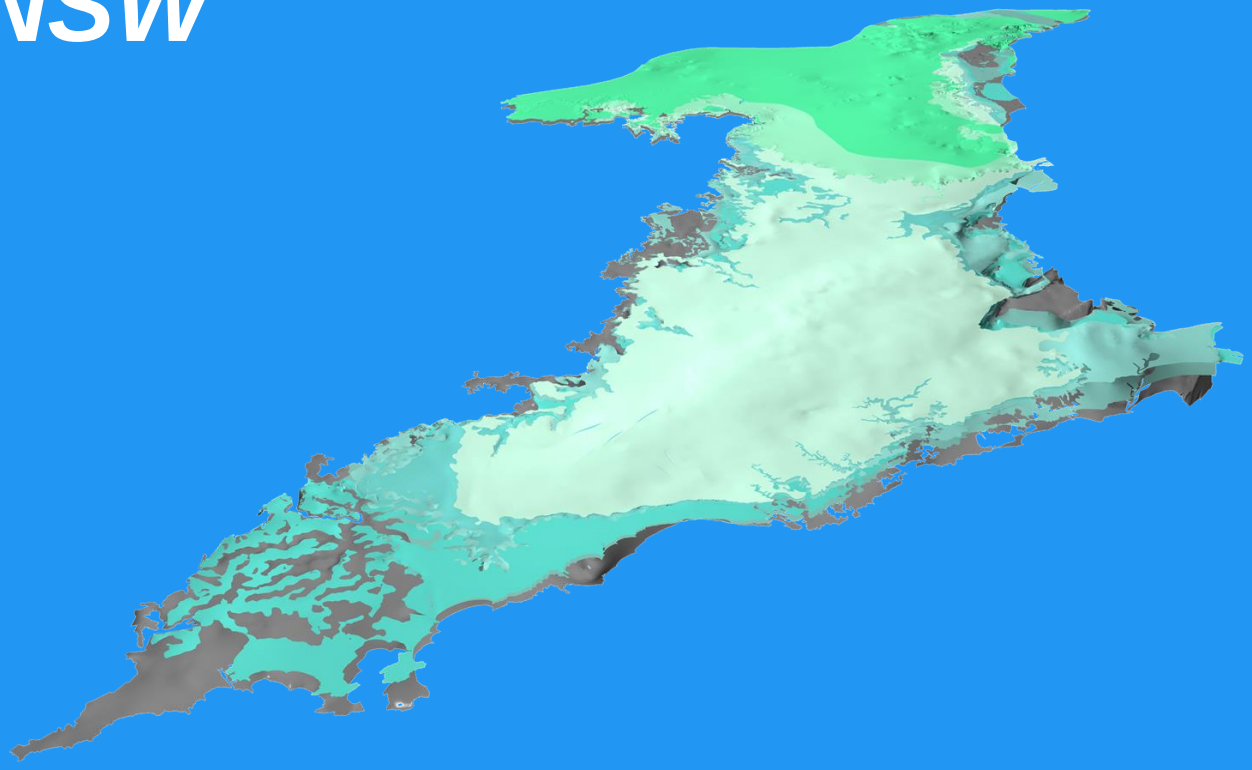
2017 Highlights from the Geological Survey of NSW



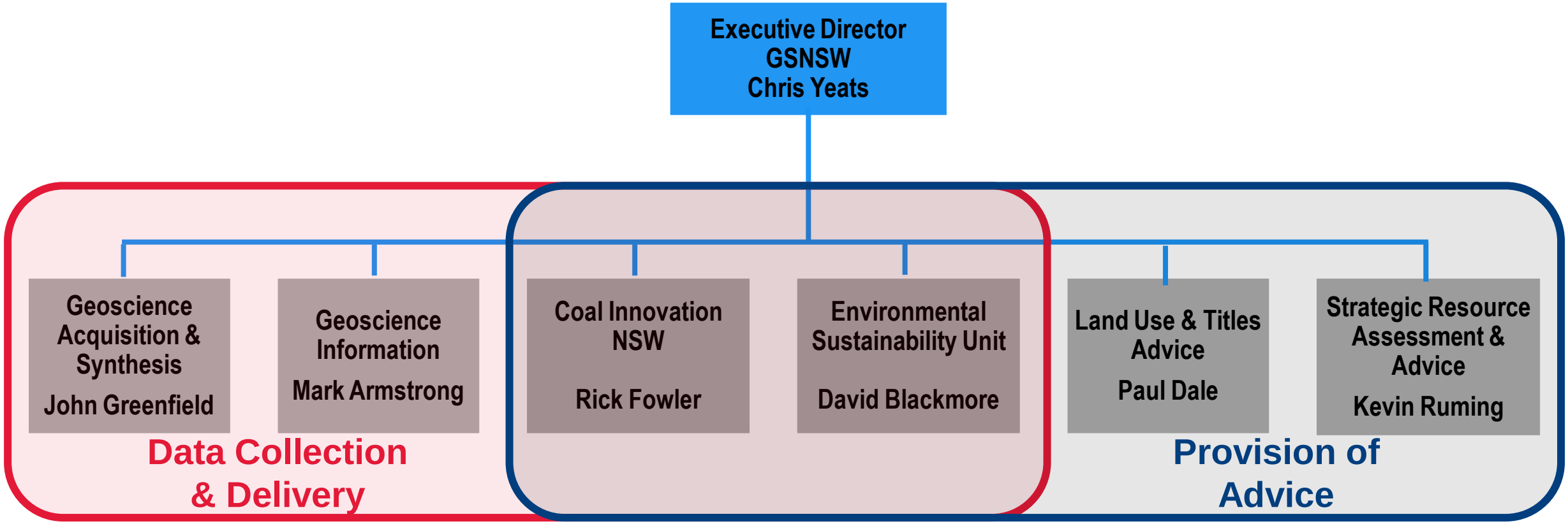
Chris Yeats, Executive Director GSNSW

23 November 2017

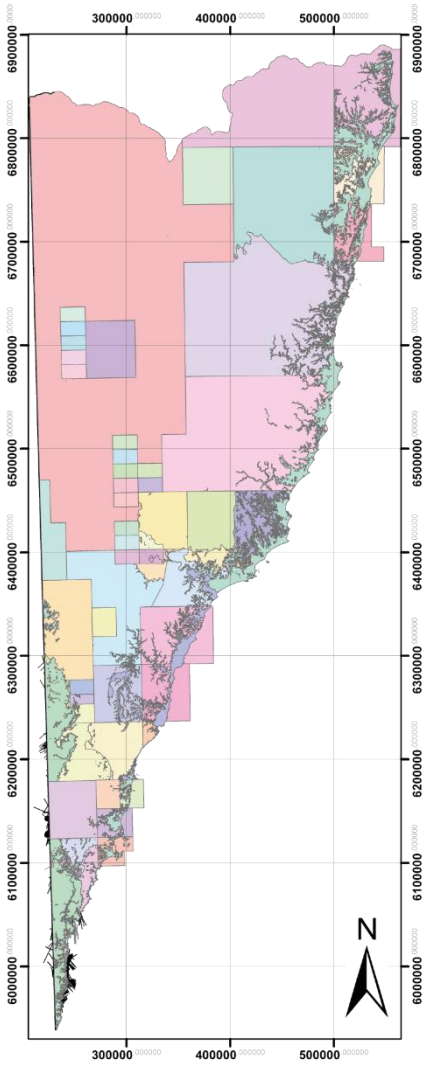
2017: A year of plain sailing?

