The GBA Program

The $35.4 million Geological and Bioregional Assessment (GBA) Program is assessing the potential environmental impacts of shale and tight gas development to inform regulatory frameworks and appropriate management approaches. The geological and environmental knowledge, data and tools produced by the GBA Program will assist governments, industry, landowners and the community by informing decision making and enabling the coordinated management of potential impacts.

A series of independent scientific studies in three geological basins – the Cooper Basin in Queensland and SA, the Isa Superbasin in Queensland and the Beetaloo Sub-basin in NT – are being conducted by CSIRO and Geoscience Australia, supported by the Bureau of Meteorology and managed by the Department of Agriculture, Water and the Environment. These scientific studies aim to provide baseline information that

- identifies and evaluates areas of high potential for shale and tight gas for future development and any potential connections with water resources
- collates and summarises key information about geological structure, groundwater movement through geological layers, surface water systems and ecological systems
- evaluates possible ways that unconventional gas resource development might impact the things we value, such as groundwaters, protected species, as well as culturally and ecologically important matters.

Cooper GBA region

The Cooper GBA region covers approximately 130,000 km^2 (Figure 1). Key features are its sparse human population density and unpredictable surface water availability influenced by rainfall and surface water flowing into the region from the north. This results in natural and human systems driven by resource pulses and boom-bust ecological dynamics that have shaped the high diversity of ecological communities and species. Global climate models project a hotter and drier future for the region. The dominant land use in the Cooper GBA region is grazing of sheep and cattle on native vegetation which has modified many of the native vegetation communities.

The Cooper GBA region is within the Eyre region for Indigenous language groups, and more than 60% of the region is covered by Indigenous Land Use Agreements.

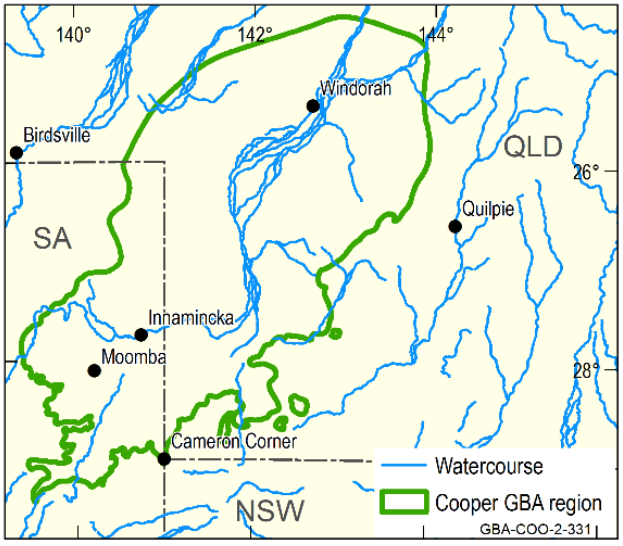

Figure 1 Location of the Cooper GBA region

What is LiDAR?

Light detection and ranging (LiDAR) measures distance by illuminating the target with a laser light and measuring the reflected light with a sensor. Differences in the time taken for the light to return and the wavelengths received can be processed to create three dimensional images of the target. LiDAR data is collected over large areas using aerial surveys, smaller areas can be surveyed from vehicles or statically. LiDAR is more accurate than traditional aerial photography for terrain mapping and modelling. LiDAR is also used to measure and monitor changes over time in vegetation or the walls of open-cut mines.

LiDAR dataset

As part of the Cooper GBA region assessment the GBA Program has collected an extensive LiDAR dataset focused on Cooper Creek (Figure 2). The LiDAR data was collected by Fugro Australia Ltd in two aerial surveys in 2019. Covering a total survey area of 31,780 km^2 across the Cooper Creek floodplain, Thompson and Barcoo river systems (Figure 3).

As part of the Stage 3 assessment for the Cooper GBA region the Program is using the dataset to build a hydrodynamic flood inundation model to better understand how resource development could impact the floodplain and landscape of the Cooper GBA region.

The LiDAR data is available for download in 1km^2 tiles through Geoscience Australia's national ELVIS (Elevation Information System) data portal.

The full (160+ GB) dataset is available for download via data.gov.au, the central source of Australian open government data. Search for 'Cooper GBA region lidar'.

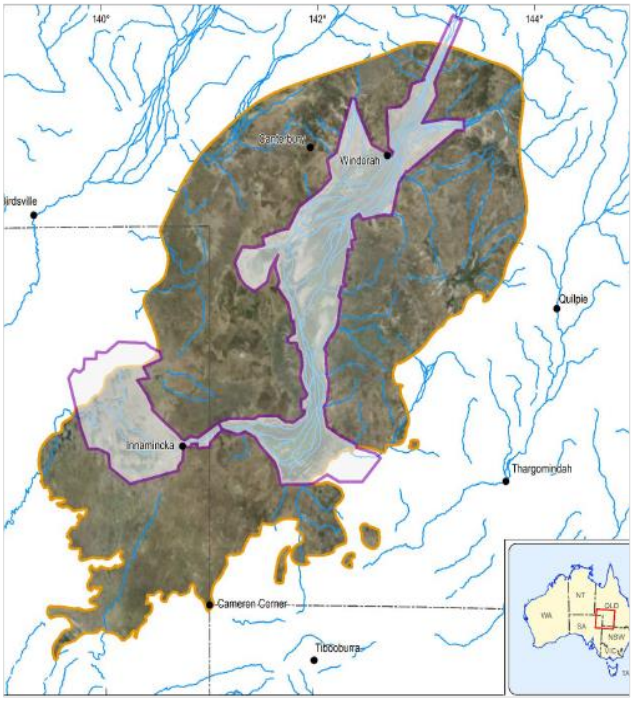

Figure 2 Area of LiDAR collection (pink bordered, white shaded area) in the Cooper GBA region (aerial imagery with yellow border).

Figure 3 Cullyamurra waterhole, looking north-west, is included in the LiDAR dataset
Credit: Geological and Bioregional Assessment Program, Russell Crosbie (CSIRO), September 2018

Links

https://elevation.fsdf.org.au

https://data.gov.au/data/dataset/d581de1d-964f-4141-ad9a-eaf500608bb9

Find out more

Further information about the GBA Program is available: https://www.bioregionalassessments.gov.au/geological-and-bioregional-assessment-program