



Regional 3D Architecture

3D Maps, Models and Minefields

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predictive mineral discovery Cooperative Research Centre



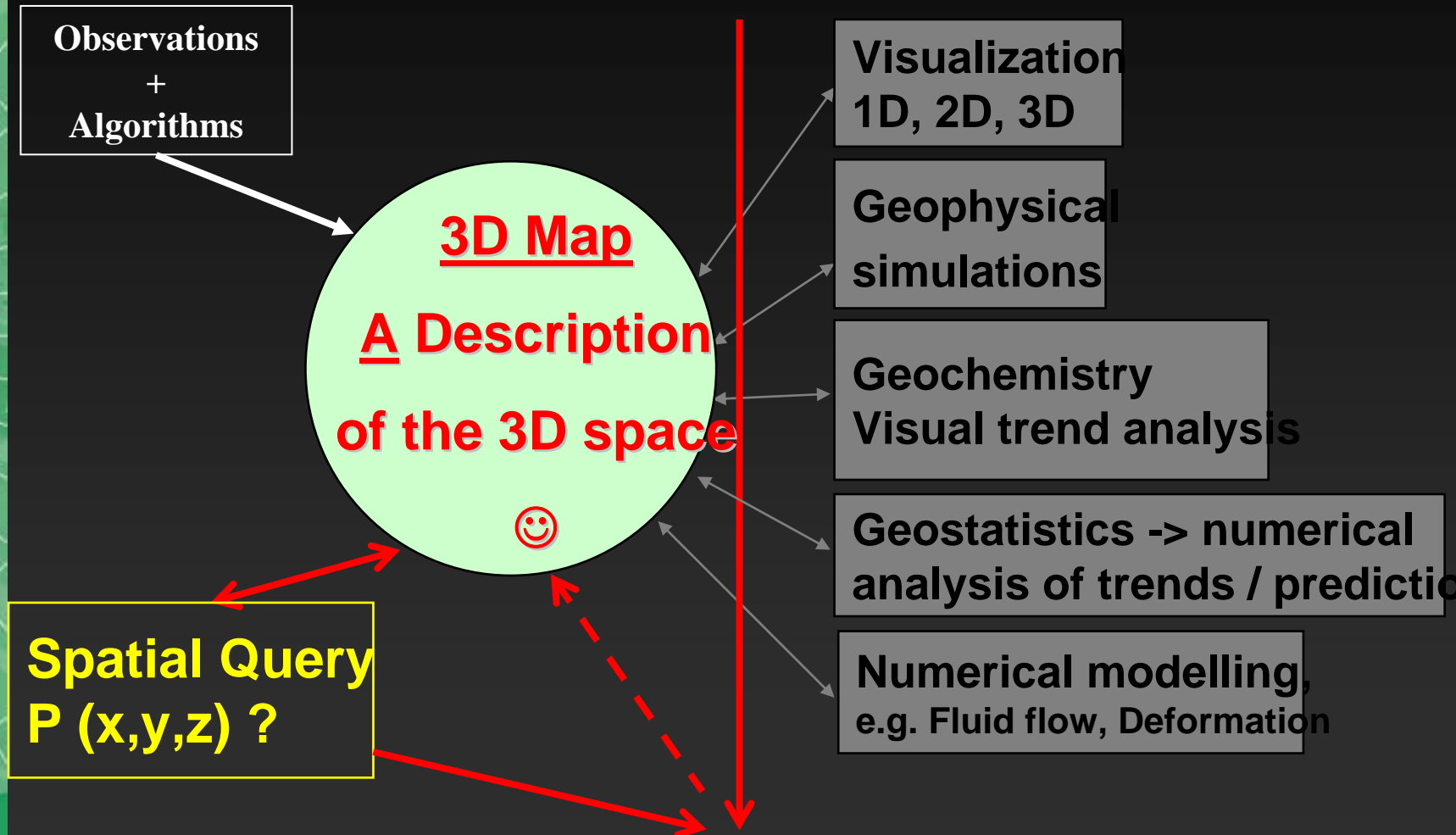
Outline

- How do we build 3D maps for I7?
 - Minefields!
- Where are we at?
 - 3D maps
- Where next?
 - Integration

Why 3D maps?

