



Government of Western Australia
Department of Mines and Petroleum



Crustal architecture of the Archean Youanmi Terrane



Ivan Zibra
GSWA

Part A: 10GA - YU2



Western Australia Archean Cratons

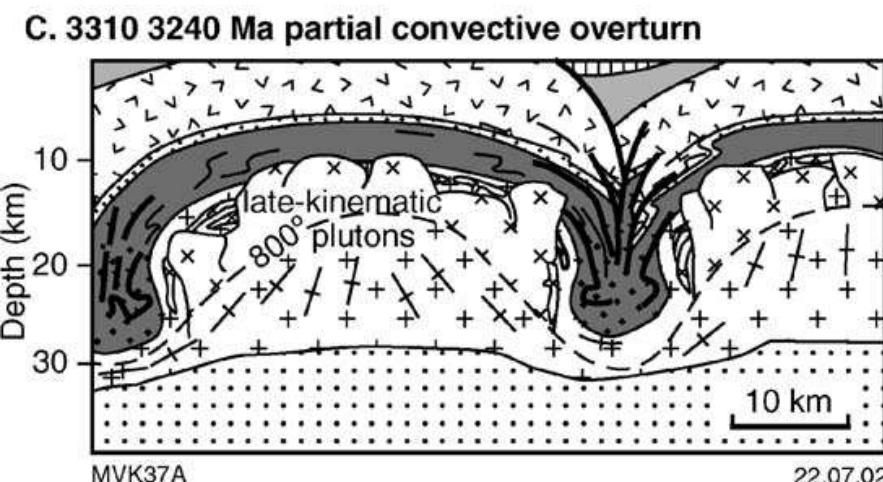
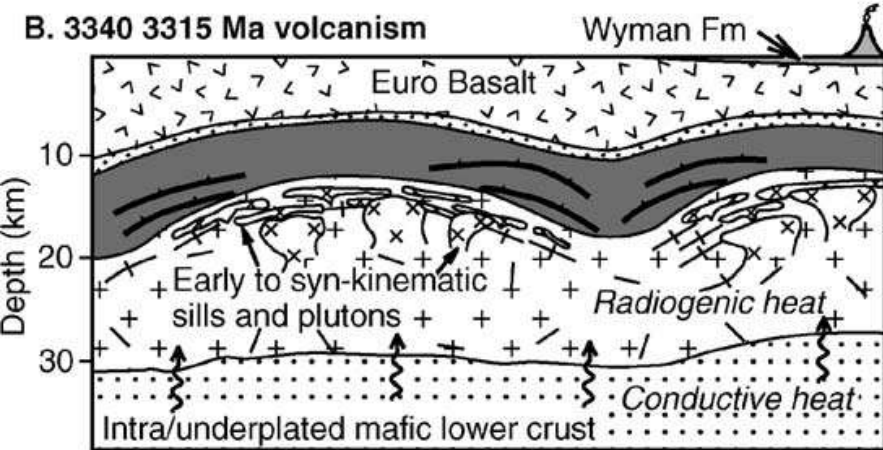
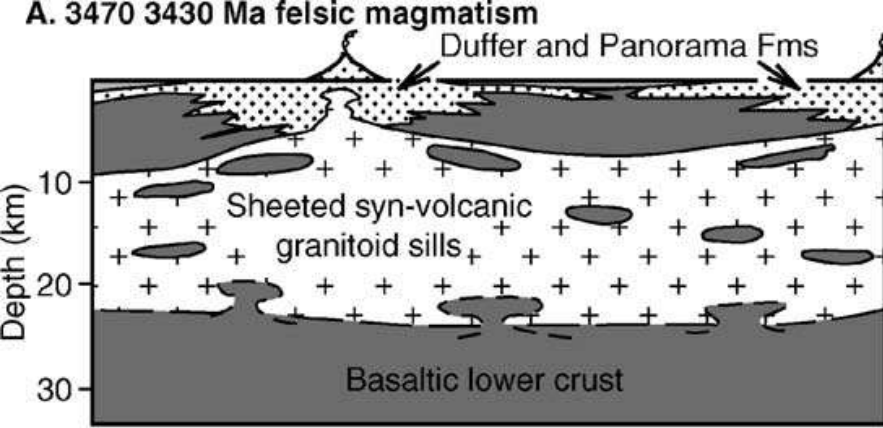


East Pilbara
~ 3-5-2.7 Ga

Yilgarn
~2.7-2.6 Ga

Granite-Greenstone
terrane

East Pilbara Craton



The model:
 “vertical tectonics”
 partial convective overturn

Van Kranendonk et al., 2004 - PR

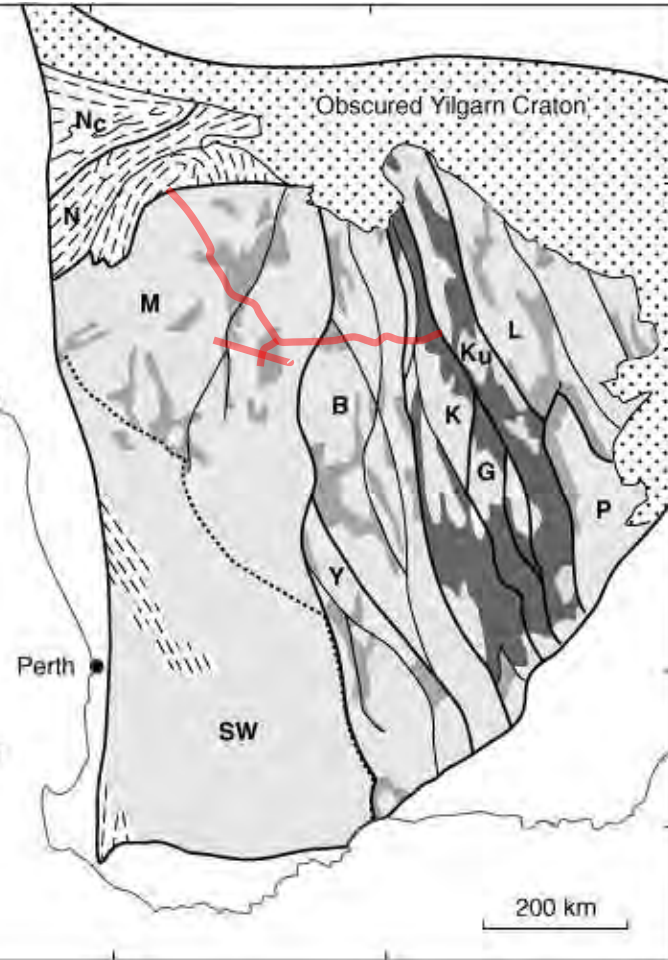


Youanmi Terrane

Yilgarn Craton



Dominated by 2 first-order features:

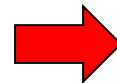


(a) Elongate, linear (high-strain) belts, dismembered GBs
(In contrast to Pilbara)

(~ contemporaneous with)

(b) Peak in magmatism/crustal recycling at ~2.7-2.6 Ga

Several models have been proposed (mainly subduction-accretion Vs. Vertical tectonics) but....



Relationship between magmatism and continental deformation?