NSW GOVERNMENT

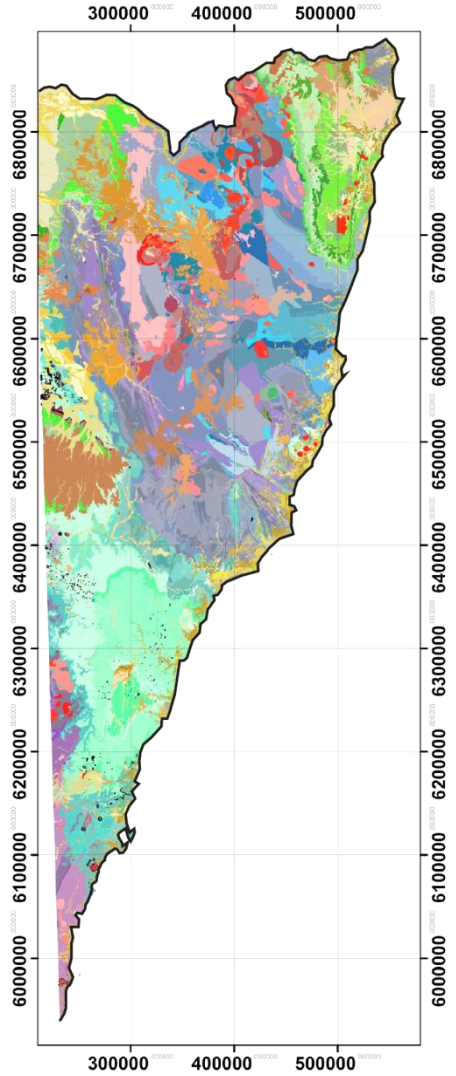
GSNSW structure November 2017



Seamless Geology of NSW



1. Correct line mismatches
2. Harmonize stratigraphic units
3. Interpret undercover for solid basement maps



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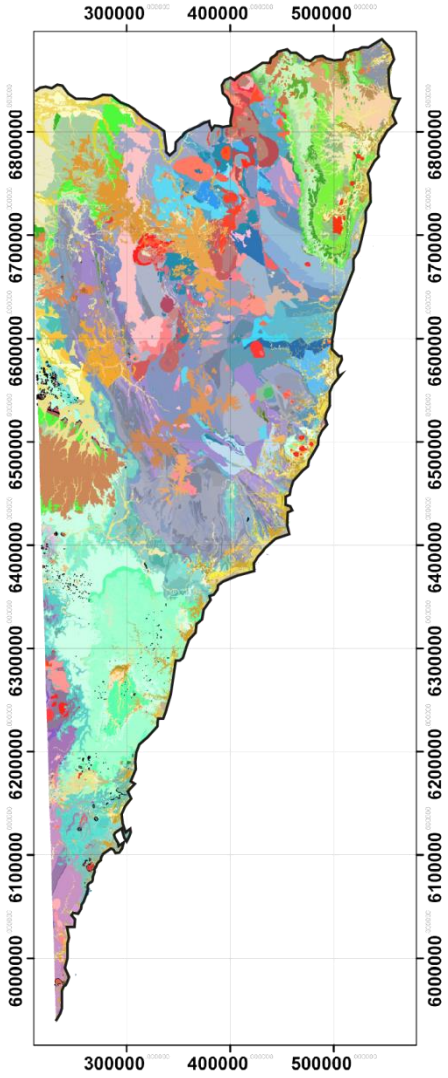