- Provide answer to some of the 5 Q's
 - What is the System Architecture?
 - What are the Fluid Pathways?
- Building 3D maps of a terrane allows
 - for integration and reconciliation of our knowledge,
 - pin points the areas where knowledge is missing or still highly interpretive
 - provides the framework within which proposed mineralising processes can be tested.

What is a 3D Map?



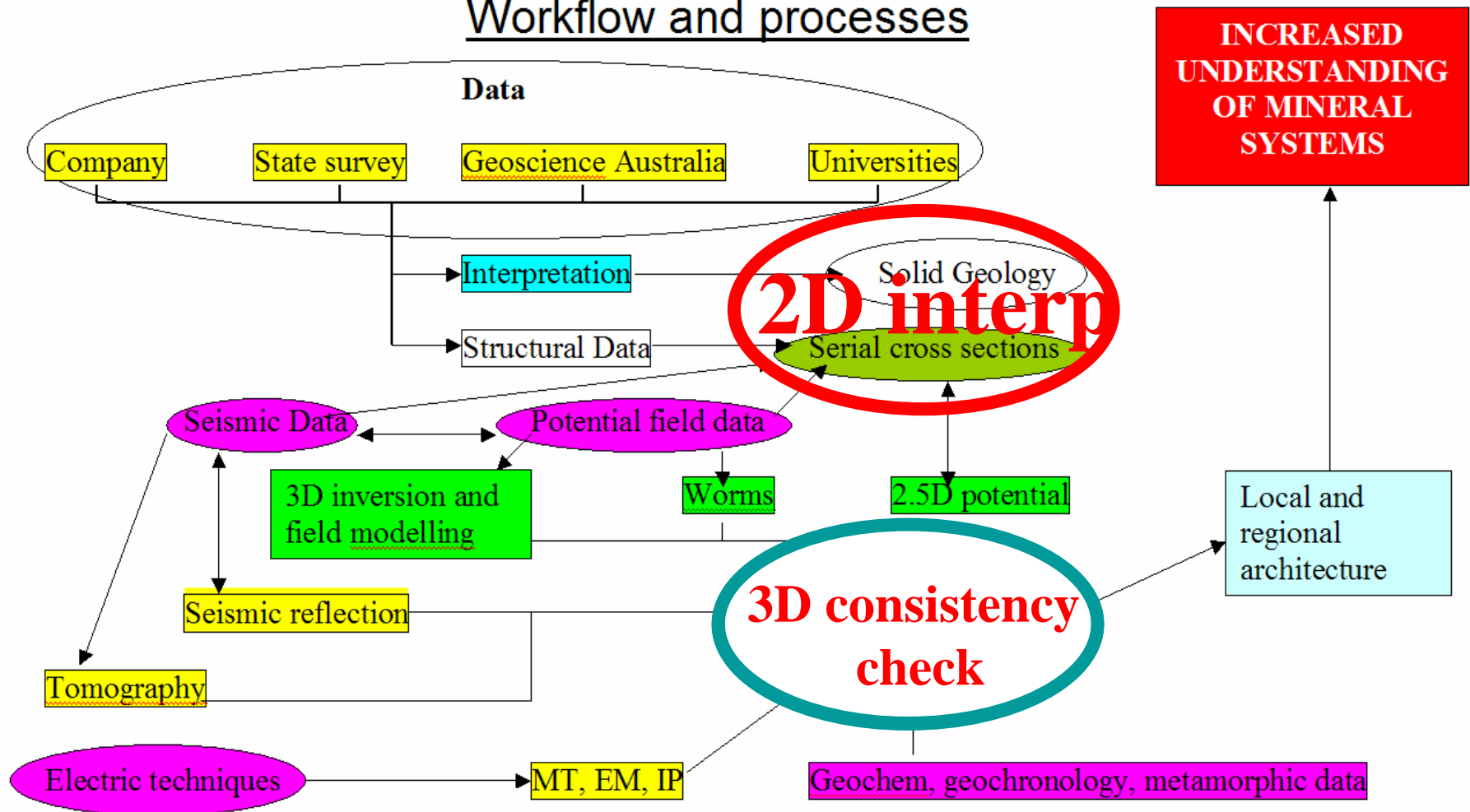
Knowledge about the Mineralising System

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How do we build 3D maps?