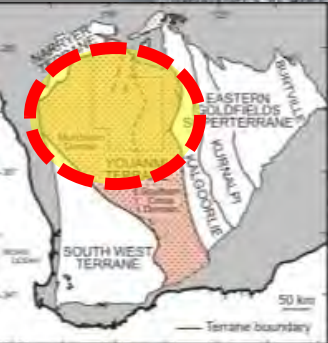
UNCLEAR

FROM: Griffin et al., 2004 - PR

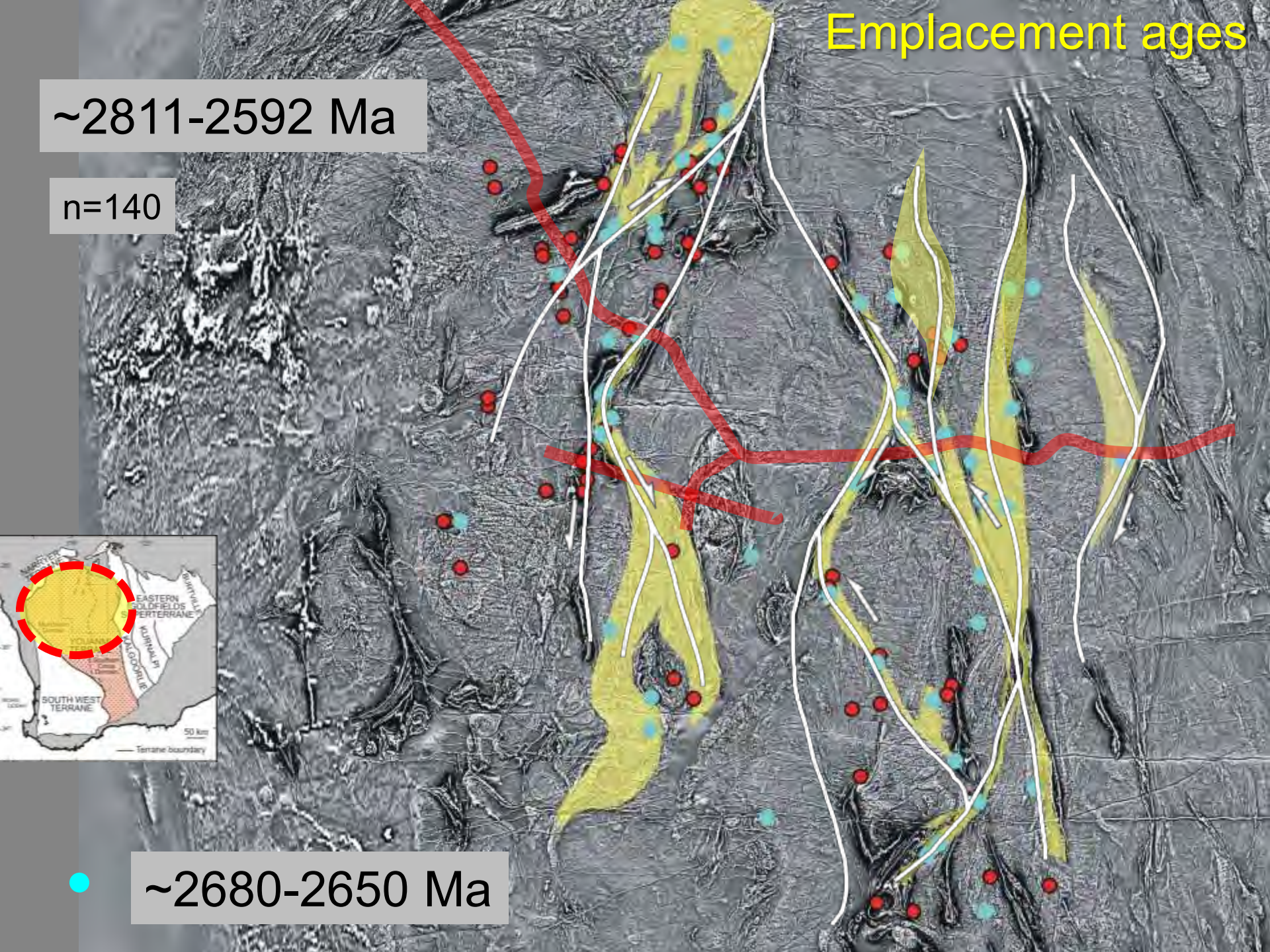
Emplacement ages

~2811-2592 Ma

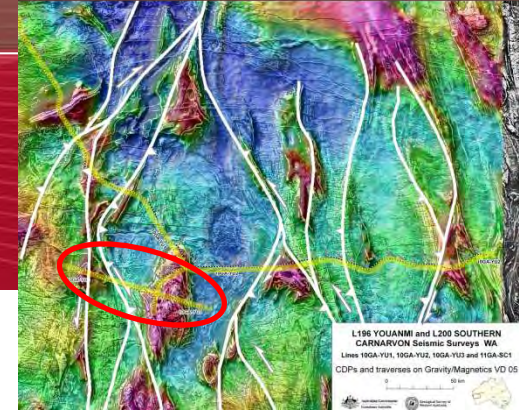
n=140



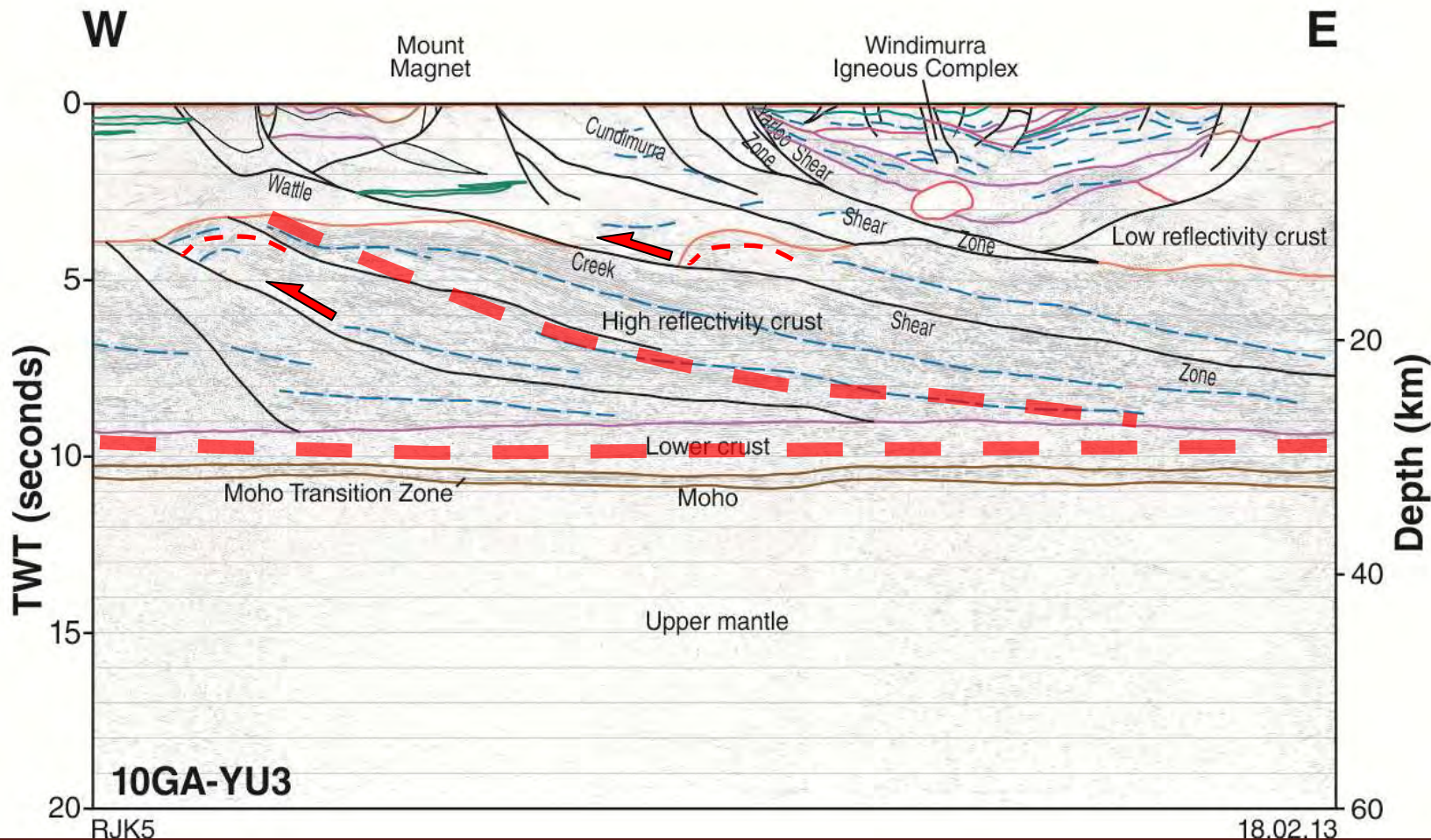
● ~2680-2650 Ma



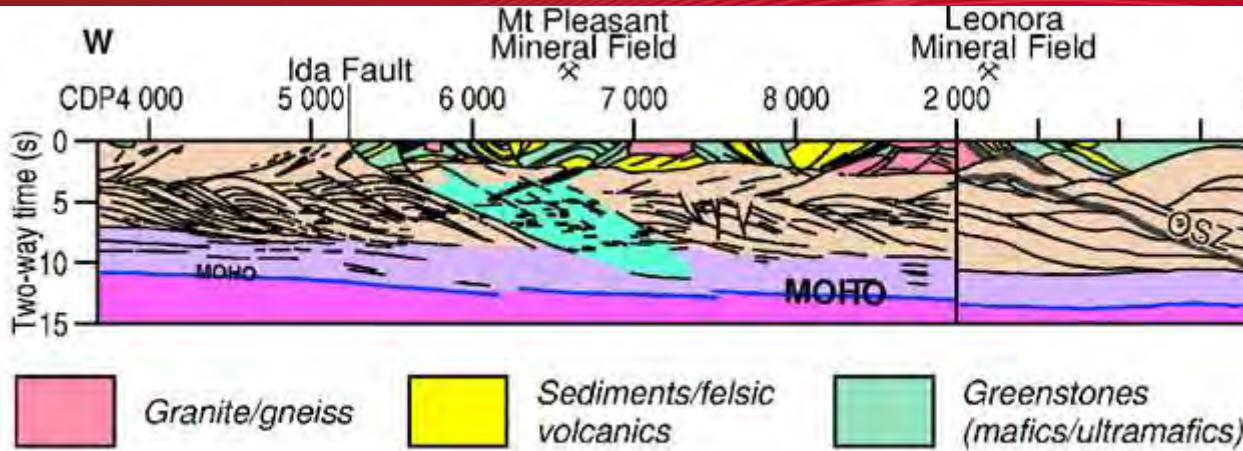
Youanmi Crust: First-order geometry



