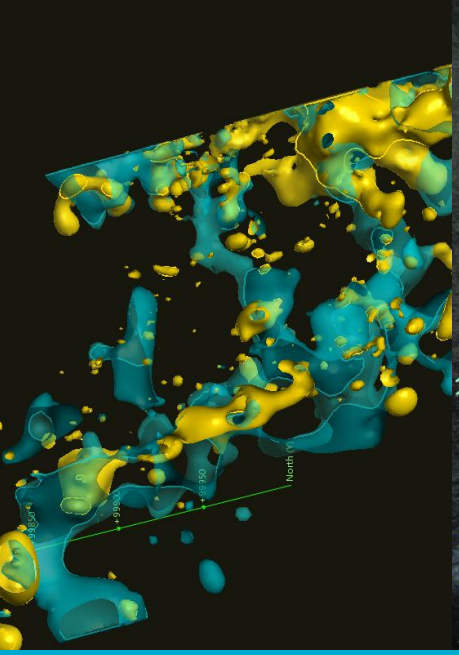
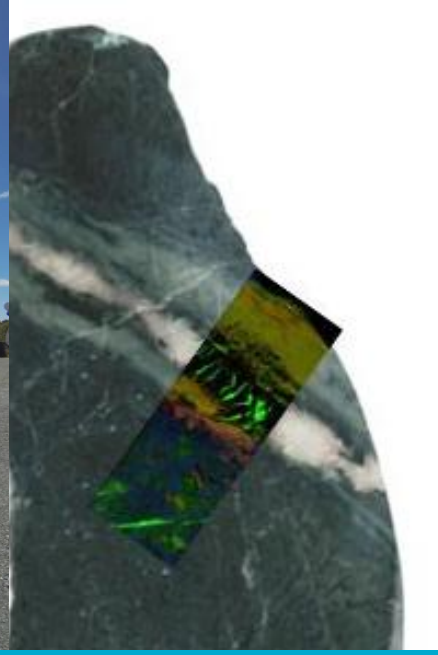






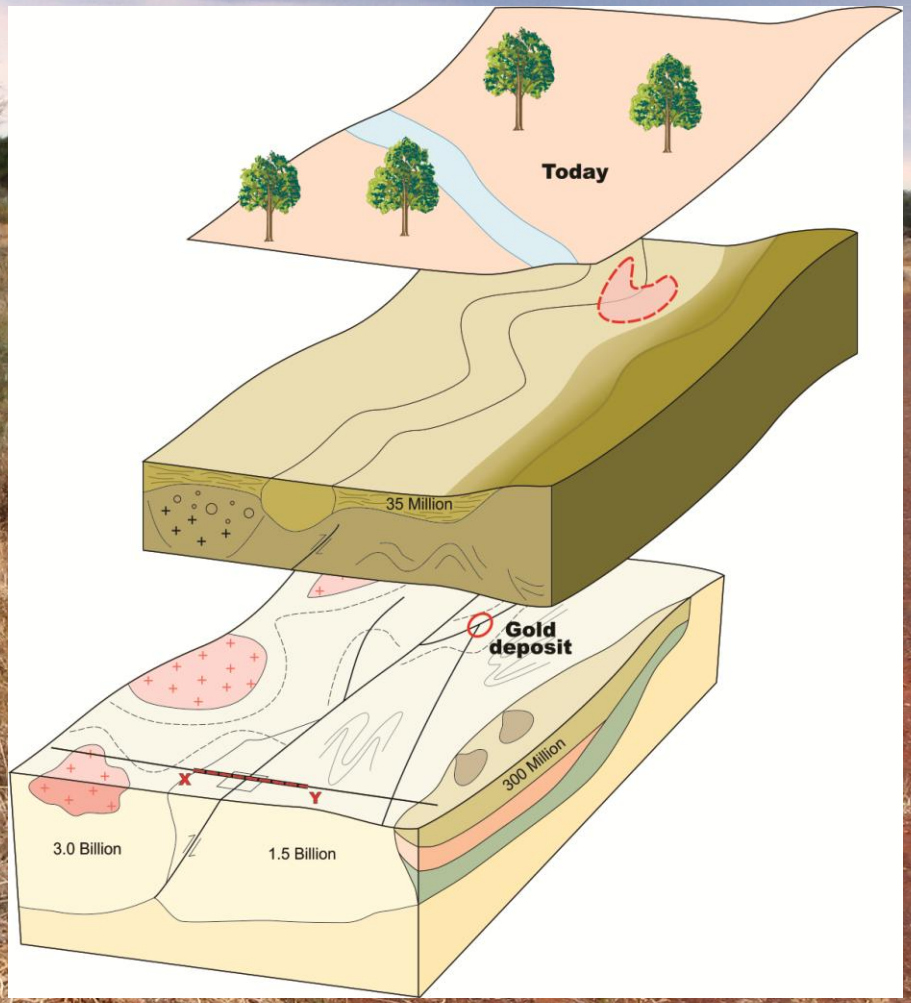
Innovation to support the UNCOVER Business

James S. Cleverley | **Principal Geochemist**

CSIRO EARTH SCIENCES & RESOURCE ENGINEERING – MINERALS DOWN UNDER
www.csiro.au

Rob Hough, Tim Munday, Dave Gray, Michelle Carey, Richard Hillis and DET CRC team, and plenty of others .....

Can we challenge perception?



Mineral Systems and R&D

The Why Question

Why is the ore body there?

6 Questions

1. Geodynamics
2. Architecture
3. Fluid reservoirs
4. Flow drivers & pathways
5. Deposition
6. Preservation

Inputs from:

Data Integration

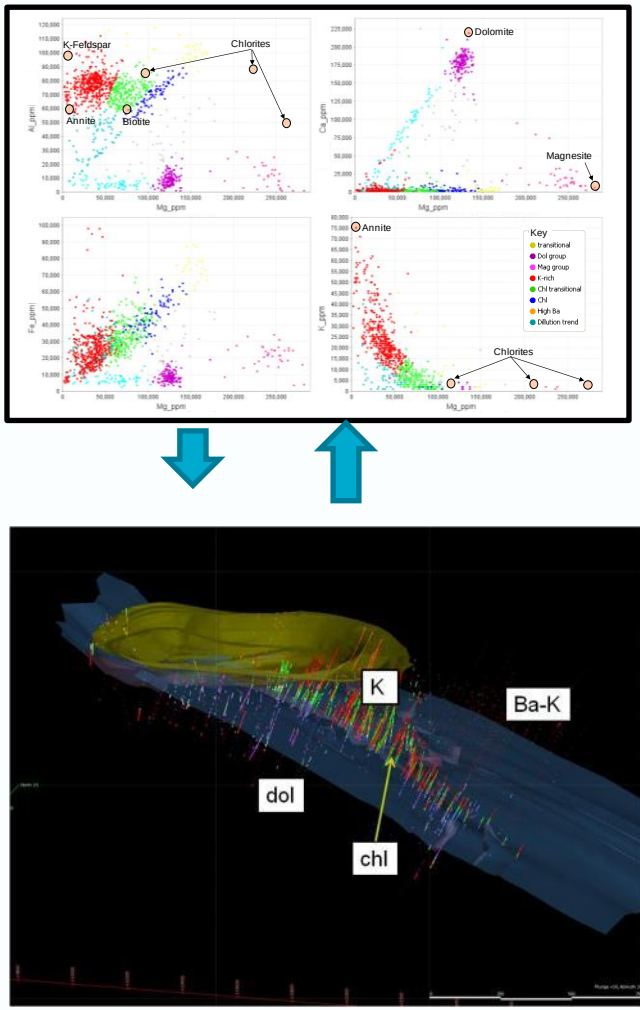
New technology

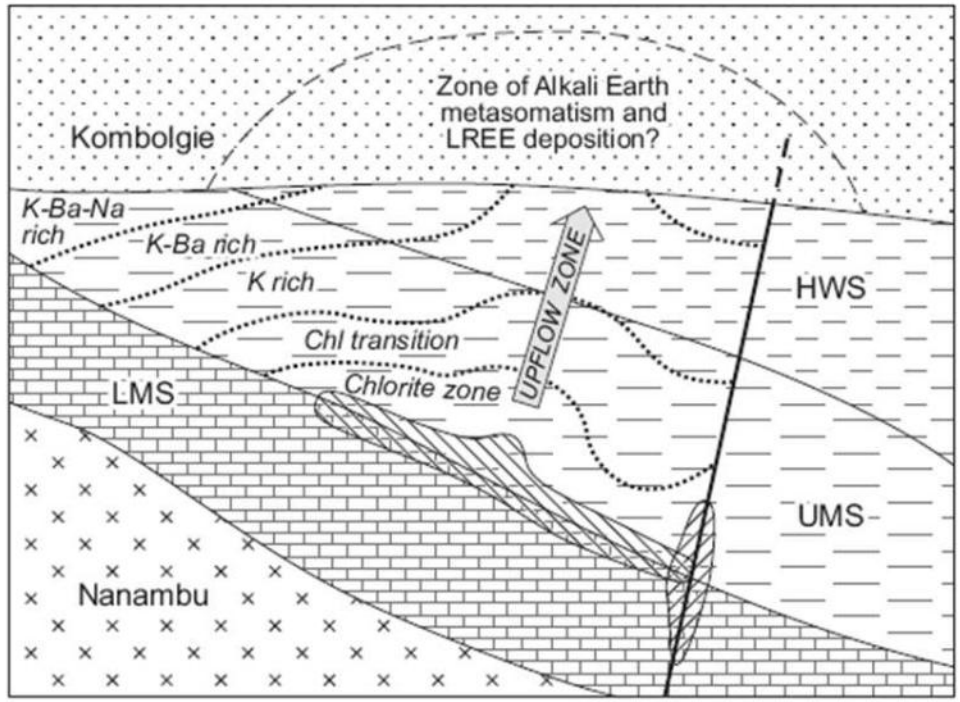
3D Analytics

The Where Question

Where is the next ore body?

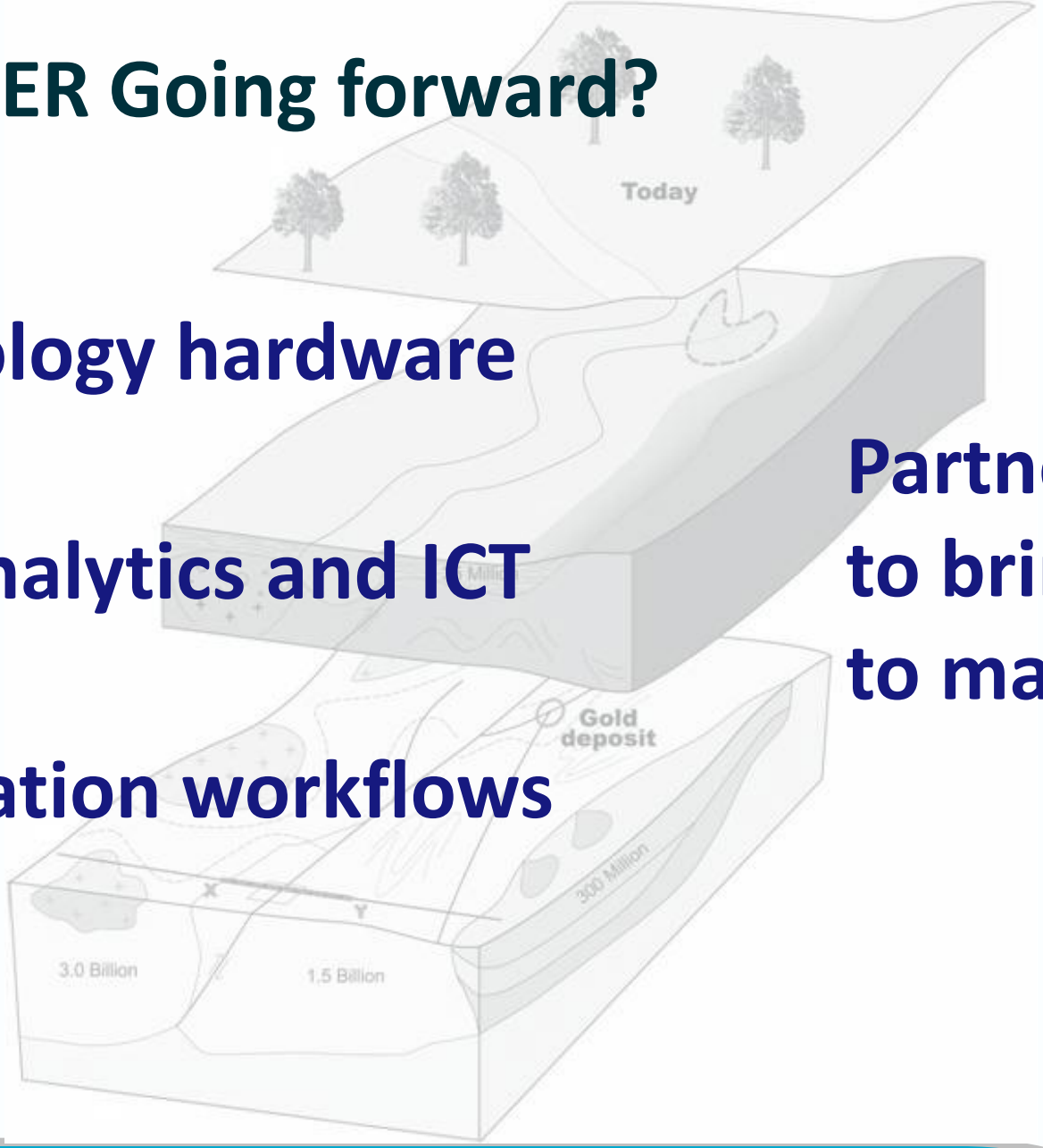
Targeting Distal Footprints





Fisher et al; 2013

UNCOVER Going forward?