Modified from Geoscience Australia, 2005.

Workflow and processes

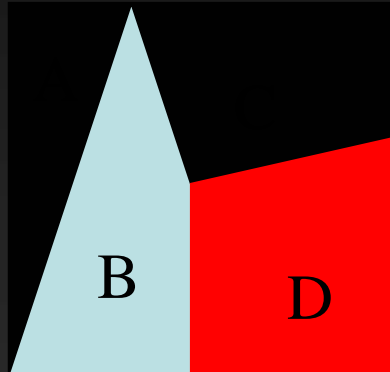
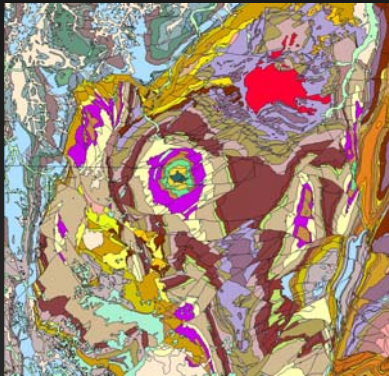


3D Maps summary

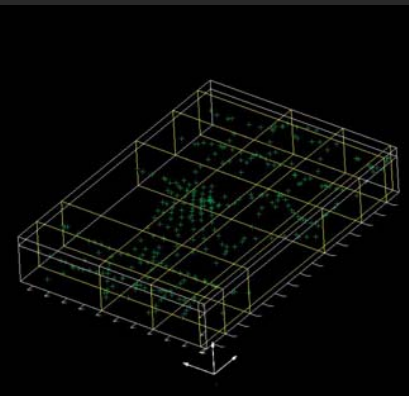
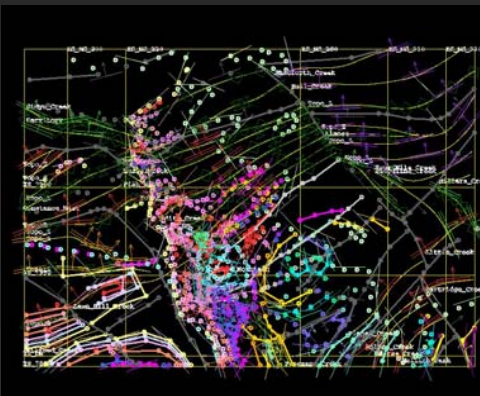
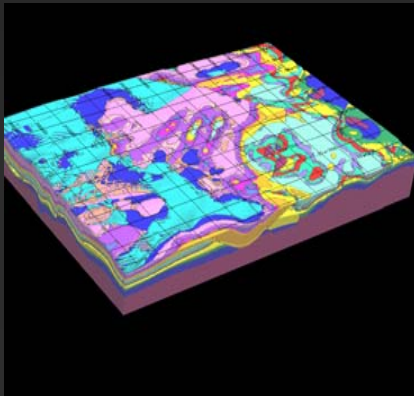
- Reconciliation, integration of different datasets,
- Highly interpretive (one or more 3D maps?),
- Most of the datasets are still in 2D (at best) or 2D interpretations