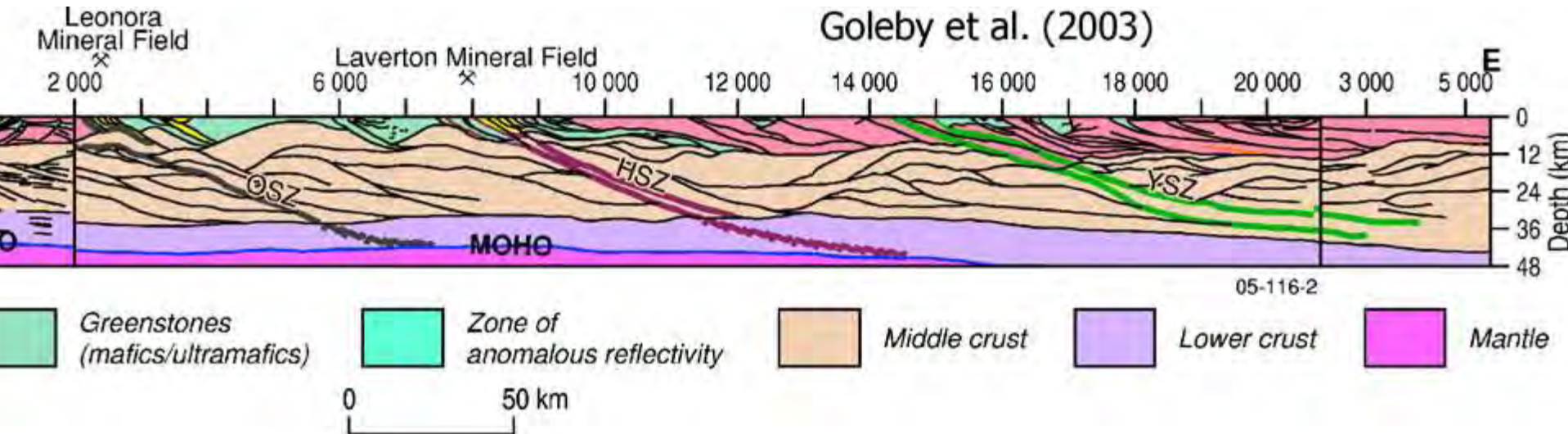
YU3



Eastern Yilgarn

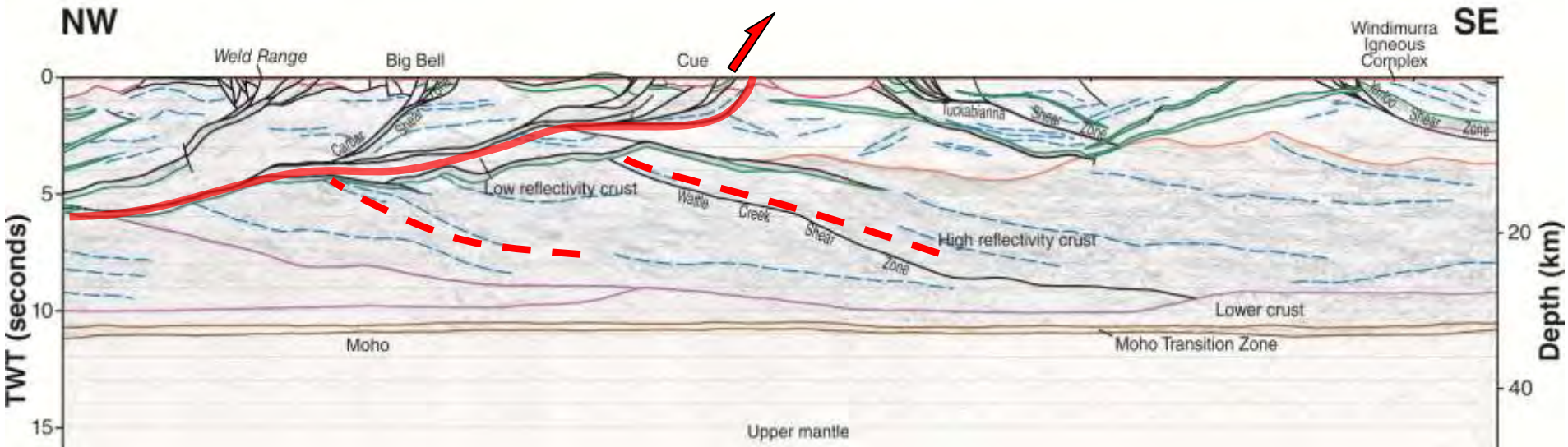
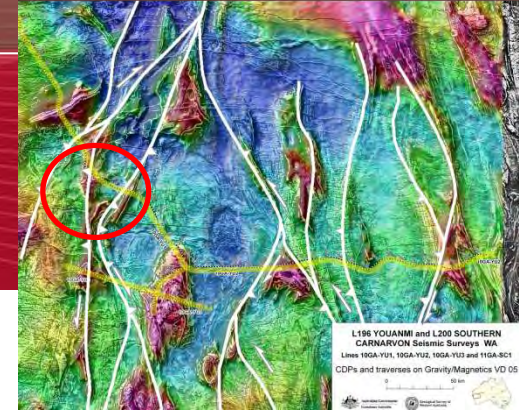


Blewett et al. (2010)



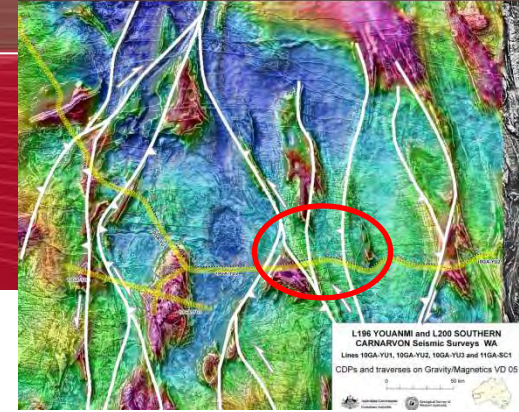
First-order geometry

YU1

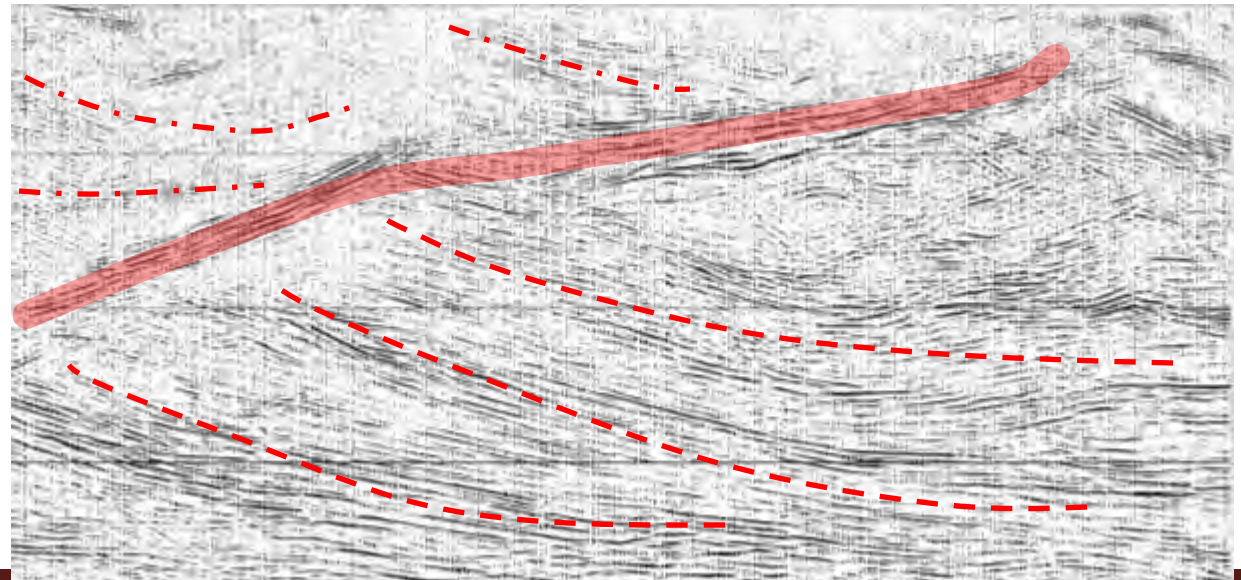
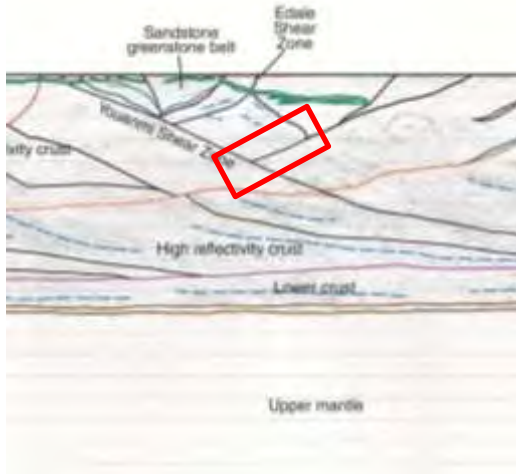


