Department of Natural Resources, Mines and Energy

Structural Interpretation of the North Cloncurry Geophysical Survey

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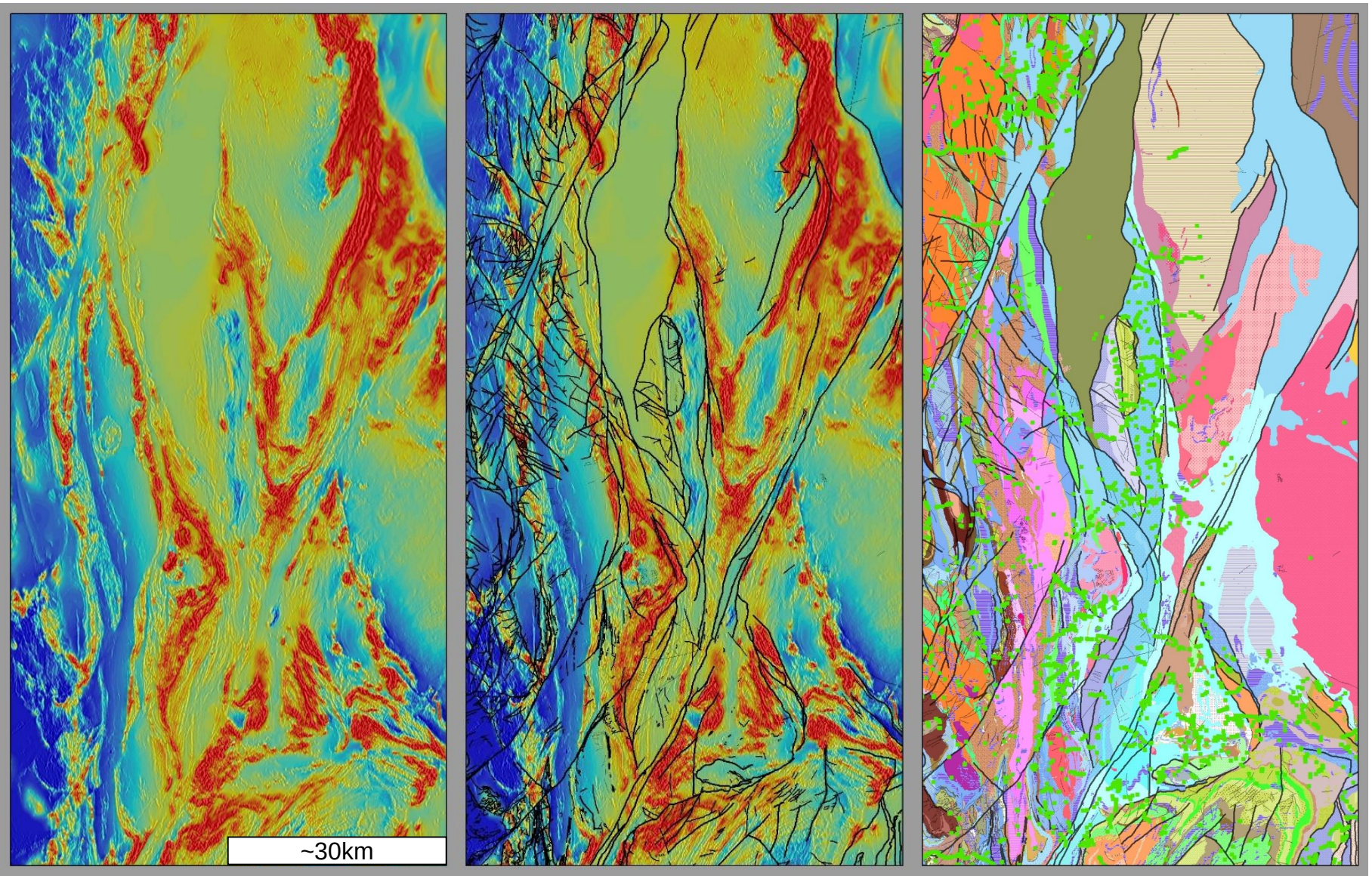
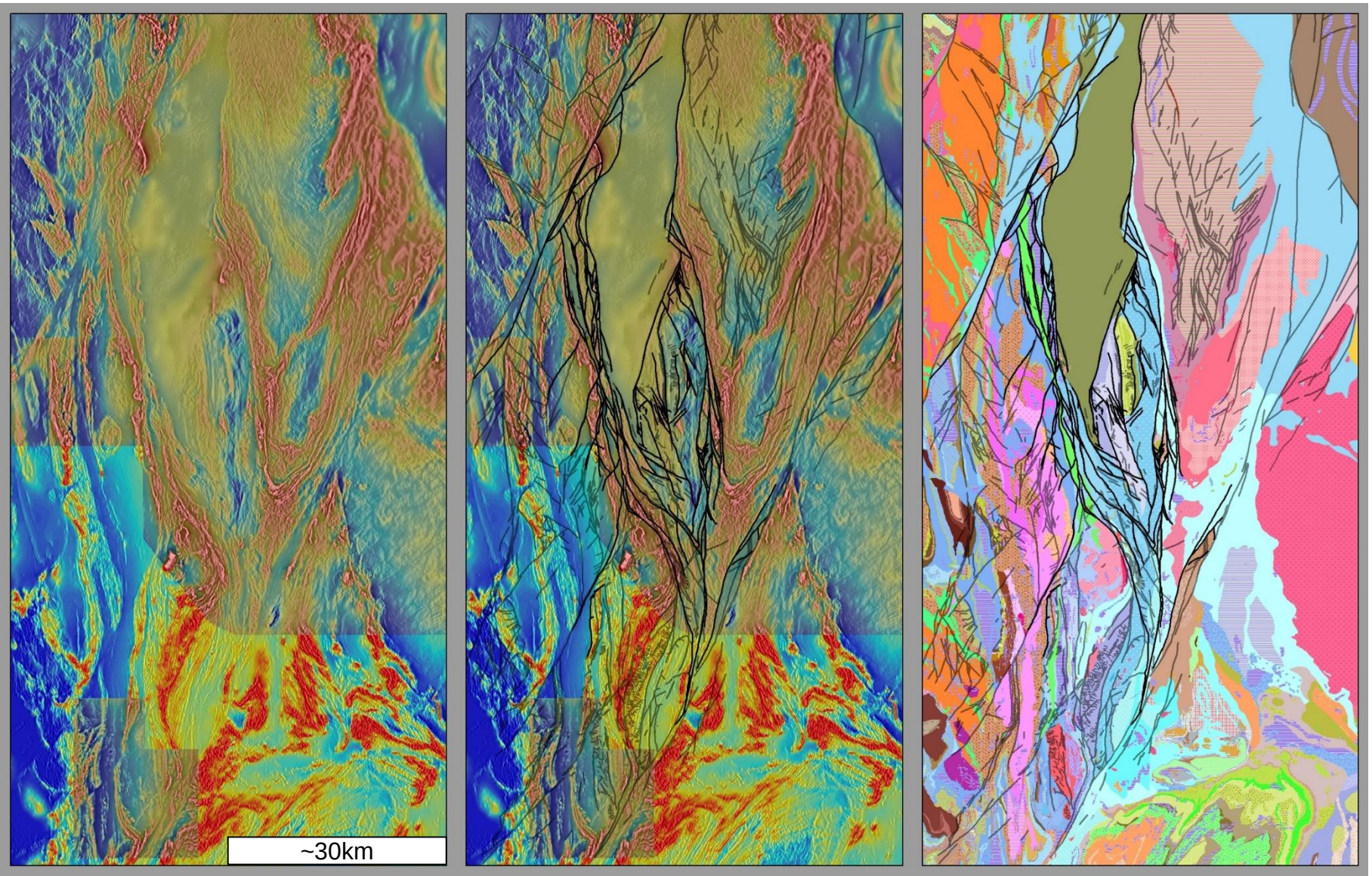
Queensland Government

Previous state



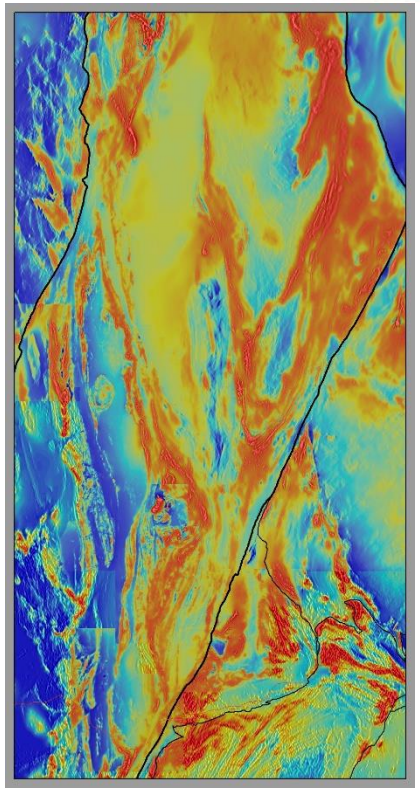
- 400m geophysics
- 100k solid geology
- Airphoto and geophysics interp with transects
- Emphasis on stratigraphy and late Isan faults
- Great place to start from, but doesn't convey much structural info