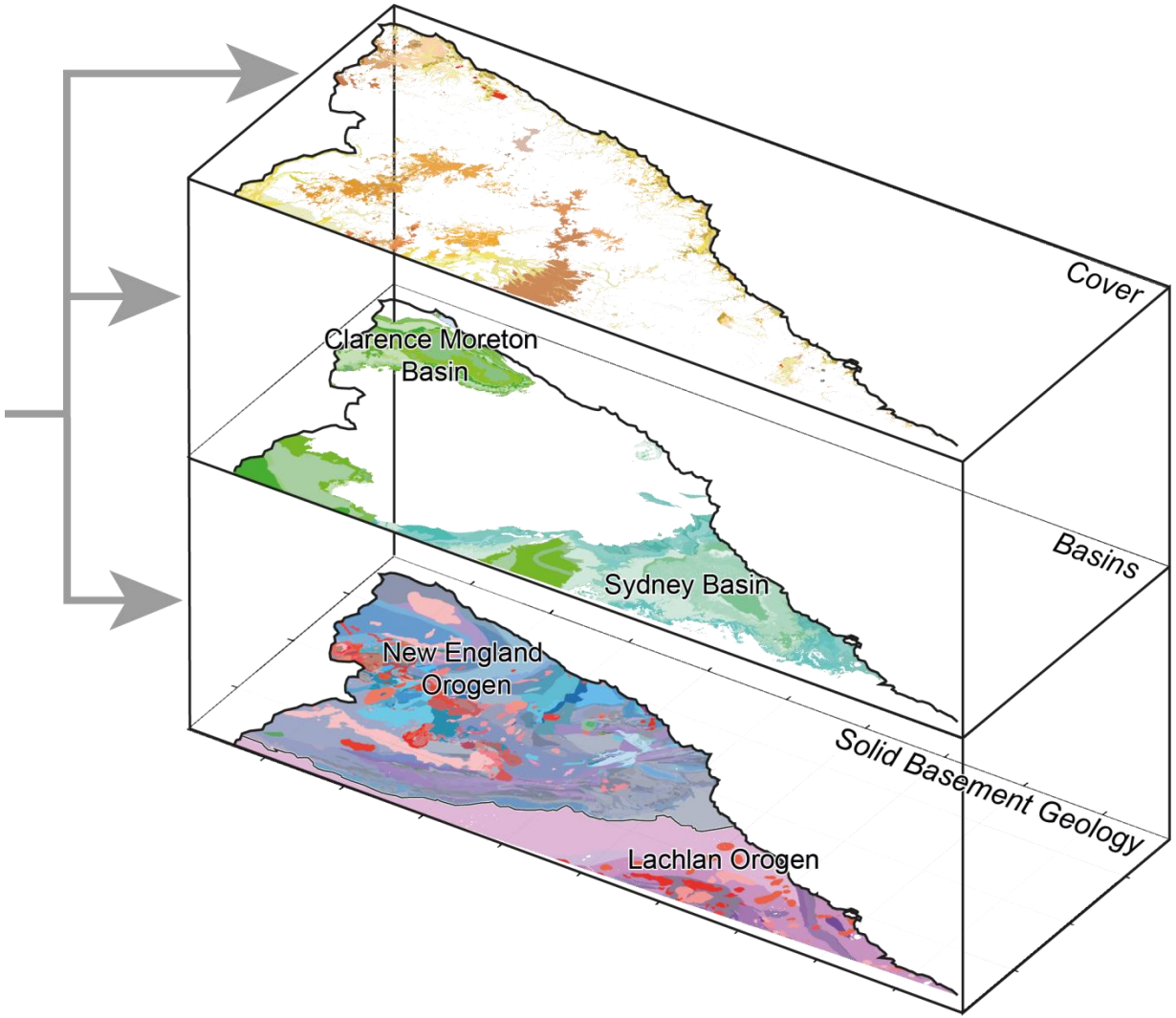

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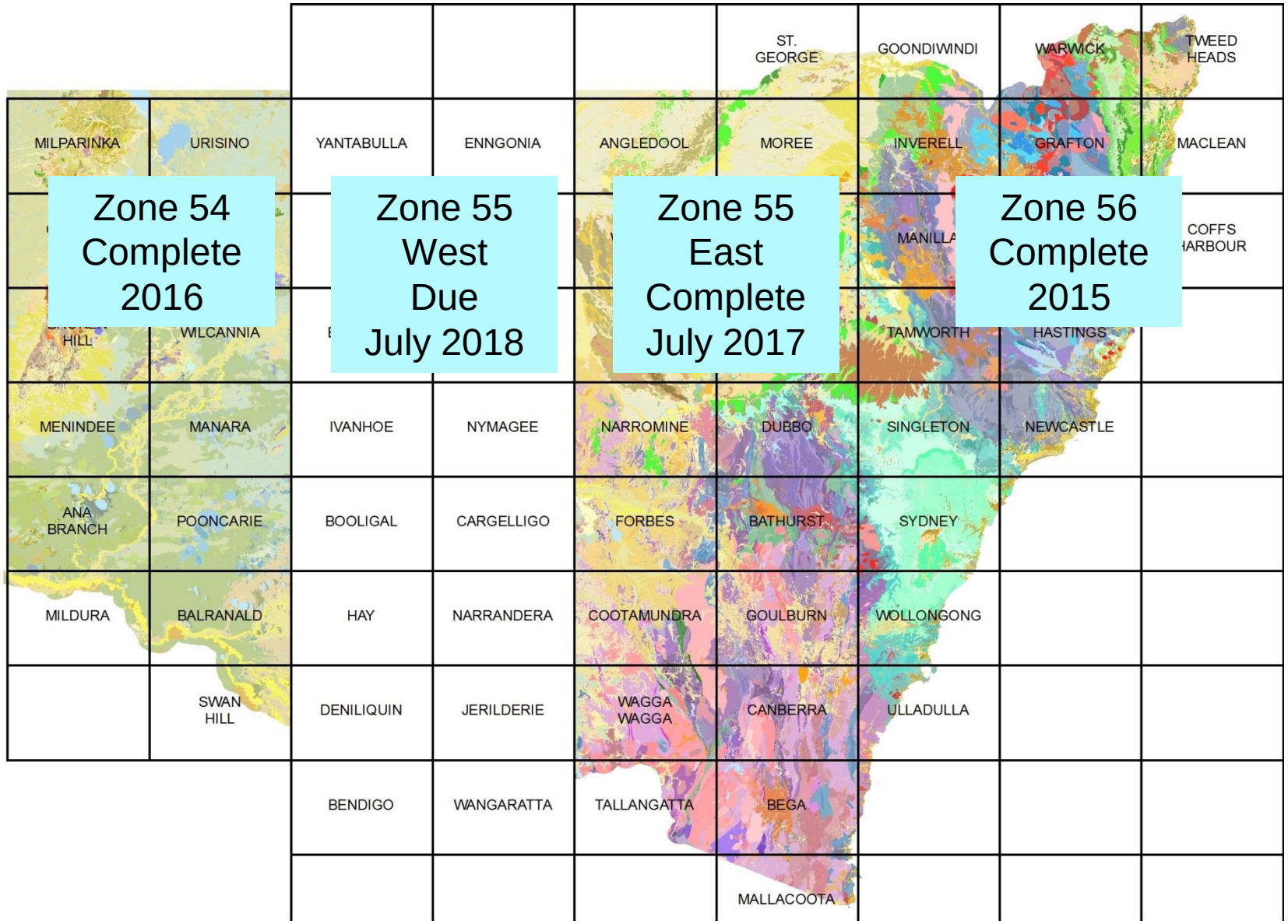
Seamless Geology

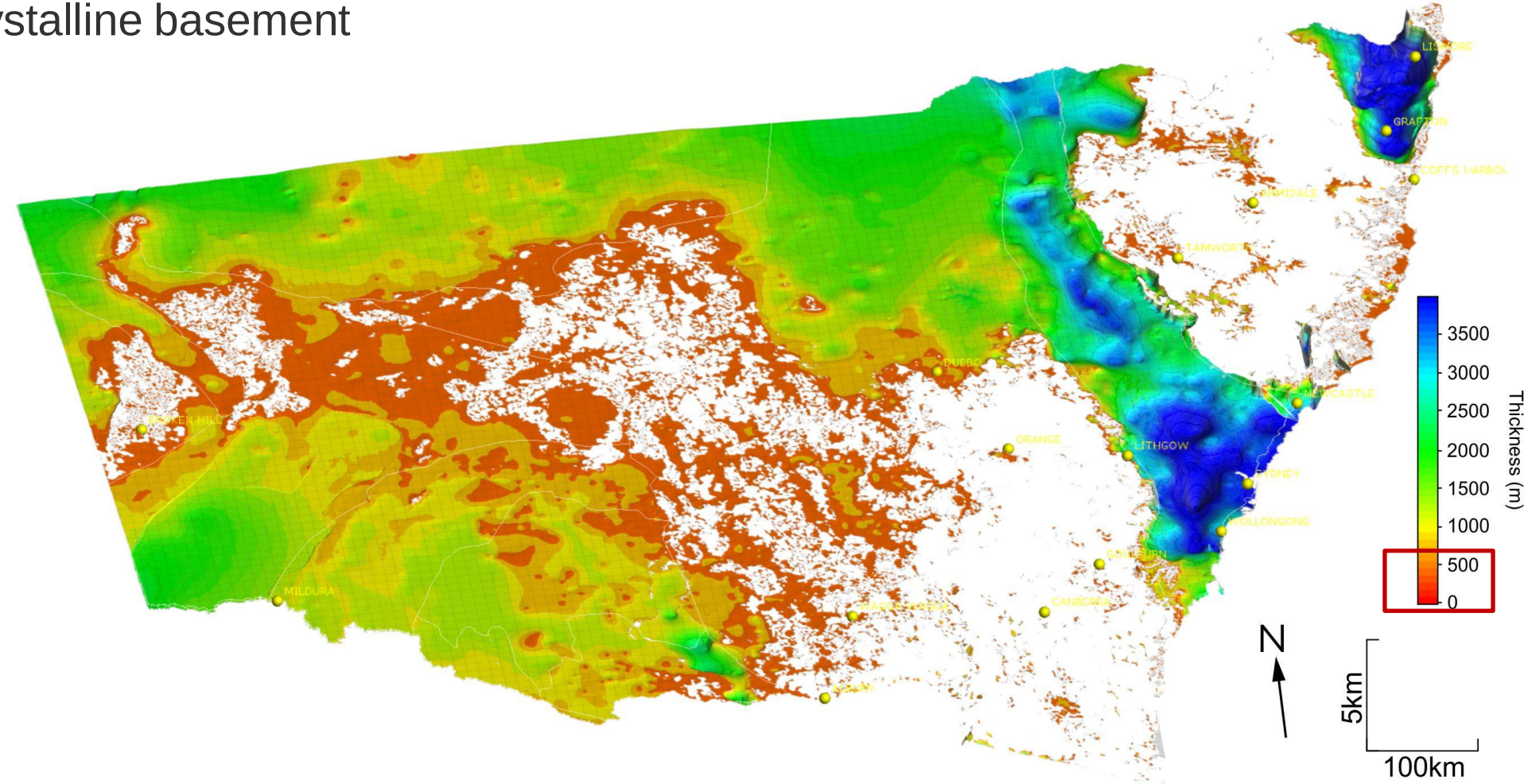
- ¾ of NSW now complete
- Series of tectono-stratigraphic provinces or ‘time slices’
  - e.g. basement, basins
- Consistent stratigraphic nomenclature
- Basis for value-add
  - Fault attribution
  - Metamorphic map
  - Time-space plots
  - Mineral potential



