Interpretation of gravity and magnetic data across the Albany-Fraser Orogen

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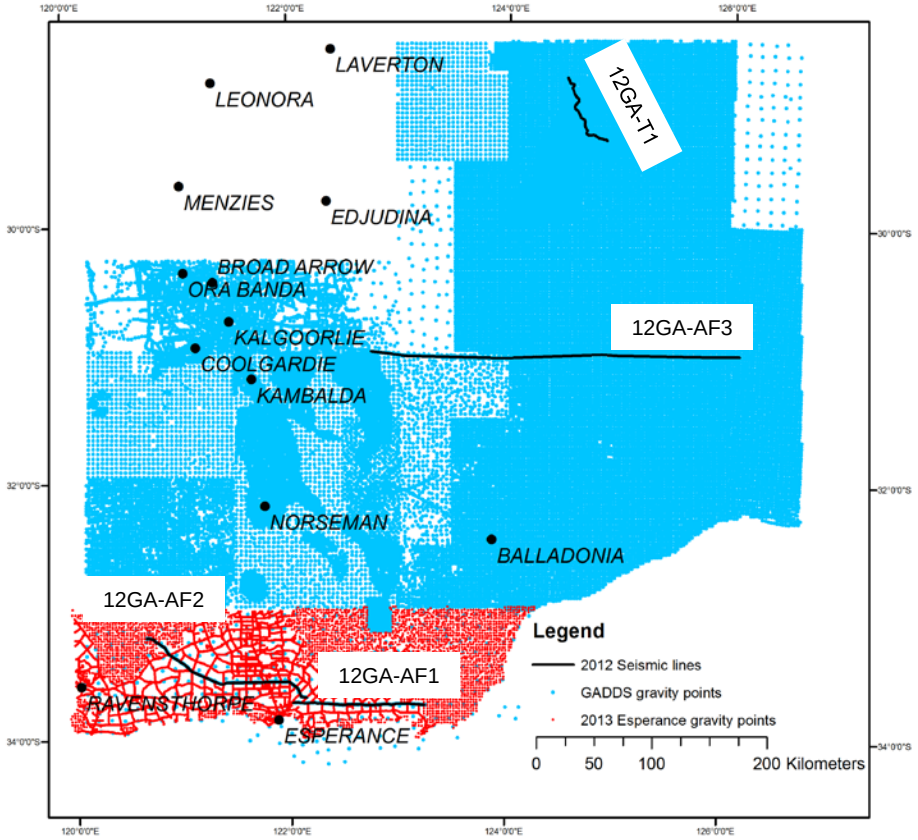
ROYALTIES FOR REGIONS
EXPLORATION INCENTIVE SCHEME

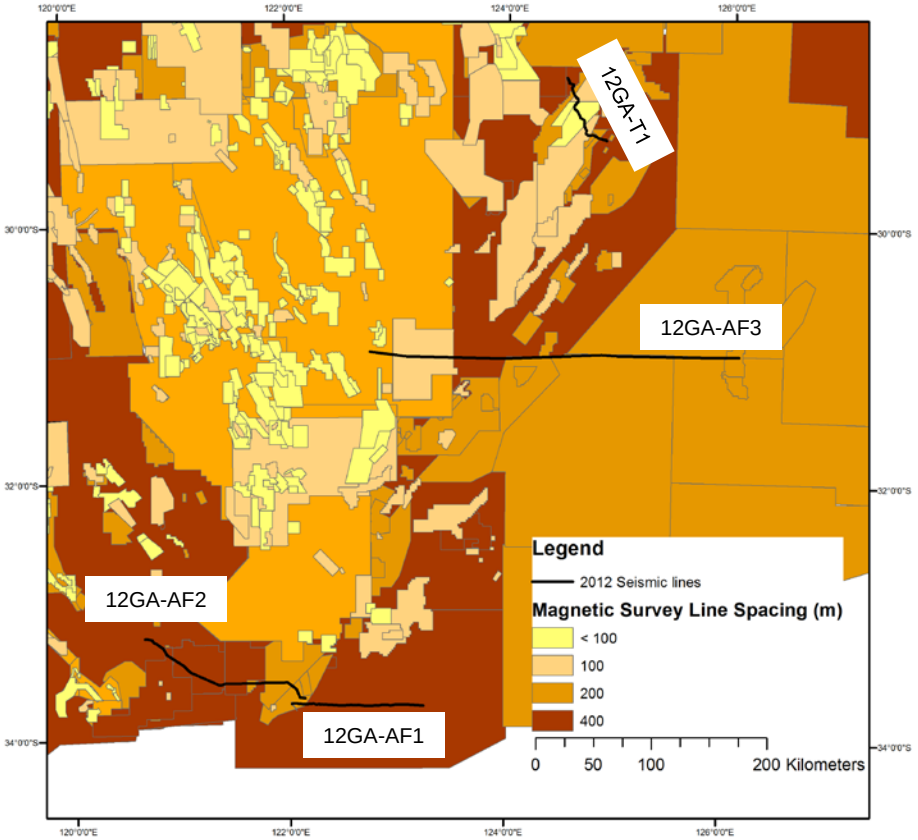
Outline

- Data distribution
- Maps of the Gravity and Magnetic
- Models along the seismic lines
- Discussion