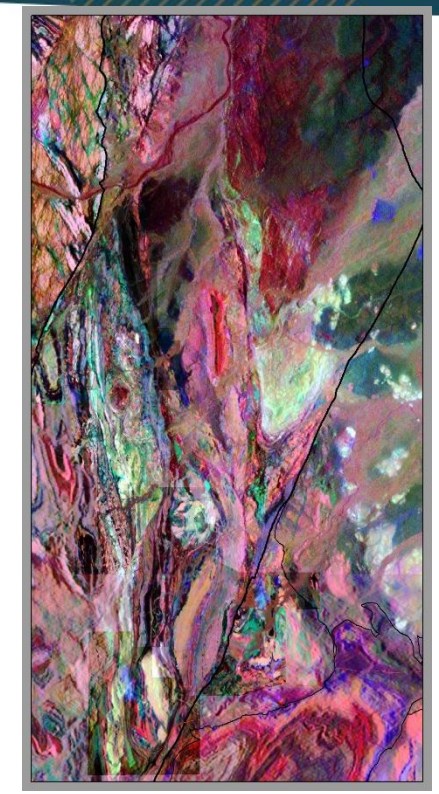
Current/future state

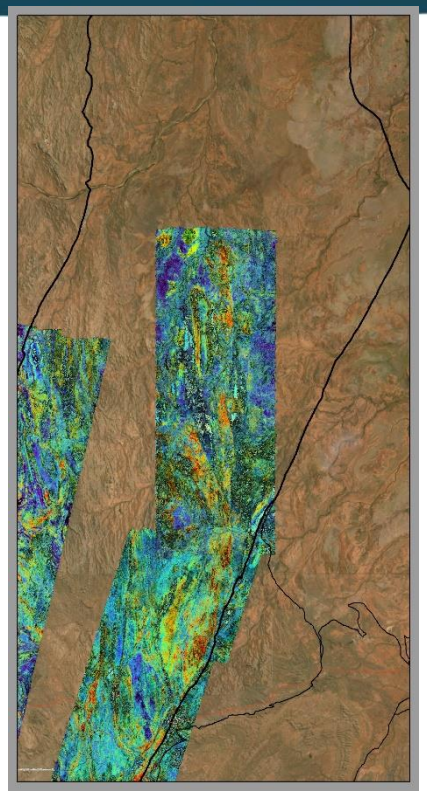


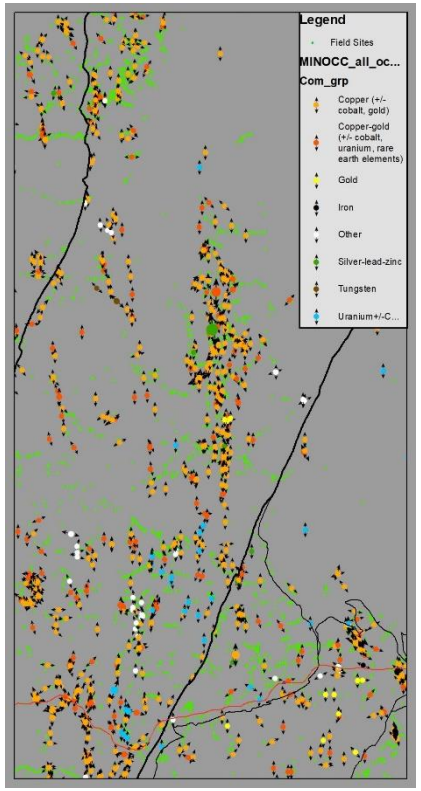
- ≤100m geophysics can see much more of the structural complexity
- Solid geology needs to be refined to support the new undercover search space
- Improved structural framework will support the next generation of solid geology products

Datasets, methodology & workflow



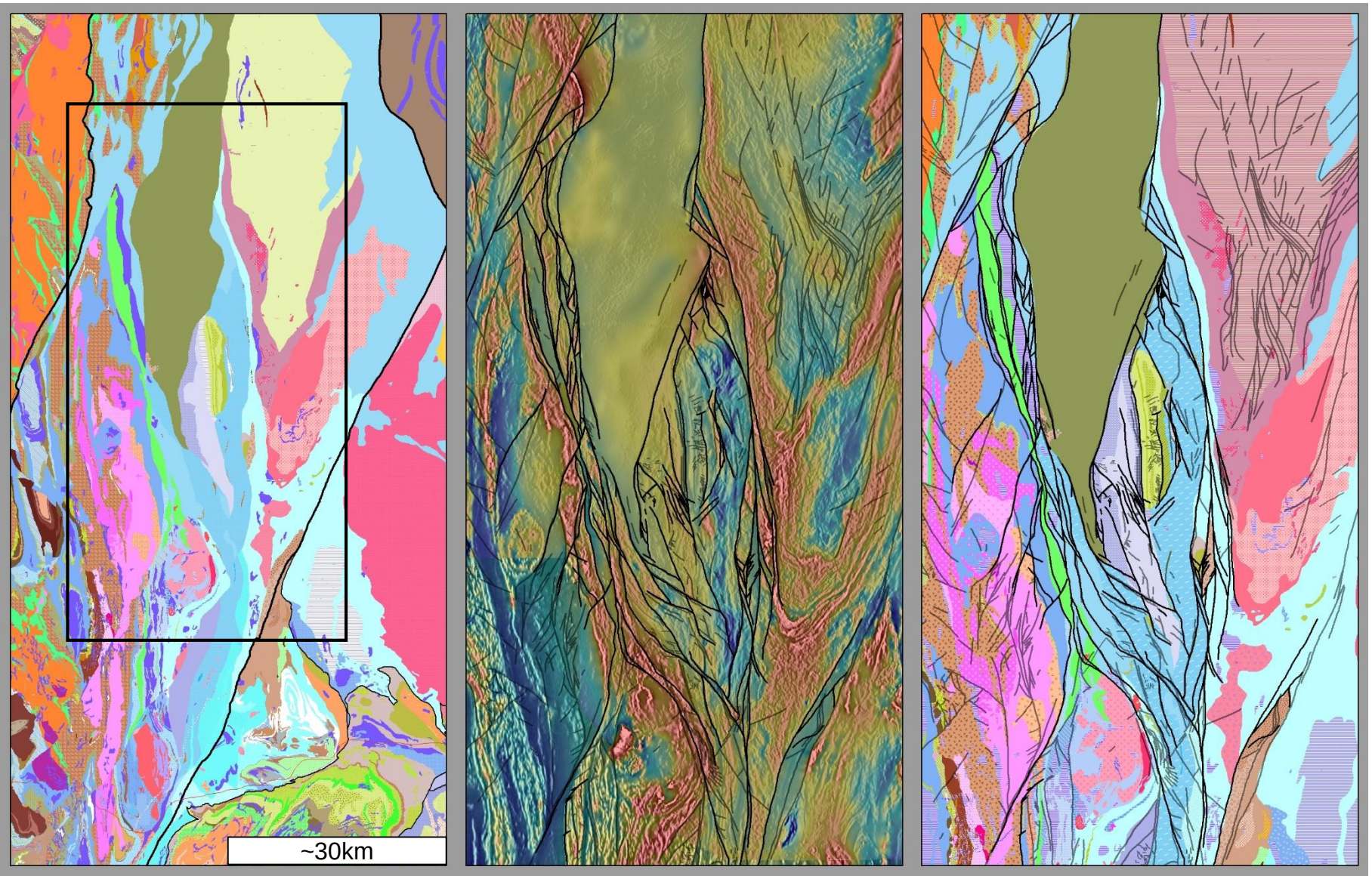






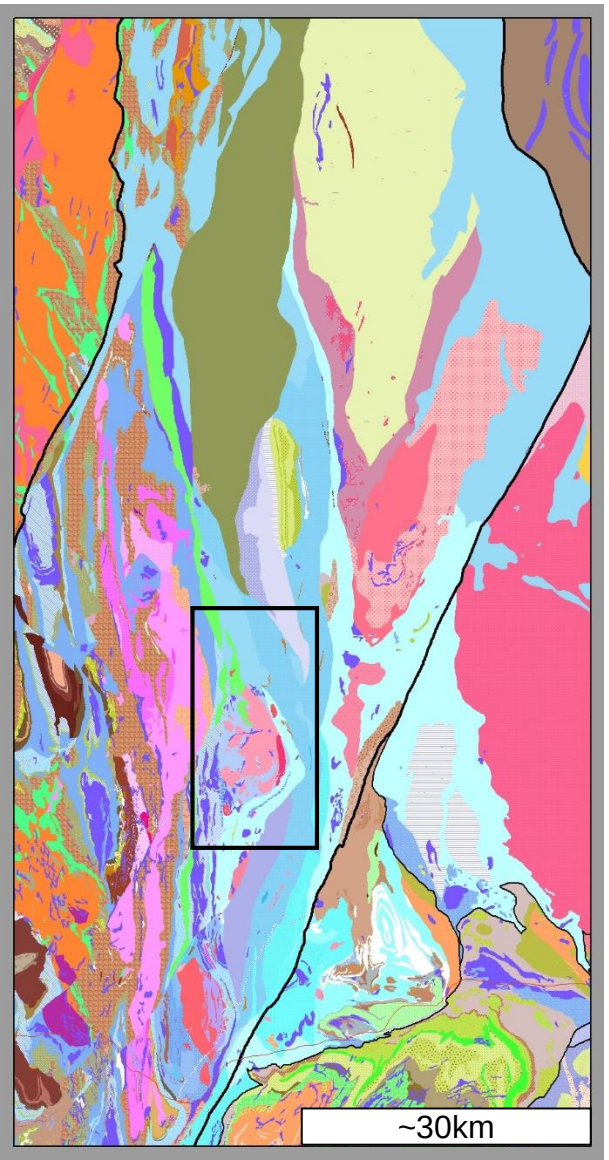
Structural Skeleton → **Preliminary Interpretation** → **Field Validation / Ground Truth** → **Final Interpretation**

