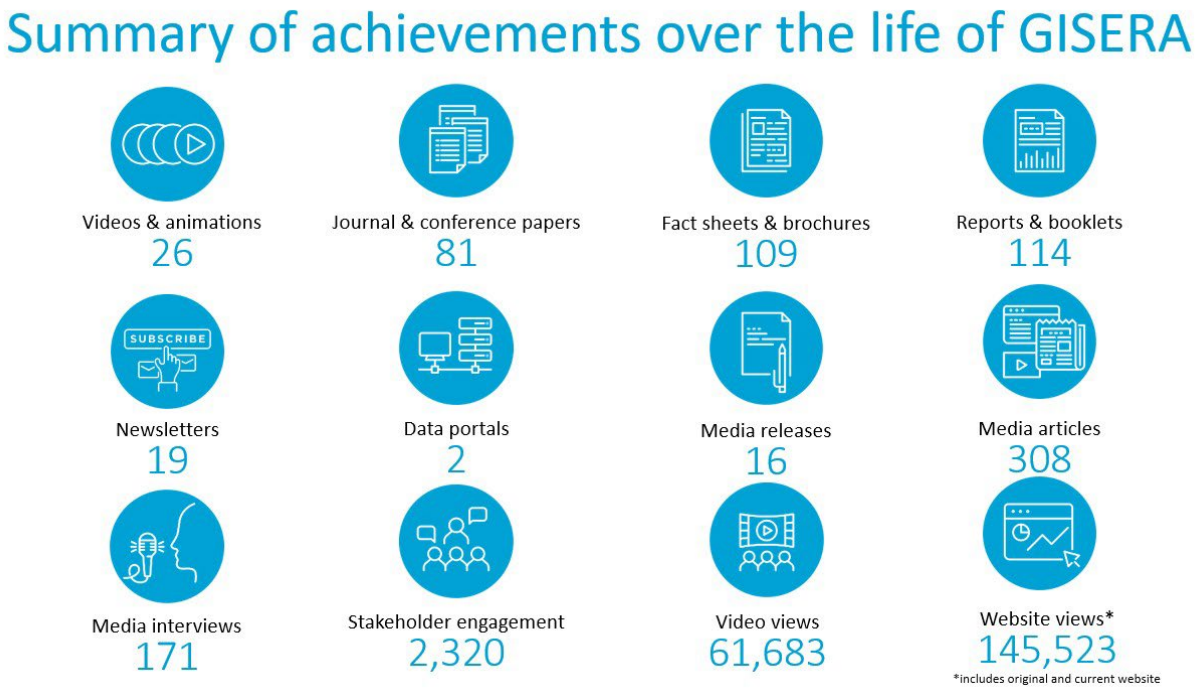

Figure 6 Summary of achievements over life of GISERA

9.2 Communication outputs

A suite of communication methods and channels have been used to ensure effective and meaningful communication of our research outcomes. Table 9.1 shows a range of communication outputs GISERA has achieved in 2023/24.

Table 9.1 Summary of technical and general communication outputs in 2023/24

OUTPUT TYPE	NAME OF COMMUNICATION OUTPUT	STATE / TERRITORY	RELEASE DATE
Fact sheet	Assessing the exposure of identified chemicals used in the CSG activities in the Surat Basin, Queensland	QLD	July 2023
Fact sheet	Analysis of dust near CSG sites in the Surat Basin, Queensland, to assess potential for respirable crystalline silica	QLD	July 2023
Final Report	Understanding and managing impacts to biodiversity from roads and pipelines in the Beetaloo Sub-region	NT	July 2023
Fact sheet	Understanding and managing impacts to biodiversity from roads and pipelines in the Beetaloo Sub-basin, in the NT	NT	July 2023
Article	CSIRO study shows shift in gas opinion in shire	NSW	July 2023
Article	A framework for future groundwater use	SA	September 2023
Article	Methane and holding ponds	QLD	September 2023
Article	Managing wastewater sustainably in the NT	NT	September 2023
Article	Future role of gas in South Australia	SA	September 2023
Final Report	Methane contributions from holding ponds – a desktop study to identify emissions potential and controls in CSG holding ponds and other aquatic systems in Queensland	QLD	September 2023
Newsletter	GISERA Newsletter - issue 18	National	September 2023
Statement	Statement on CSIRO research	National	October 2023
Article & media release	CSIRO Narrabri airborne electromagnetic survey	NSW	November 2023
Article	CSIRO Narrabri airborne electromagnetic survey	NSW	November 2023
Fact sheet	CSIRO takes to the sky to learn what's beneath our feet around Narrabri, NSW	NSW	November 2023
Q&A	Questions and Answers: CSIRO Narrabri airborne electromagnetic survey	NSW	November 2023
Interim report	Baseline Seismicity of Beetaloo Basin-Interim Report 1	NT	November 2023