Data availability

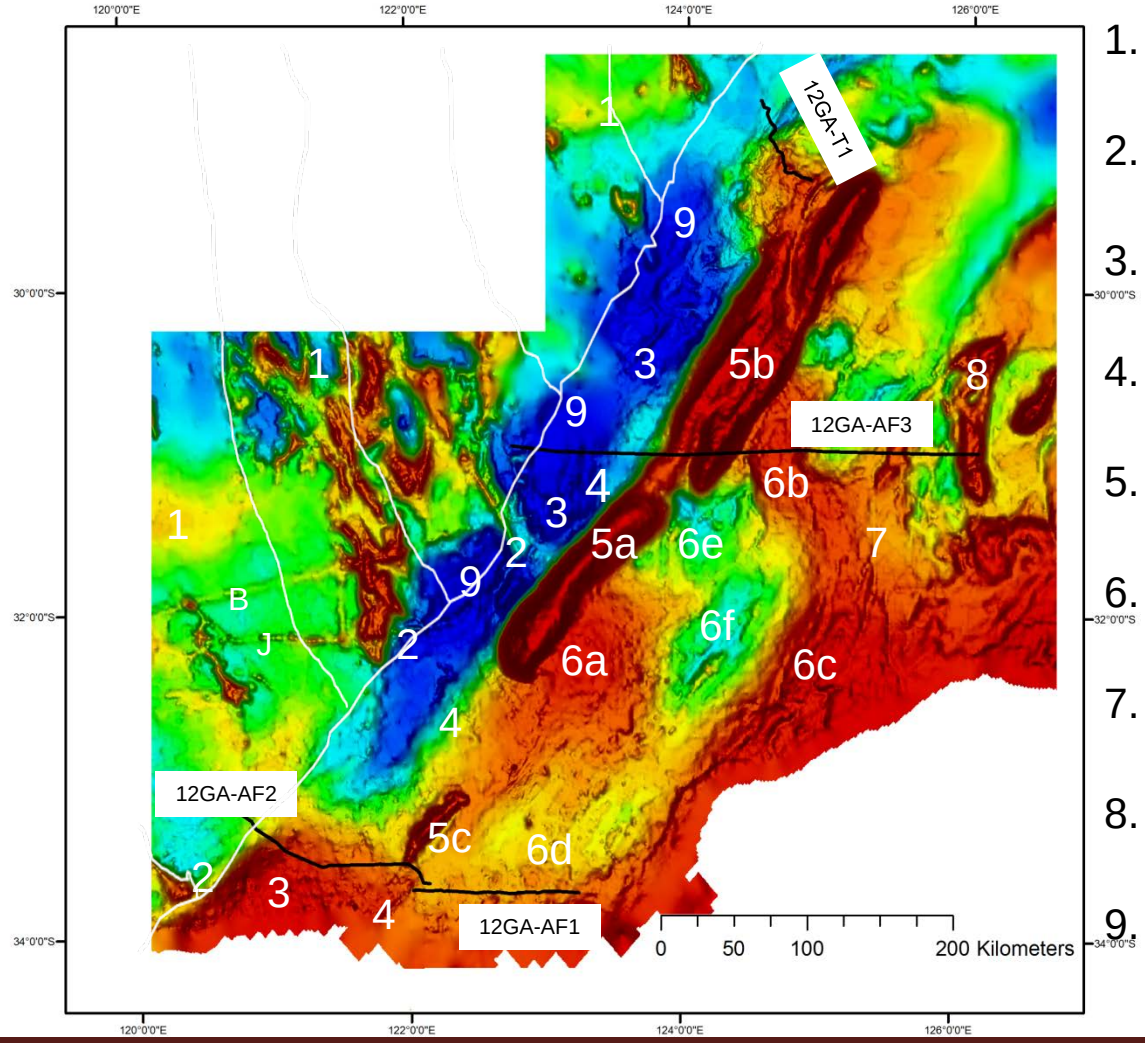


Gravity



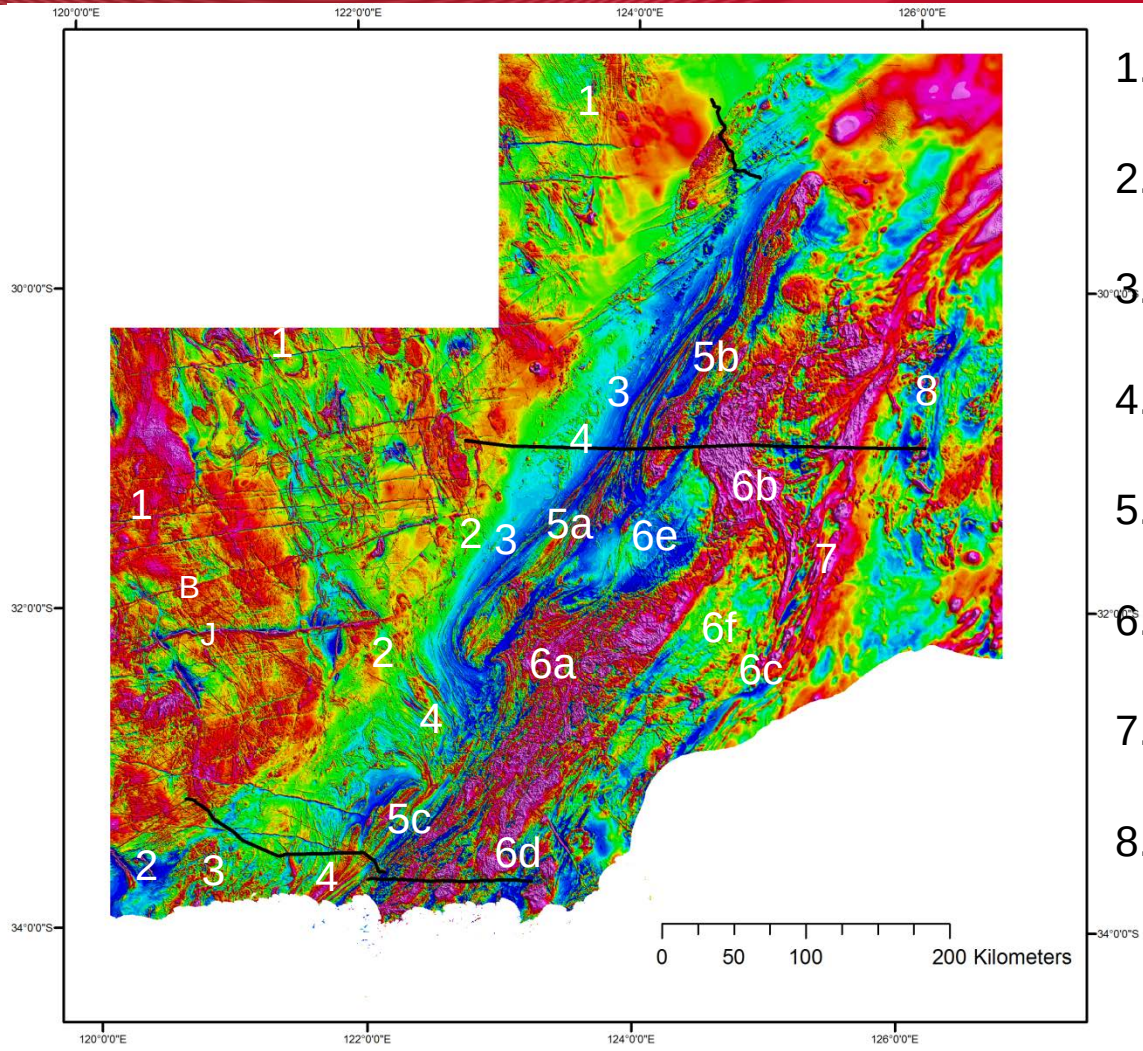
Magnetic

Gravity map



1. Yilgarn Granite-Greenstones
2. Edge of Yilgarn
3. Northern Foreland inc Muglinup gneiss
4. Biranup Zone
5. Fraser Zone
6. Nornalup
7. Rodona Shear Zone
8. Loongana gabbro
9. Regional Bouguer low