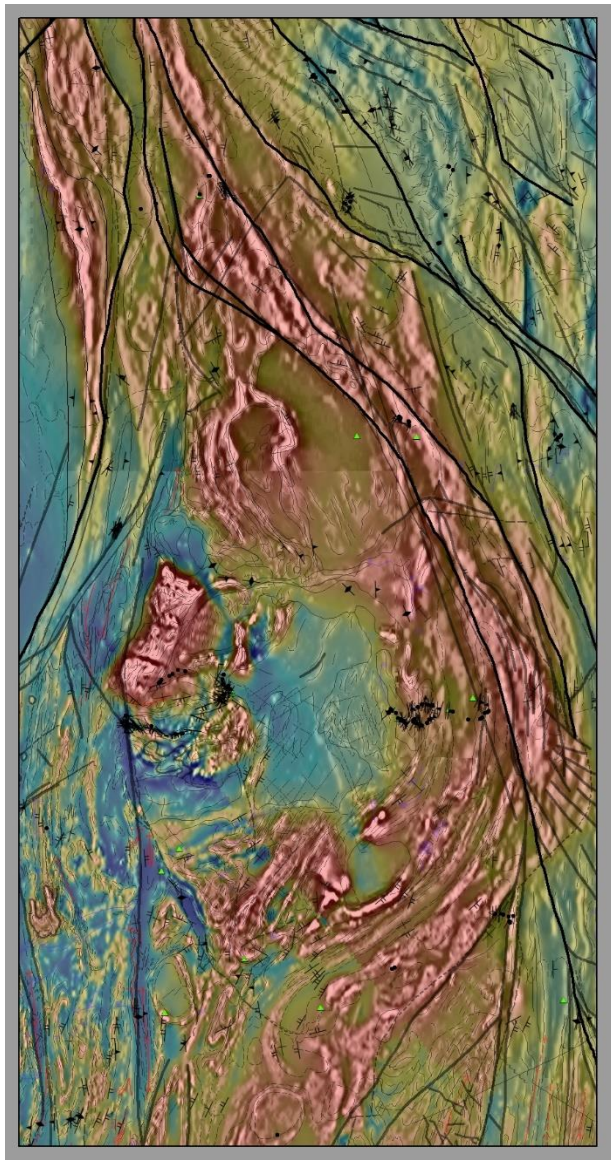
Project area



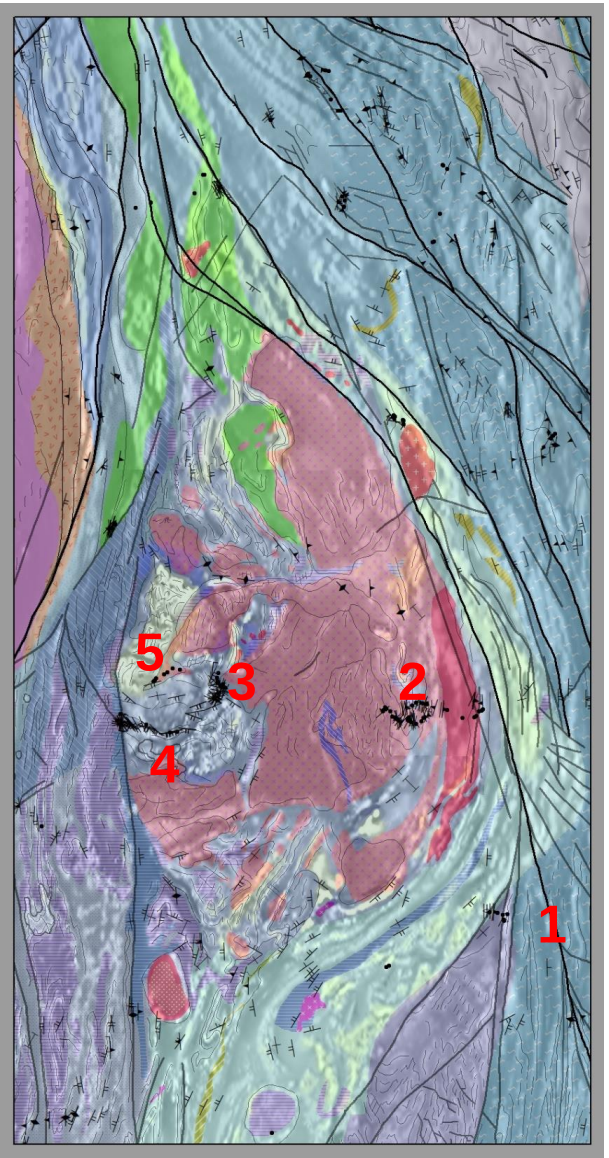
- Wonga belt to Mount Rose Bee Fault (inc. Landsborough graben)
- Structural corridors that affect undercover rocks to the north and east