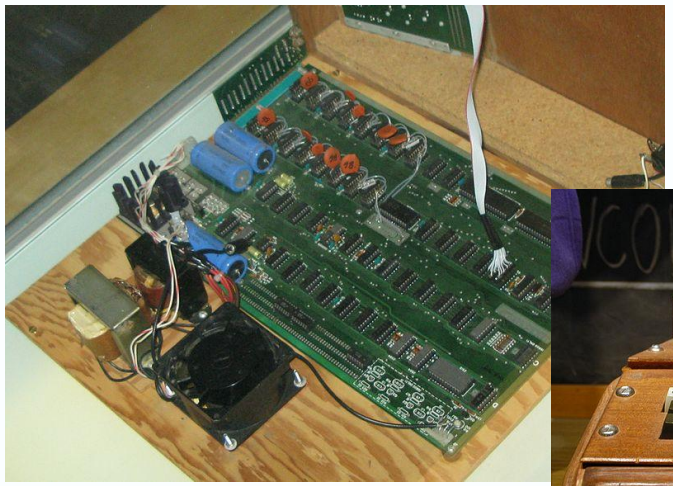
Technology hardware

Data analytics and ICT

Exploration workflows

Partner to bring to market

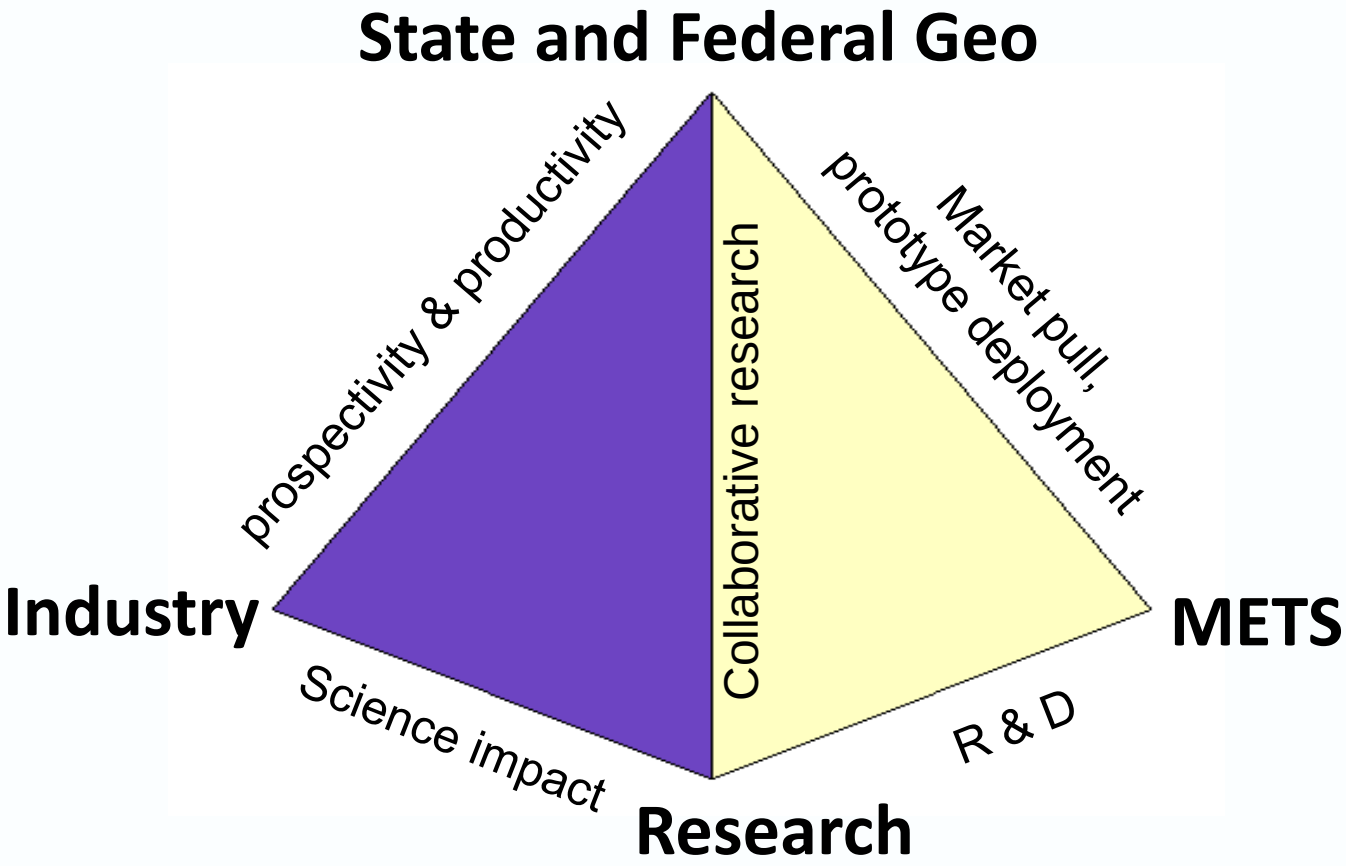
“Innovation is the process of bringing better solutions to solve new requirements, unarticulated needs or existing market needs.”



The birth of Apple

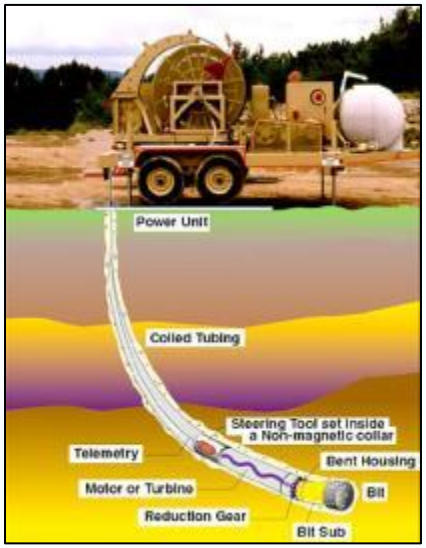
How will UNCOVER make a material difference to the business of exploring under cover?