Two set of structures

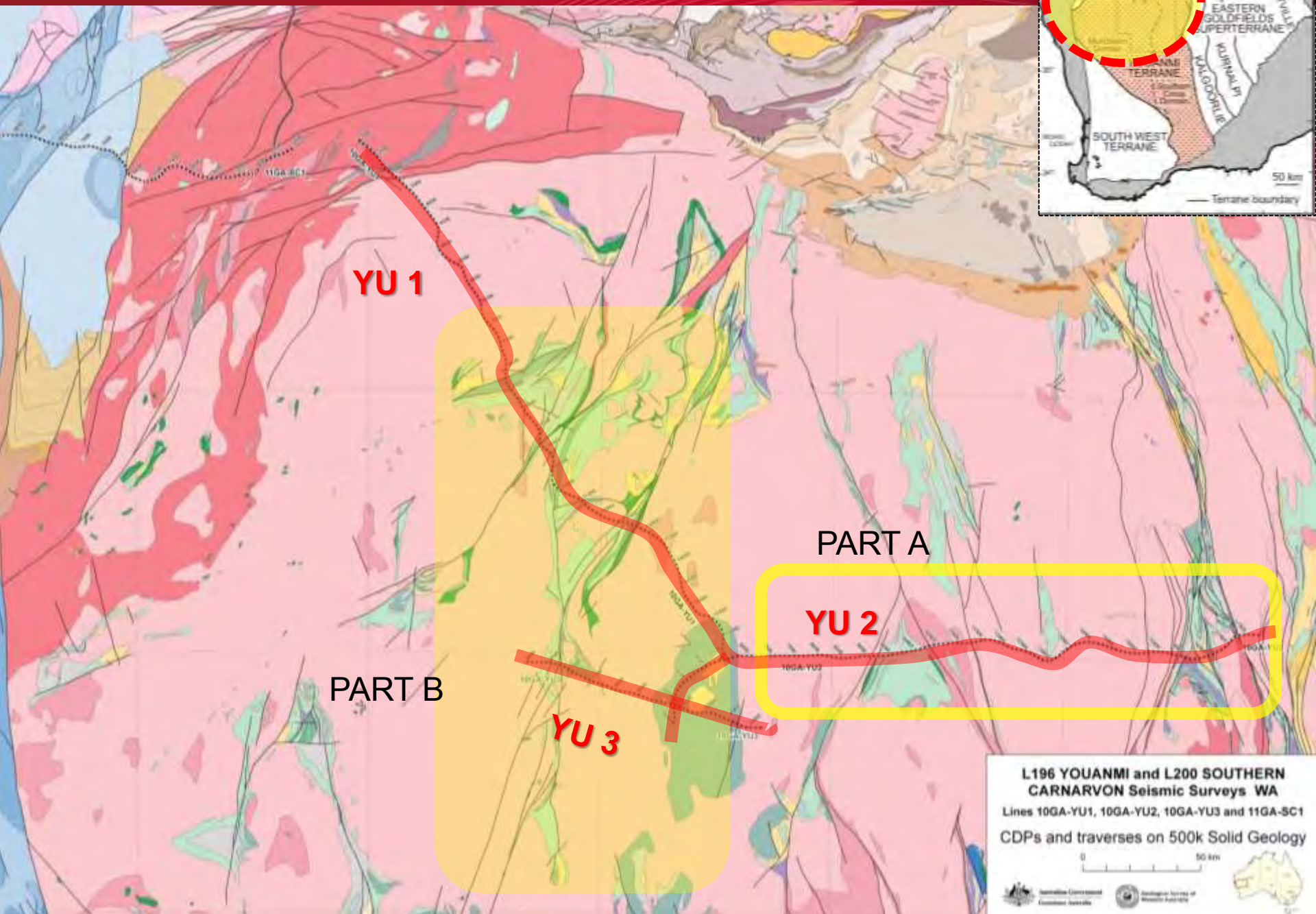
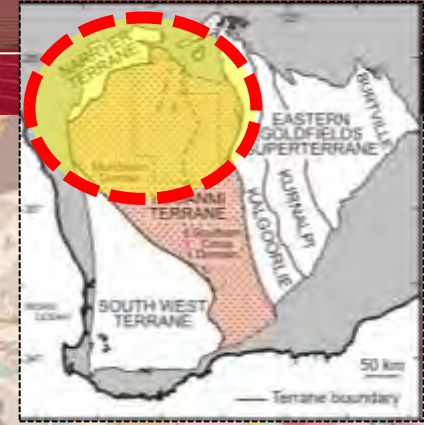
E-dipping & W-dipping structures



YU2



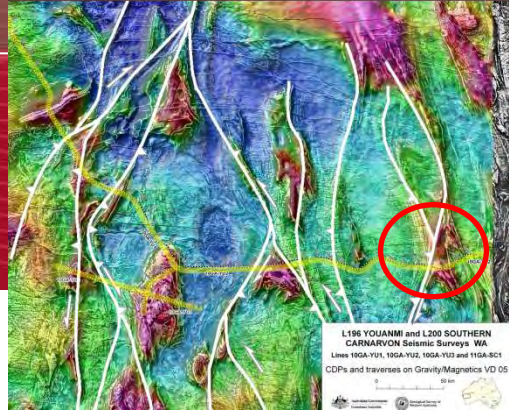
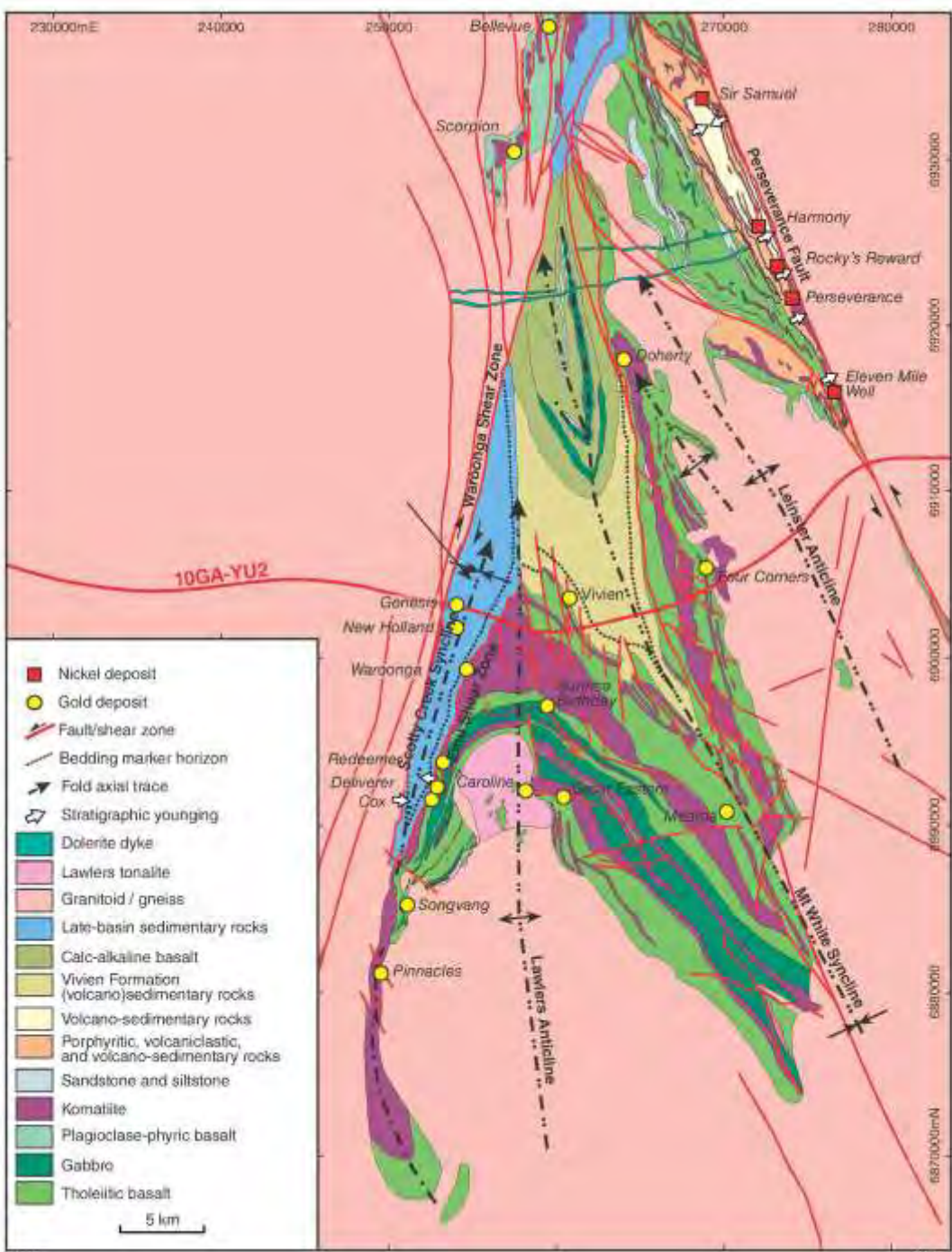
NW portion of Yilgarn Craton



L196 YOUANMI and L200 SOUTHERN CARNARVON Seismic Surveys WA
Lines 10GA-YU1, 10GA-YU2, 10GA-YU3 and 11GA-SC1
CDPs and traverses on 500k Solid Geology