Magnetic map



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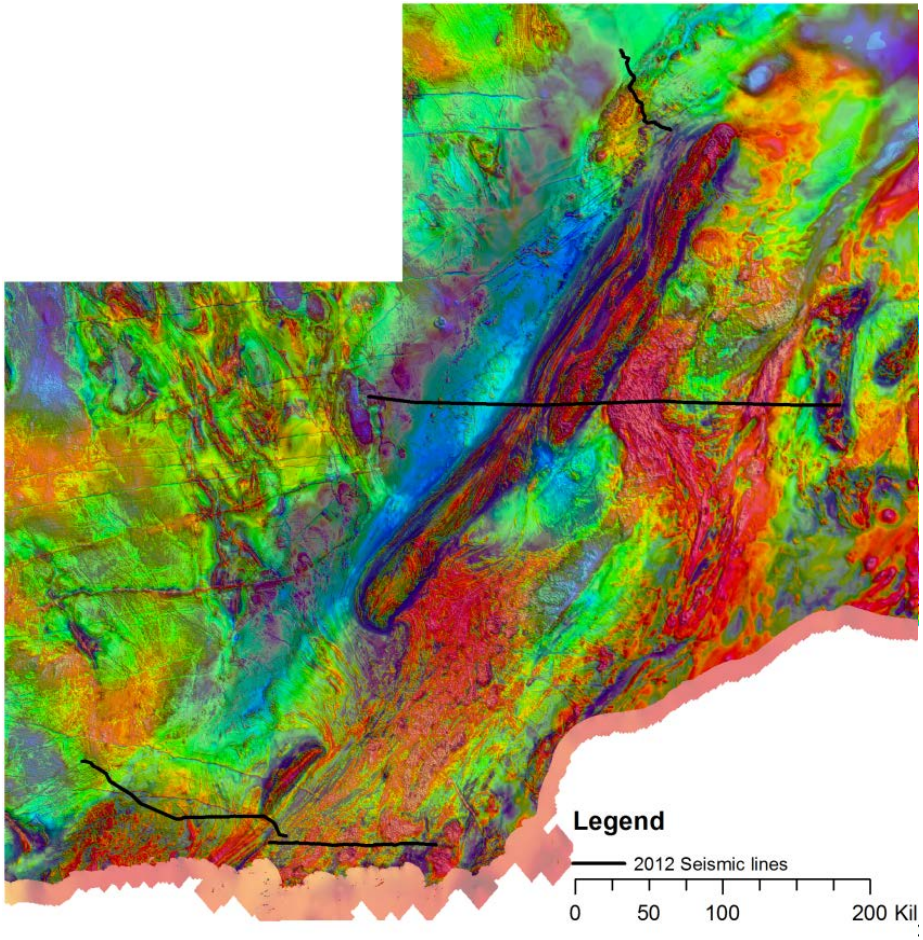
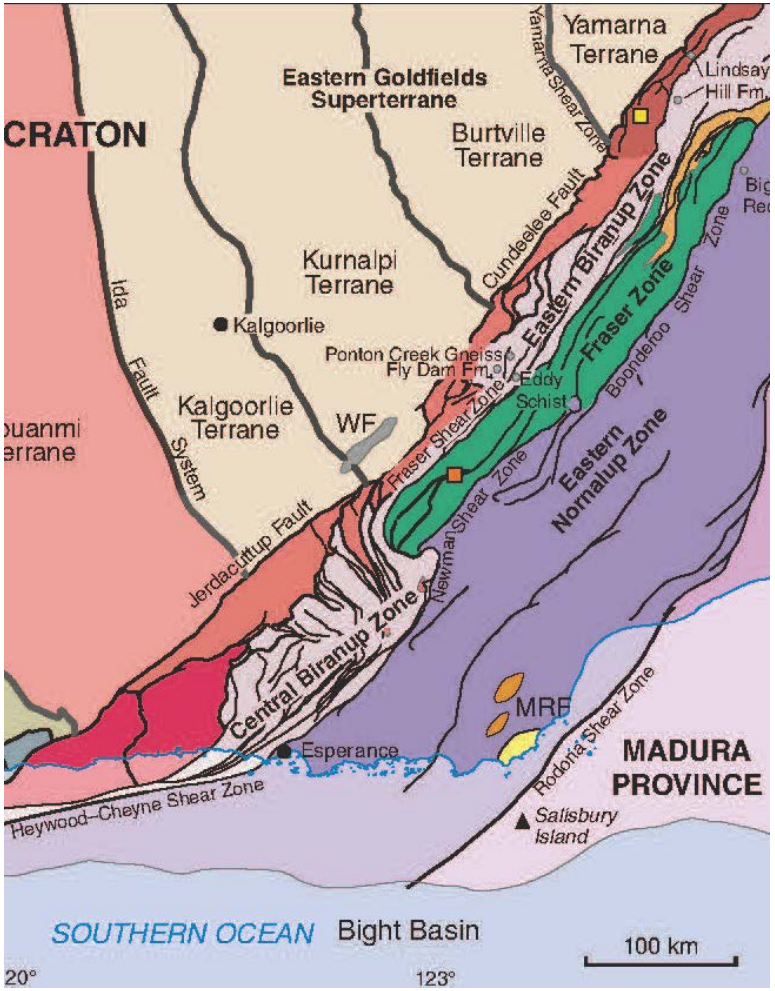
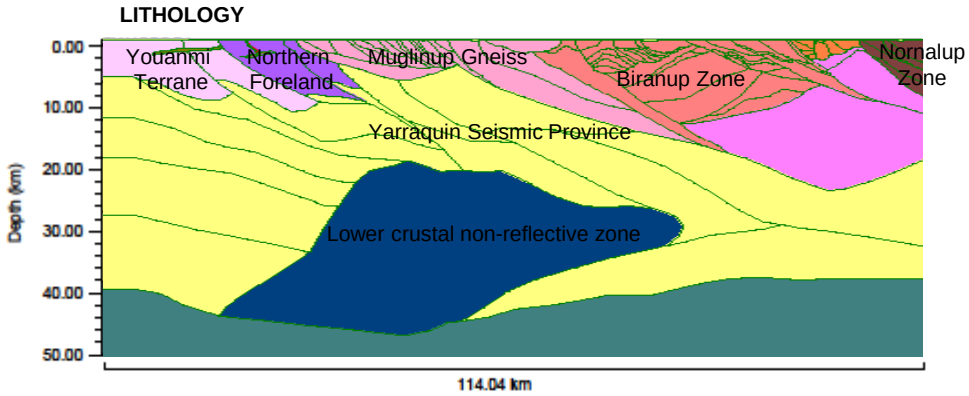
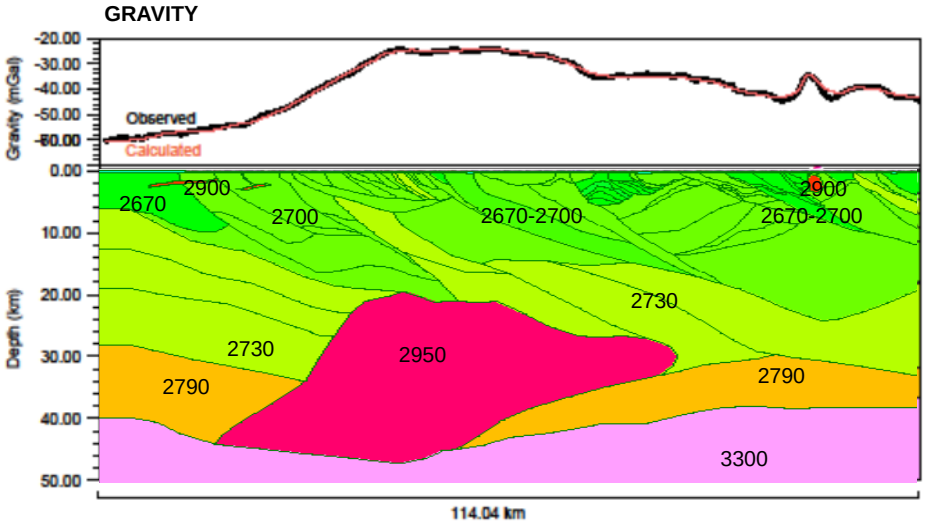
Gravity overlay on Magnetic