Mount Godkin



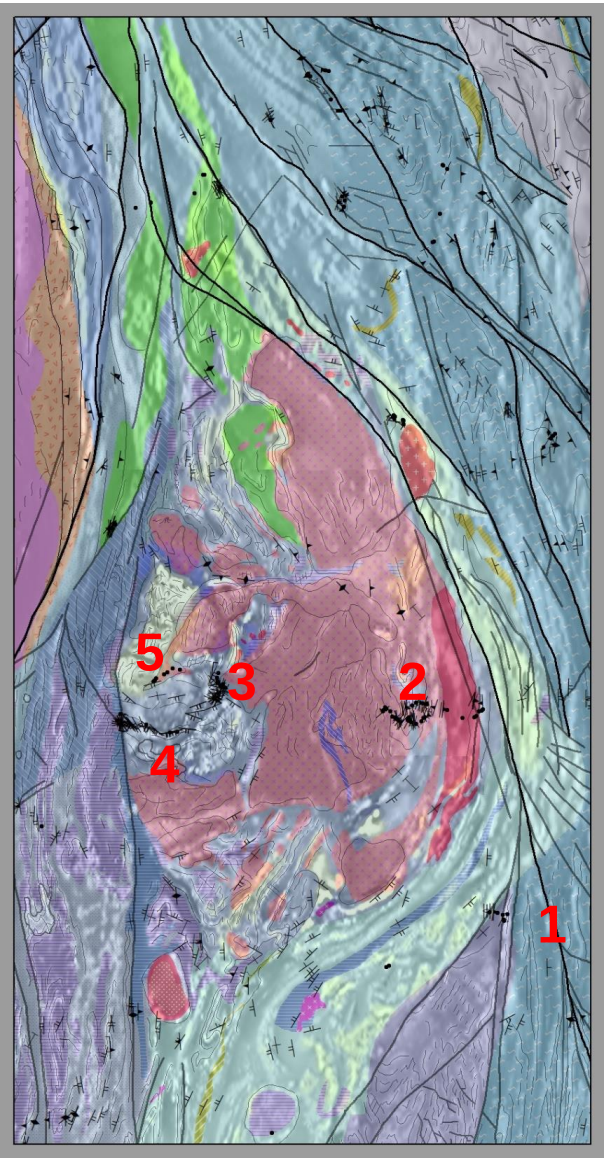


Mount Godkin



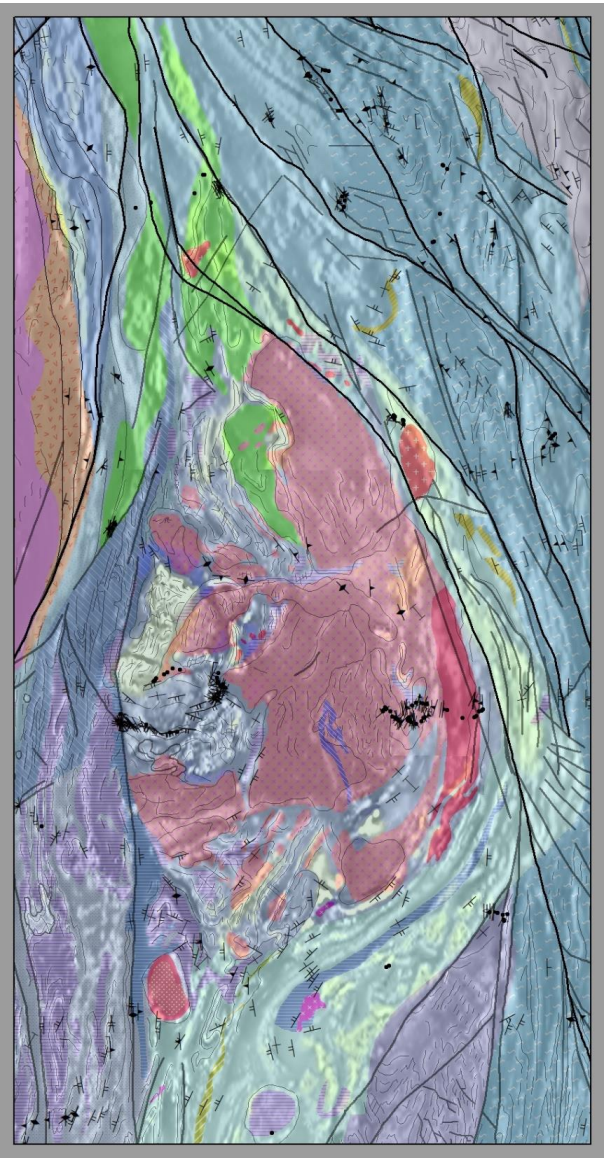
- Well preserved x-beds in metaseds

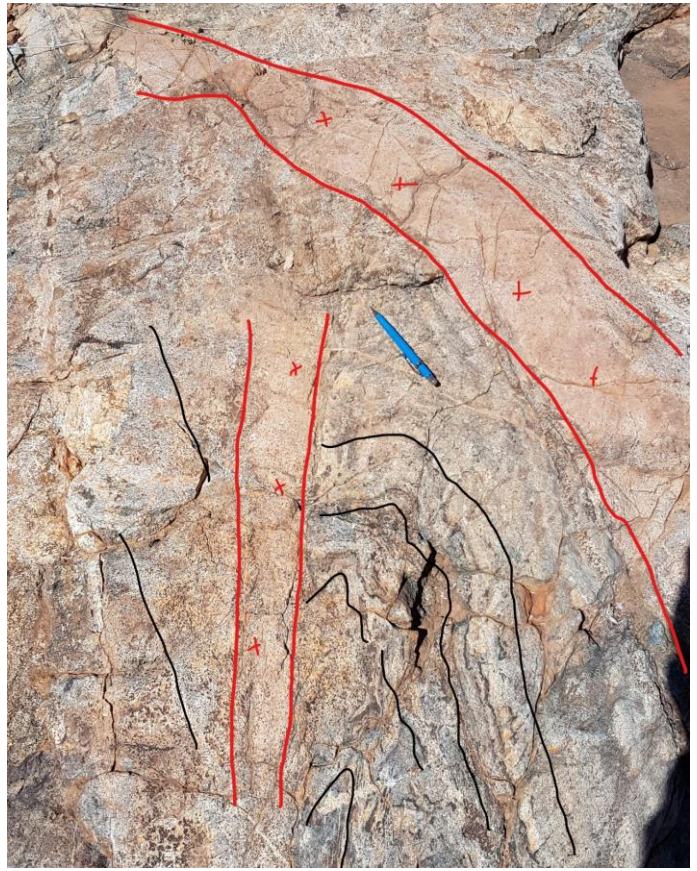
Mount Godkin



- Strange amoeboid features within some CASI layers
- Spherical, cylindrical, and contorted shapes
- Fluid-rock reactions during intrusion???

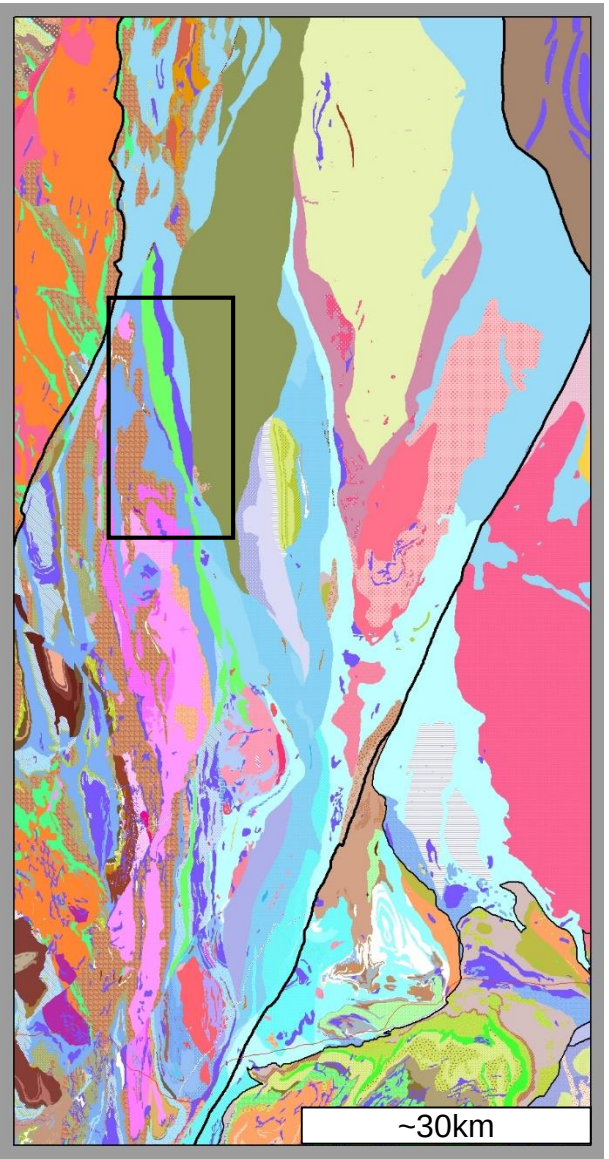
Mount Godkin

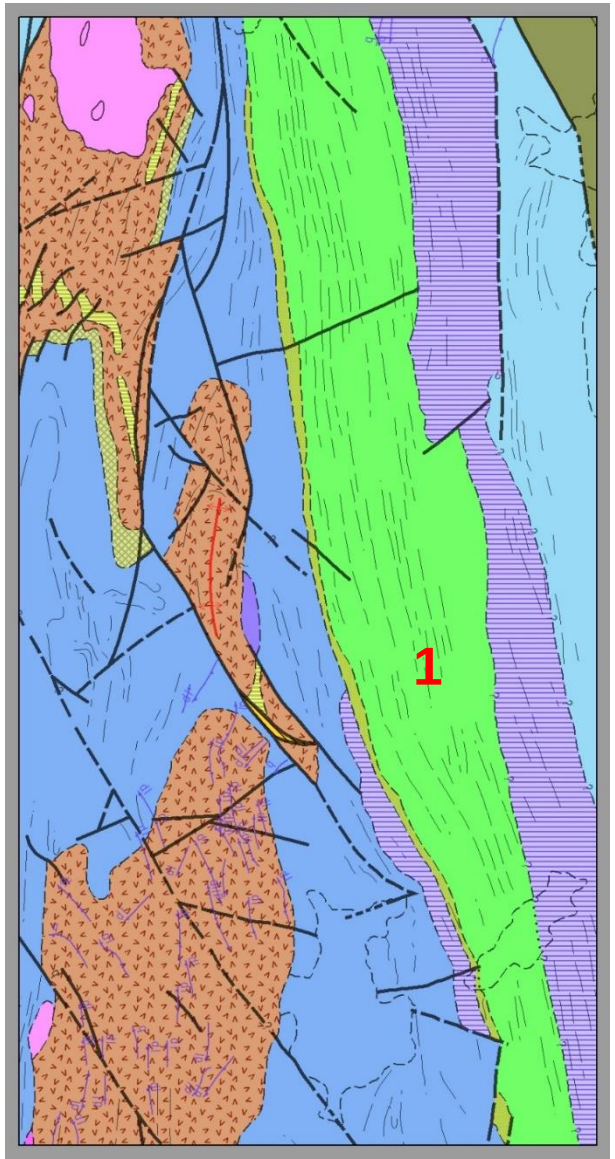


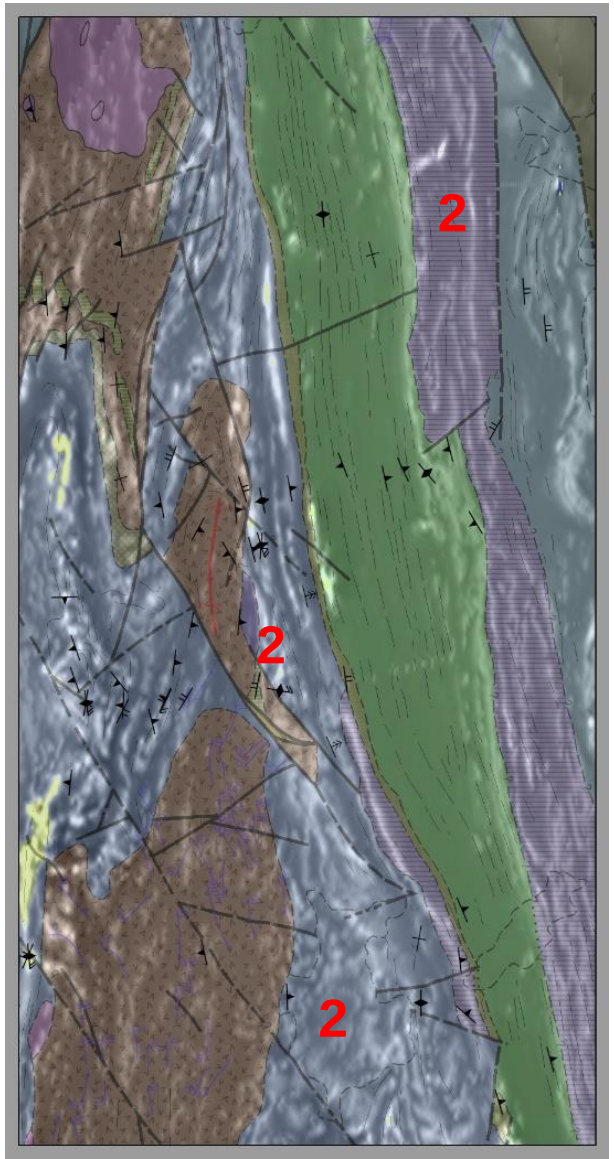


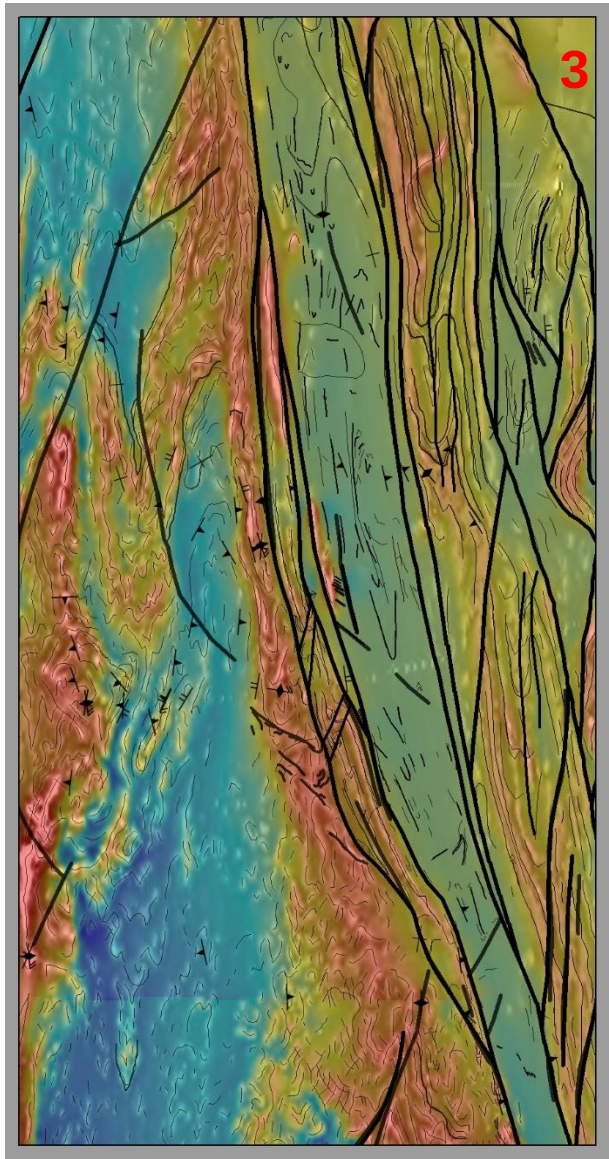
- Dykes from Mt Godkin Granite locally cut deformed rocks

