



Putting land management knowledge into practice in the Northern Territory

Using modern data visualization techniques, this project will create a ‘virtual landscape’ of the Beetaloo Sub-basin – helping landholders, regulators and industry evaluate the design and placement of gas infrastructure in the region.

Using virtual reality to understand complex processes

Many landscape processes – including hydrology, soil loss and pasture dynamics - can be impacted by the development and construction of gas infrastructure.

Because these processes often occur over large scales in space or time, they can be hard to see with the naked eye and are not always easily understood.

The objective of this project is to develop high quality spatial data that will drive improved understanding and easier communication of the best land management practices to mitigate risk.

The Beetaloo Sub-basin

The Beetaloo Sub-basin lies southeast of Katherine in the Northern Territory and spans approximately 30,000 square kilometres. One of the most promising areas for shale gas production in Australia, it contains an estimated gas resource of 178,200 petajoules (PJ).

Understanding landscape processes in the Beetaloo Sub-basin will help land managers in both agriculture and the gas industry to design and place infrastructure in a way that protects surface water and vegetation, and reduces erosion, soil damage, and dust.

Establishing the project

The first step in the project will be to select an appropriate study area within the Beetaloo Sub-basin.

It is critical that the location is well chosen, and this will require input from key stakeholders, including local communities, farmers, and the gas industry.

The site needs to be in an area that captures existing infrastructure development and where future development is anticipated. It also needs to include a range of environmental conditions, including soils, vegetation and hydrology.



A virtual landscape can help understand potential impacts of development options, such as location of access tracks.

KEY POINTS

- The Final Report of the Scientific Inquiry into Hydraulic Fracking in the Northern Territory recommends that construction of infrastructure should be guided by best practice designed especially for the NT.
- A key driver of this recommendation is the need to minimise potential impacts on wet season water flows and erosion risks.
- Several recommendations of the Report Inquiry will be directly addressed by this project.
- The project is committed to developing communication tools that will assist the communities of the NT in their decision-making processes.

MORE INFORMATION

- More about [the project](#)
- Scientific inquiry [final report](#)
- About the [Beetaloo Sub-basin](#)

Building a digital twin of the site

Once the study area for the project has been selected, an aerial survey will be undertaken to derive high resolution vegetation and soil surface elevation maps.

The images from the aerial survey will be combined with other data to develop a 'digital twin' of the location, where environmental processes for soils, water flows and pastures can be explored.

For example, ground surface elevation can be used to calculate water flows according to small-scale topographical variation and features such as gullies, contour banks, drains and roadways.

Long term satellite data can be analysed to identify likely areas of fragile soil conditions and develop maps of grazing land condition.

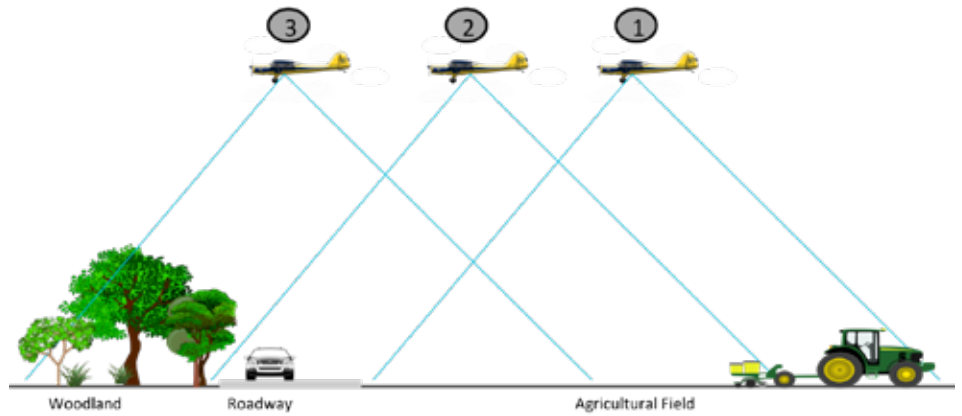
Development of online platform

A key component of the project will be the development of an online platform which is accessible to stakeholders.

The online platform will integrate data that has been developed within the project and data that is already owned or operated by the stakeholder – e.g. a farming enterprise.

It will allow 3D visualisation of the agricultural area, any existing infrastructure, and the processes that are at play within the landscape.

Greater understanding of these landscape processes will help both land managers and gas developers manage environmental risks such as erosion or water contamination.



Digital aerial photogrammetry can be used to create 3-dimensional models of landscapes.



Typical Beetaloo terrain.

Communication and knowledge transfer

This project will assist communities to meet the recommendations of the Scientific Inquiry into Hydraulic Fracking in the Northern Territory by ensuring informed decision making and improving the exchange of data. Broad stakeholder engagement is crucial.

Through planned, targeted communications - including one-on-one meetings, small group sessions, and public demonstrations at rural shows - the project will convert knowledge gathered through research into improved practice for the design and maintenance of gas development in the Northern Territory.

FAQ

What is the timeline for the project?

July 2020 to March 2022.

When will the results be available?

Reporting will take place from late 2021 onwards.

Who is funding the project?

This project is co-funded by the Australian Government and the Northern Territory Government (72%); CSIRO (25%); and by Origin Energy, Santos and Panagaea (3%).

ABOUT CSIRO's GISERA

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

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