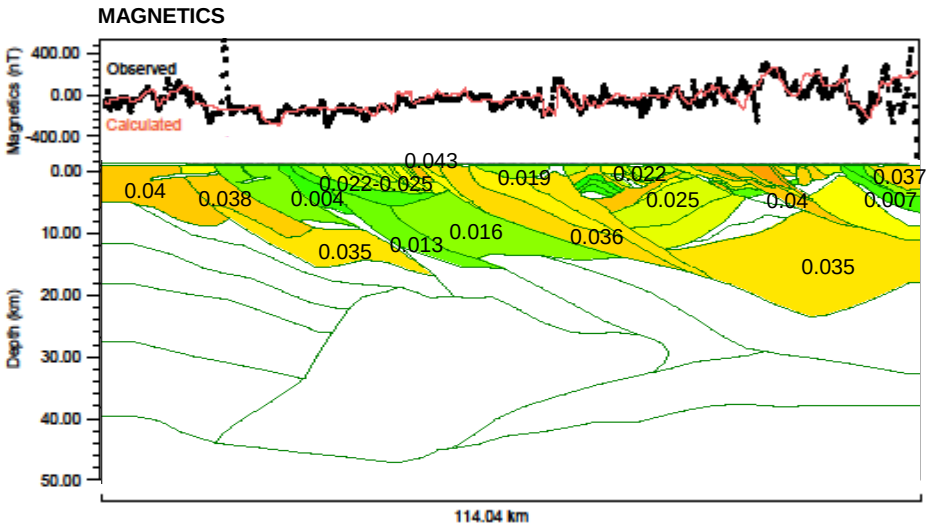




12GA-AF2

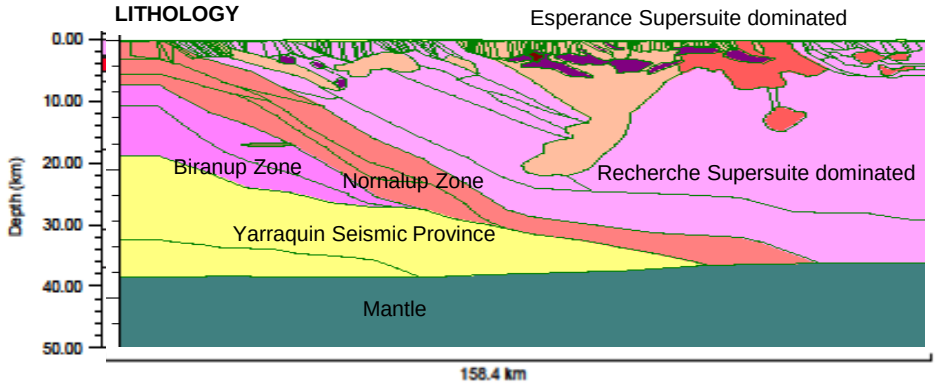


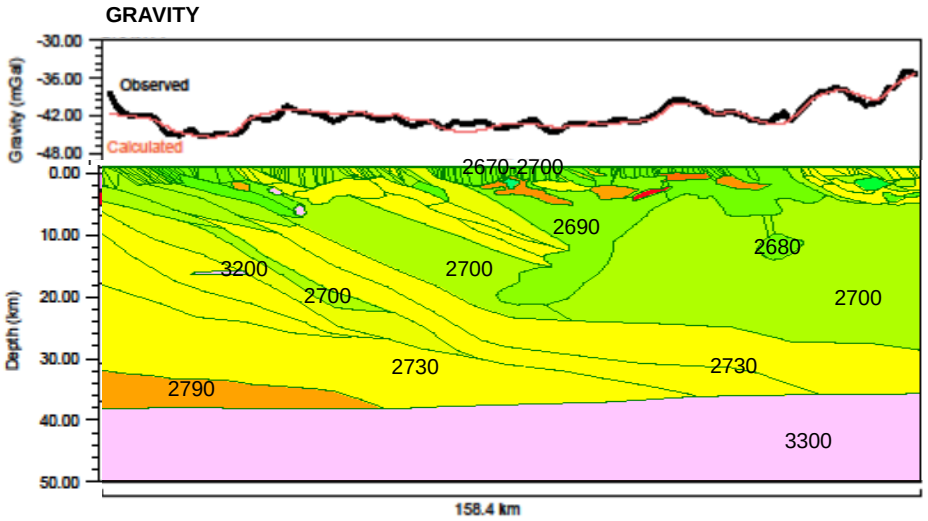


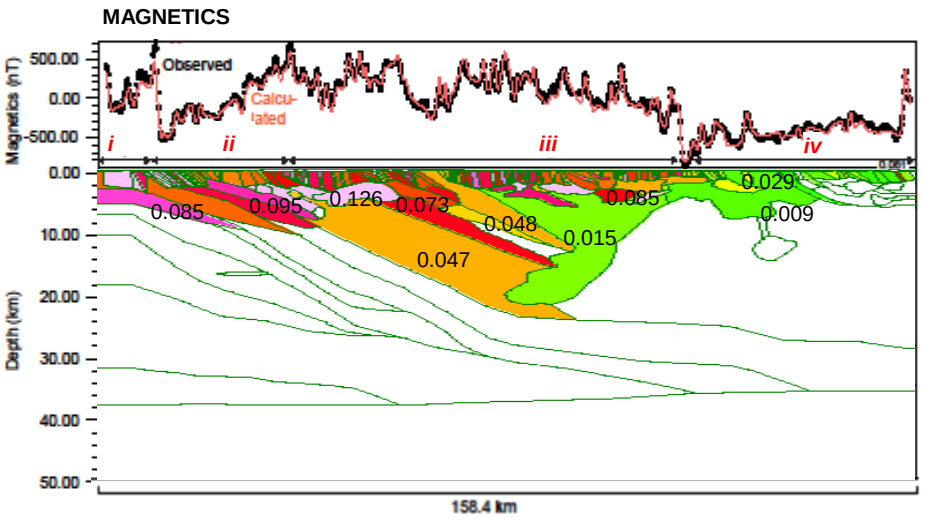


Mantle

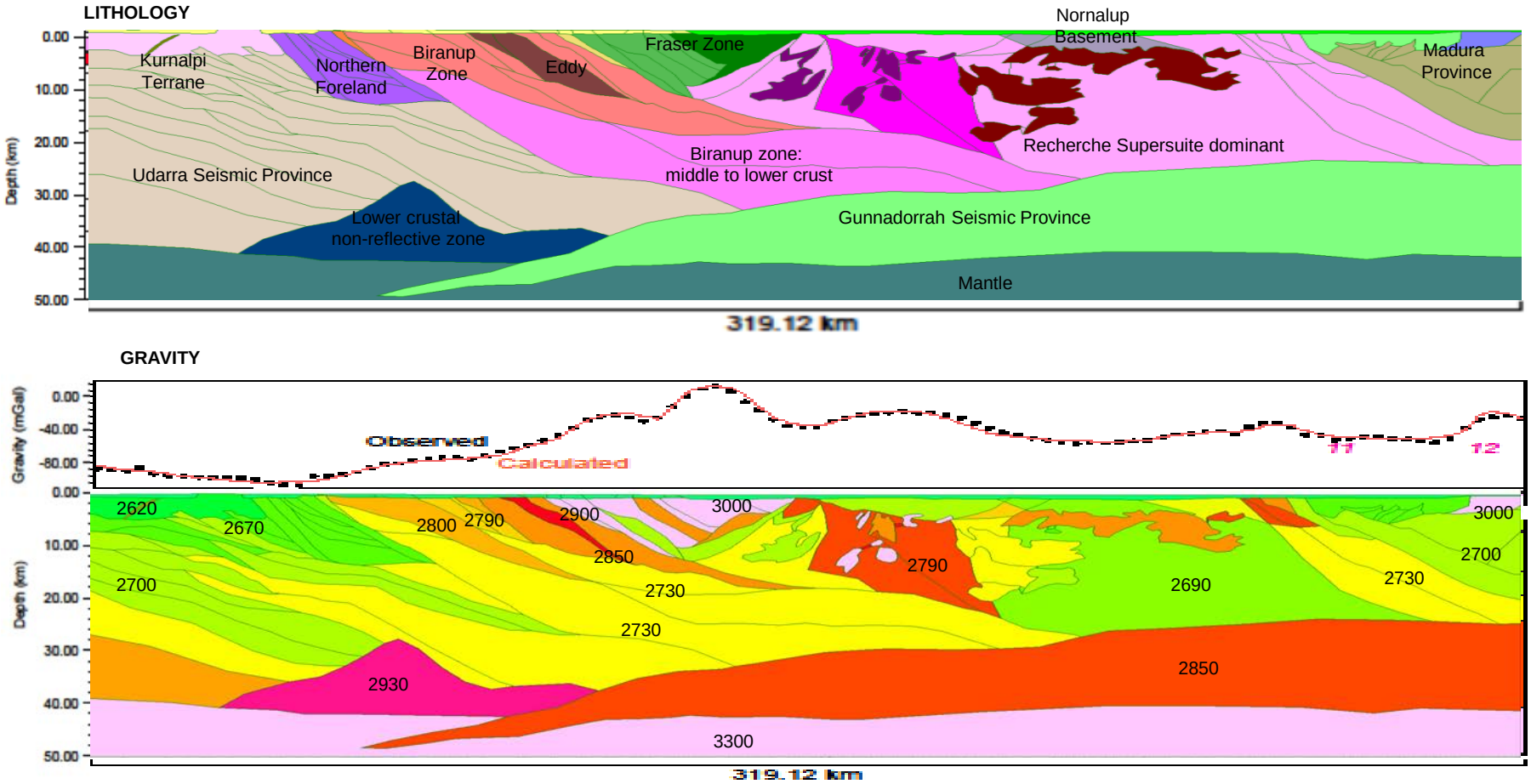
12GA-AF1


LITHOLOGY
Esperance Supersuite dominated
Biranup Zone
Nornalup Zone
Recherche Supersuite dominated
Yarraquin Seismic Province
Mantle
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
158.4 km