OUTPUT TYPE	NAME OF COMMUNICATION OUTPUT	STATE / TERRITORY	RELEASE DATE
Presentation	Presentation at the NARSC Annual Conference 2023 and the ANZRSAI/RSA joint Conference 2023 on the Medium-term socio-economic impacts in Southern Queensland project preliminary results	International & National	November 2023
Presentation	Presentation at the Australasian Groundwater & New Zealand Hydrological Society Joint Conference 2023 titled *Hydrochemical Assessment of Groundwaters in the Great Artesian Basin: Implications for Recharge and Connectivity Processes* on the 'Assessment of faults as potential connectivity pathways' project results	International	November 2023
Student expo	CSIRO Energy and GISERA stand at the WA Energy Club Student Expo in Perth	WA	December 2023
Presentation	Presentation at the International Atomic Energy Agency (IAEA) isotope workshop on the 'Assessment of faults as potential connectivity pathways' project results	International	December 2023
Final report	Putting Land Management Knowledge into Practice	NT	December 2023
Final report	Microbial degradation of onshore gas activity chemicals and fluids in aquifers of the Limestone Coast, South Australia	SA	December 2023
Presentation	Presentation at the 3rd Annual Queensland Geochronology Alliance workshop on the 'Assessment of faults as potential connectivity pathways' project results and the 'Geochemical modelling and geophysical surveys to refine understanding of connectivity between coal seams and aquifers' project preliminary results along with some broader GAB work.	National	February 2024
Newsletter	GISERA Newsletter - issue 19	National	March 2024
Article	Northern Territory shale gas companies Tamboran and Empire join CSIRO's GISERA	National	March 2024
Article	Microbial degradation of chemicals in the Tertiary Limestone Aquifer	SA	March 2024
Article	New CSIRO research to reveal Narrabri from 400 metres underground	NSW	March 2024
Article	CSIRO science teams heading north for new GISERA projects	NT	March 2024
Article	Researching potential methane emissions from CSG water holding ponds	QLD	March 2024
Article	Understanding biodiversity impacts in the Northern Territory	NT	March 2024
Article	Energising WA students for a STEM future	WA	March 2024
Article	Baselining groundwater and seismicity in the northern Perth Basin	WA	March 2024