The Australian Innovation Partnership

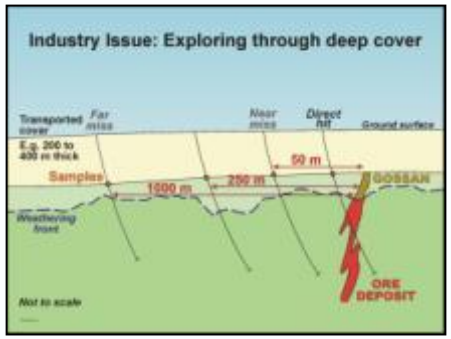


Market push-pull strategies

CT Rig drilling at $50/m sampling cover and basement

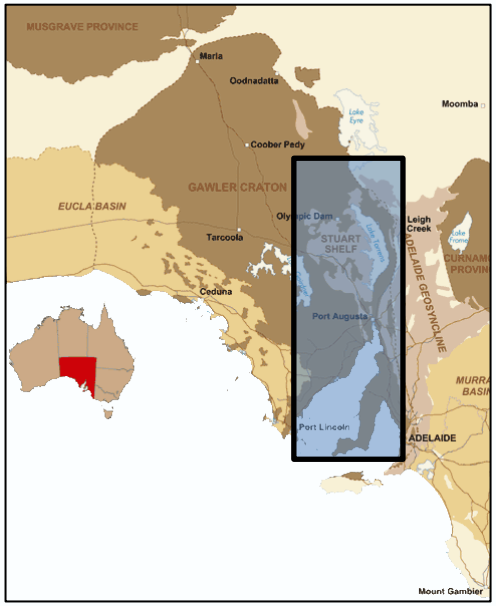


Lab-on-rig detects geochemical vectors within 3.5 km of mineralised system



Technology Push
(R&D Providers)

Commercialisation (Suppliers)



Government co-sponsored regional 5km x 5km grid drilling program

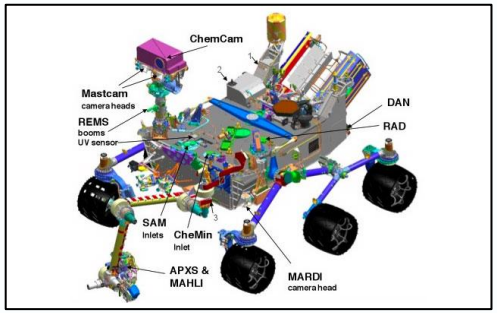
Market Pull
(Government & Mining Companies)