NSW GOVERNMENT

Depth to basement

Total depth of cover (unconsolidated and consolidated)
to Pre-Permian crystalline basement



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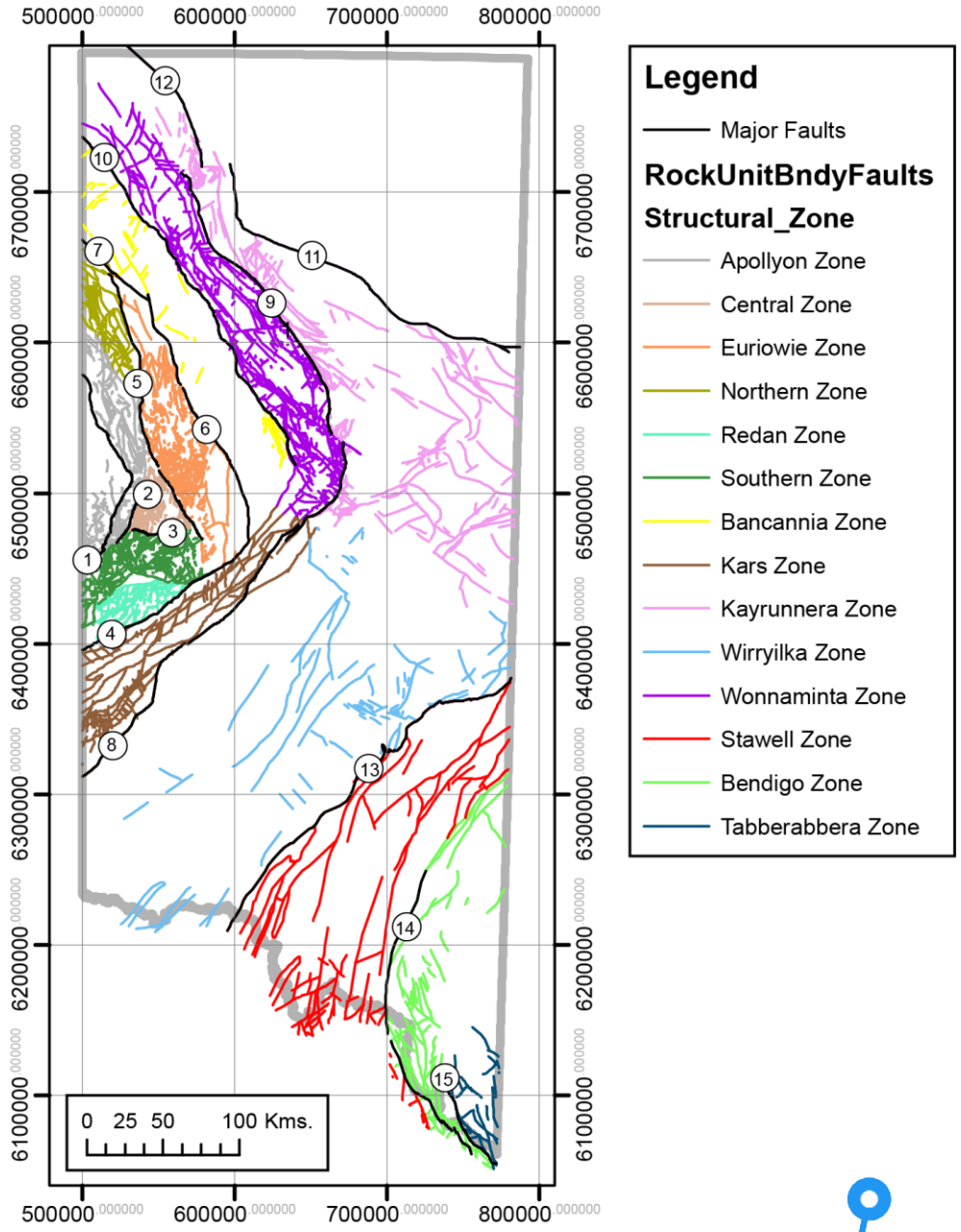
Fault attribution

- Value-adding to seamless geology
- Every fault attributed with:
  - Geometry, order, character
  - Kinematics by geodynamic event

Sub System	Province	Structural features	Relevance for mineral prospectivity
Olary Detachment	Curnamona	Faults located at the contact between the Broken Hill and Sundown groups.	Extensional detachment between the Broken Hill and Sundown Group is also a major redox boundary and potential site for Pb-Zn-Ag mineralisation (Gibson & Nutman, 2004).
Cobham Kink Zone	Curnamona & Delamerian	NE-SW striking faults located in the Cobham Kink Zone.	NE-SW striking zone of crustal weakness that may have favoured repeated igneous intrusions (Gilmore et al., 2007).
Arrowsmith	Delamerian	Dominantly NW-SE striking faults spatially associated with the Mt. Arrowsmith Volcanics.	Faults that are spatially related to the Neoproterozic (c. 585 Ma) mafic igneous Mount Arrow sith Volcanics. These igneous rocks and associated faults may host magmatic nickel-sulfide and remobilised copper (Gilmore et al., 2007).
Larapintine	Delamerian	Basin bounding faults associated with the formation of post Delamerian basins.	Post-Delamerian basins including the Nuntherungie and Kayrunnera basins may contain orogenic gold.
Grasmere Knee Zone	Delamerian	Faults located in the Grasmere Knee Zone.	Zone of higher-strain that may host structurally modified and remobilised VMS/Besshi Cu, Pb, Au and Ag deposits.



