![GISERA logo] Gas Industry Social & Environmental Research Alliance

Research update

Message from the Director

Welcome to the Gas Industry Social and Environmental Research Alliance's (GISERA) first e-newsletter, the purpose of which is to update you on research progress and highlight any interesting science.

GISERA is a collaborative research vehicle co-founded by CSIRO and Australia Pacific LNG. It undertakes publicly-reported research that addresses the socio-economic and environmental impacts of Australia's natural gas industries.

News and Events
New research portfolio

The research project _Characterisation of regional fluxes of methane in the Surat Basin, Queensland_ is the first project in the GHG emissions research portfolio. The aims of the project are to detect and measure methane seeping from underground in the Surat Basin, and identify sources of methane to provide methane emissions data on a regional scale. This data set can be used to compare changes in methane concentrations as coal seam gas production increases in the Surat Basin.

The research program consists of 16 research projects in six subject areas: terrestrial biodiversity, greenhouse gas footprint, surface and groundwater, agricultural land management, marine environment and social and economic impacts.

GISERA's research program has been operational for approximately one year and research projects are an average of 40% completed. Some research highlights include:

- clay movement identified as a significant source of re-injection clogging
- development of potential new methods for determining groundwater 'age'
- close parallels of farm impacts identified for CSG, wind farms and US shale gas industry
- tagging and tracking of turtles around Gladstone Harbour
- community resilience, a community's ability to adapt and respond to and benefit from change, identified as an important feature for the continued prosperity and function of a community beyond CSG.

There are some initial research outputs and fact sheets available on the GISERA website.

In addition to the research work, GISERA has actively engaged in communicating the social and environmental challenges and opportunities arising from unconventional gas development in Australia. GISERA has had over 185 engagements with a wide range of

stakeholders through forums such as [workshops, seminars, conferences and technical briefings](#) over the last two and half years.

I look forward to sharing more research updates with you in the future.

Cheers,
Peter Stone, Deputy Director Sustainable Agriculture Flagship and Director of GISERA.

Project Updates

Surface and groundwater

The four research projects in this portfolio look at maximising the amount of treated coal seam gas water that can be re-injected into aquifers. Initial results have identified clay mobilisation as a significant source of reinjection clogging, a process that reduces the volume of water that can be re-injected.

Greenhouse gas footprint

It is not clear how much methane seeps out of the ground under natural circumstances. This has been identified by scientists, general public and the natural gas industry as an important knowledge gap. The [current project](#) in the Greenhouse gas footprint portfolio addresses this gap.

"The research aims to do three things, the first is to determine and refine the best method to detect and measure methane seeping from underground in the Surat Basin; the second is to identify background sources of methane – is it natural seepage from coal seams or from biological processes occurring in wetlands, swamps, rivers and dams; and finally, to provide a methane emissions data set from soils, rivers and agriculture on a regional scale," says Professor Damian Barrett, from CSIRO, who is leading this research project.

Findings from this research will provide a methane emissions data set that can be used to compare against changes in methane emission as coal seam gas production in the Surat Basin increases. CSIRO is also investigating fugitive methane emissions from coal seam gas production facilities in NSW and Queensland. Results from both investigations will add to the bigger picture bigger picture of assessing the coal seam gas industry's whole of life cycle greenhouse gas emission footprint.

Agricultural land management

The five research projects underway in this portfolio are examining the practical implications and opportunities for farmers when operating their existing farming or grazing business alongside the coal seam gas (CSG) industry. Key questions being investigated include how much land will be affected by CSG development, the impacts on farm production and productivity, the impact of surface infrastructure on farm operations, and the long term impacts on farm productivity and soil quality.

"The initial input from producers at workshops held in Dalby, Chinchilla and Roma has helped to identify the key concerns and shape these research projects. For example, the issues of dust, light and noise from gas industry activity have highlighted the importance of proper farm design and planning for roads and traffic", said CSIRO farming systems expert, Dr Neil Huth, who is heading up these projects.
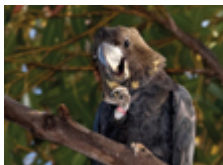
Terrestrial biodiversity

There are two projects currently underway in this portfolio. The first project aims to document potential threats to biodiversity and cost-effective responses across the development region. The second project uses ants to help determine how fire affects the amount and distribution of plants and animals in regions impacted by coal seam gas activities. Watch the video to find out more.

Marine environment

The marine environment research aims to improve understanding of the vulnerable components of the marine ecosystem to minimise impacts from LNG developments around Gladstone Harbour.

Turtles around Gladstone Harbour have been tagged and are being tracked using two types of technology - acoustic and satellite tagging systems.

"By studying the movements of these turtles and interpreting the data we get we'll be able to identify feeding areas and also transit paths that turtles use to get from one part of the harbour to the next," says Dr Russ Babcock, CSIRO Marine and Atmospheric Research.

Watch the video to find out more.

Social and economic

The three research projects underway in the social and economic research aims to identify what communities want and need to help inform and support changes occurring in coal seam gas development regions.

The *Community function and well-being* project has identified community resilience as an important aspect for the continued prosperity and function of a community beyond CSG. There are five factors that are important in helping community groups to be resilient.

Drawing on the insights gained from the *Community function and well-being* project, as well as others in this research portfolio, the *Understanding community aspirations* research project is designed to identify the diverse values, interests and aspirations that underpin community expectations. The project also aims to understand the extent to which these perspectives reflect and how they may inform the economic and policy options for the region.