OUTPUT TYPE	NAME OF COMMUNICATION OUTPUT	STATE / TERRITORY	RELEASE DATE
Article	Balancing act in the northern Perth Basin	WA	March 2024
Fact sheet	Methane contributions from coal seam gas holding ponds in Queensland	QLD	March 2024
Knowledge transfer presentation	Review of cements, steels and microbial activity for Queensland CSG wells	QLD	March 2024
Knowledge transfer presentation	Cooper Creek Flood modelling scenarios	QLD	March 2024
Fact sheet	Understanding the sources of methane emissions from the Western Downs Region in the Surat Basin, Queensland	QLD	March 2024
Fact sheet	Drones and satellites to monitor habitat in the Northern Territory	NT	March 2024
Fact sheet	Surveying emissions from coal seam gas water holding ponds in QLD	QLD	March 2024
Fact sheet	Establishing an environmental baseline characterisation of the springs in Hot Springs Valley, Northern Territory	NT	March 2024
Fact sheet	Understanding what controls and contributes to methane emissions from coal seam gas water holding ponds in the Surat Basin, Queensland	QLD	March 2024
Fact sheet	Putting land management knowledge into practice in the Northern Territory	NT	April 2024
Fact sheet	Microbial degradation of chemicals in South Australian aquifers	SA	April 2024
Animation	Microbial activity in the subsurface	National	April 2024
Presentation	Presentation at CSIRO's GISERA Southern Queensland Research forum to community stakeholders in Chinchilla. Ten researchers gave short presentations on work that has been based in the southern Queensland region including broad topics of health and socio-economic impacts, methane emissions, and gas infrastructure.	National	April 2024
Final report	Cement and steel used in coal seam gas (CSG) well construction in Queensland	QLD	May 2024
Final report	Potential microbial interactions with cements and steels	QLD	May 2024
Final report	Fate of hydraulic fracturing chemicals and geogenic compounds in surface facilities and in the subsurface	NT	May 2024
Fact sheet	Understanding the lifecycle of hydraulic fracturing fluids	NT	June 2024
Rural show	Engagement at Emerald Agricultural Show	QLD	June 2024

OUTPUT TYPE	NAME OF COMMUNICATION OUTPUT	STATE / TERRITORY	RELEASE DATE
Knowledge transfer presentation	Microbial degradation of chemicals used in coal seam gas activities and chemical baselining in the Narrabri region, NSW	NSW	June 2024
Knowledge transfer presentation	Review of beneficial reuse or end-use options for brine from the Narrabri Gas Project region	NSW	June 2024
Knowledge transfer presentation	Evaluating medium-term socio-economic impacts of onshore gas activity in Southern Queensland	QLD	June 2024
Knowledge transfer presentation	Assessing the long-term sealing competency of Beetaloo Basin after gas well decommissioning	NT	June 2024
Fact sheet	Cements, steels and microbial activities in Queensland's coal seam gas wells	QLD	June 2024
Fact sheet	Northern Perth Basin subsurface resources conflicts	WA	June 2024
Fact sheet	Understanding community wellbeing and attitudes to energy development in the North Perth Basin	WA	June 2024
Fact sheet	Baseline groundwater and seismicity of northern Perth Basin	WA	June 2024

9.3 Stakeholder Engagement

GISERA aims to promote ongoing trust and respect from all stakeholder groups through the open and transparent conduct and communication of its research and synthesis activities.

Since launching CSIRO's GISERA in July 2011, the GISERA Director and CSIRO research staff have participated in 2,320 engagements with a range of stakeholders, such as federal and state Members of Parliament, industry associations, community groups, research organisations, gas developers, journalists and consultants.

Table 9.2 outlines the engagements for 2023/24 and Figure 7 shows stakeholder interactions over the past 13 years.

Table 9.2 Summary of GISERA engagements for 2023/24

STAKEHOLDER	NUMBER OF ENGAGEMENTS FOR 2023/24	NUMBER OF ENGAGEMENTS OVER LIFE OF GISERA
Regional community	69	321
Gas Industry	89	476
Federal, State and Local Departments and Agencies	88	705
Media (includes print, TV and radio)	5	248
School/Educational institutions/Students	2	24
Research organisations	22	249
Industry associations	11	144
Business groups	53	153
Total	**339**[28]	**2,320**[29]

[28] It is important to note here that these numbers of interactions do not take into account the number of individuals engaged in that interaction. For example, regional community group interactions can range from 20-360 participants and a gas industry interaction can be a technical meeting with only 1-10 participants

[29] It is important to note here that these numbers of interactions do not take into account the number of individuals engaged in that interaction. For example, regional community group interactions can range from 20-360 participants and a gas industry interaction can be a technical meeting with only 1-10 participants