0 50 km

Geological Survey of Western Australia
Geoscience Australia



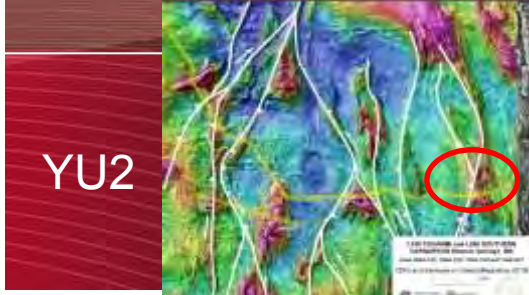
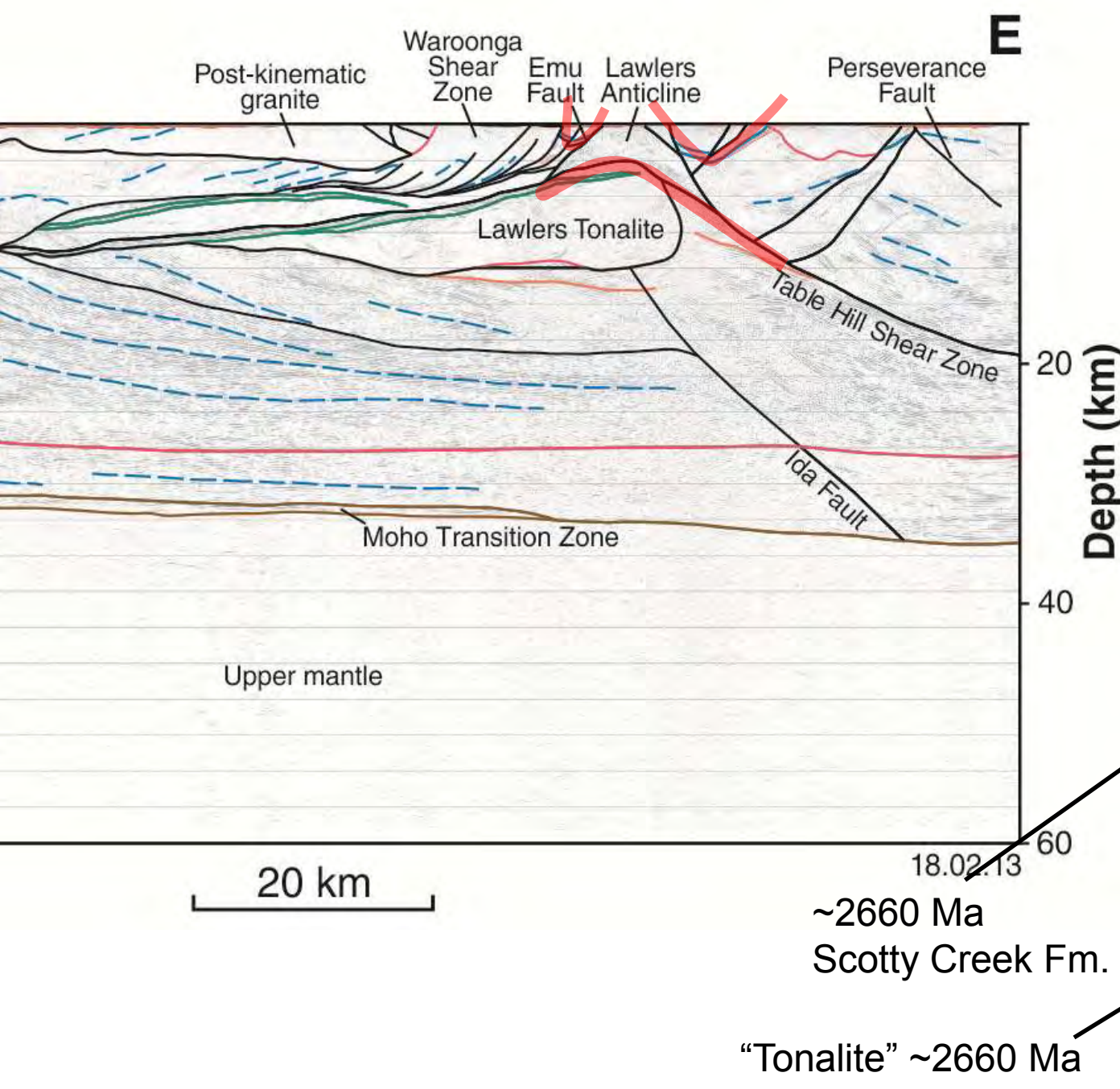
YU2

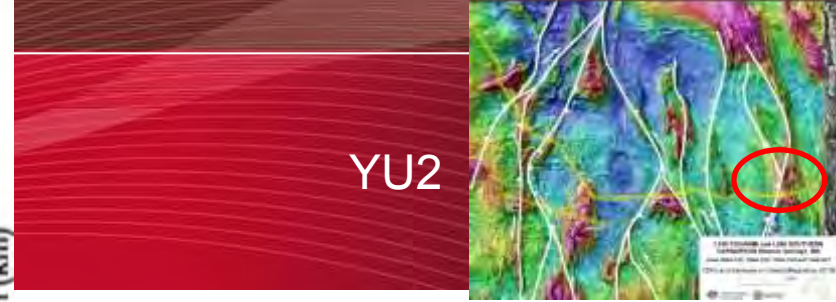
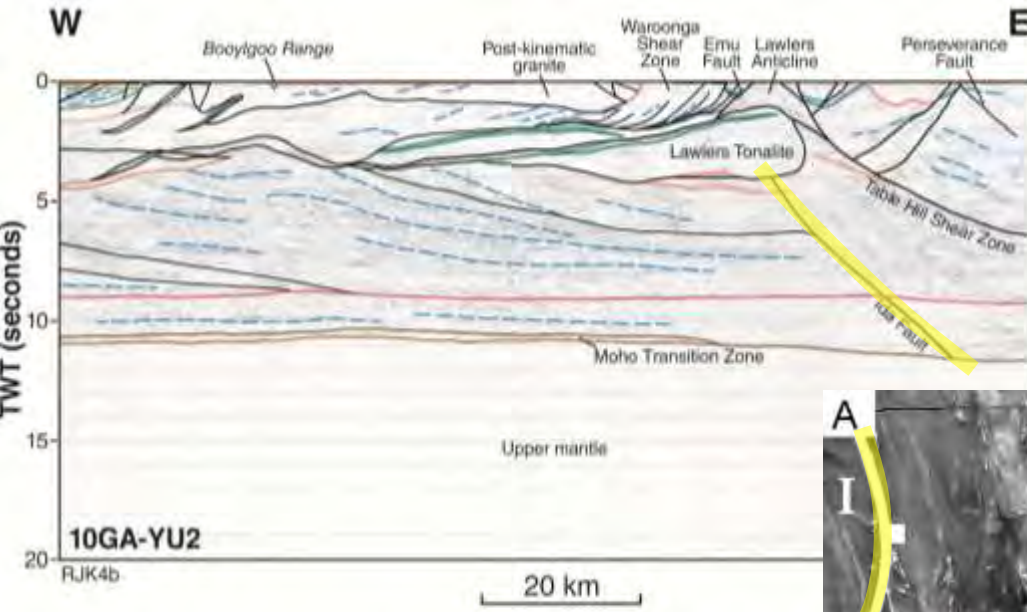
Agnew Greenstone Belt (EGST)

- - -

Ida Fault ?

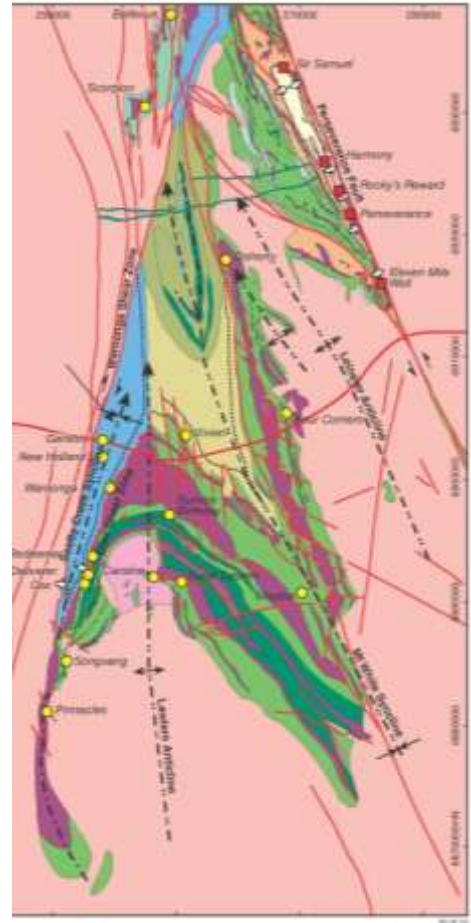
modified from Duuring et al., (2012)