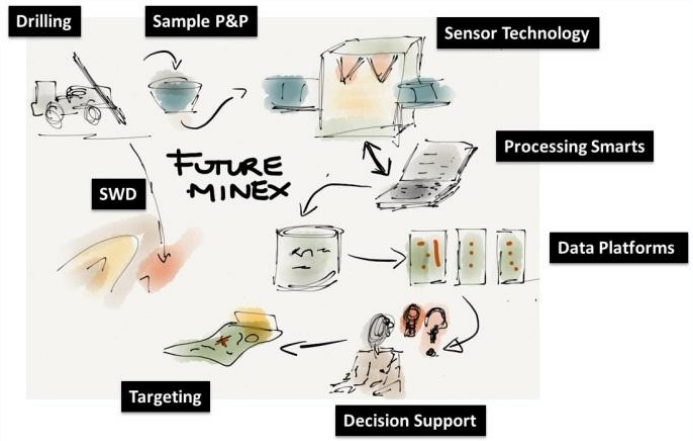
The DET CRC Strategy 2013-2017

Drilling

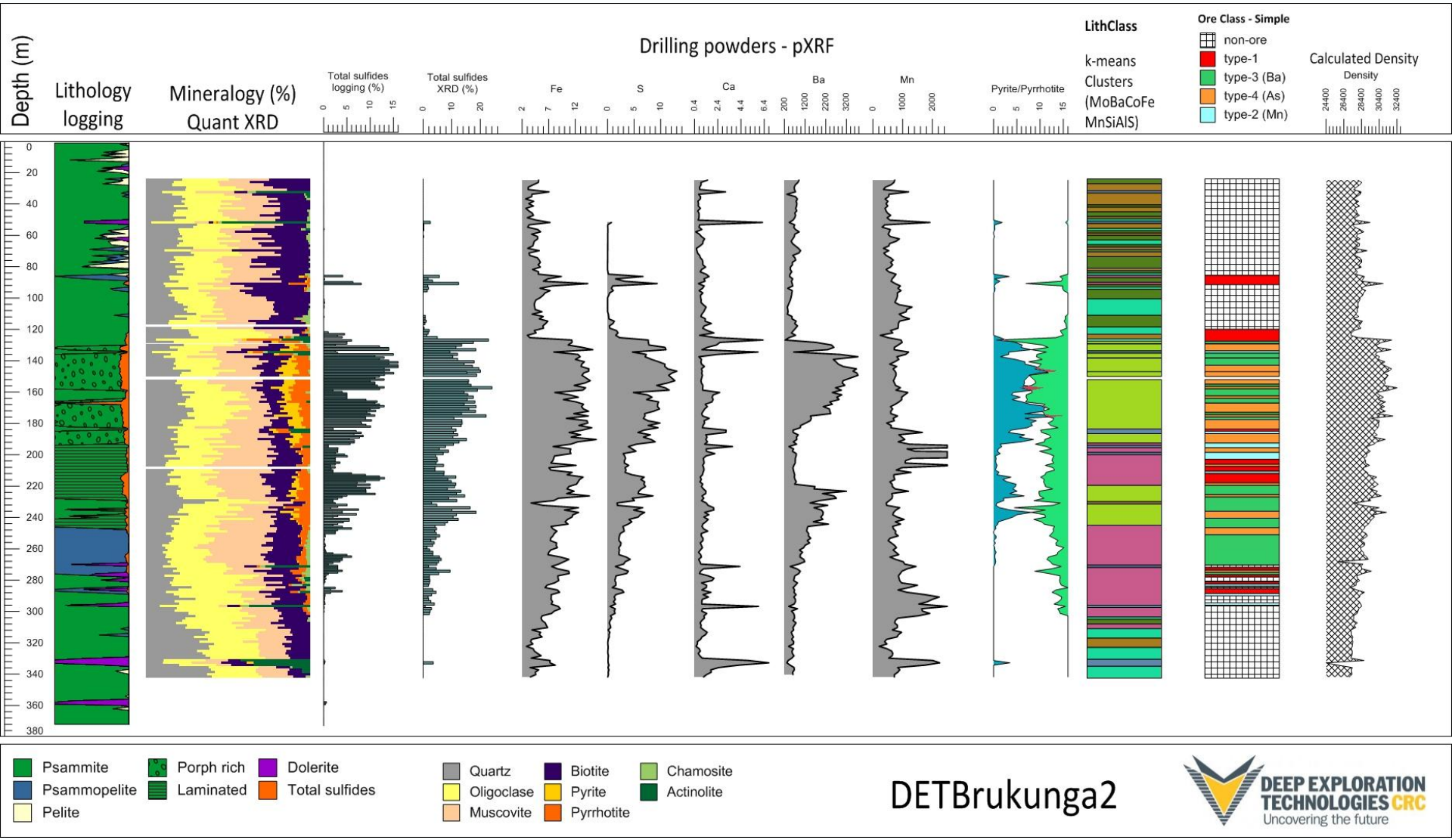
Down hole sensors

Top of hole sensors



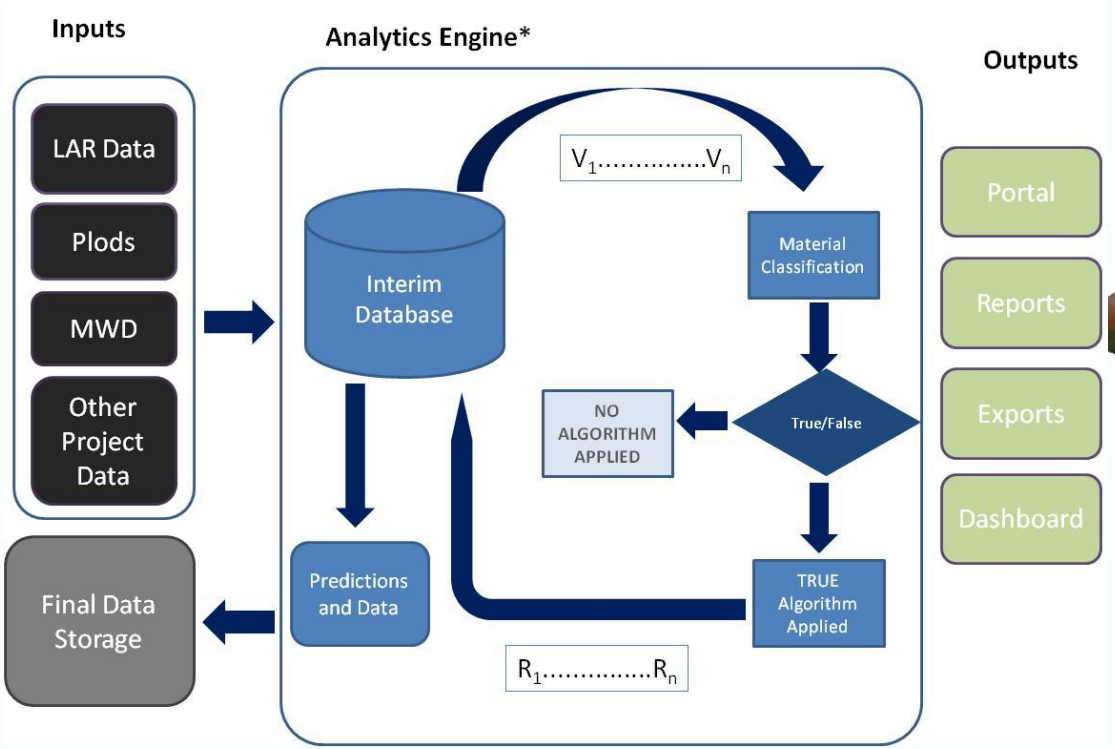


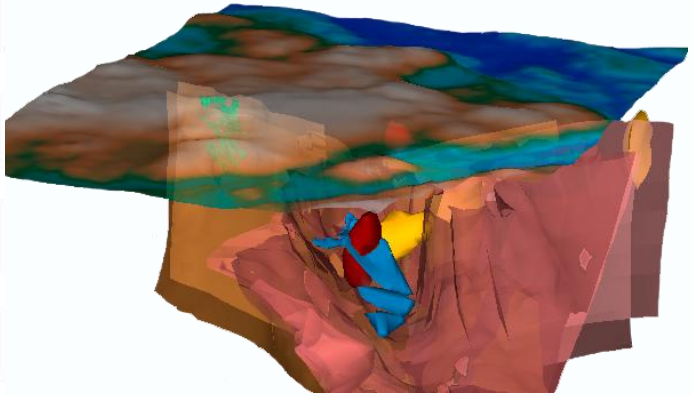
Initial Brukunga Drilling Powders Work



Decision Support?