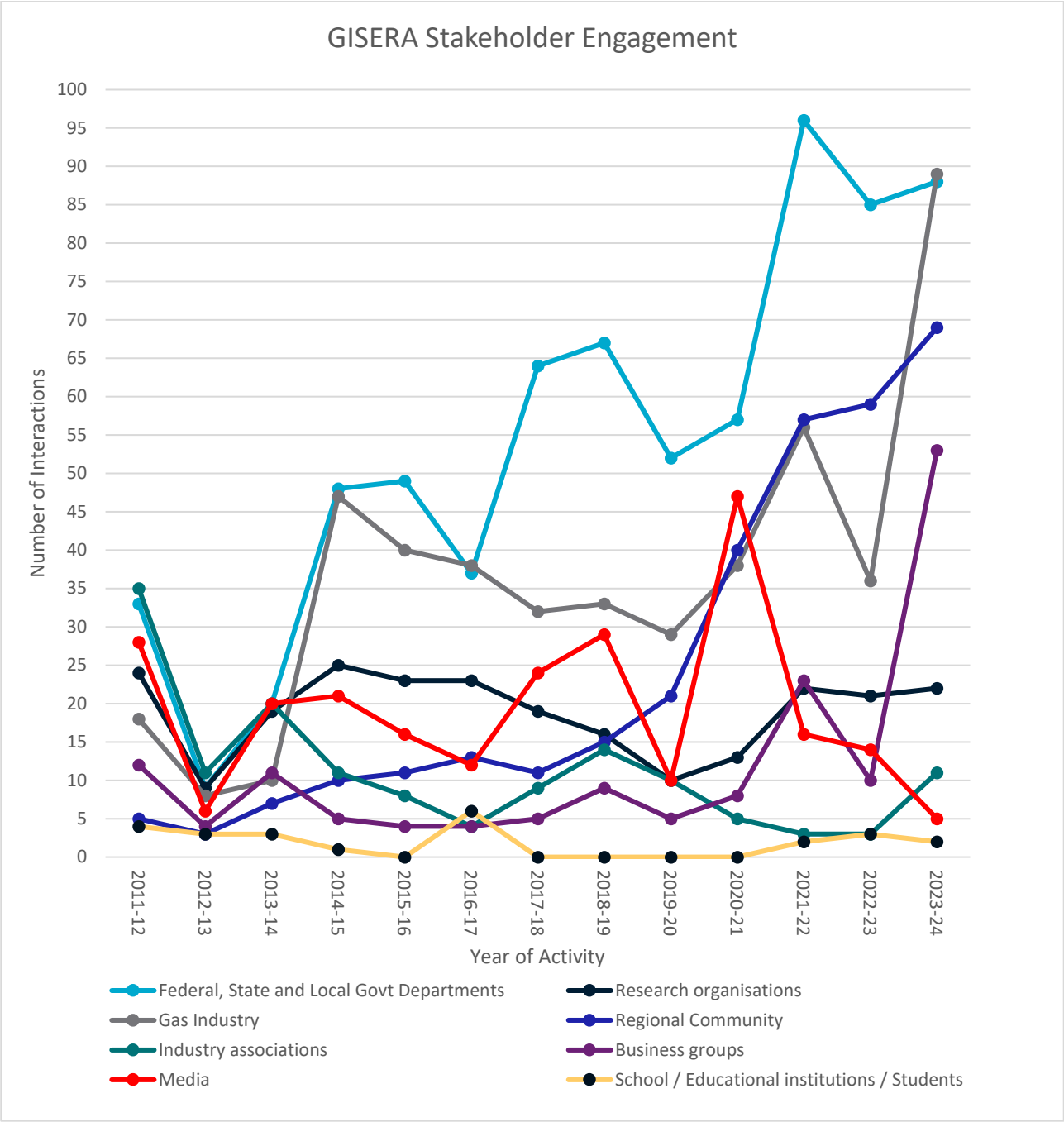

Figure 7 Stakeholder interactions from 2011/12 to 2023/24 - these numbers do not take into account the number of individuals engaged in that interaction. Regional community group interactions can range from 20-360 participants and a gas industry interaction from 1-10 participants.

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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, greenhouse gas emissions, 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.