North-eastern Wonga Belt



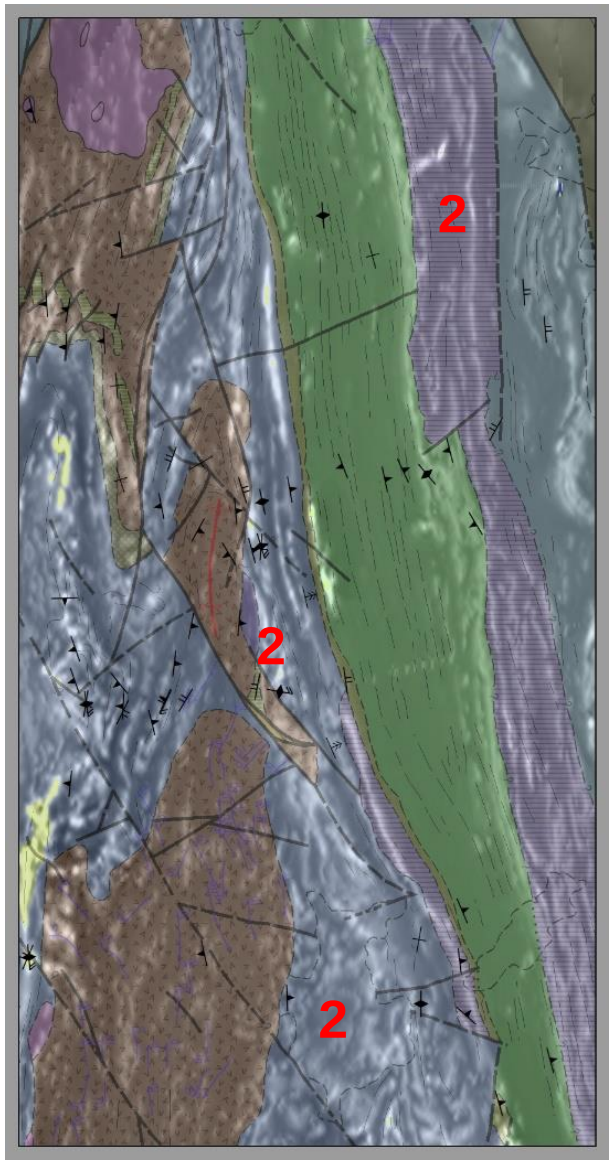


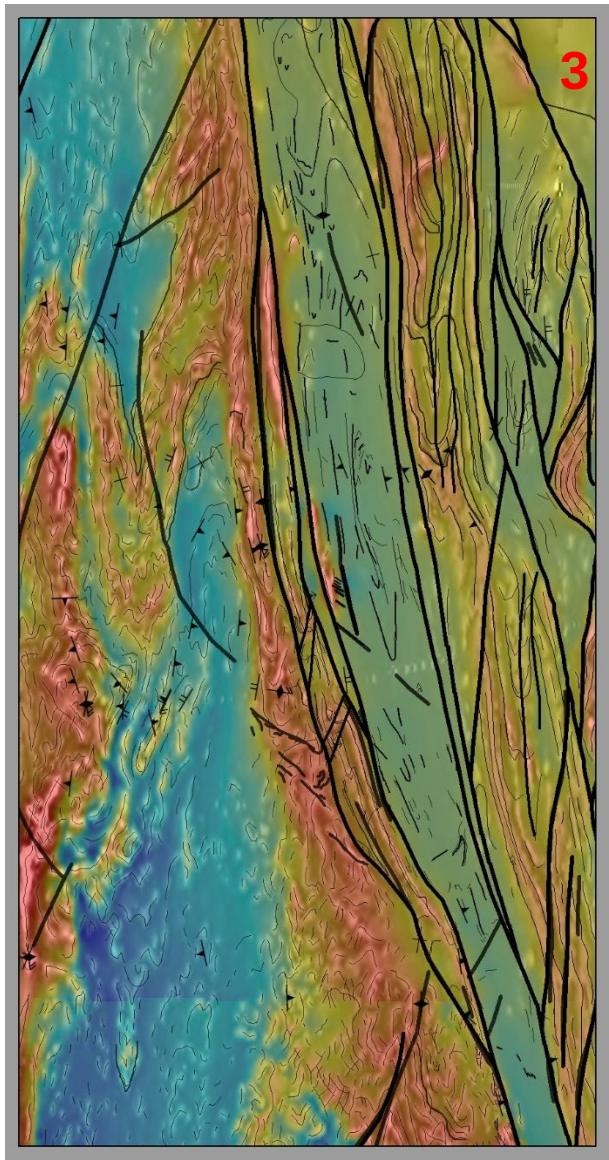




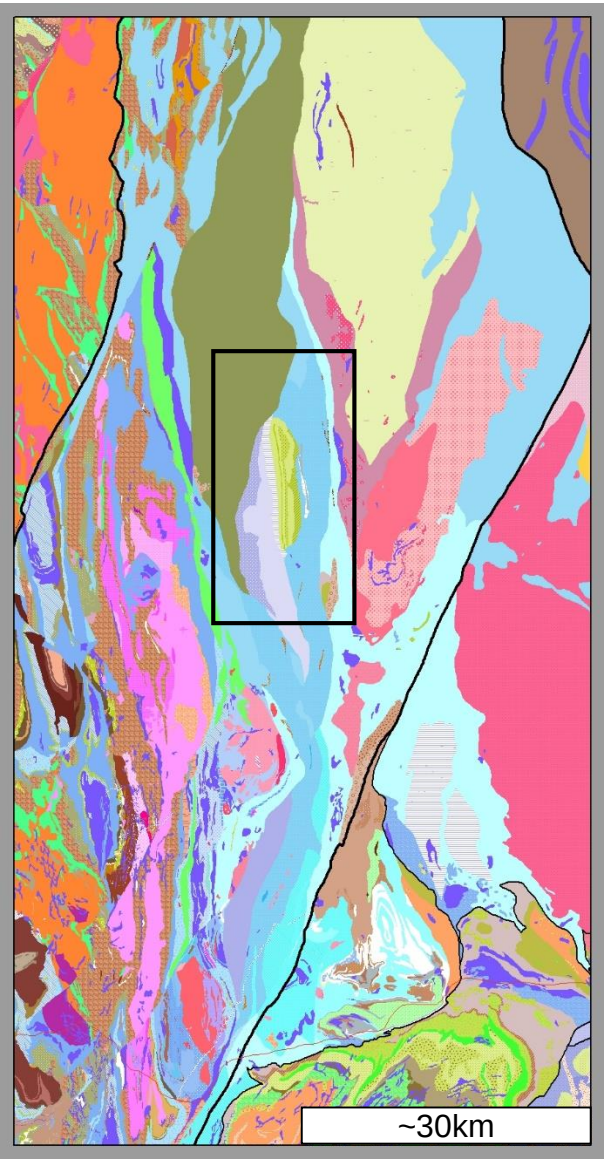
North-eastern Wonga Belt

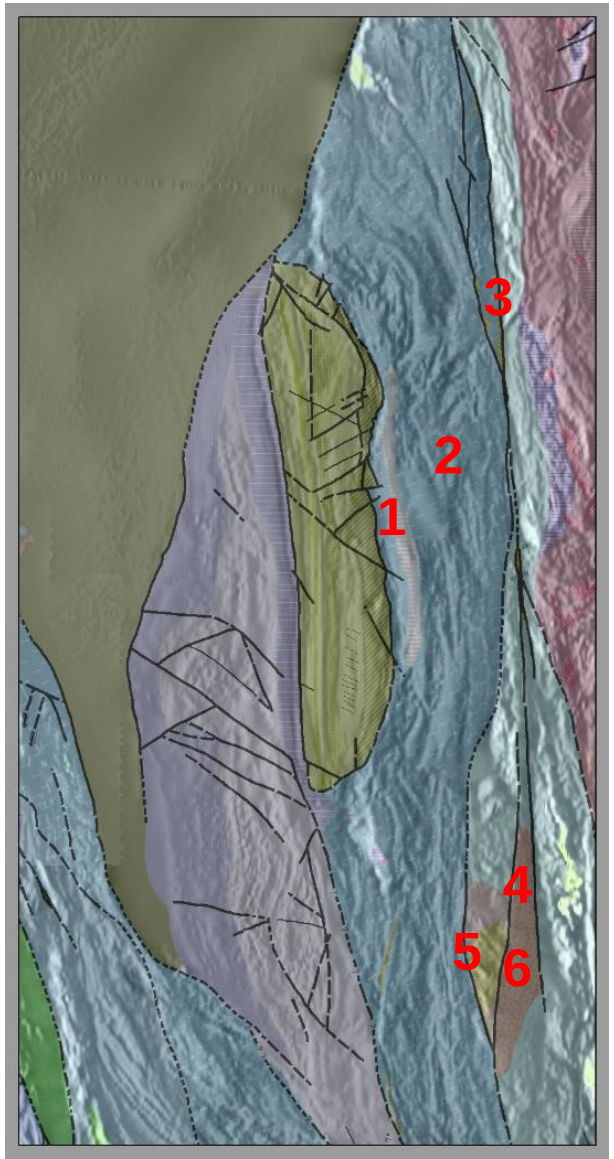
~5m thick breccia zone in Jurassic sandstone due to Pinnacle Fault reactivation

