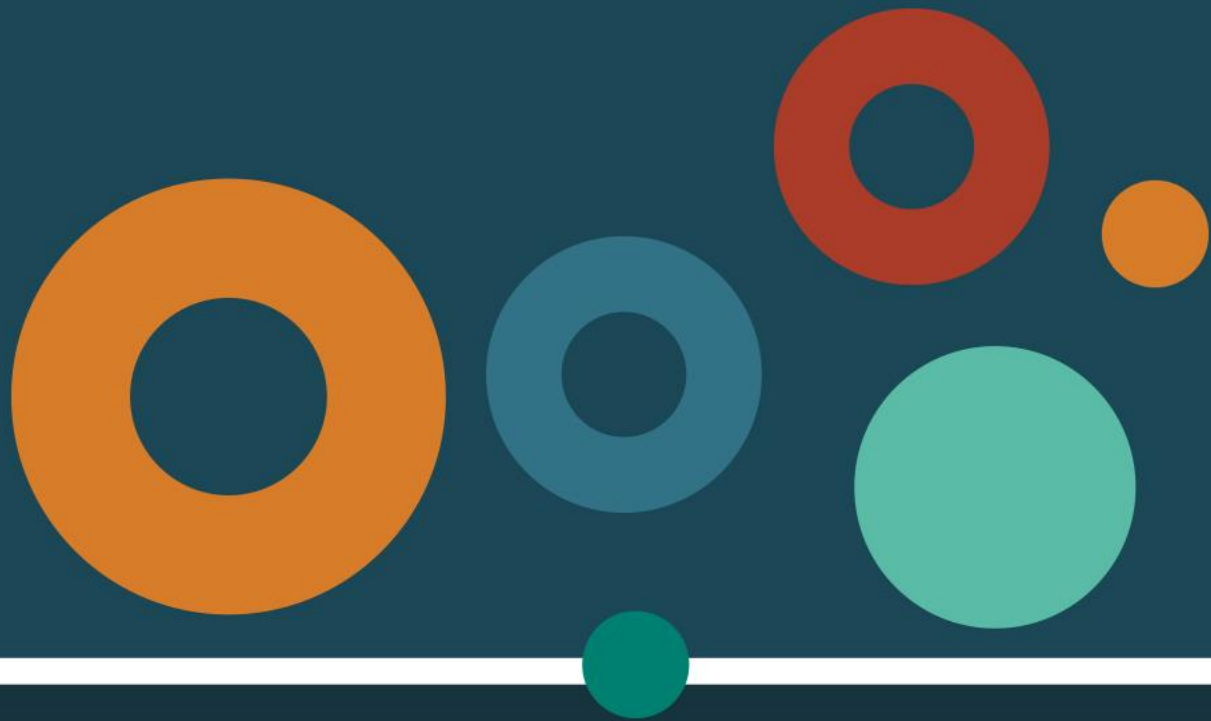


GSQ's New Discovery Program

Enabling data-driven exploration in the North-West Minerals Province



QEC Technical Forum
February 2019



Geological Survey of Queensland

- **What is our purpose?**

- To enable ongoing success for the resources industry in Queensland

- **Who are we?**

- Mineral Geoscience
- Basin Studies
- Geoscience Information
- Industry Engagement
- Resources Planning