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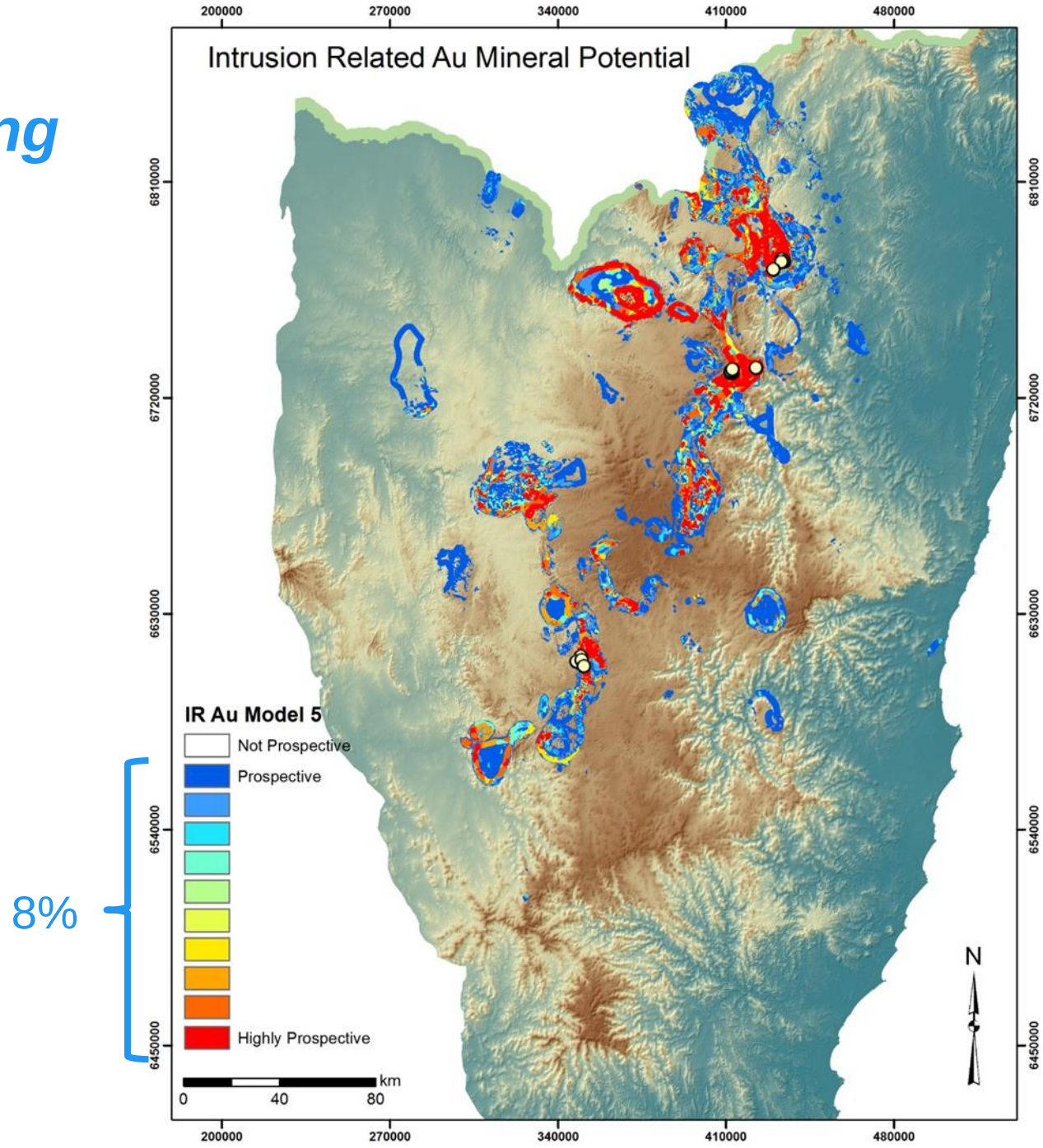
Mineral Potential Mapping

- Uses Seamless Geology as a framework for integration
- Focus on key economic mineral systems
- Weights of Evidence approach
- NEO completed 2017
  - Sn-W, IR Au, Orogenic Au
- Zone 54 will be delivered in 2018
- Useful for explorers and planners!



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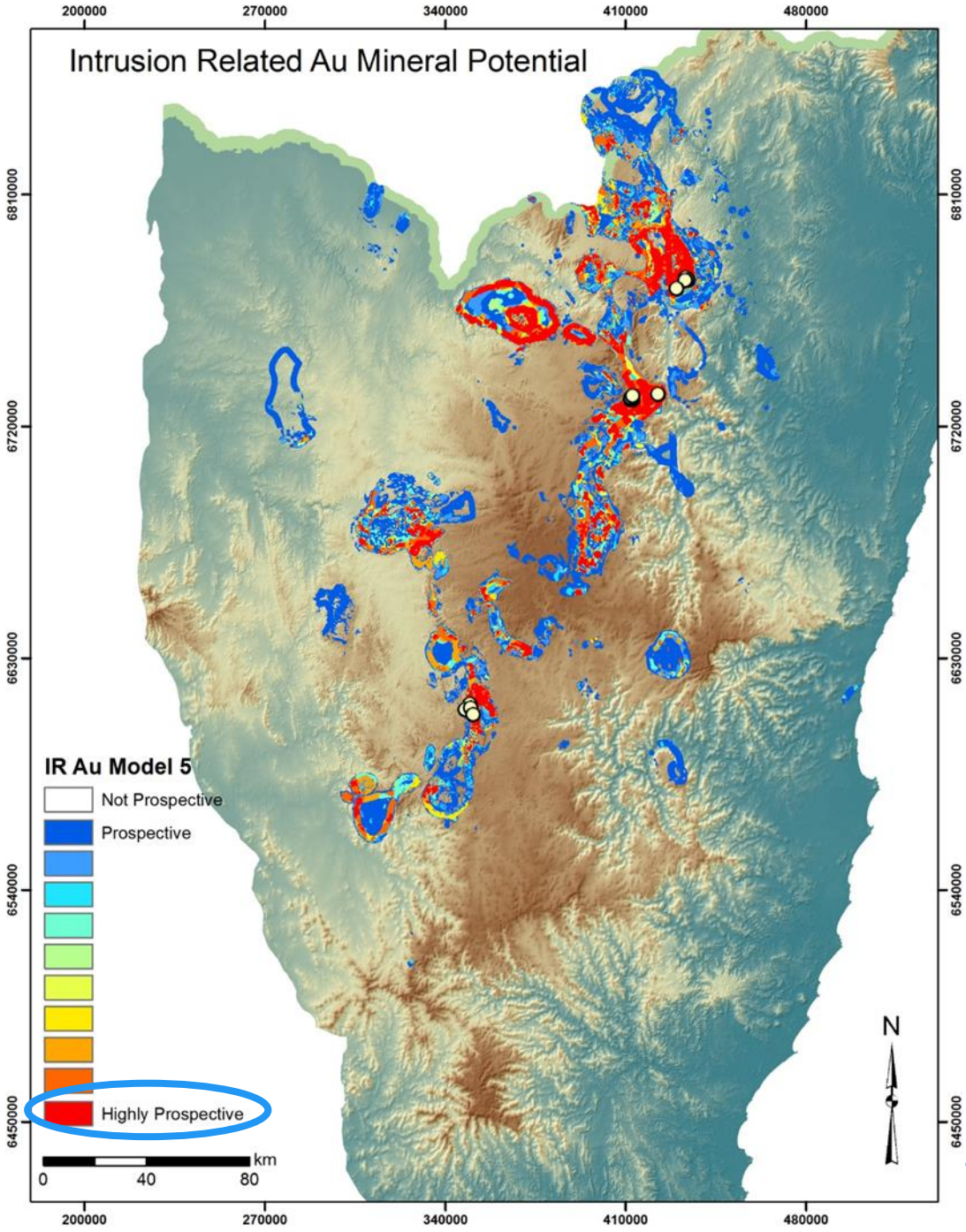