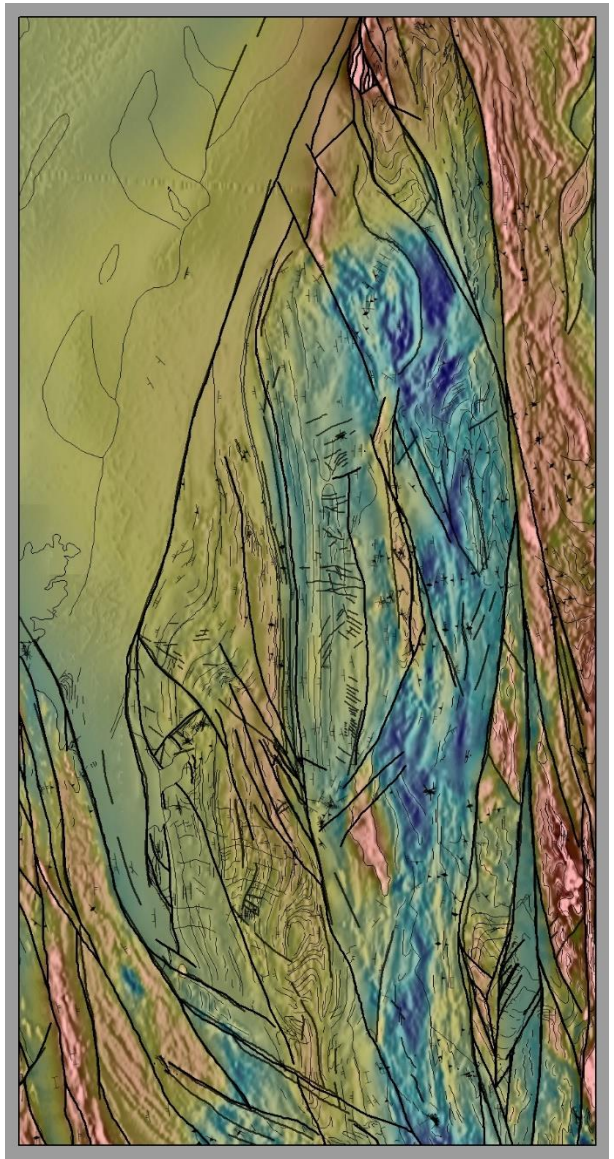


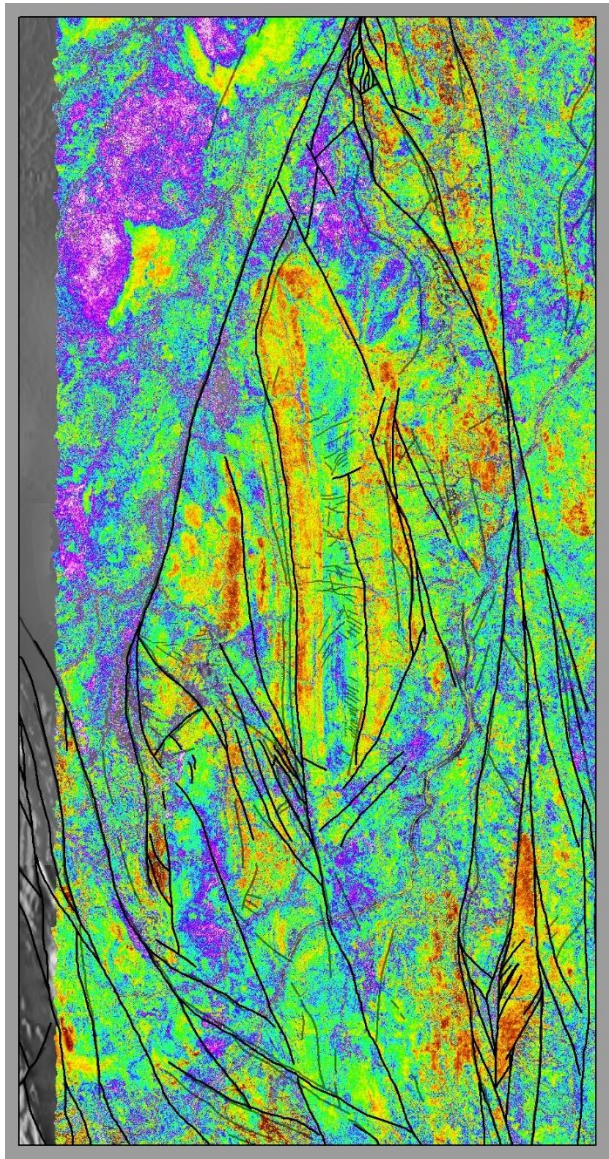


Roseby Schist – Eastern Arm









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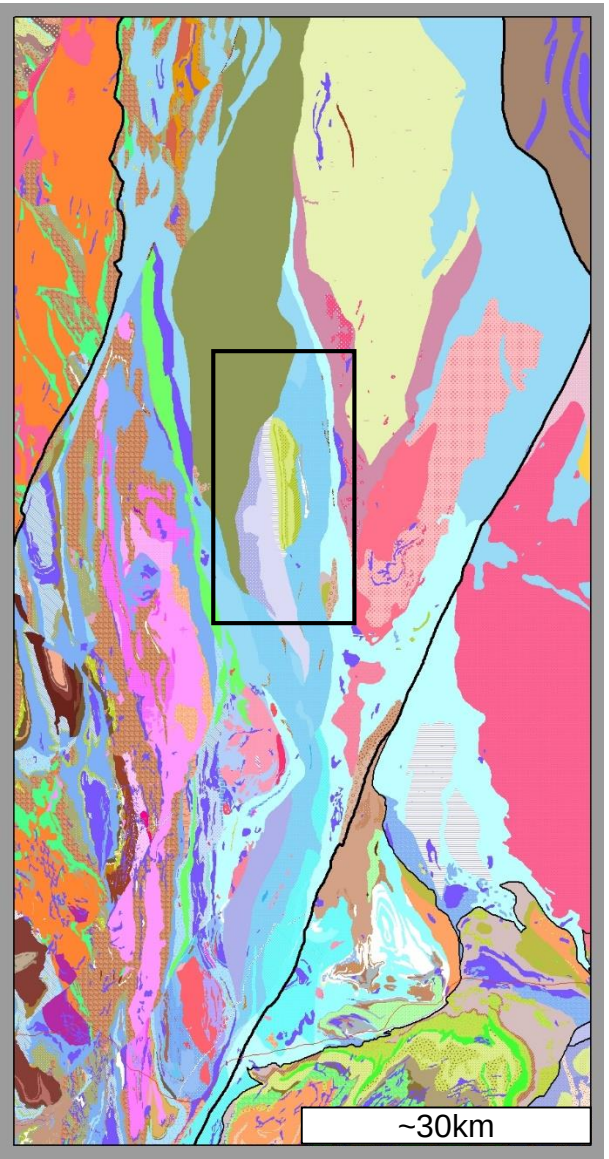