Geological Survey of Queensland

The 'bridge' between academia and industry



Geological Survey of Queensland

The 'bridge' between academia and industry



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GSQ - Mineral Geoscience



Responsibilities

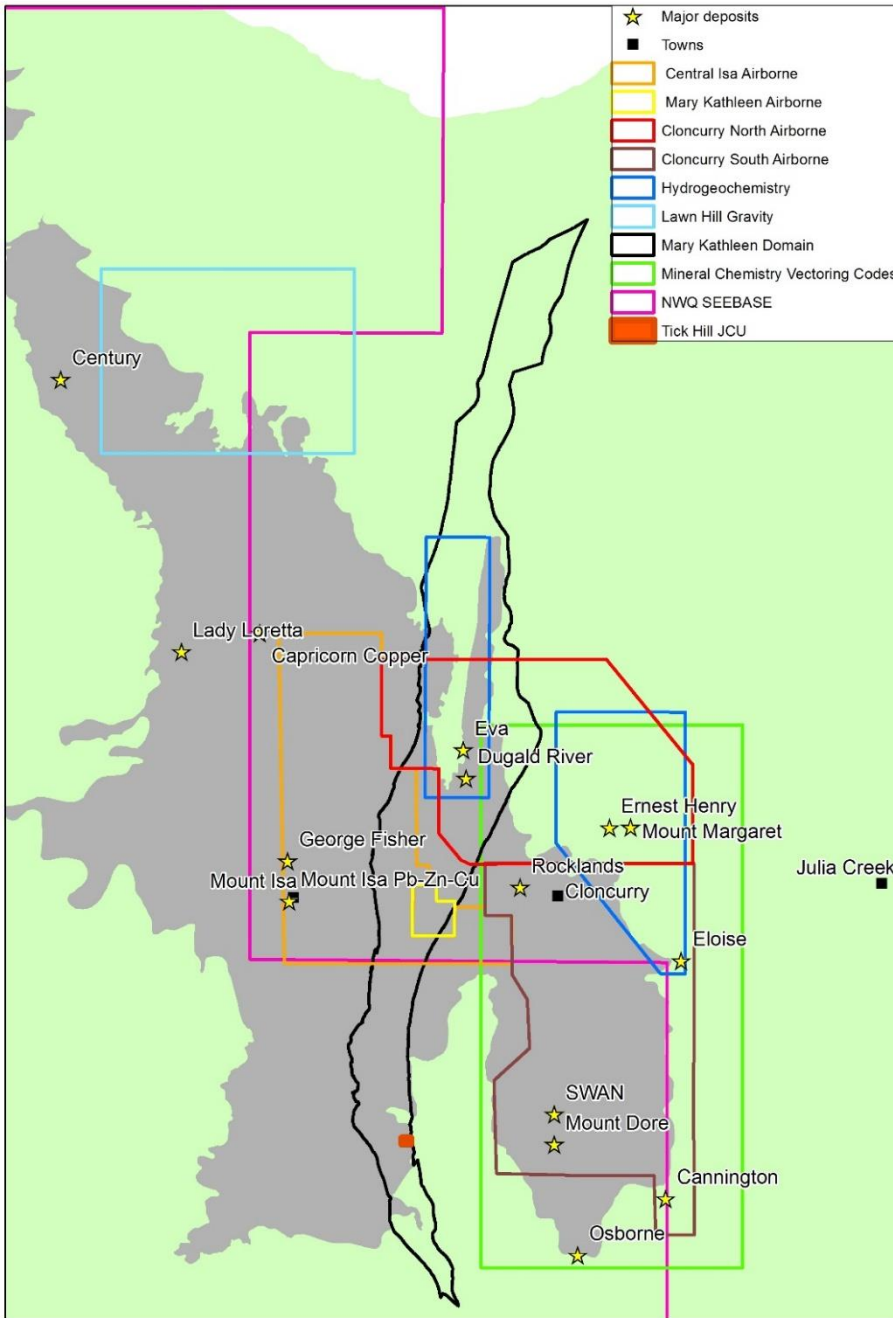
- ***Support and embrace GSQ's ongoing evolution***
 - Industry first
 - Geoscience Data Modernisation Program
 - Work collaboratively, support debate
- ***Stay at the forefront of developments in geoscience and industry***
 - **Science** - new concepts and ideas
 - **Technologies** - new ways to see deeper, detect better
 - **Communication**
 - no uptake in application of new science, new technology if not partnered with ***effective communication***
 - GSQ important bridge between academia and industry; unique role
 - Information custodian
 - Information dissemination



Goals for 2019:

New Discovery Program

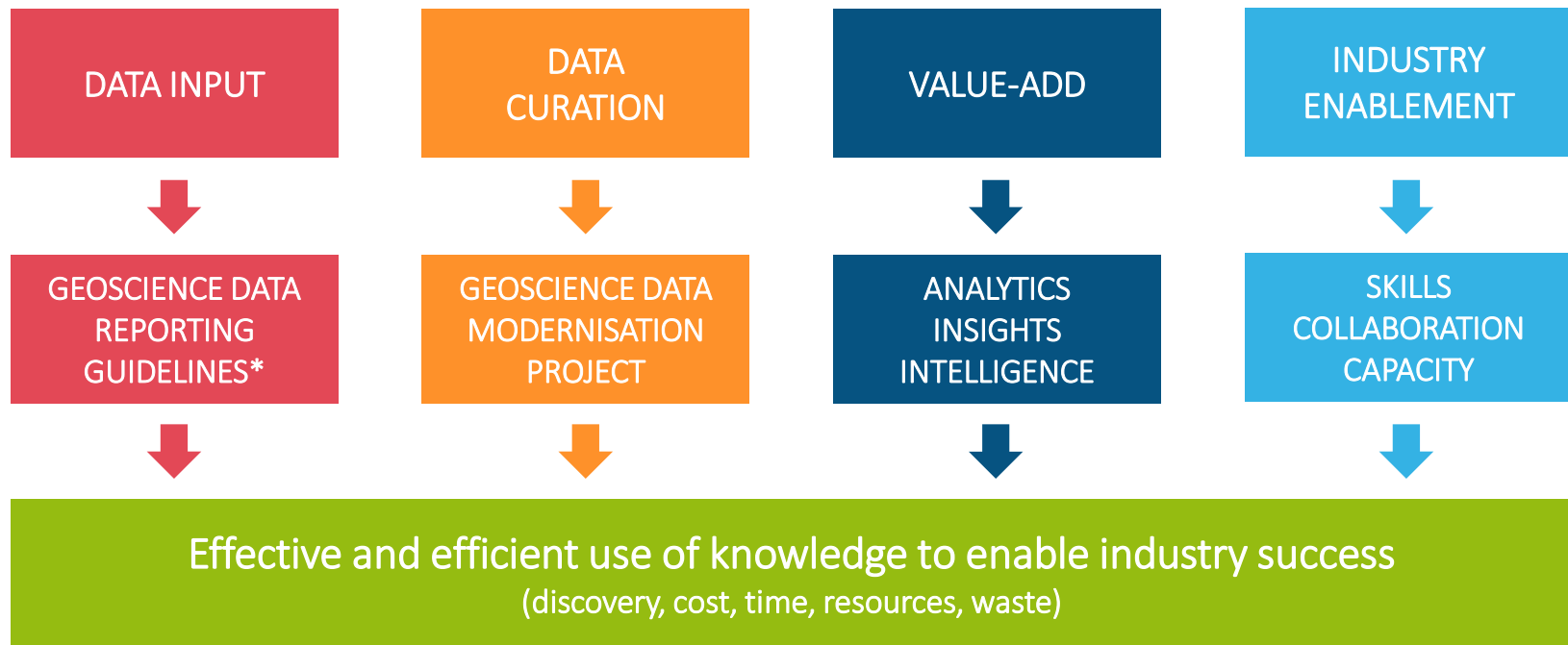
- **Mary Kathleen Domain**
 - hunting for IOCG signatures in granites
- **Reference Collection**
 - a digital library of deposits from the North West Minerals Province
- **Hydrogeochemistry** of the NW Minerals Province
 - Developing new tools for minerals explorers to see through cover
- Manage, support and engage with research partners (UQ, QUT, CODES, GA, CSIRO, JCU....)
- Disseminating Knowledge
 - Regular Technical Workshops for Industry



Coverage of the New Discovery Program

Geoscience Data Modernisation

Data-Driven Exploration



* Draft Mineral & Coal Reporting Guidelines available for Industry feedback after 31st March 2019

Geoscience Data Modernisation

Data Lake

Find insights in
data

Interact with the data
via spatial, textual,
graph, 3D

DATA
VISUALISATION

DATA
ANALYTICS

MACHINE
LEARNING

AI that learns from
data, and identifies
patterns & insights

Optimise, enhance,
cleanse & curate data

DATA PROCESSING

Index all digital
& physical data

DATA CATALOGUE

DATA ACCESS

Human, computer
& cloud data
access

Store every piece of data
as an object

DATA OBJECT STORE

Geoscience Data Modernisation

- Less than 10% of all open file data is publically accessible on GSQ systems
- Aiming to have >90% available by 2021
- Imagine the possibilities.....