3D Maps summary

- Need to be associated with confidence volume

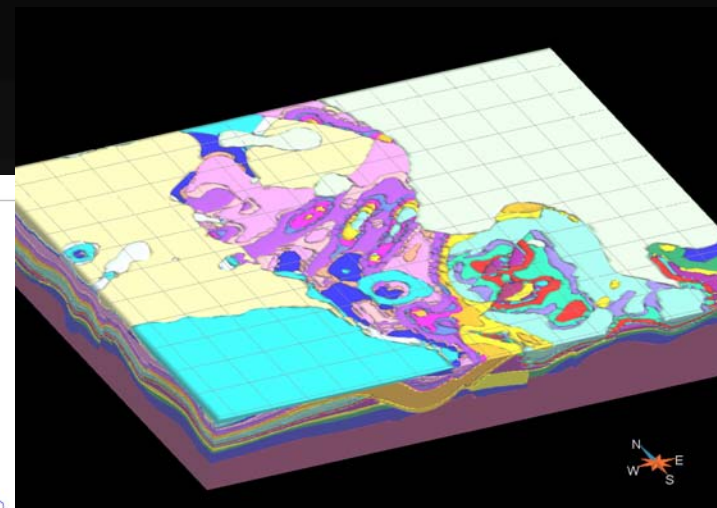


- A: a few traverses,
- B: Aerial Photography and ground checks,
- C: Detailed ground mapping,
- D: discussion with locals at the pub. 😊



Confidence: only
at surface and a
few sections

Isa 3D maps



McArthur

G14

CENTURY

11

LADY LORETTA

14

MT ISA

AGCRC

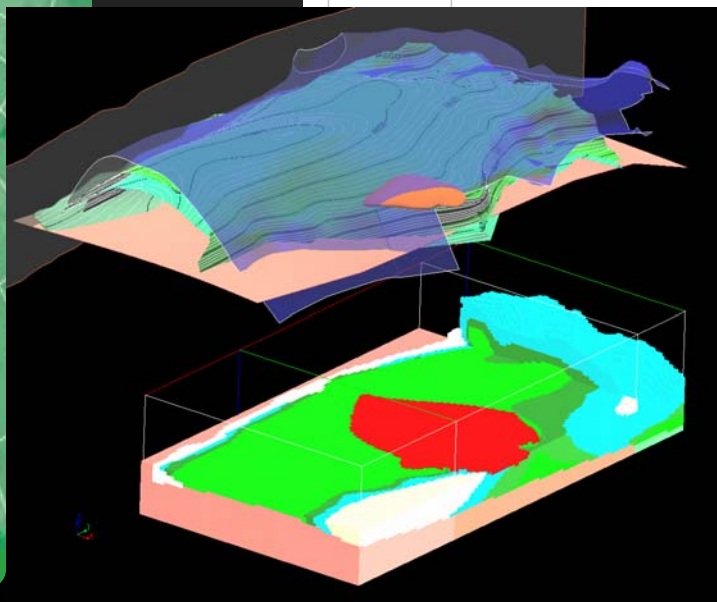
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ERNEST HENRY