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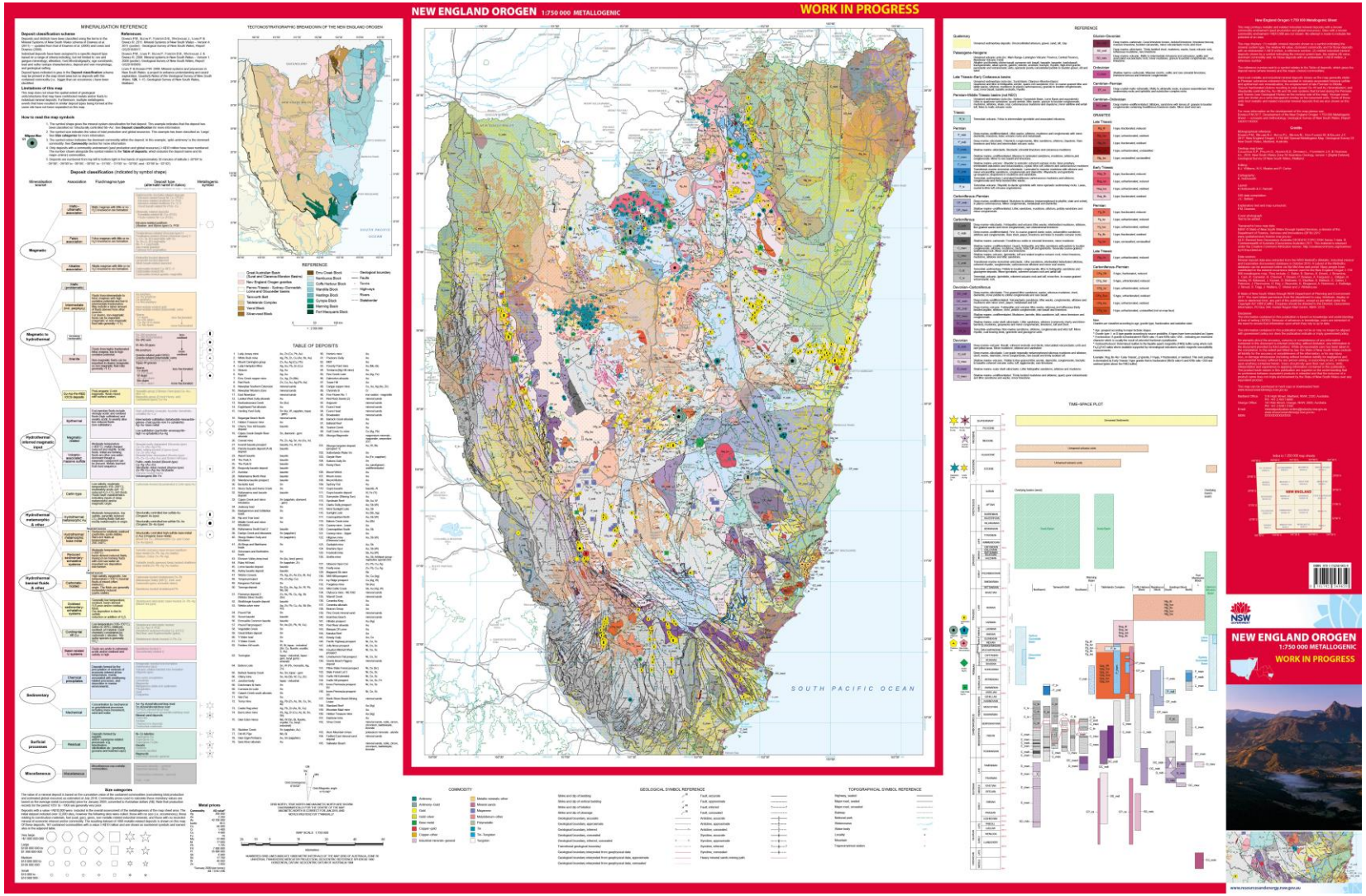
New England Orogen Metallogenic Map



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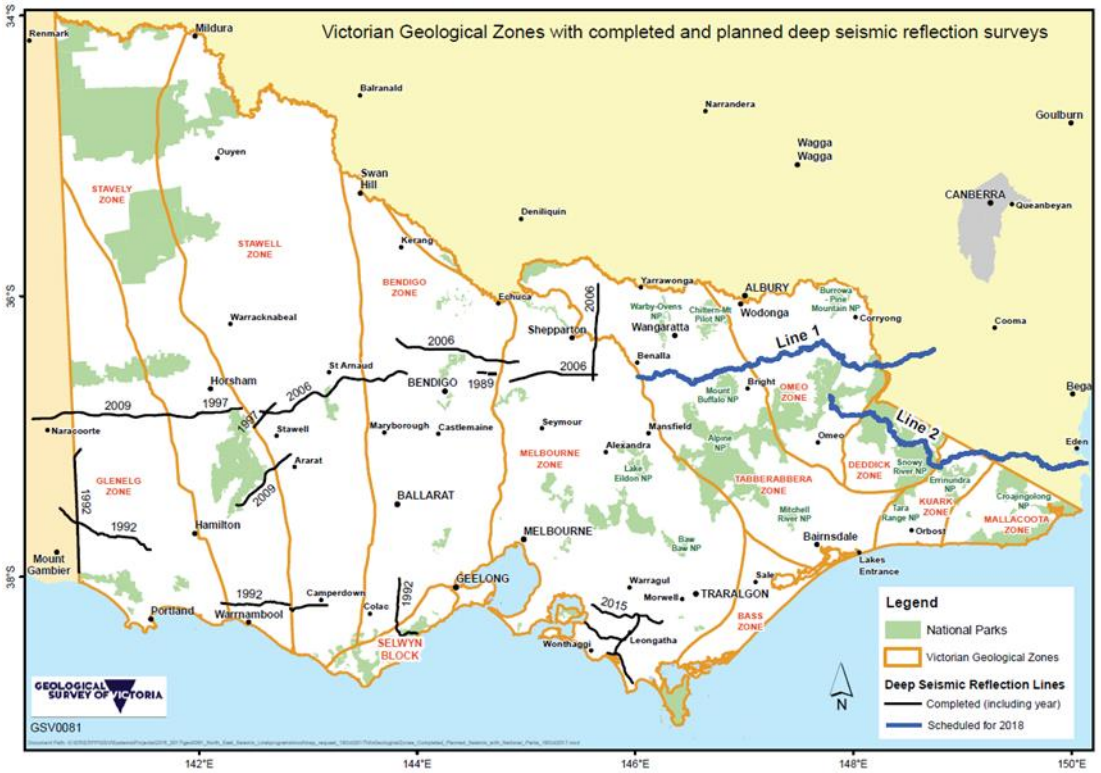
Southeast Lachlan Crustal Transect