Future of the Mineral Geoscience group



- **Our main goal is to enable industry success**

Future of the Mineral Geoscience group



- Our main goal is to enable industry success
- **Traditional activities need to be modernised**

Future of the Mineral Geoscience group



- Our main goal is to enable industry success
 - Traditional activities need to be modernised
 - **Do the jobs that will help industry, but are:**
 - too big
 - too hard
 - too expensive
- for any one company to undertake**

Future of the Mineral Geoscience group



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 - **Regional geophysics** (already do well – ongoing)

Future of the Mineral Geoscience group

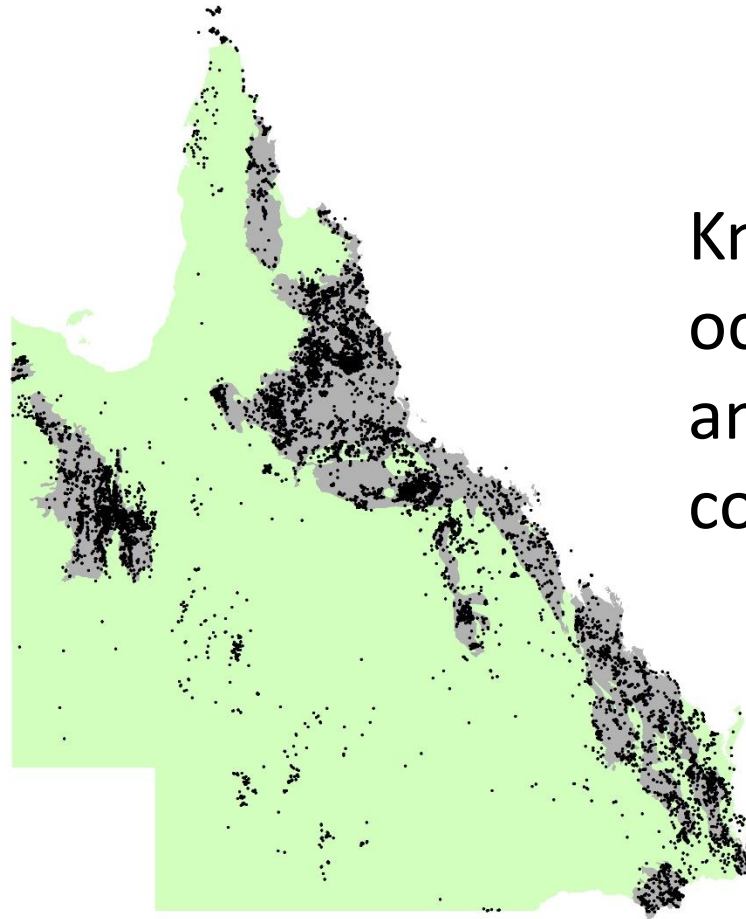


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 - **Regional geology**.... Of areas under cover; change our map production to mapping under cover

Future of the Mineral Geoscience group

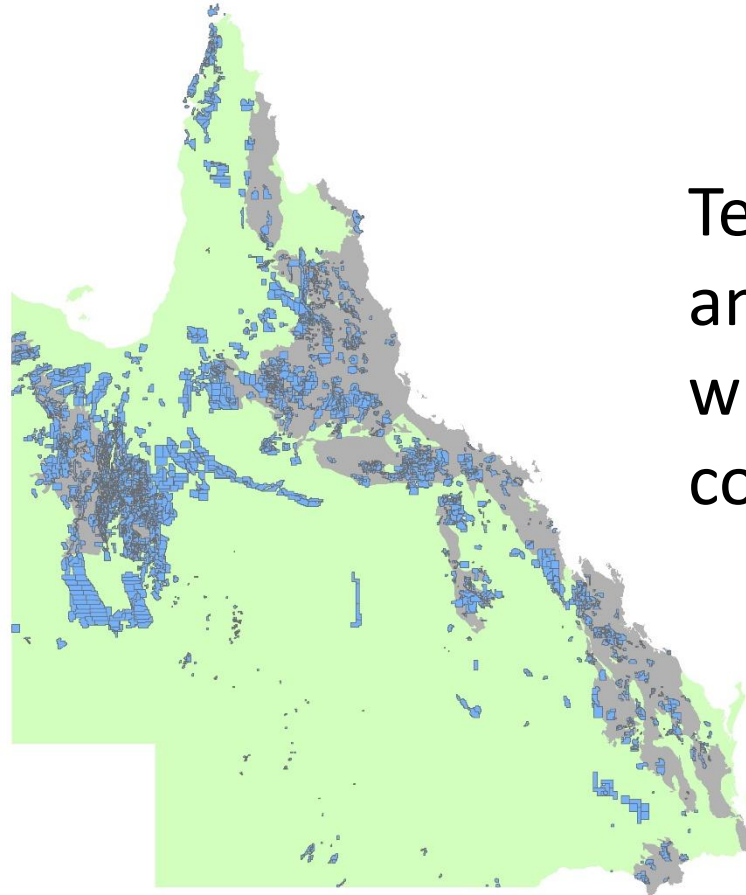
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 - Regional geophysics (already do well – ongoing)
 - Regional geology.... Of areas under cover; change our map production to mapping under cover
- **Greatest value for industry in reducing the unknowns**
 - Minimise risk

