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BIOREGIONAL ASSESSMENTS
CSIRO

The GBA Bulletin

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Introducing Emily Turner

Hi, I'm Emily, the new Geological and Bioregional Assessments (GBA) Program Director. I'm very excited to join the team! I've recently worked on regulation of coal seam gas approvals in Queensland and previously worked on the Bioregional Assessment Program. I'm looking forward to seeing a lot of our beautiful country in the coming months, so hope to meet many of you soon. Anthony Swirepik has contributed so much to the Program and we wish him all the best in his new role in the Department. Our team also farewells Rod Dann and Alex Tomlinson and welcomes Megan Stanford and Jason Hendriks. Megan will focus on making sure the assessments are useful to our key audiences and Jason will use his IT expertise to assist on our data and information systems.

Program Progress

Work has commenced on Stage 3 of the Program, Impact Analysis and Management. Stage 3 will analyse the potential impacts to water resources and matters of environmental significance to inform and support Commonwealth and State management and compliance activities. Stage 3 will be finalised in 2021.

Machinery of Government Change

On 5 December 2019 the Prime Minister, the Hon Scott Morrison MP, announced a reduction in the number of government departments from 18 to 14 to ensure services Australians rely on are delivered efficiently and effectively. As of 1 February 2020, the environment functions of the Department of the Environment and Energy, including the Program, will be consolidated with the Department of Agriculture to form the Department of Agriculture, Water and the Environment.

Isa GBA region

User panel

The second Isa user panel meeting was held in Normanton, Far North Queensland in mid-August 2019. Progress on Stage 2 of the Program was reported and the potential direction for the next stage of work was discussed.

Topics covered at the meeting included:

- The limited science data and knowledge for the Isa GBA region which creates problems in modelling future impacts on water, the environment and possible development scenarios.
- Remote sensing techniques to identify groundwater dependent ecosystems (See in focus: GDEs).
- Cultural and food related matters of importance to local Traditional Owners.

A communique from the meeting is at: https://www.bioregionalassessments.gov.au/assessments/geological-and-bioregional-assessment-program/isa-superbasin/isa-superbasin-user-panel-communiques.

The Norman river downstream of Normanton. Source: Geological and Bioregional Assessment program, Steve Lewis (Geoscience Australia)

The Burketown Bore, with the bore fed wetland in the background Source: Geological and Bioregional Assessment program, Steve Lewis (Geoscience Australia)

In focus: GDEs

Groundwater dependent ecosystems (GDE) are terrestrial and aquatic systems that rely on groundwater for at least some portion of their life history. These systems can vary greatly, they could be a waterhole fed by a spring, or an area of vegetation whose roots can reach a source of groundwater.

GDE's support important ecological communities or provide refuge habitat for vulnerable species during dry periods or drought. Increased extraction from groundwater sources may impact GDE's. The Program, through regional conceptualisations, is aiming to investigate connections between groundwater and surface systems, and build a picture of regional GDE's. More information can be found at http://www.ga.gov.au/scientific-topics/water/groundwater/understanding-groundwater-resources/groundwater-dependant-ecosystems.

Cooper GBA Region

Field work

Field work to support Impact Analysis and Management (Stage 3) has begun in the Cooper GBA region. Two field trips have been completed and a third is planned for March 2020 .Factsheet available: https://www.bioregionalassessments.gov.au/assessments/geological-and-bioregional-assessment-program/fact-sheets/fact-sheets. The planned field work will collect information to address knowledge gaps related to floods and the floodplain, waterholes, and the regions groundwater systems. Water samples will help build a better understanding of possible connections between shallow groundwater on the floodplain and deeper groundwater systems, as well as GDEs across the floodplain.

Sampling of a Great Artesian Basin bore in the Cooper GBA region
Source: Geological and Bioregional Assessment program, Matthias Raiber & Jorge Martinez

User panel

The third Cooper GBA region user panel was held in Brisbane on 1 August 2019.

CSIRO and Geoscience Australia updated the panel on the work being finalised in the Geological and Environmental Baseline Assessment (Stage 2).

A question and answer session focused on the Cooper creek floodplain and recent flood events. Discussions about the risk analysis and management work (Stage 3) included defining resource development scenarios for shale, tight and deep coal gas, and the need for topic based communication materials.