KELOSE

17

CANNINGCOTCH



pmd CRC

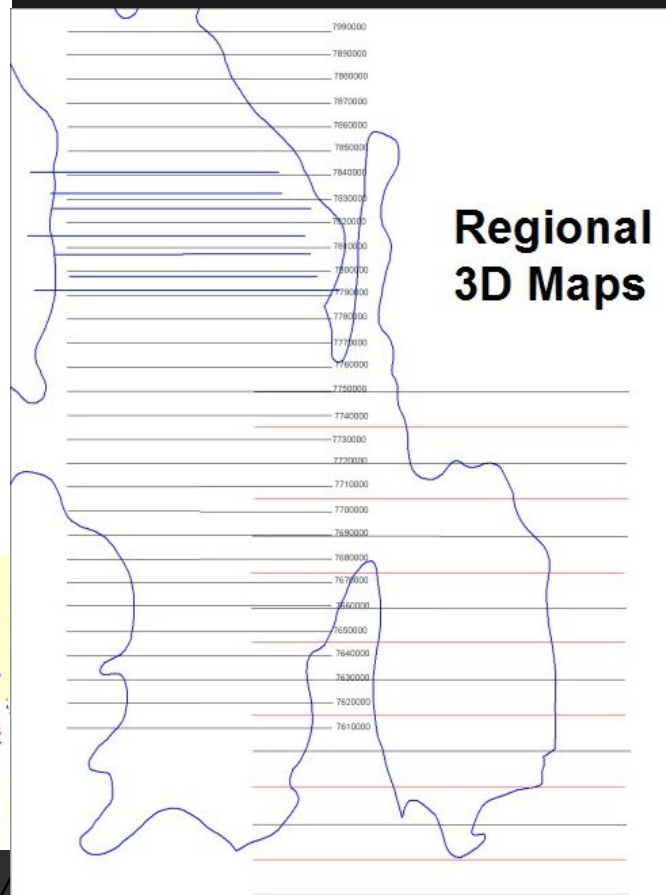
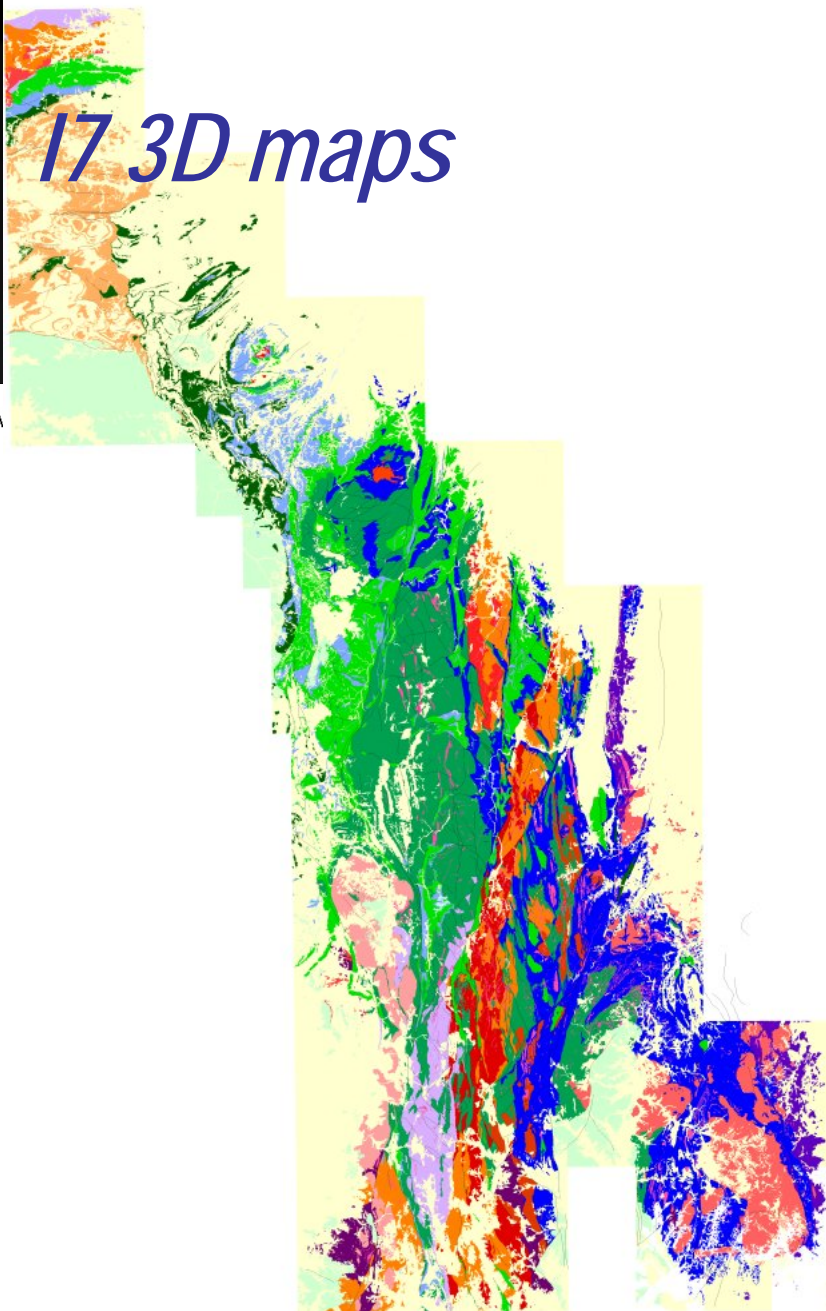
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17 3D maps