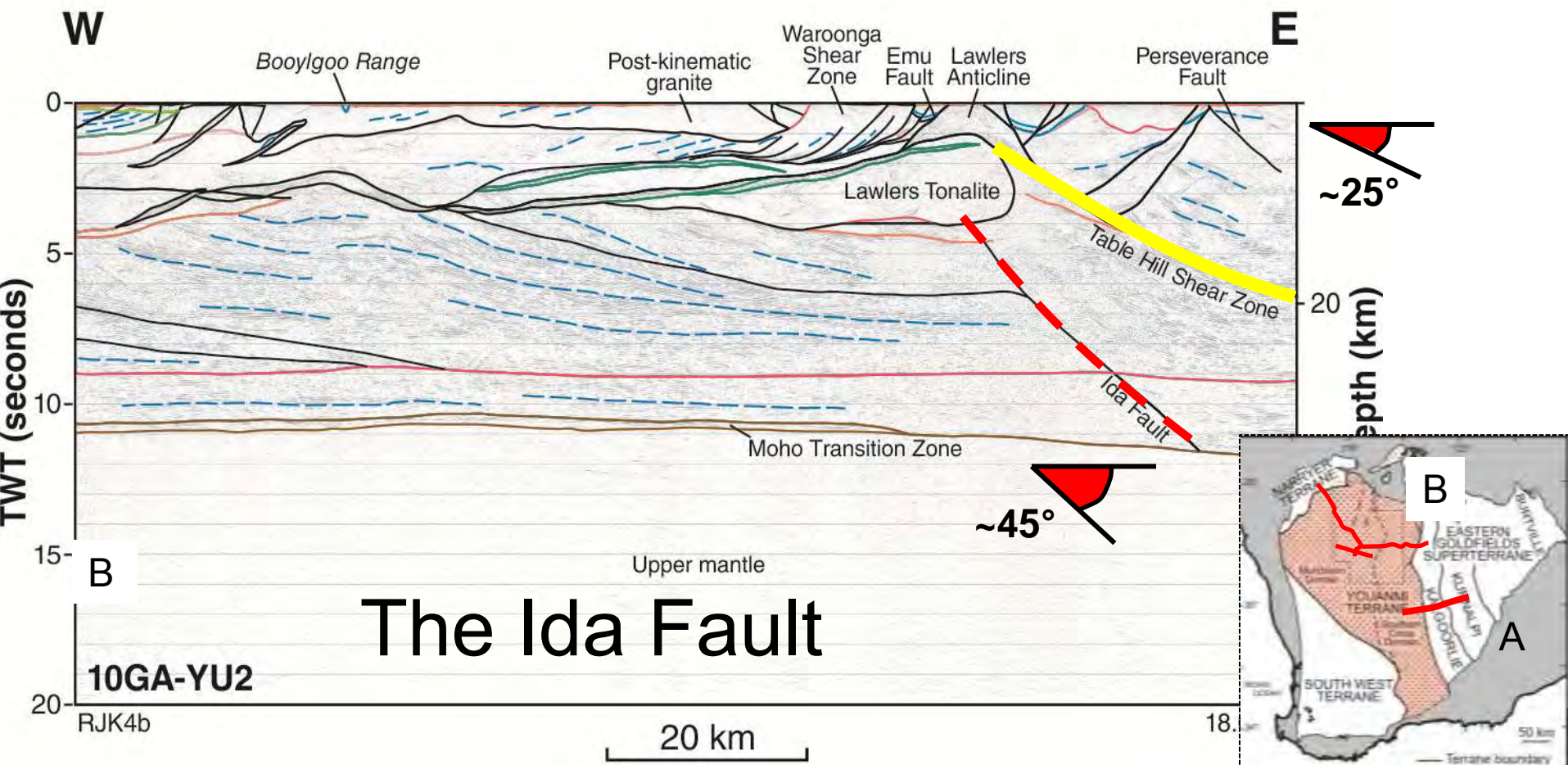


- Dyke or sill
- Form line
- Base middle crust
- Base Regolith
- Moho
- Granite
- Base felsic volcanic rock
- Fault
- Base
- Top

Activity Ida Fault:
~2720-2670 Ma)



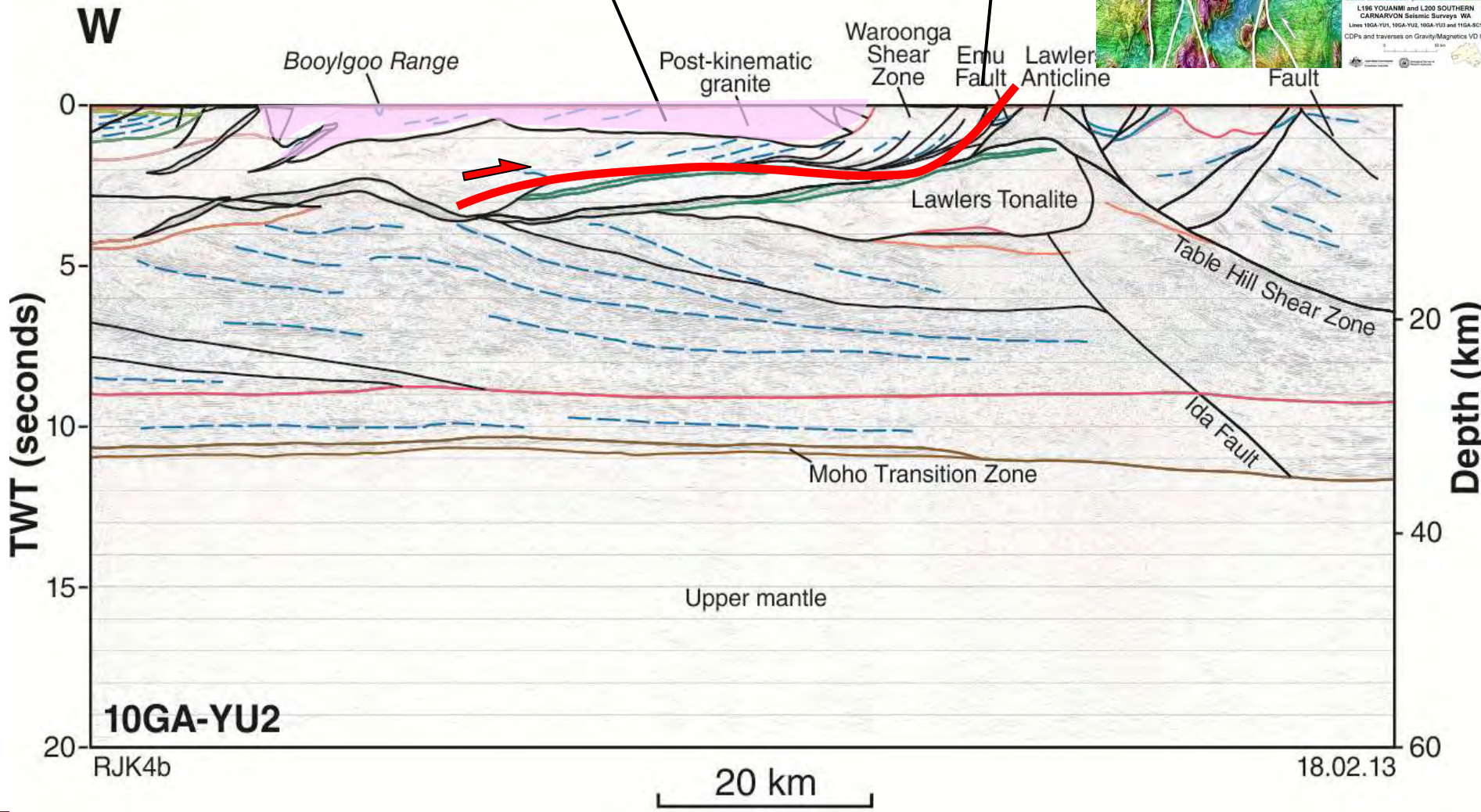
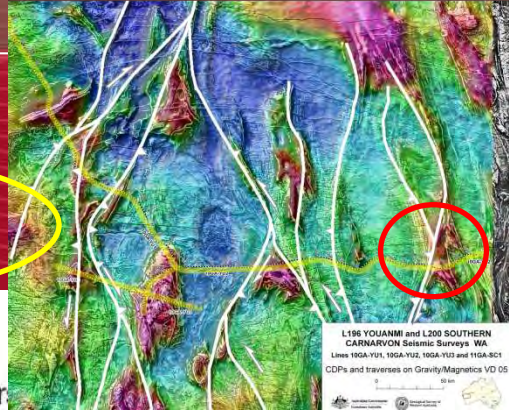
Blewett et al. (2010)