New technology will need data analytics

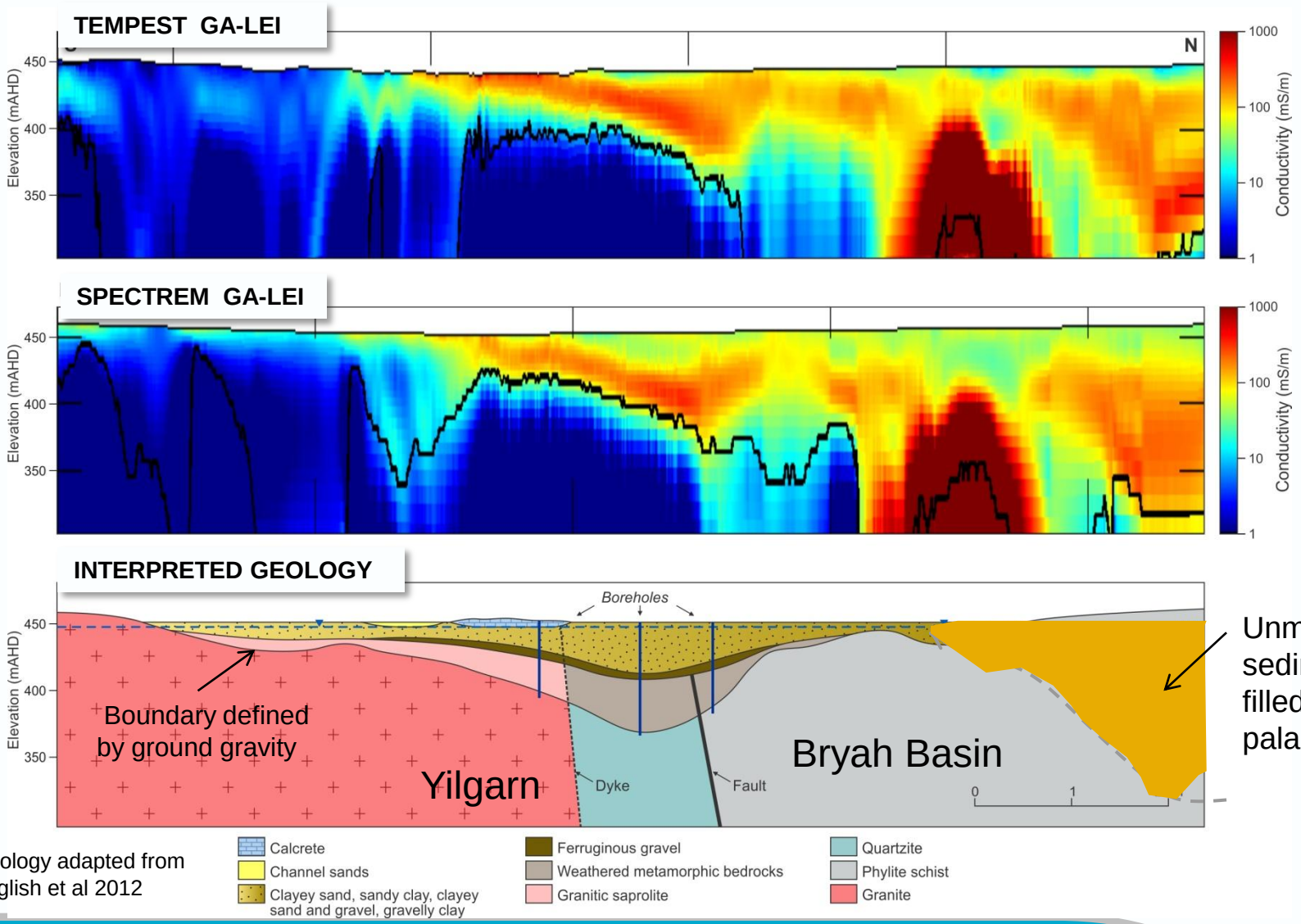




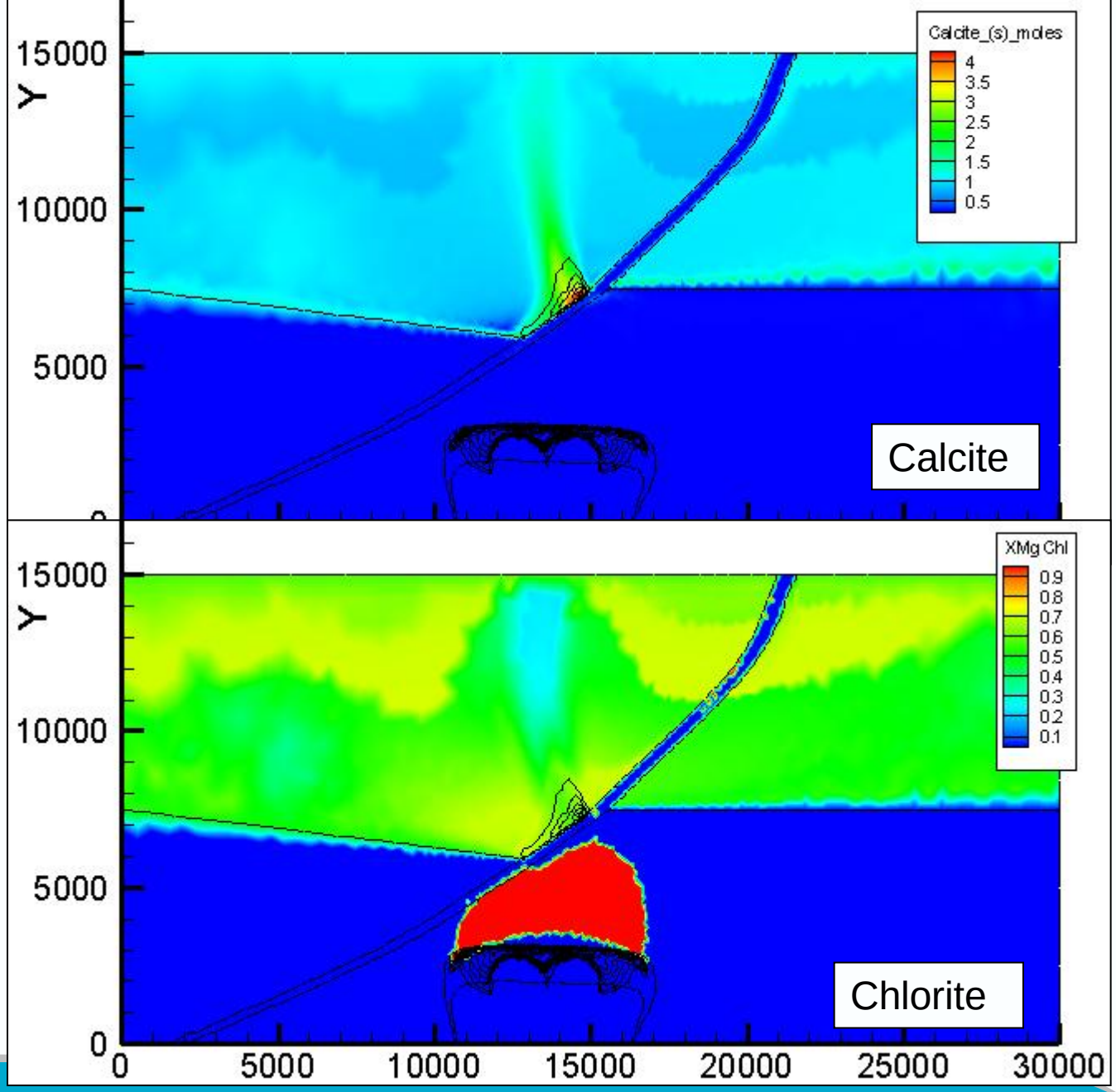
Research Outcomes

Michelle Carey/James Cleverley – DET CRC

Characterisation of Cover

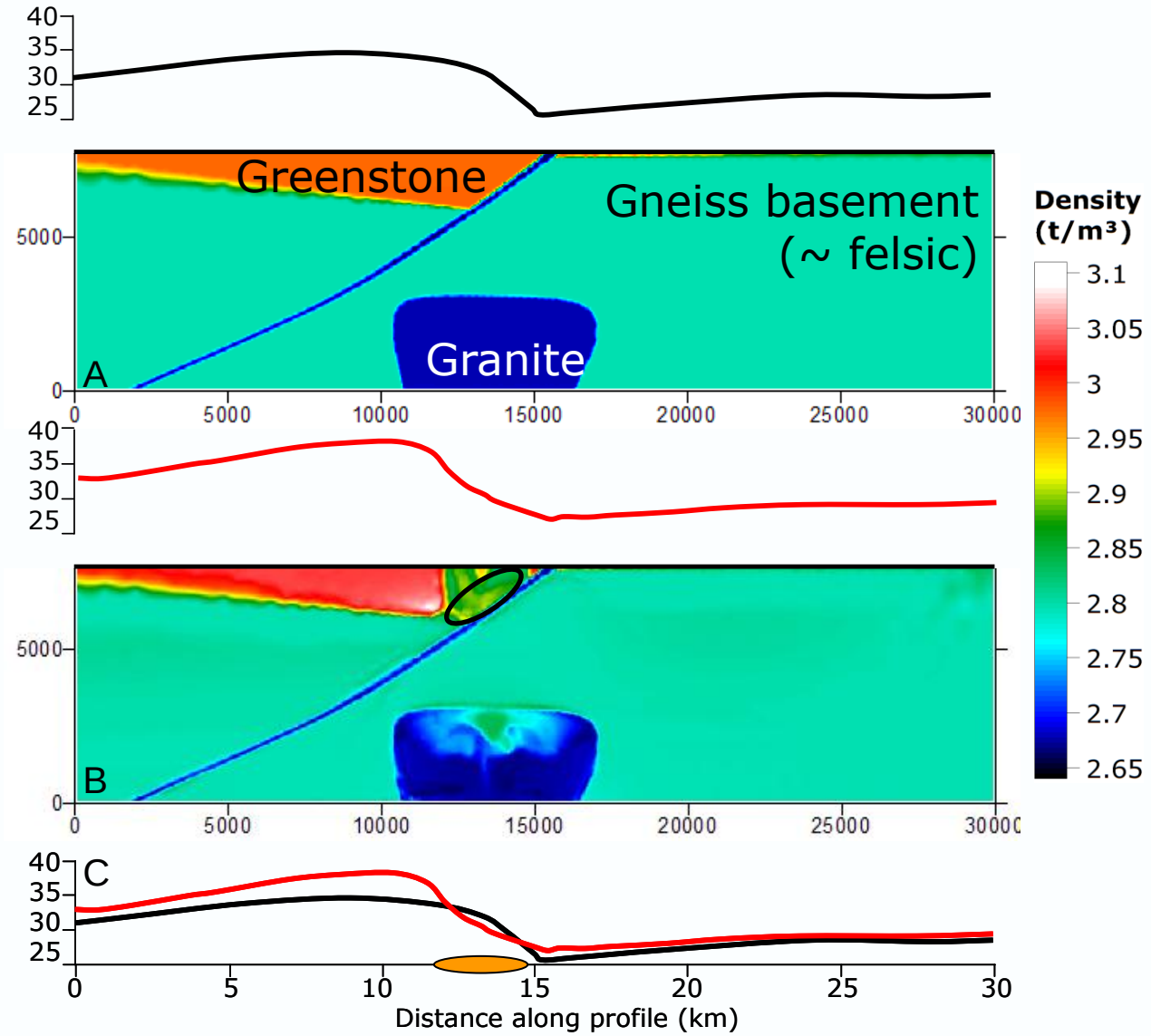