The Under Cover problem



Known mineral
occurrences
and outcrop vs
cover

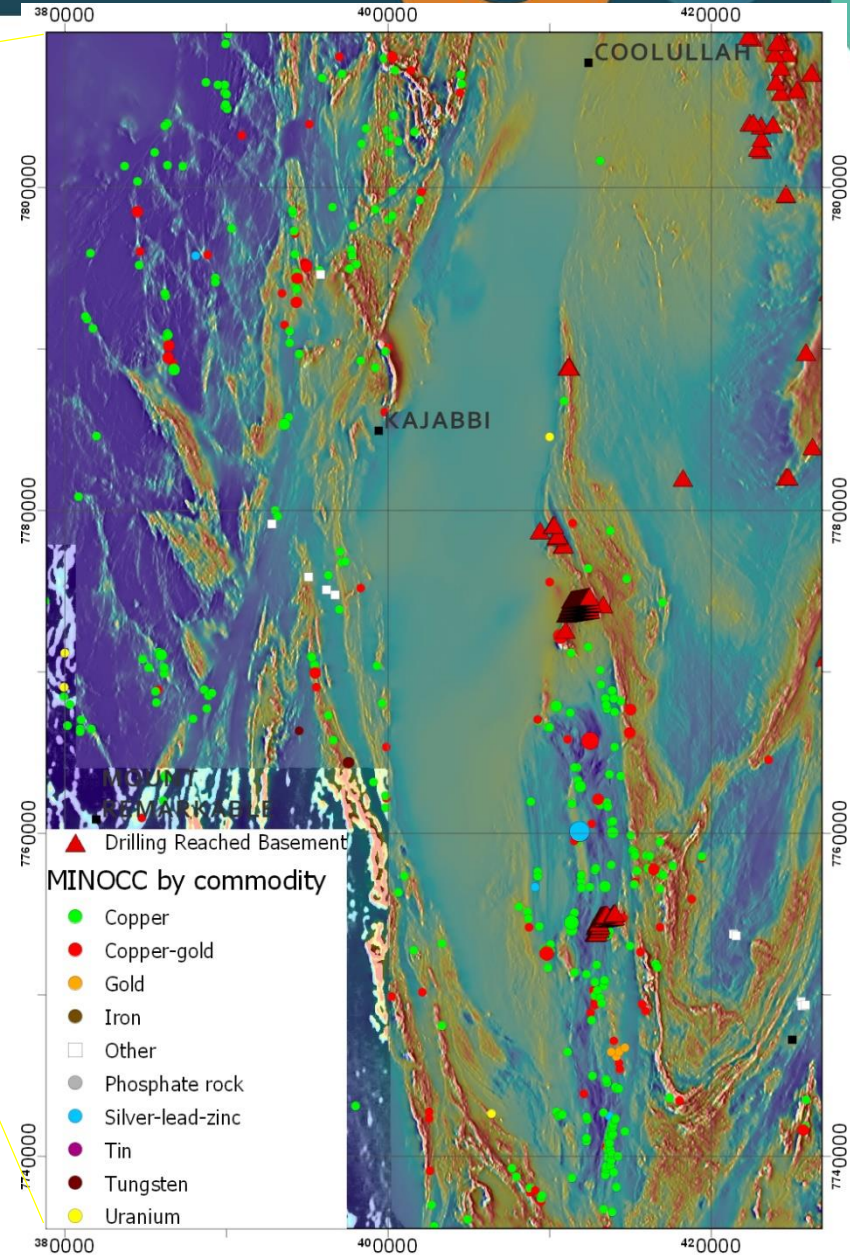
The Under Cover problem



Tenure (granted and