- Total of approximately 460km of deep crustal seismic
- Crosses major geological zones and regional scale faults in SE Australia
- Completes east-west deep crustal seismic across Australian Continent
- Collaboration: Geological Survey of Victoria, GSNSW, AuScope and Geoscience Australia
- Acquisition commencing March 2018



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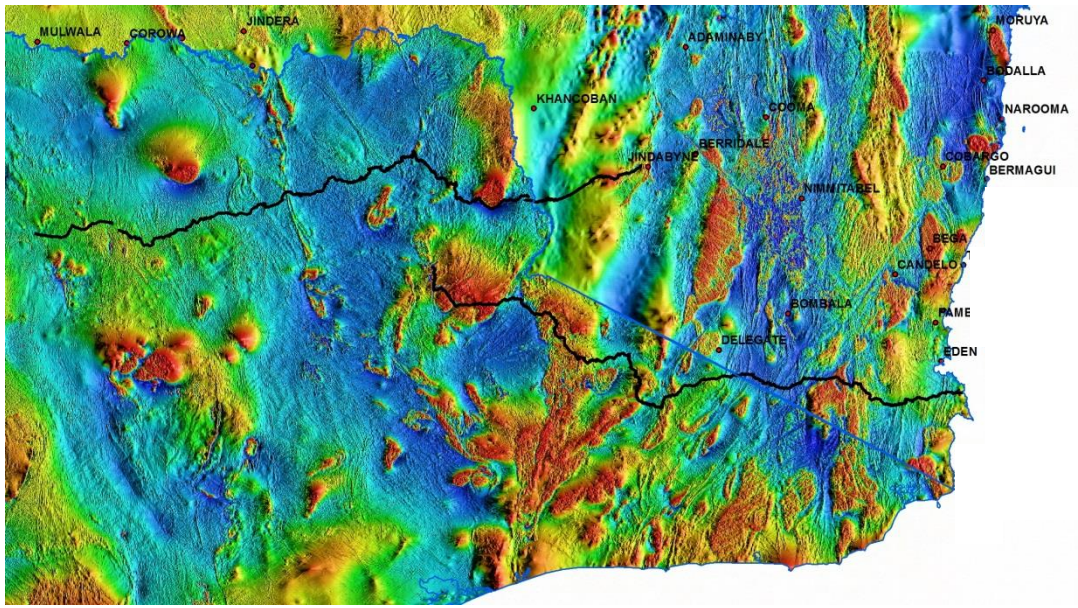


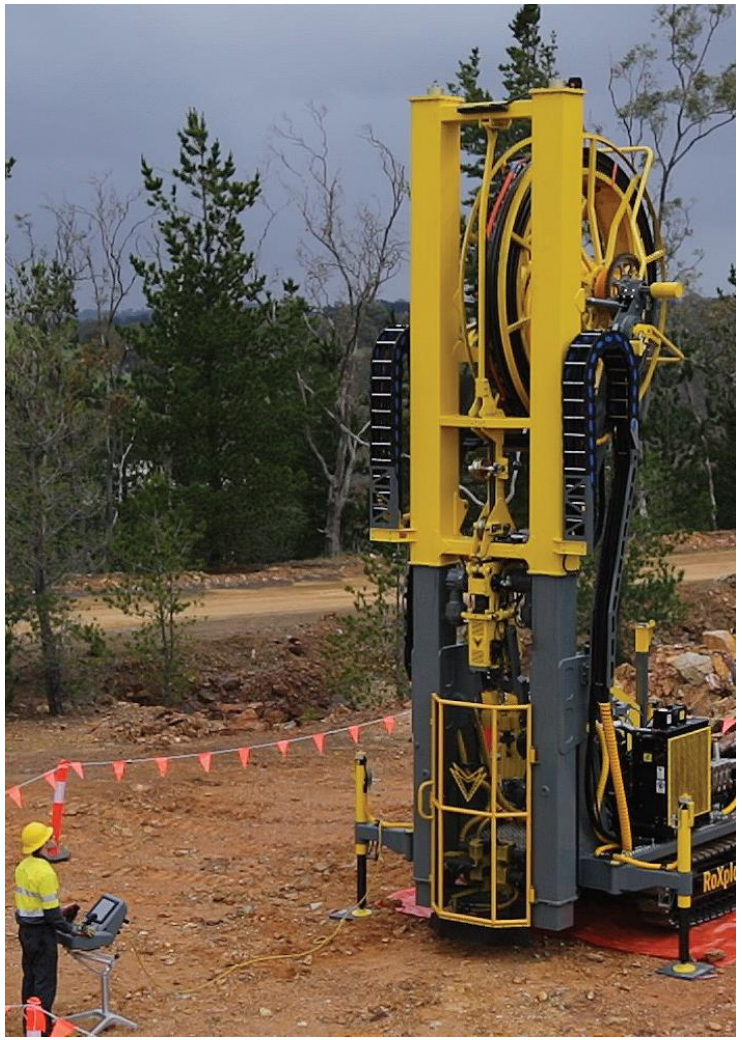
E.C. Andrews drillcore facility upgrade

- Existing facility has storage for 80,000m of drillcore, plus core preparation room and viewing facilities
- $900,000 capital works program will increase capacity by 80,000m
- Completion before July 2018

NSW GOVERNMENT

MinEx CRC bid

- Proposed ~$200 million, 10 year collaborative program between the mining industry, state and federal government, CSIRO and Australian universities
- Improved mineral discovery rates (esp. under cover) by:
  - Developing novel CT drilling, sensing and analytical technologies
  - Optimising conventional drilling technologies
  - Undertaking precompetitive drilling programs to unlock the undercover portions of prospective terranes for mineral exploration
- Detailed application due 13 December 2017
  - It’s not too late to get involved (minimum contribution $10kpa)