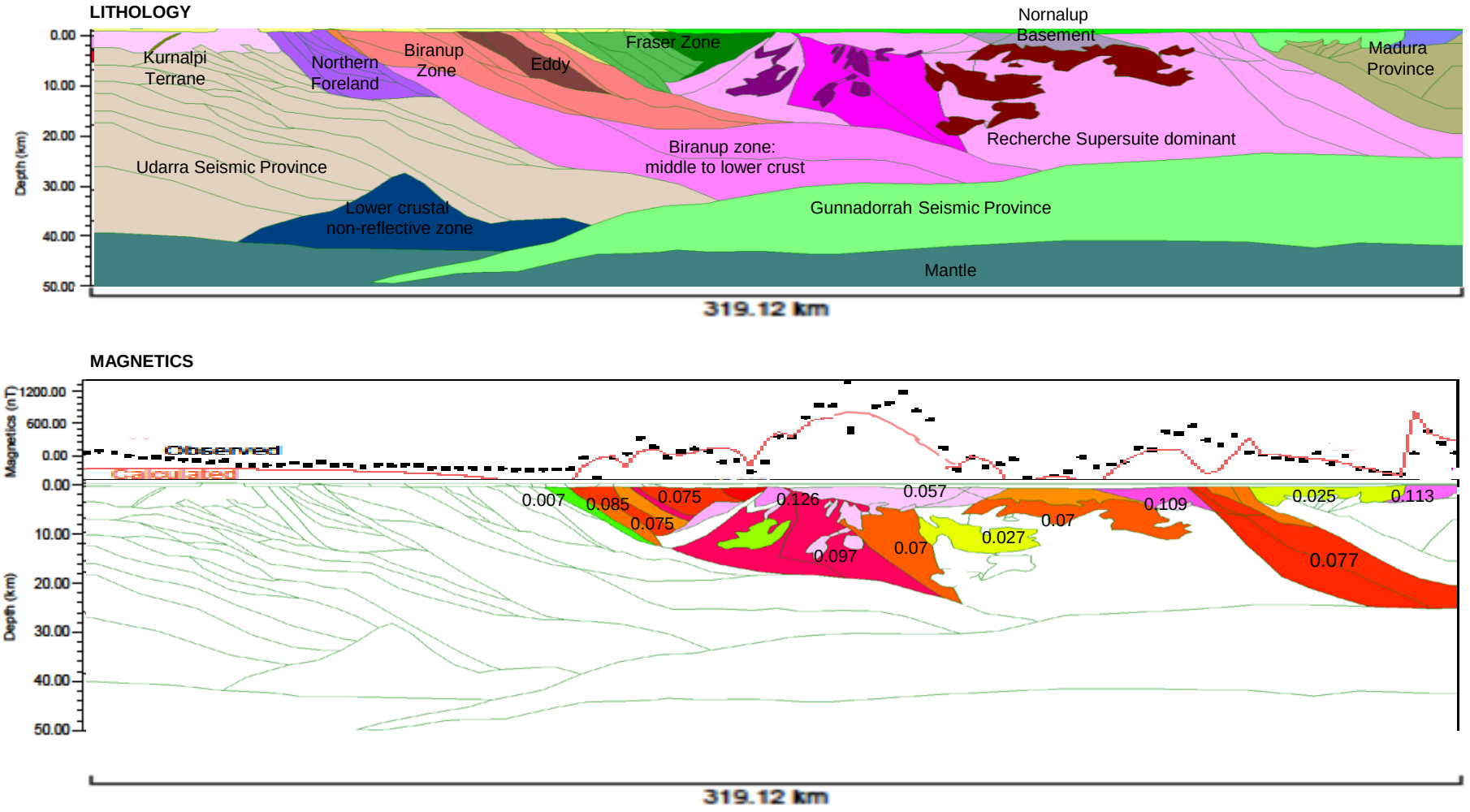

GRAVITY
Observed
Calculated
Gravity (mGal)
-30.00
-36.00
-42.00
-48.00
2670
2700
2690
2680
3200
2700
2700
2700
2730
2730
2790
3300
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
158.4 km


MAGNETICS
Observed
Calcu-
lated
Magnetics (nT)
500.00
0.00
-500.00
i
ii
iii
iv
0.085
0.095
0.126
0.073
0.085
0.029
0.048
0.009
0.015
0.047
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
158.4 km

12GA-AF3


LITHOLOGY
Kurnalpi Terrane
Northern Foreland
Biranup Zone
Eddy
Fraser Zone
Nornalup Basement
Madura Province
Udarra Seismic Province
Biranup zone: middle to lower crust
Recherche Supersuite dominant
Lower crustal non-reflective zone
Gunnadorrah Seismic Province
Mantle
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
319.12 km
GRAVITY
Gravity (mGal)
0.00
-40.00
-80.00
Observed
Calculated
11
12
2620
2670
2800
2790
2900
3000
2850
2790
2730
2690
2700
2730
2730
2850
2930
3300
3000
2700
319.12 km