17: 10Km spacing
between EW sections

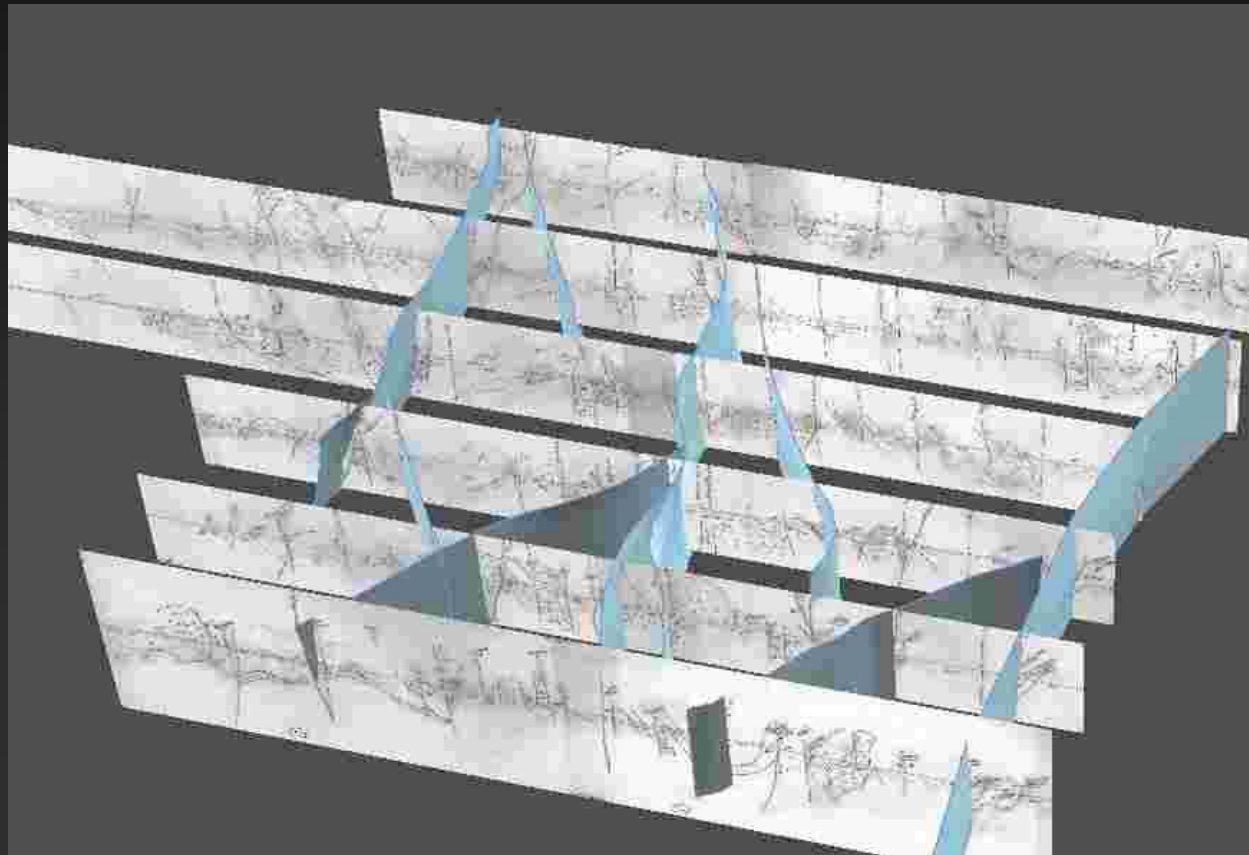
Combined_100k_Total by M

- Base of Bottletree F
- Base of Calvert Supe
- Base of Cambrian
- Base of Cover
- Base of ECV
- Base of Isa Superbas
- Base of Leichhardt
- Base of Leichhardt V
- Base of Quilalar For
- Base of Riversleigh
- Base of Soldiers Cap
- Base of South Nichol
- Basement
- Big Toby Granite
- Burstall Granite
- Dyle
- Ewen Granite
- Kalkadoon Granite
- Naraku Granite
- Nicholson Granite
- Sybella Granite
- Water Feature
- Weberra Granite
- Wonga Granite
- Yeldham Granite