applications) with outcrop vs cover

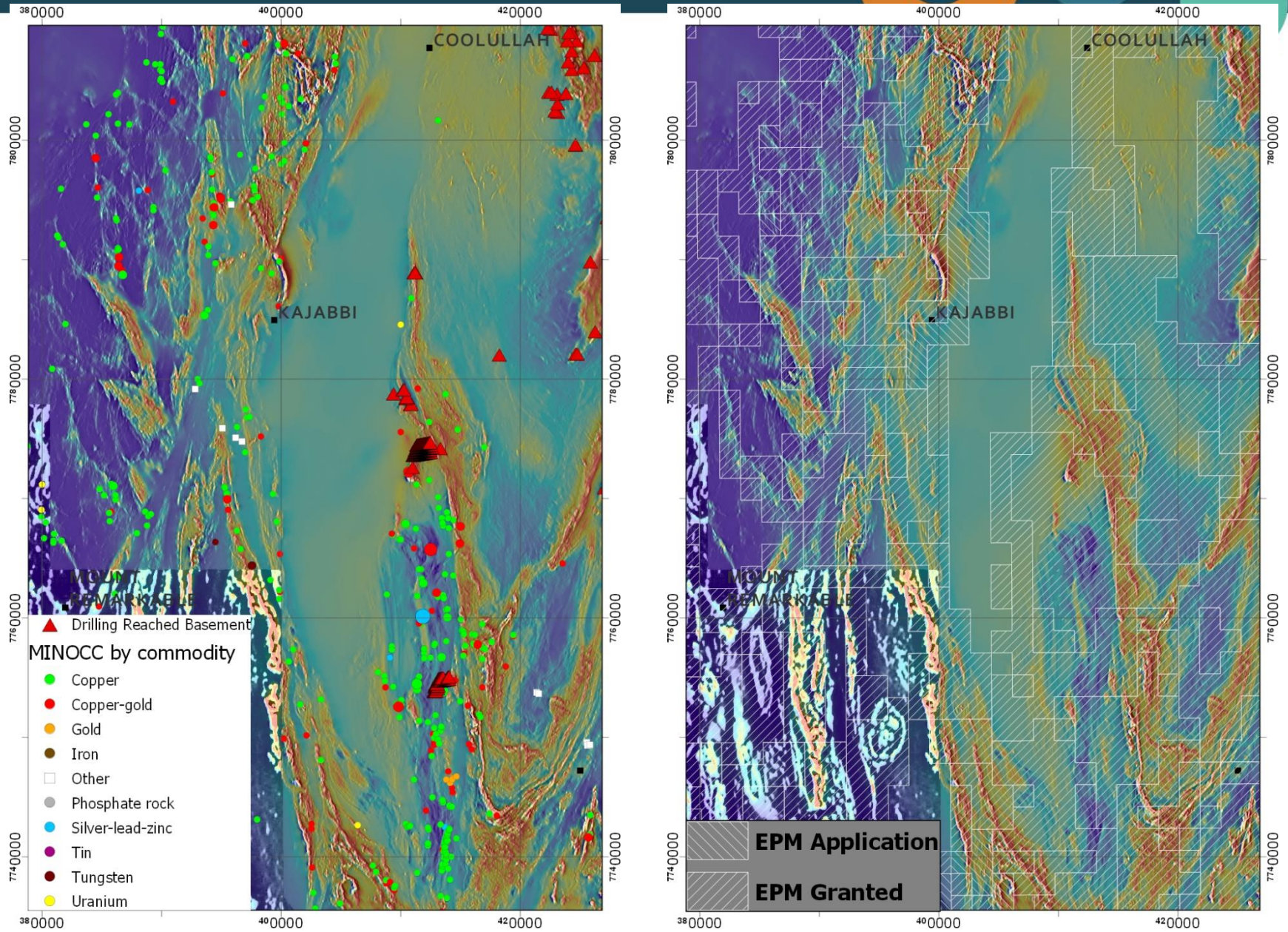
No outcrop means exploration risk higher
GSQ Mineral Geoscience's role is to minimise that risk