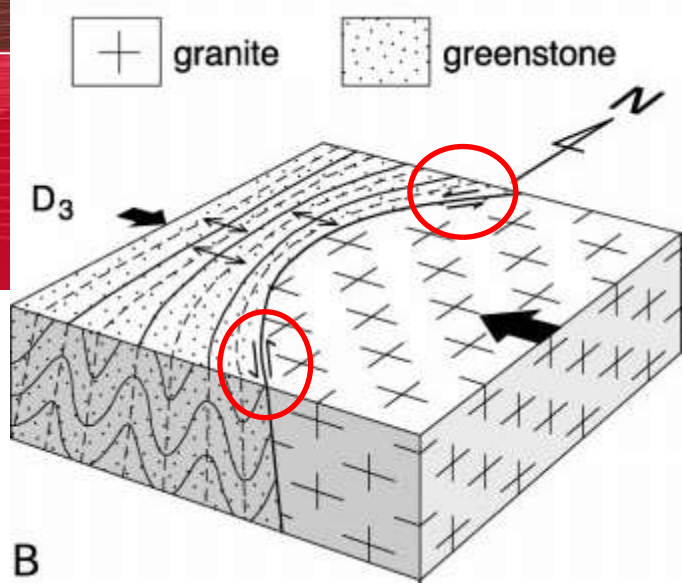


Waroonga Shear Zone

**~2650 Ma
Post-kinematic pluton**

**~2660 Ma
Scotty Creek Fm.**

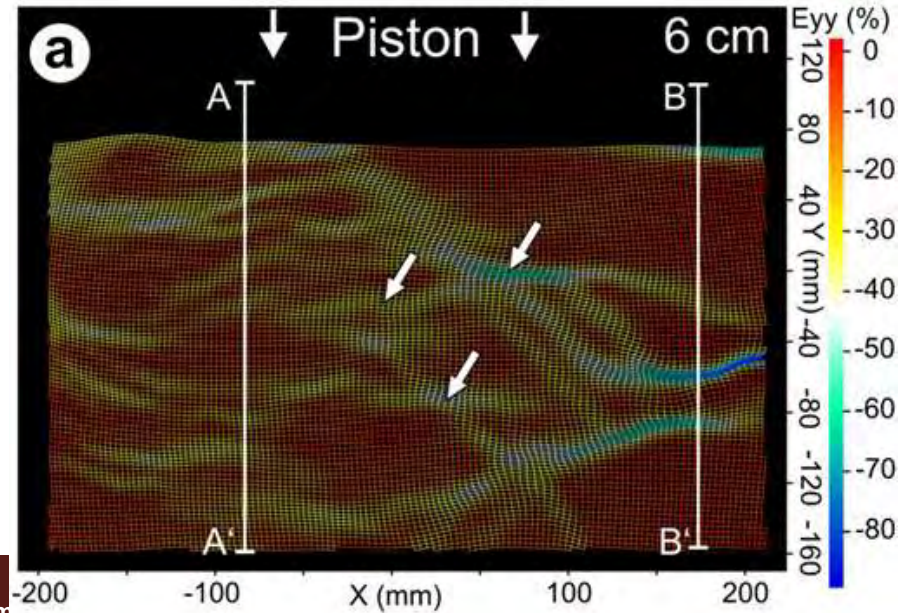


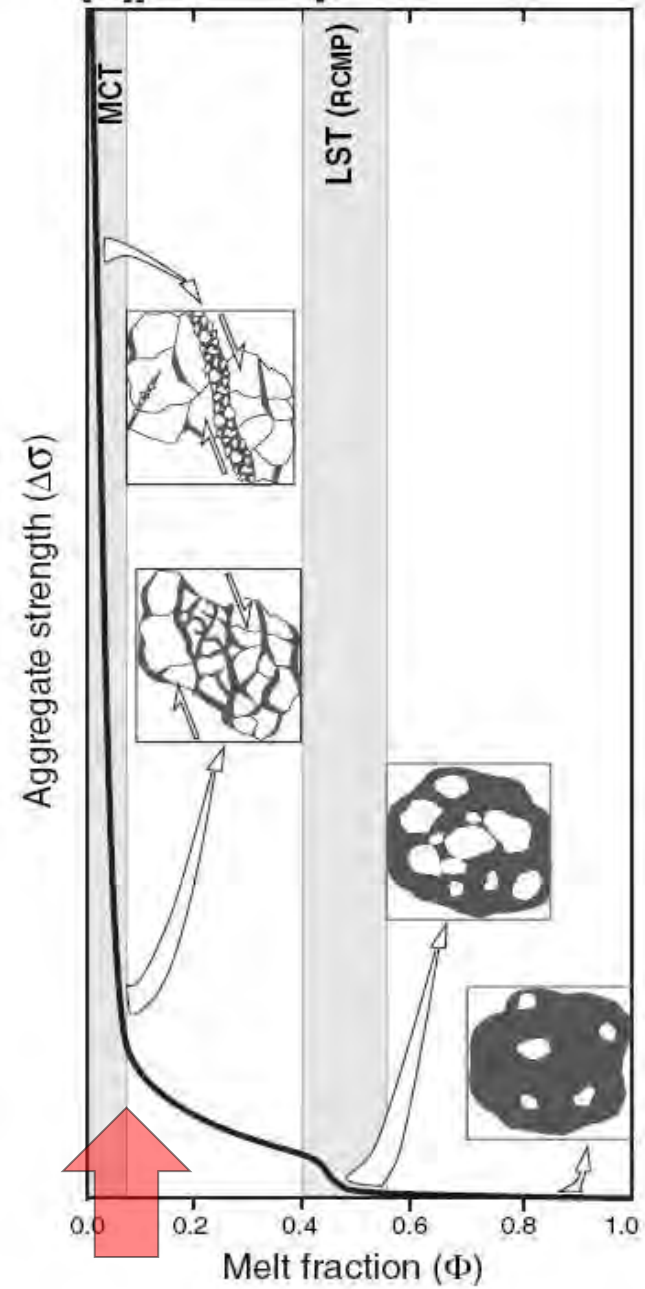


B

Chen et al (2001) ; Chardon et al (2009)

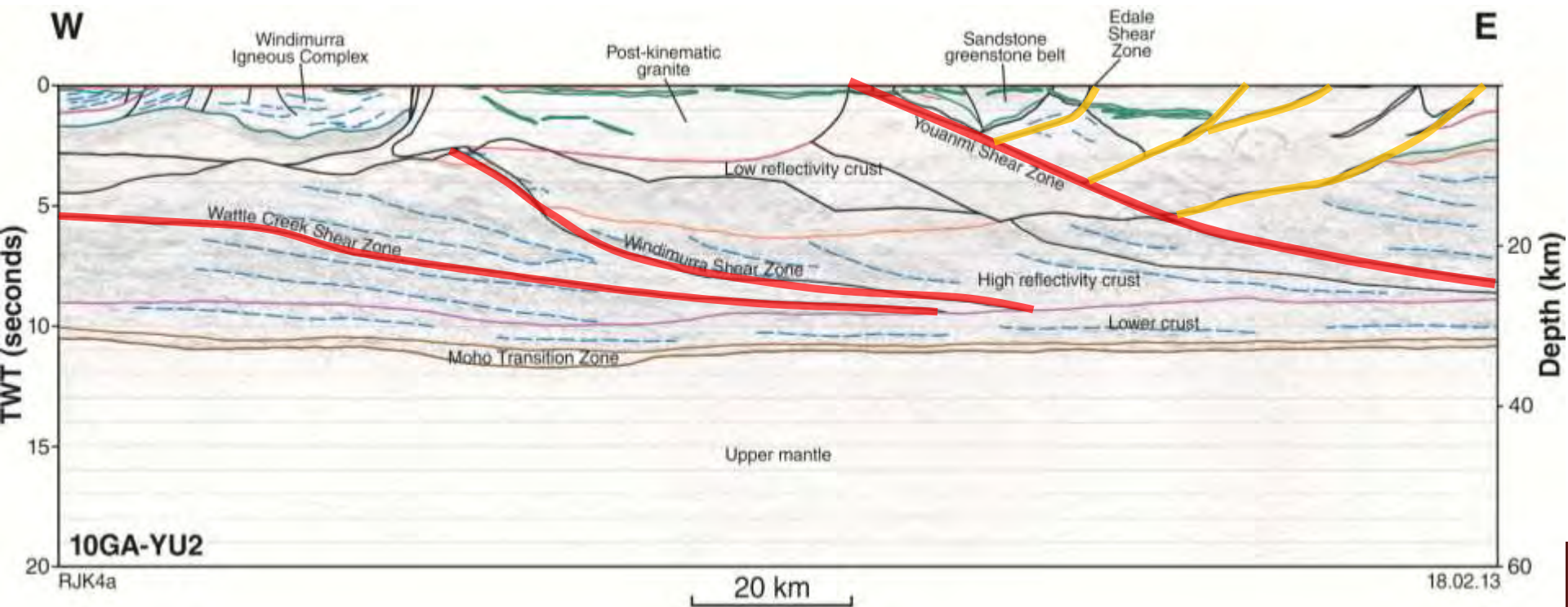
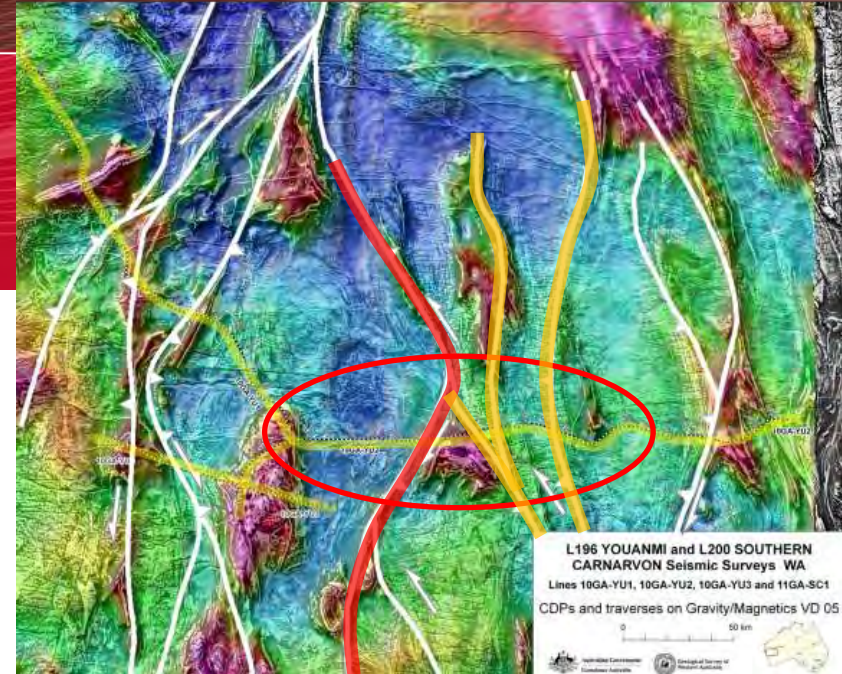
Riller et al (2012 - JsG)