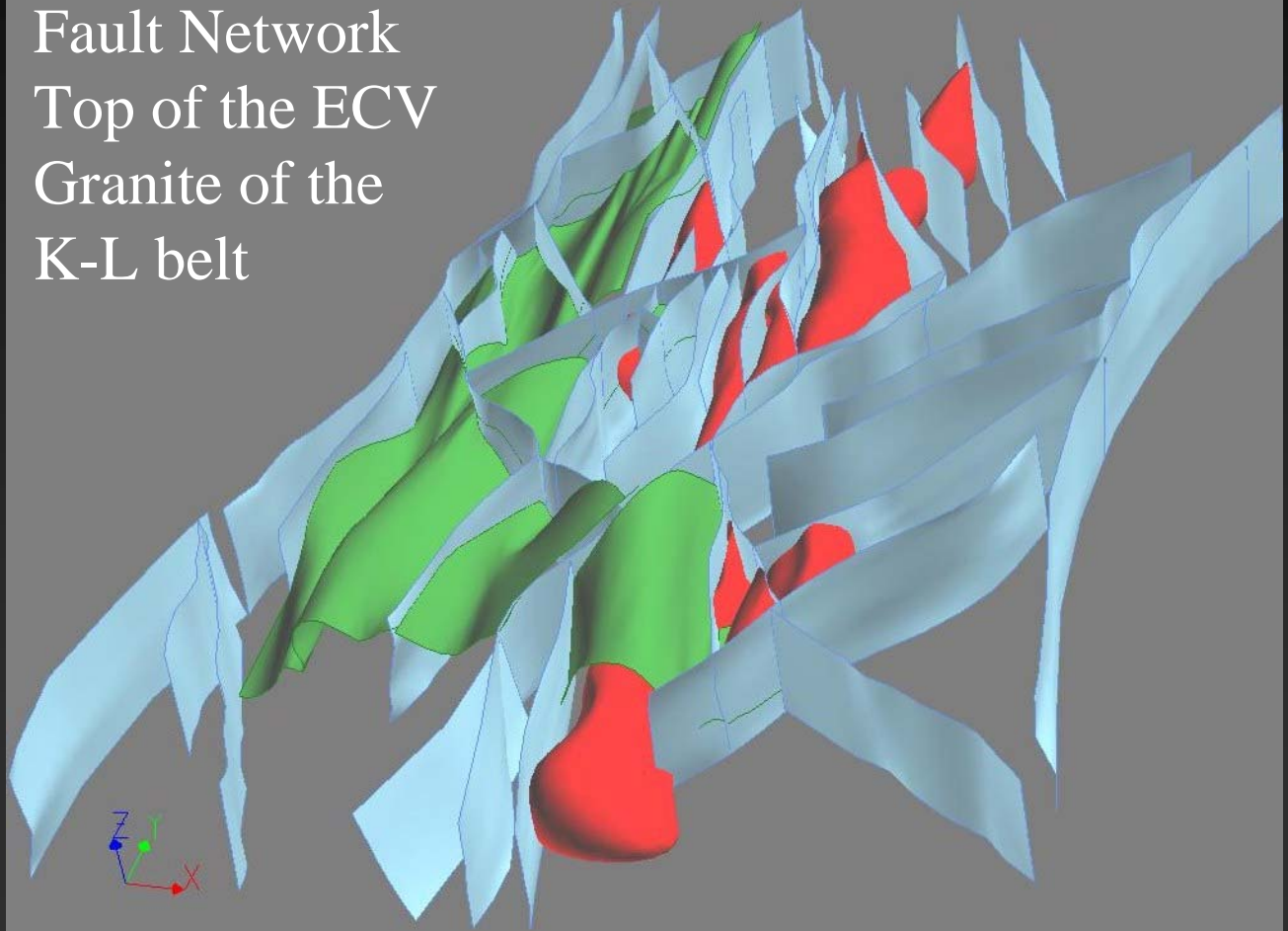
17 3D maps

Preliminary Fault Network - 10Km spacing between EW sections



17 3D maps

Fault Network
Top of the ECV
Granite of the
K-L belt



Where Next?