Example: Landsborough Graben



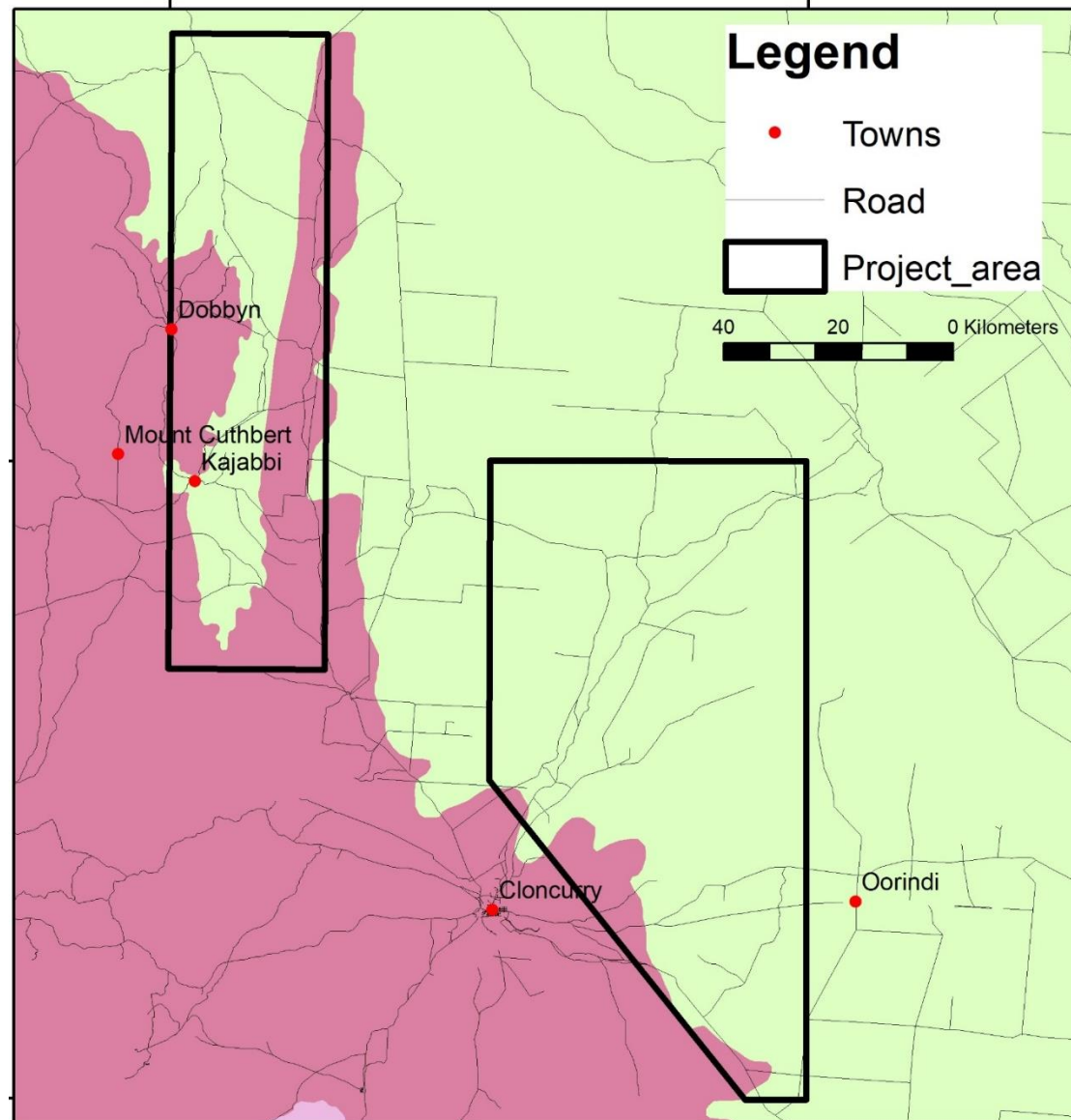
North Cloncurry Airmag + Rad Survey:
<http://bit.ly/GSQCloncurryNorth>

Example: Landsborough Graben



Mineral Exploration through Hydrogeochemistry

- Seeking other novel ways to detect mineralisation at depth
 - Aiming at areas under cover
 - 400 boreholes to be tested
 - TDS, anions, cations, pH, Pb & stable isotopes



Future State



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 - Enabler, facilitator, collaborator

Future State



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- Data is reliable, good quality; an effective exploration tool
- GSQ is an effective bridge between academia (universities, CSIRO, GA) and industry
 - Enabler, facilitator, collaborator
- **GSQ is doing the work that industry needs**
 - Not exploration, but filling in knowledge gaps in high risk/high prospectivity areas

Thankyou