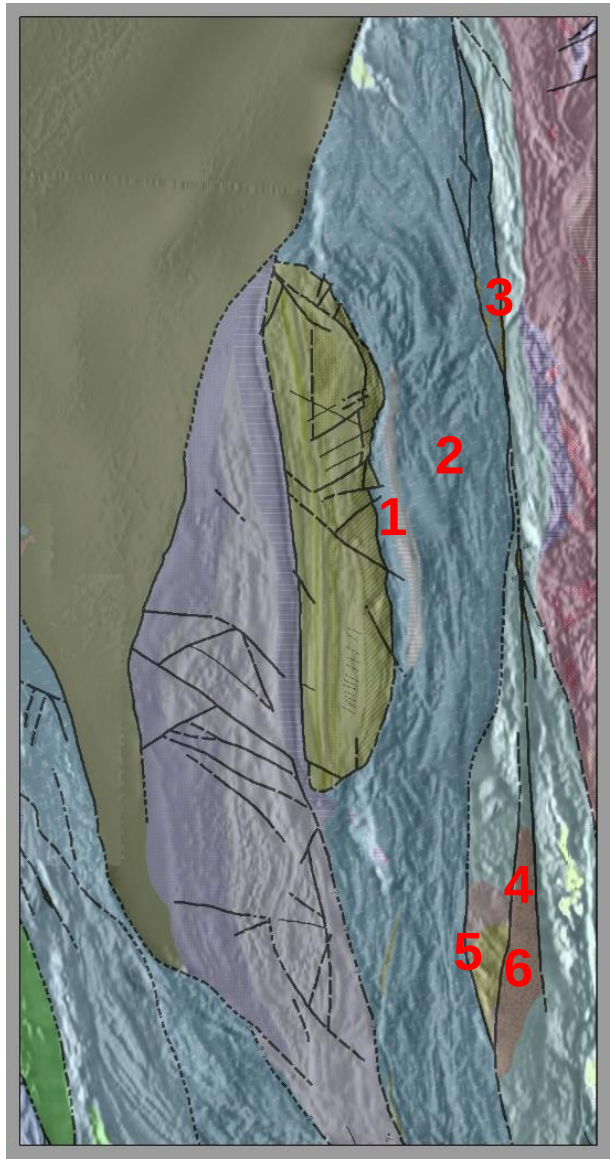
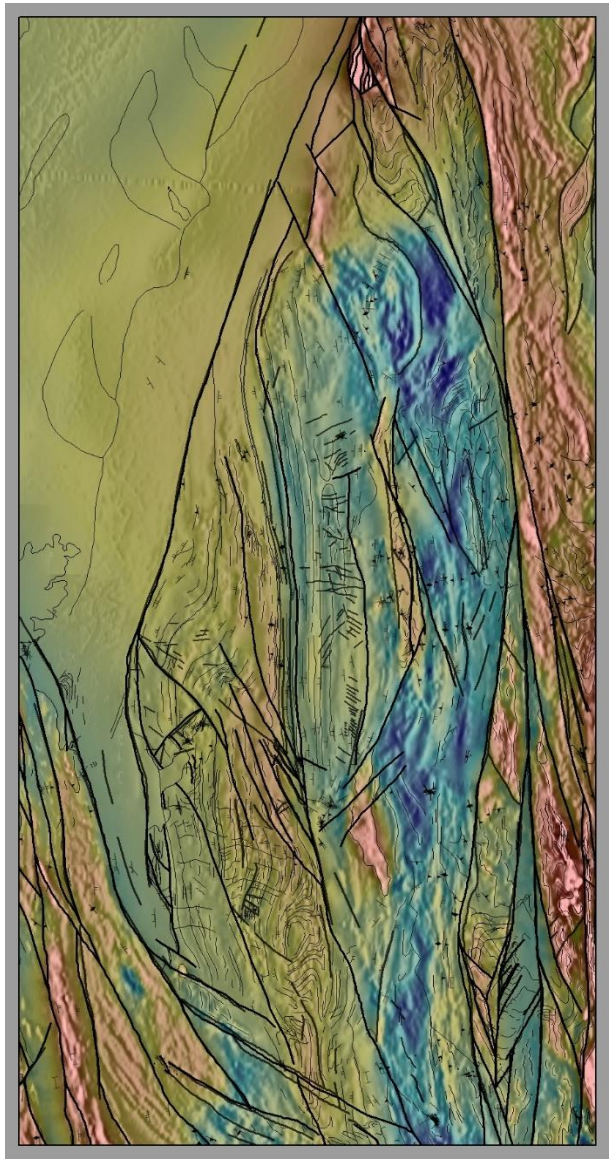
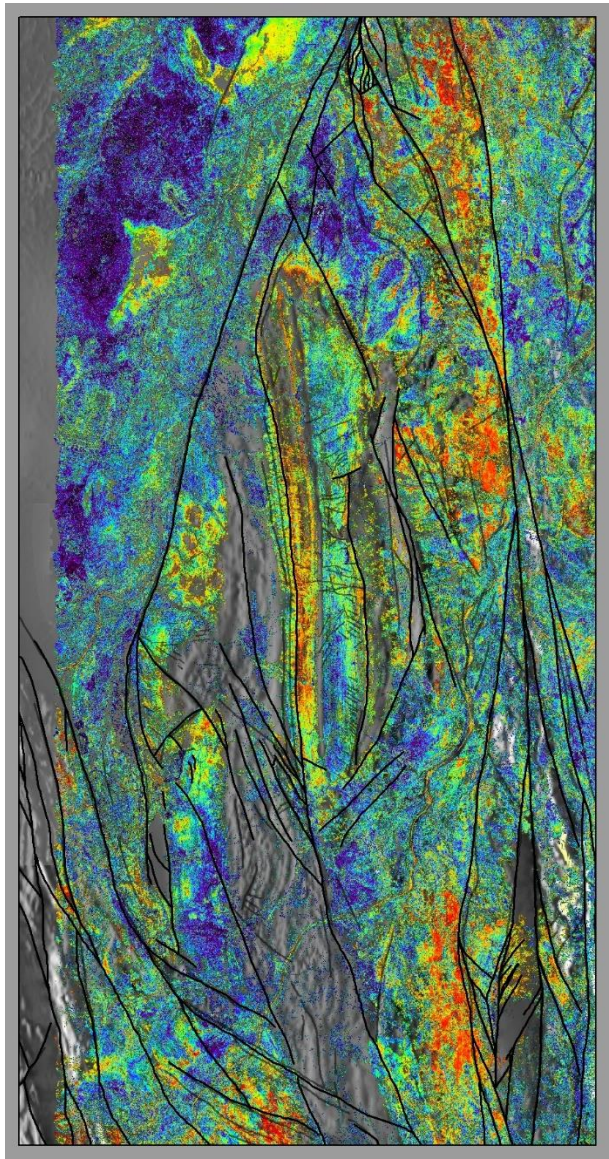
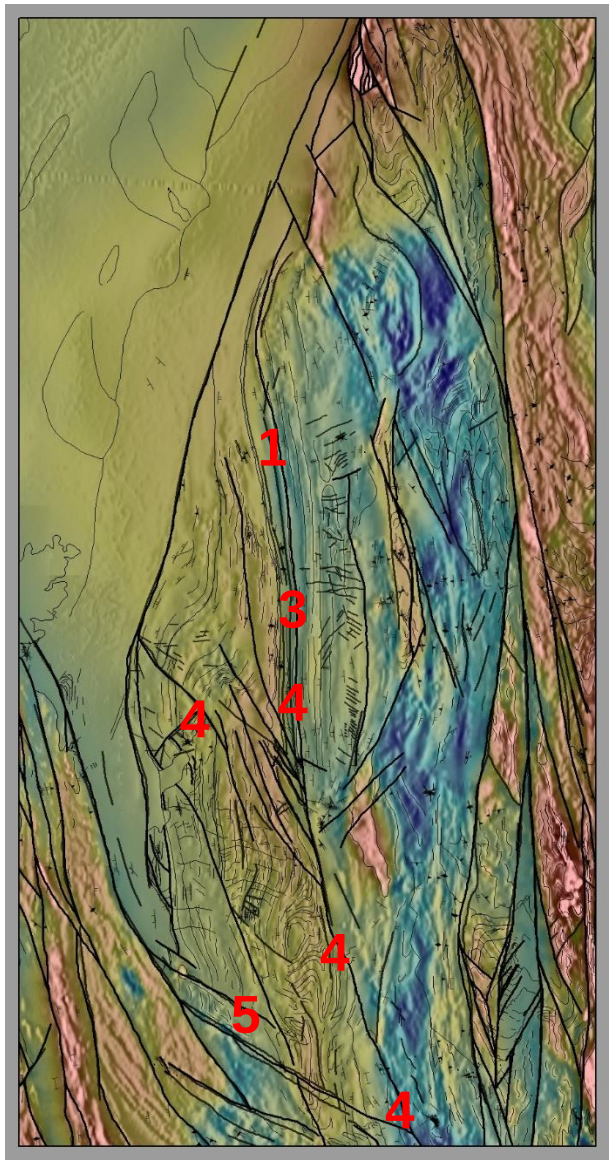