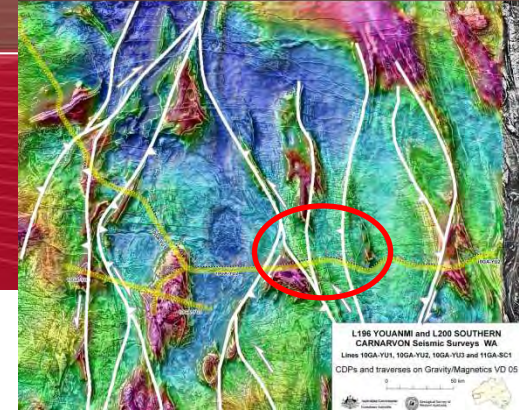


FROM: Rosenberg et al., 2007

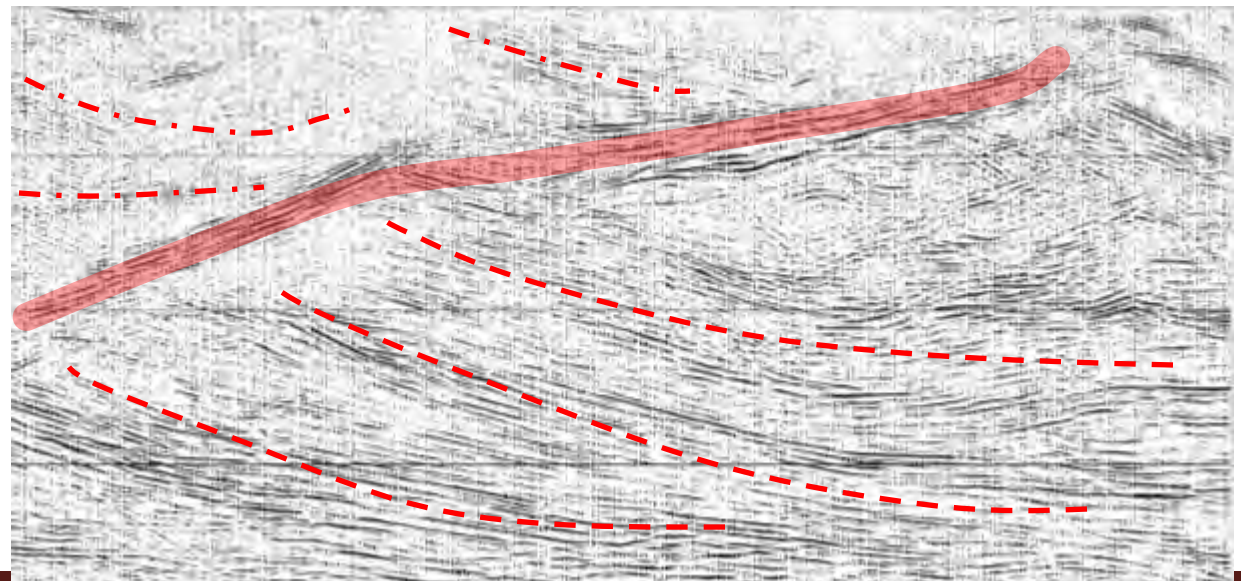
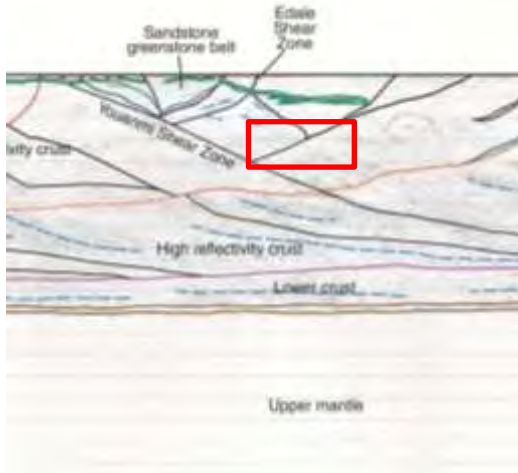
Western portion of 10GA-YU2

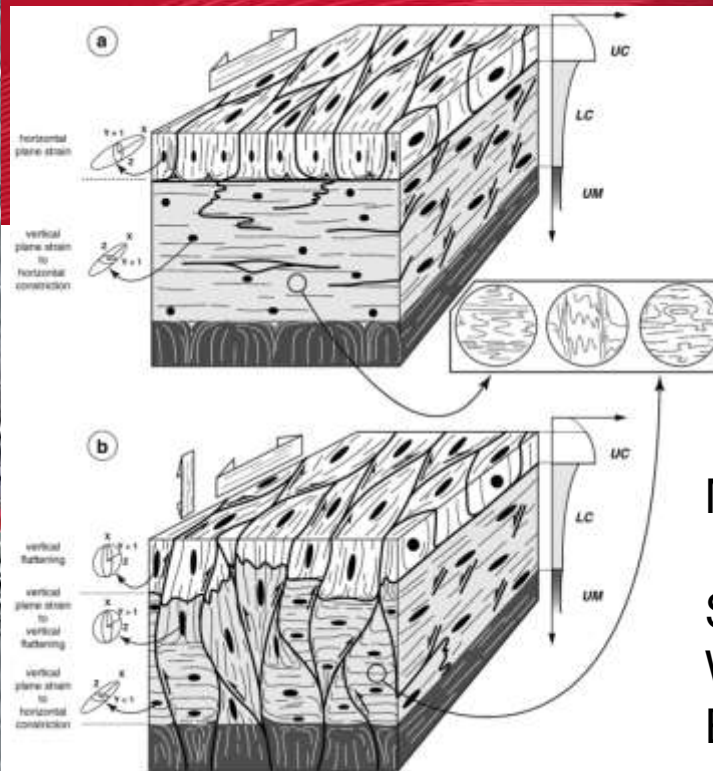
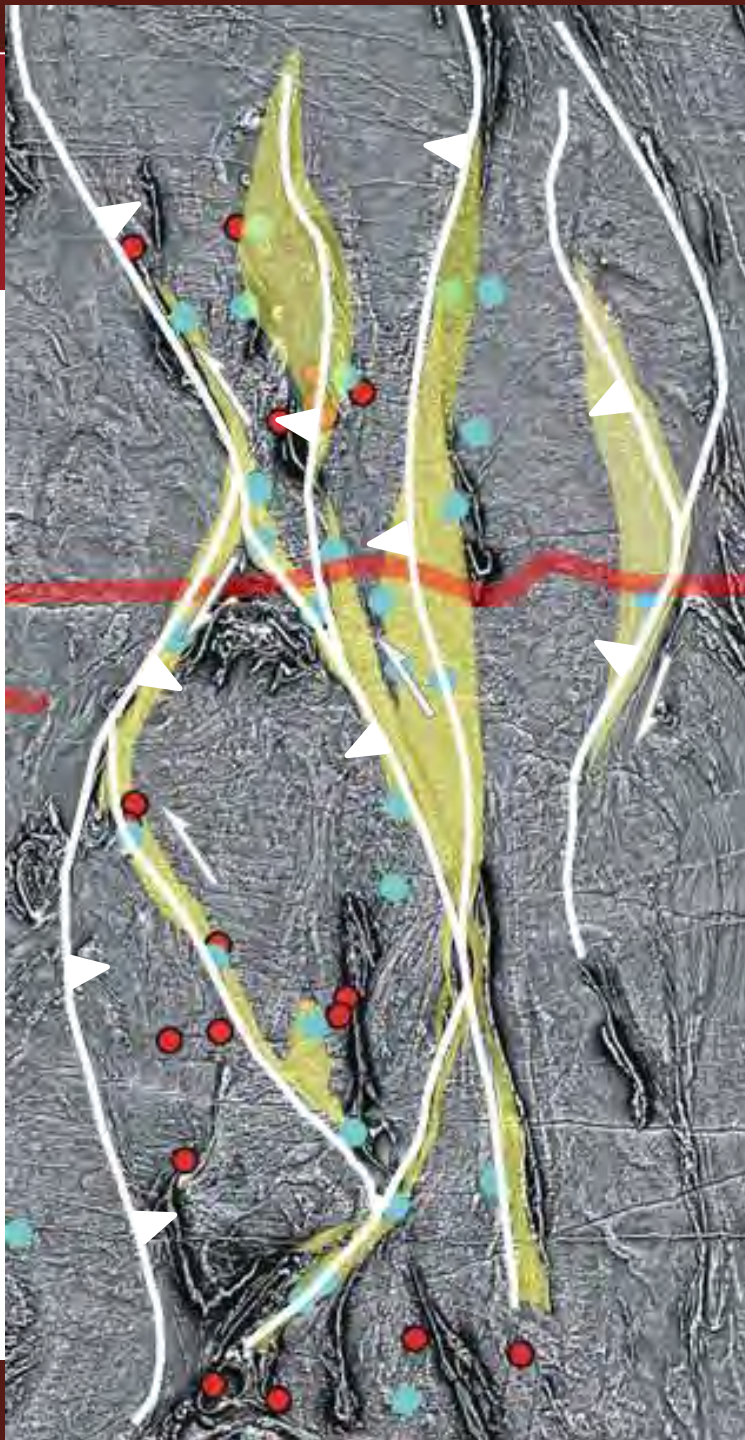


W-dipping and E-dipping fabric



YU2





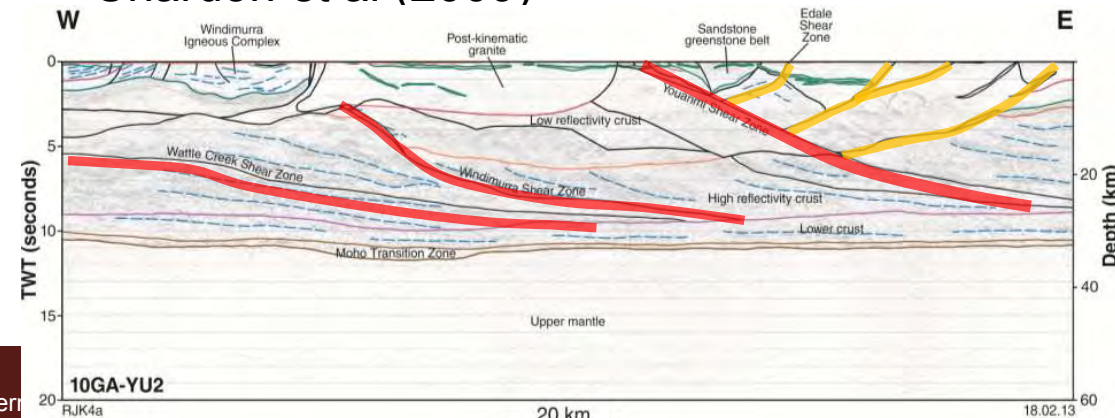
ork



Map-view symmetry:

Superposition of
W-dipping SZs on
E-dipping ones?

Chardon et al (2009)





Thanks