Geology adapted from English et al 2012

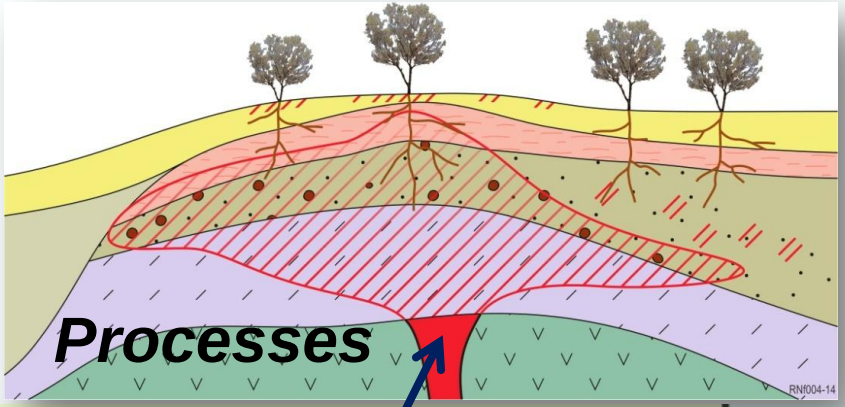

Calcite_(s)_moles
4
3.5
3
2.5
2
1.5
1
0.5
15000
Y
10000
5000
Calcite
XMg Chl
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
15000
Y
10000
5000
0
Chlorite
0
5000
10000
15000
20000
25000
30000