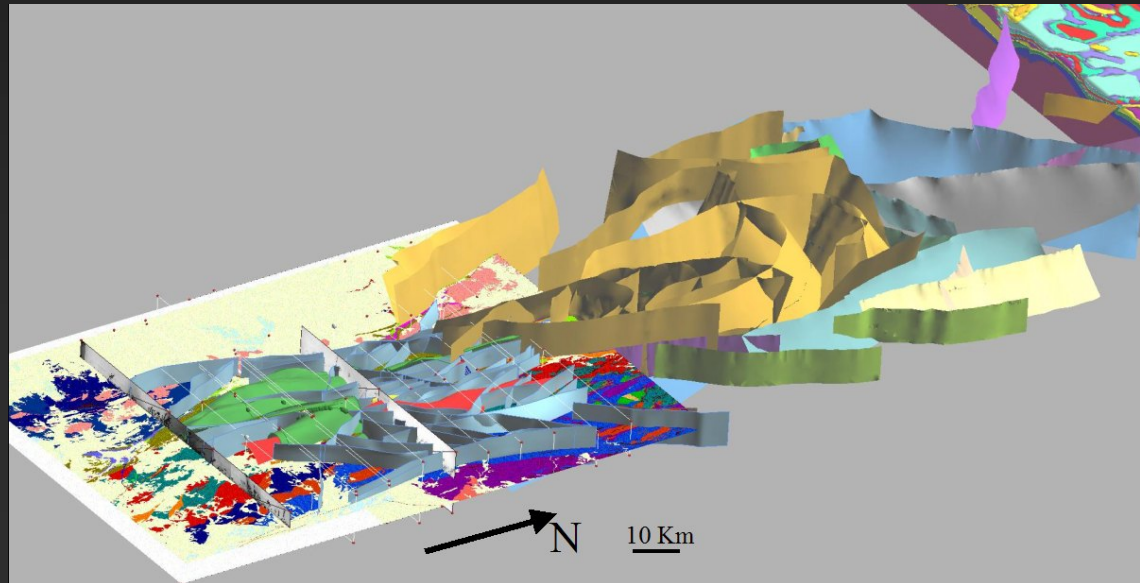
The model need to become more reliable in the 3rd dimension through:

- geophysical constrained (geology & petrophysics) inversions,
- dip sensitivity analysis on major faults and boundaries through forward potential field modelling (worms are not quantitative enough),
- more ground truthing on the sections
- ...? Suggestions?

Where Next? ctd'

There is a need for better integration of sub-projects results. This should be done in 3D.

Integration / reconciliation of multiple 3D maps: I4, I1, I7, G14, I2-3



Where Next? ctd'

Building 3D maps should be done with a purpose e.g. as a test for some of our interpretations or as a tool to help with integration of varied datasets to produce a framework for further modelling/hypotheses testing

In the short term, the models will be rationalised with the results of the E-W correlation group in order to test in 3D the proposed basinal/rifting histories and resulting basins architectures.

Where Next? ctd'

The following surfaces will be specifically mapped in 3D:



Table from
 P. Southgate,
 N. Neumann and
 G. Gibson

Conclusion – What have we learnt so far...

This may have been obvious to many but so far...

The 3D map has confirmed that the plumbing systems was complicated and reaching deep sources at the time of mineralisation. (allow for variation according to differing metal systems)

The 3D map shows that early basin architecture was a controlling factor on geometries developed during the Isan orogeny (as previously proposed by Betts et al., 2004 & references within).

The 3D map shows that there is no obvious detachment between basement and hosted basins.