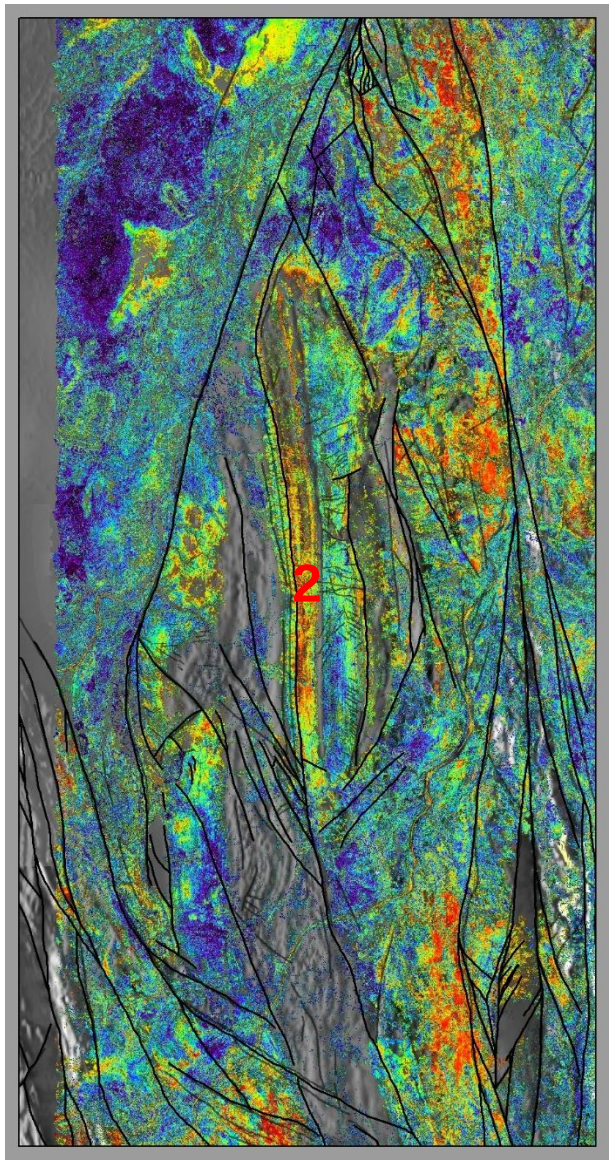






Roseby Schist – Western Arm





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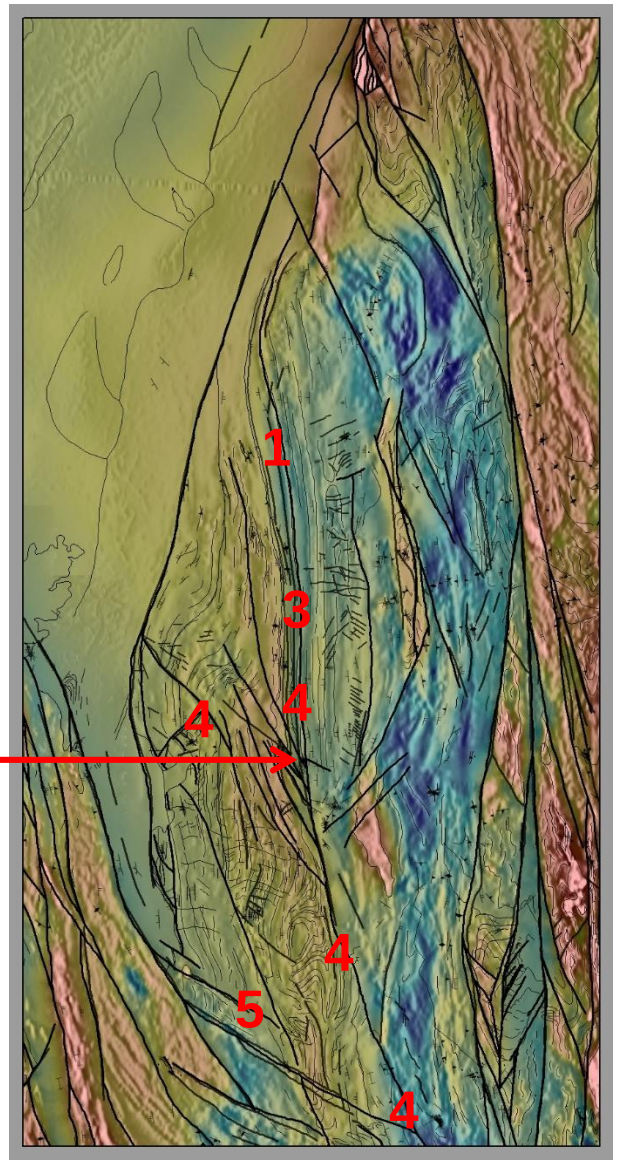

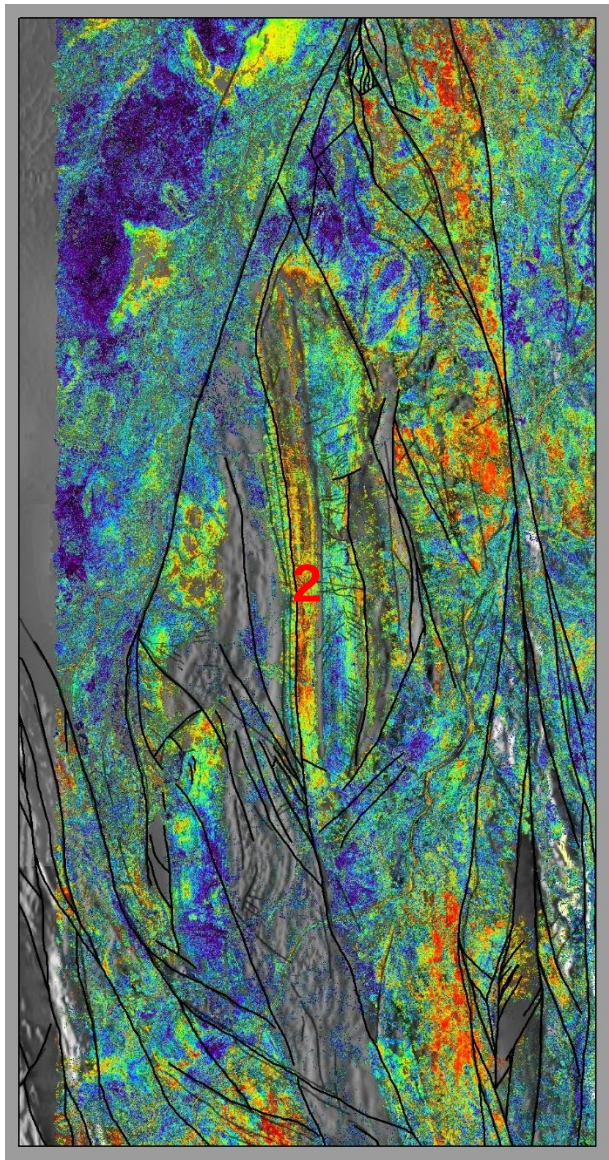

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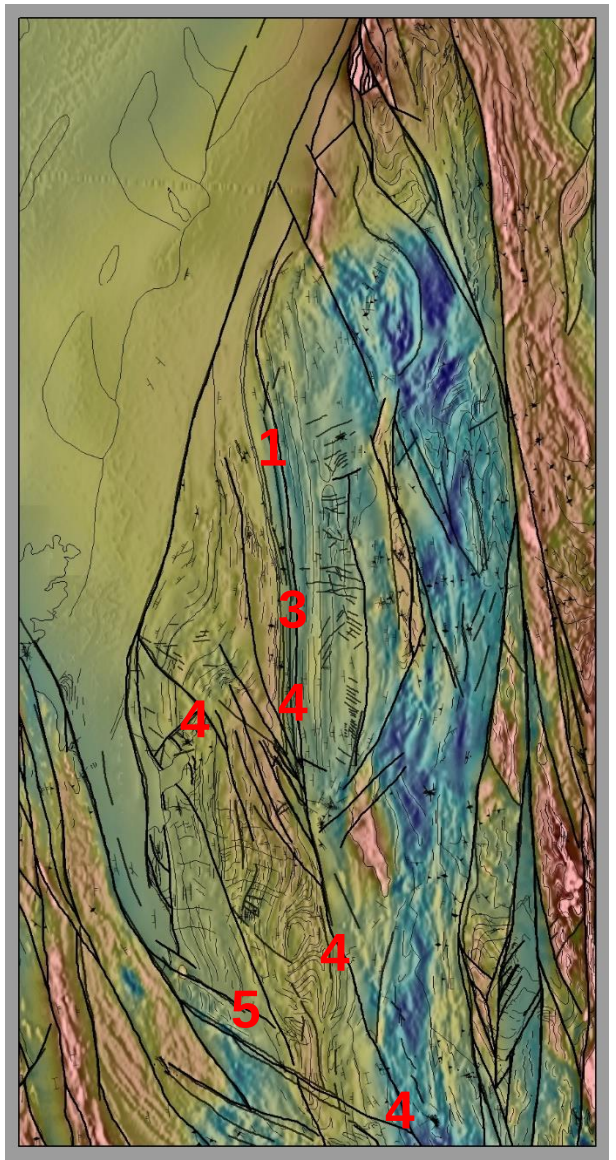

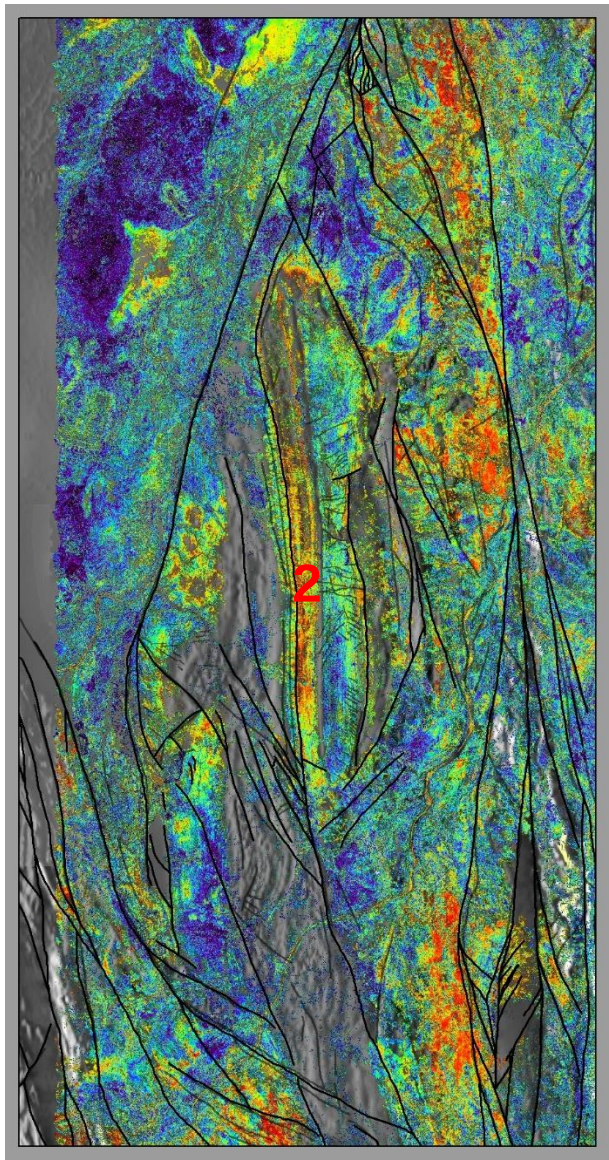

Take home messages

- High-resolution regional geophysical datasets represent a real step change in data quality and an opportunity for adding value
- There is much more structural complexity imaged in the data which needs to be incorporated into future GSQ products
  - Isan D2 deformation usually dominant, resulting in large scale transposition with layering parallel to a penetrative ductile fabric
  - Late Isan brittle (silicates) to ductile (carbonates) deformation causes shear on the composite fabric, spaced cleavage, and fault reactivation
- Structural-solid geology interpretation initially focussed on areas that can be validated in the field to link geological features with the geophysical response and refine the structural framework
- Greater understanding of the structure will be applied to the understanding of adjacent undercover areas

Thank you

For more information please contact Derek Hoy

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