Communique available:

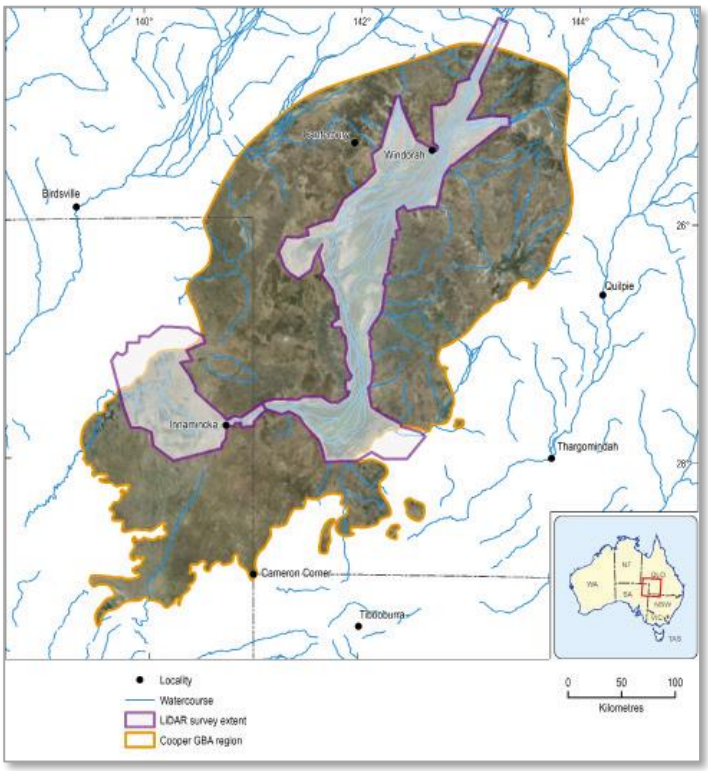
https://www.bioregionalassessments.gov.au/assessments/geological-and-bioregional-assessment-program/cooper-basin/cooper-basin-user-panel-communiques.

Cooper Creek floodplain

The floodplain of Cooper Creek (known as 'Channel Country') exceeds 60 km at its widest.

Understanding how surface water flows across and is stored in this floodplain is important for studying the potential impacts of disturbance to surface water flows.

Light Detection and Ranging (LiDAR) data has been collected for the Cooper Channel and data uploaded and shared with the Queensland Government (https://data.gov.au/data/dataset/801320f9-901a-4482-a8e8-9029c55a472c). This data will be used for surface water models of Cooper Creek flow patterns and flooding.



Map of the extent of LiDAR flown over the Cooper GBA region.
Source: Geological and Bioregional Assessment Program

The Australasian Groundwater Conference 2019

Scientists and staff from CSIRO, Geoscience Australia and the Department of the Environment and Energy gave presentations related to the Program at the Australasian Groundwater Conference 2019 held in Brisbane.

Abstracts from the presentations can be found at https://dspace.flinders.edu.au/xmlui/handle/2328/39338.

A poster outlining the GBA program displayed at the conference has also been added to the Bioregional Assessments website: https://www.bioregionalassessments.gov.au/assessments/geological-and-bioregional-assessment-program/fact-sheets/fact-sheets.

Beetaloo GBA Region

In 2019 the Beetaloo GBA region assessment received an additional $5.022 million to align with the Northern Territory Government's Strategic Regional Environmental and Baseline Assessment (SREBA). Activities have already commenced using this additional funding:

Land and water biodiversity surveys – including terrestrial, aquatic and stygofauna (see In Focus) baseline biodiversity surveys to be carried out over the next two years, and the establishment of an ecological steering committee to oversee fieldwork and biodiversity baseline surveys.

Geological seismic monitoring – installation of an initial seismic monitoring network by Geoscience Australia to detect and locate natural seismic activity (i.e., earthquakes) in the area, as well as human-induced seismicity as a result of hydrocarbon extraction activities.

More information can be found at: https://www.ga.gov.au/about/projects/safety/beetaloo-sub-basin-seismic-monitoring-project.

Water sampling – collection of groundwater samples to improve understanding of recharge mechanisms into the Cambrian Limestone Aquifer and contributing water sources to Mataranka Springs.

Transparent delivery of data – work has commenced to build a public facing, low maintenance and interactive data management platform for sharing information from the Beetaloo GBA region, the SREBA and to support and complement other Northern Territory Government systems and processes.

In focus: Stygo-what?

Stygofauna are animals that live permanently in groundwater, either in the pore space between sand grains or in larger open cave systems. With no light, they are blind, lack pigmentation, and tend to be fragile and have elongated shapes. While some species are fish, most tend to be small crustaceans between 0.3 – 10mm. Stygofauna can be highly endemic (native and restricted to a certain place) with species localised to specific aquifers and areas.

Stygofauna help maintain water quality and flow by removing organic matter. They are susceptible to pollution and changes in the water table.

Understanding stygofauna diversity and distribution for the Beetaloo Sub-basin was recommended by the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory and may be useful in assessing any potential impacts of industry development on water resources.

Swimming access point for Bitter Springs part of the Mataranka Thermal Pools, Northern Territory.
Source: Geological and Bioregional Assessment Program, Clare Brandon (CSIRO)