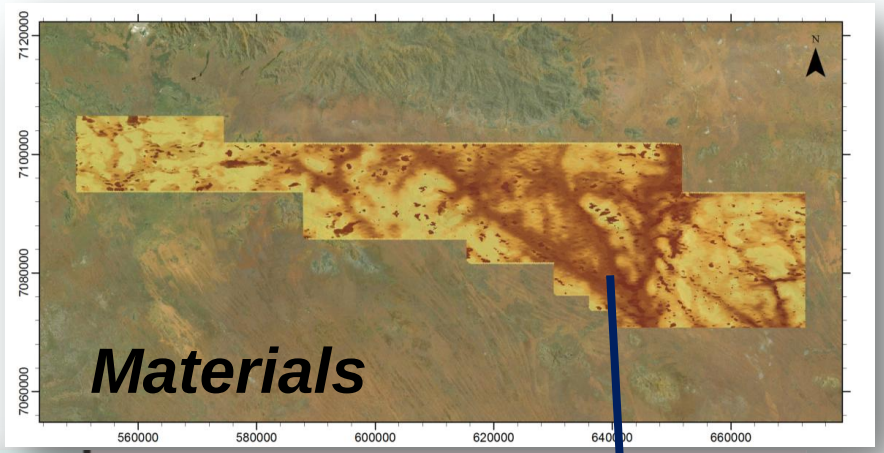
0.189 Ma

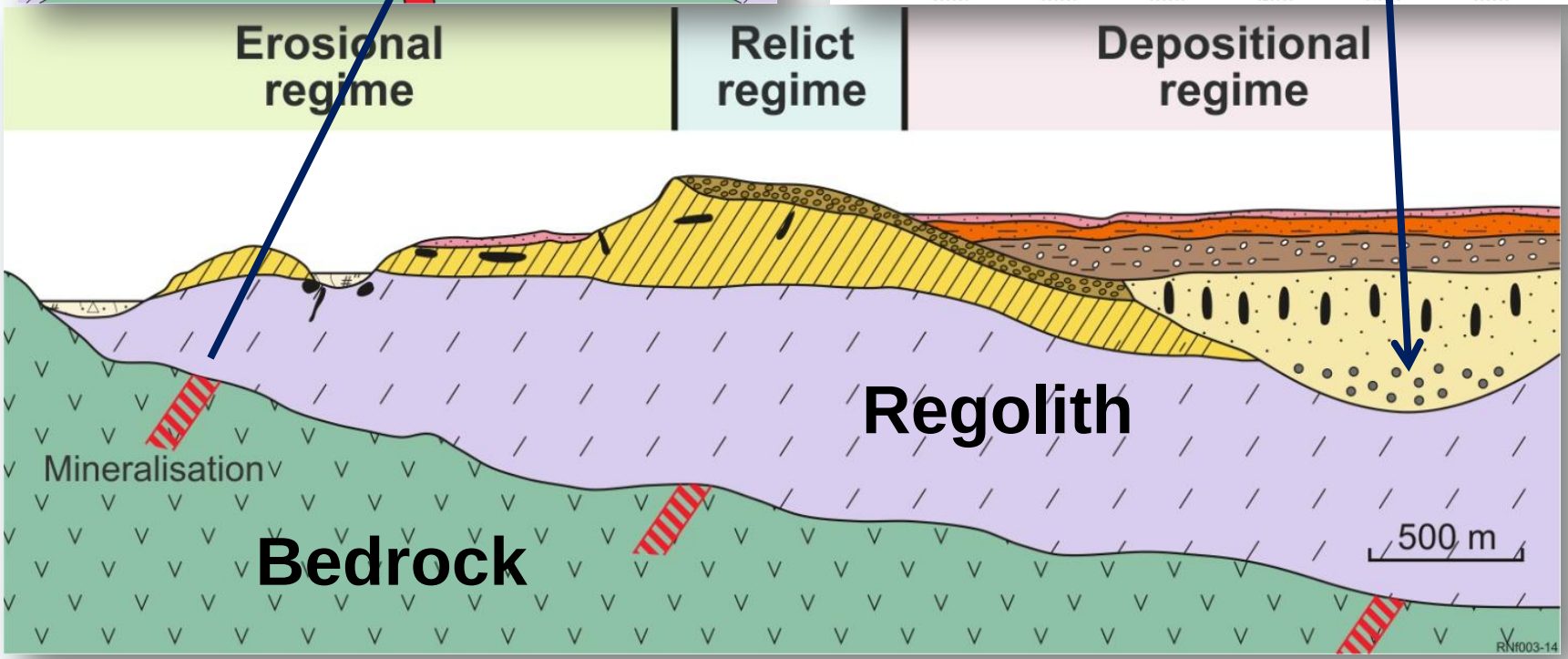
Gravity response from this model



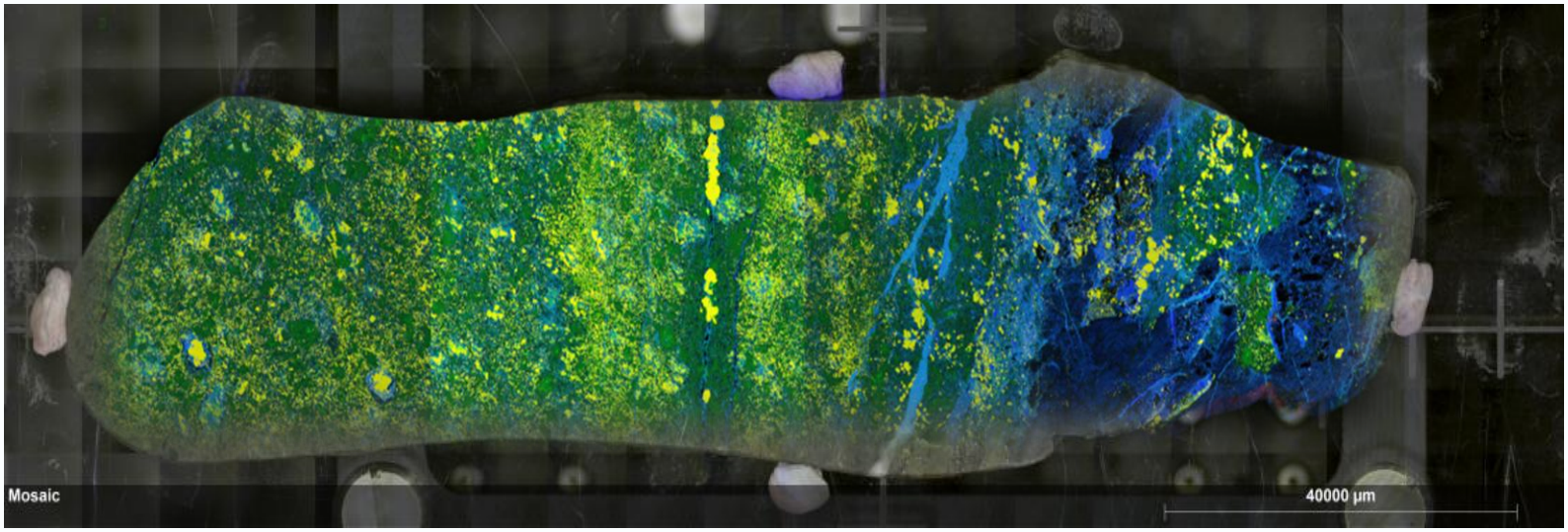
Materials and Process







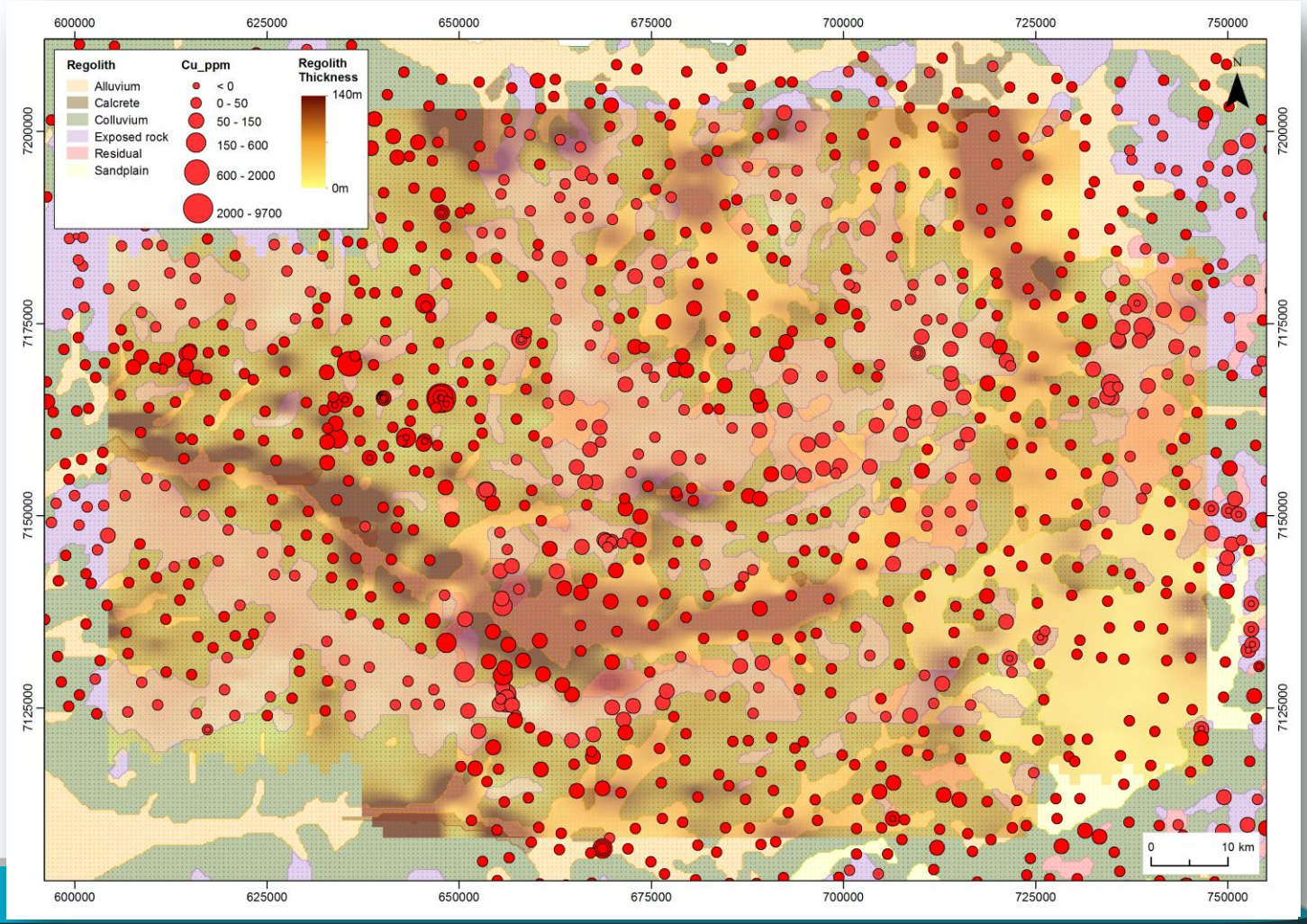
Advanced Characterisation



Characterise the rocks with next gen core facilities

Capricorn Orogen – Merging disciplines

Future science linking core strengths in regolith and geochemistry with geophysics to better define exploration workflows



Technology will drive new thinking but how do we capture the opportunity – work programs?

How will UNCOVER make a material difference to the business of exploration under cover?

UNCOVER needs to cross the discipline barriers. How will we grow the network and share the data and thinking?