12GA-AF3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Kurnalpi Terrane
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Biranup Zone
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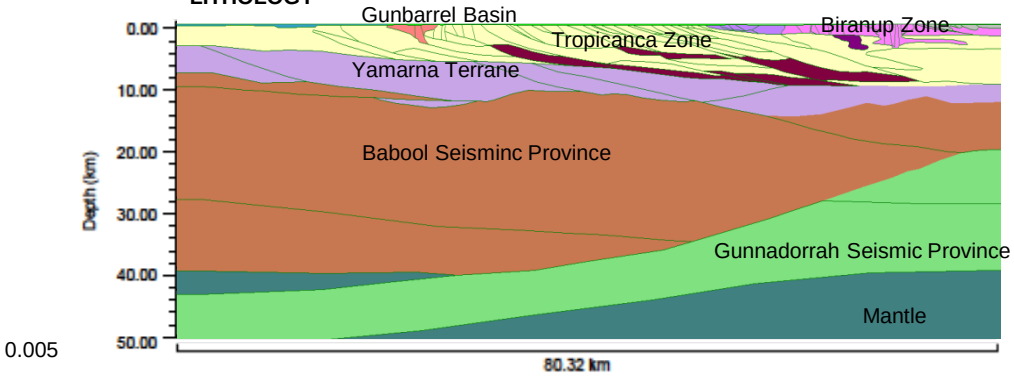
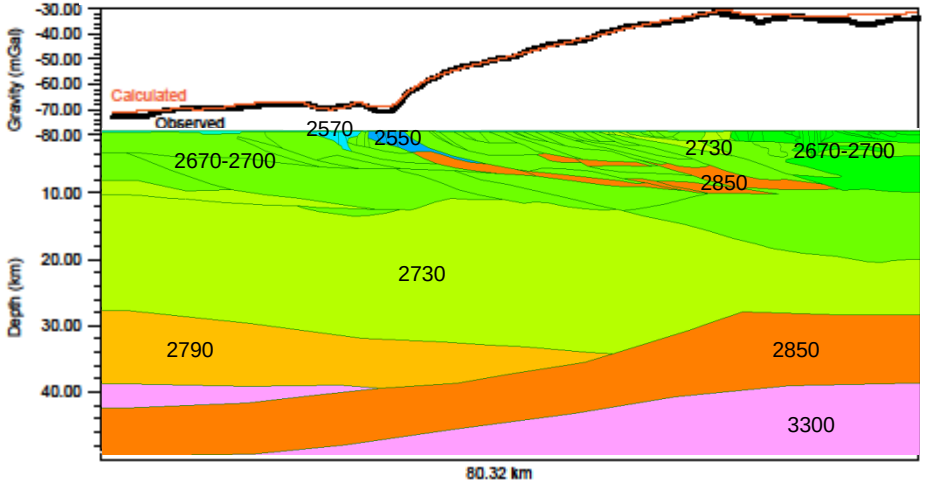
Fraser Zone
Nornalup Basement
Madura Province
Udarra Seismic Province
Biranup zone: middle to lower crust
Recherche Supersuite dominant
Lower crustal non-reflective zone
Gunnadorrah Seismic Province
Mantle
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
319.12 km
MAGNETICS
Magnetics (nT)
1200.00
600.00
0.00
Observed
Calculated
0.007
0.085
0.075
0.075
0.126
0.097
0.057
0.07
0.027
0.07
0.109
0.025
0.113
0.077
Depth (km)
0.00
10.00
20.00
30.00
40.00
50.00
319.12 km