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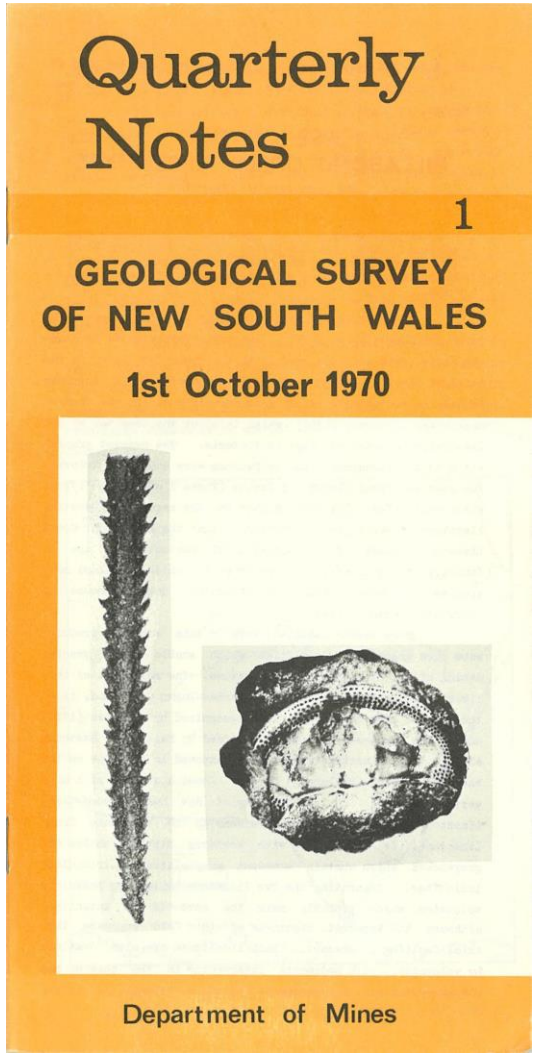
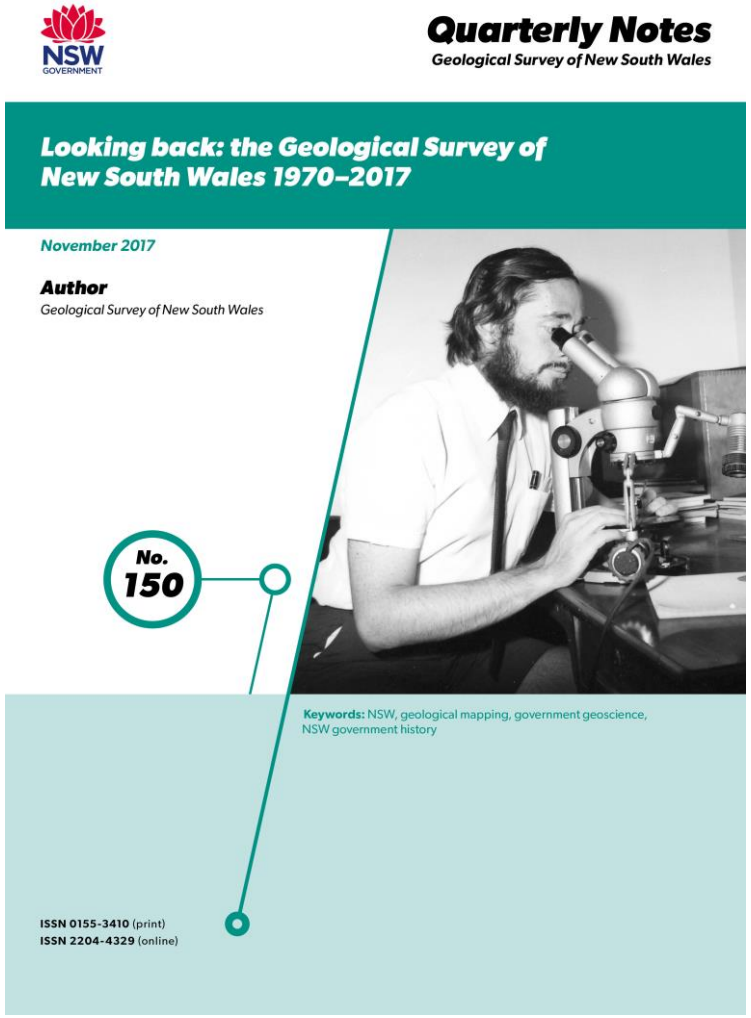
Quarterly Notes – 47 years of GSNSW geoscience





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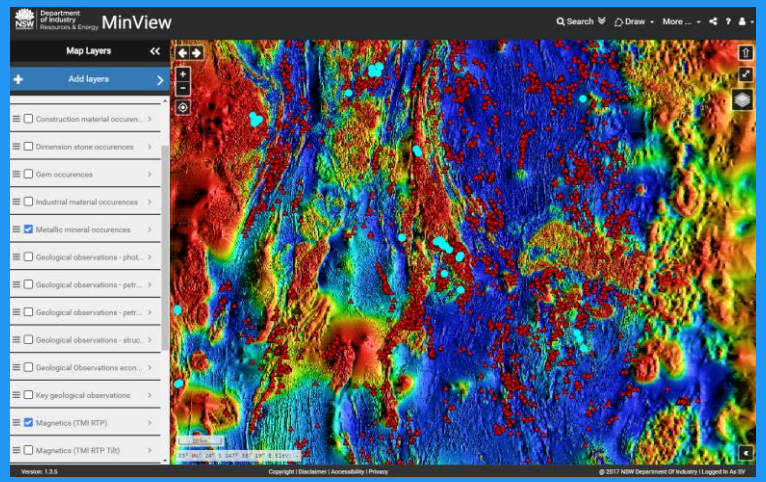

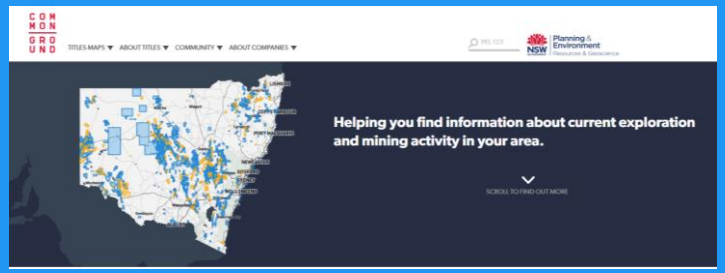

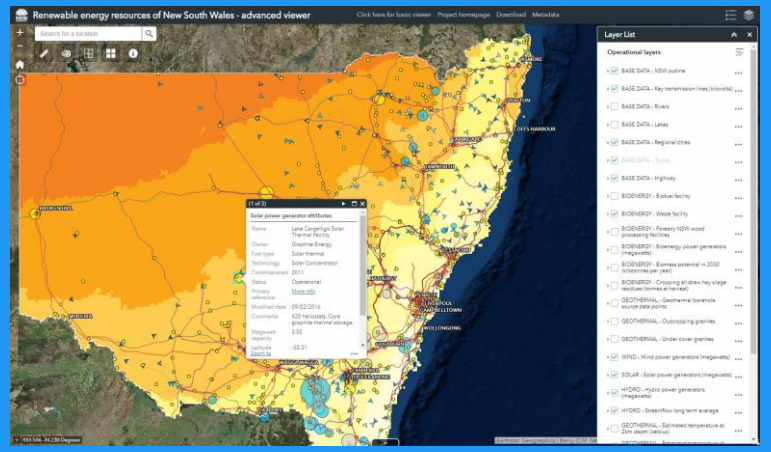

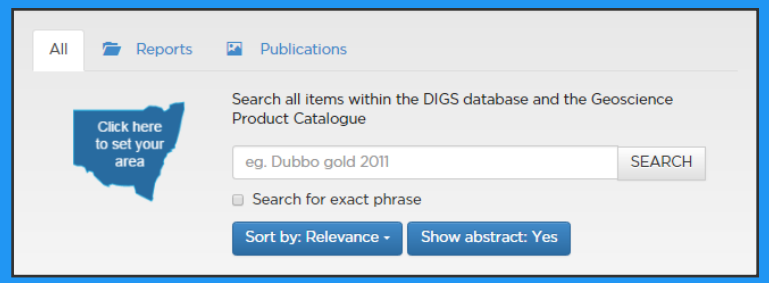

Discover New South Wales

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Acknowledgements:

All GSNSW staff

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