12GA-T1

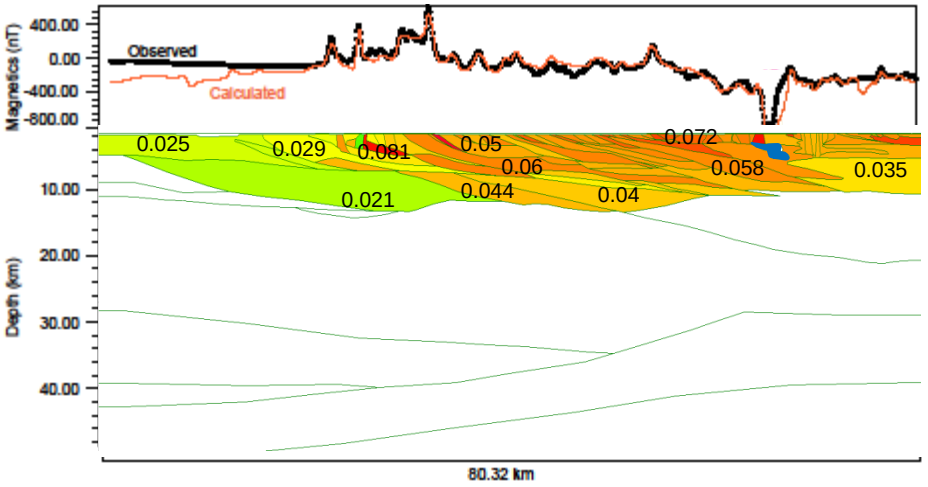
LITHOLOGY



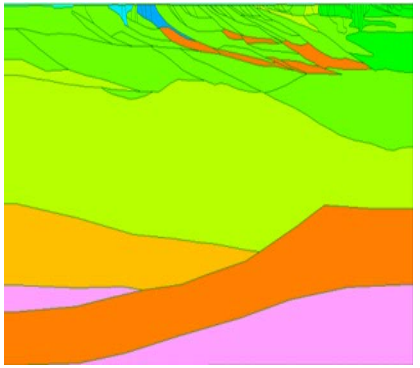
GRAVITY



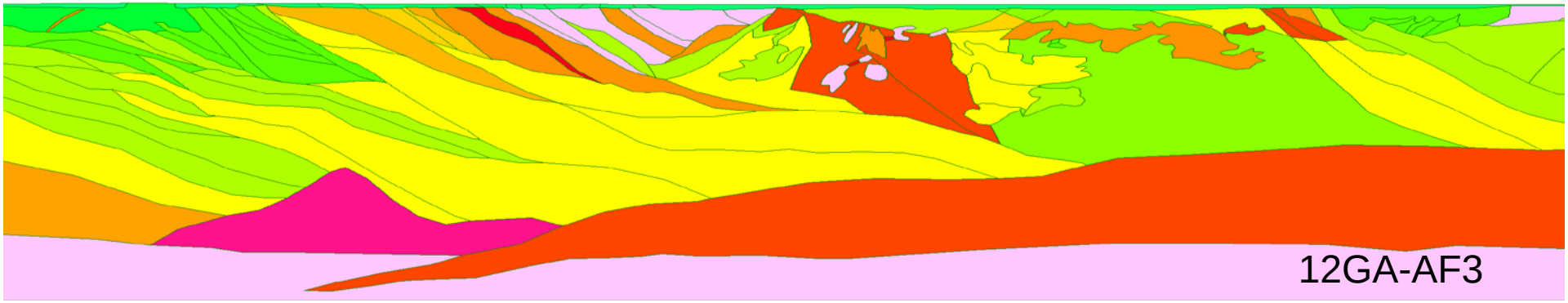
MAGNETICS



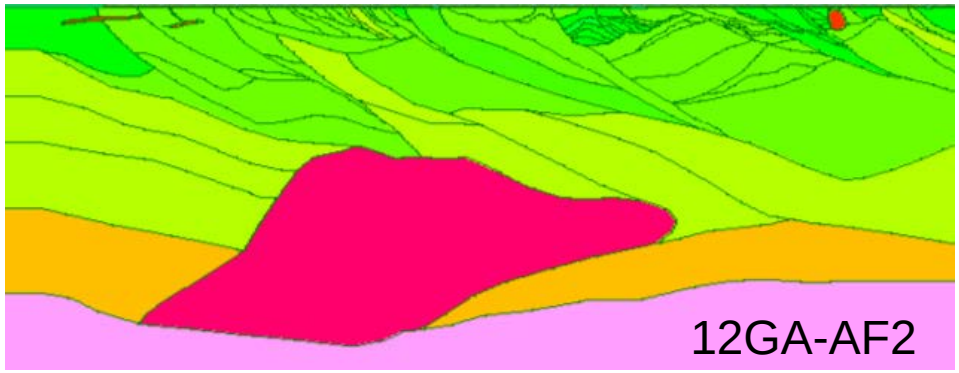
Gravity compilation



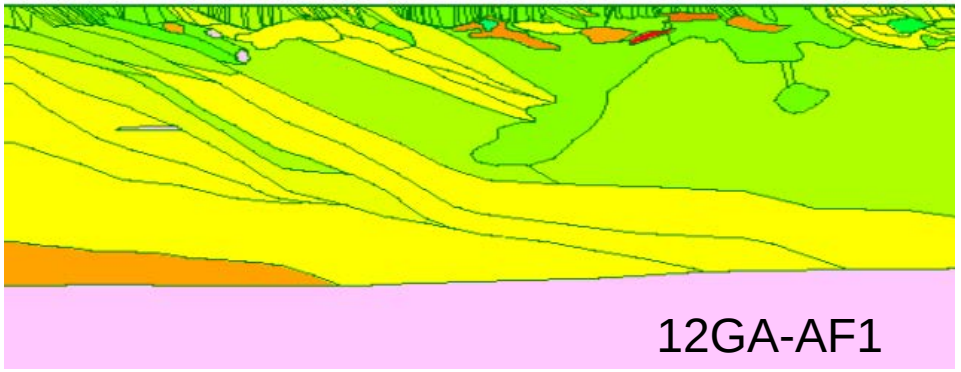
12GA-T1



12GA-AF3

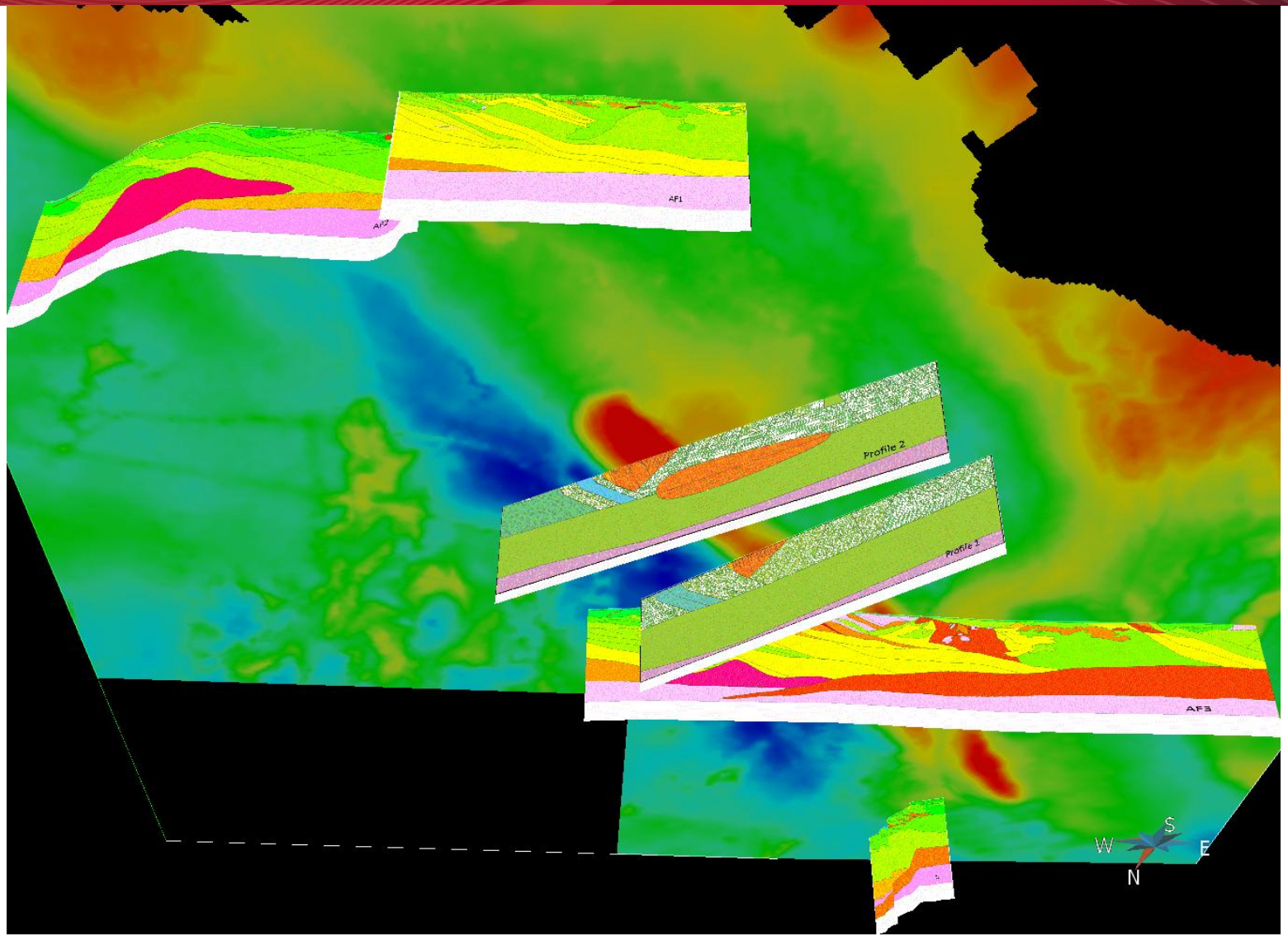


12GA-AF2



12GA-AF1

Profiles in relation to the gravity



3D geology

Conclusions

- Seismic lines can be modelled for gravity anomaly using reasonable densities and the fault-bounded blocks from the seismic interpretation

- Magnetic models require more detailed subdivision of the seismic polygons to reflect the layering within the units

- High density areas are modelled in the
  - Fraser Zone,
  - Mid-crustal blocks within the Recherche/Esperance Supersuites,
  - Lower crustal non-reflective areas,

  - These high density areas coincide with high magnetic signal.

- A regional low Bouguer anomaly AFO parallel reflecting the influence of the AF Orogen on the different terranes of the Yilgarn.