



Government of **Western Australia**
Department of **Mines and Petroleum**

U–Pb Geochronology of the Forrest Zone, Coompana Province


John de Laeter Centre



EXPLORATION
INCENTIVE SCHEME

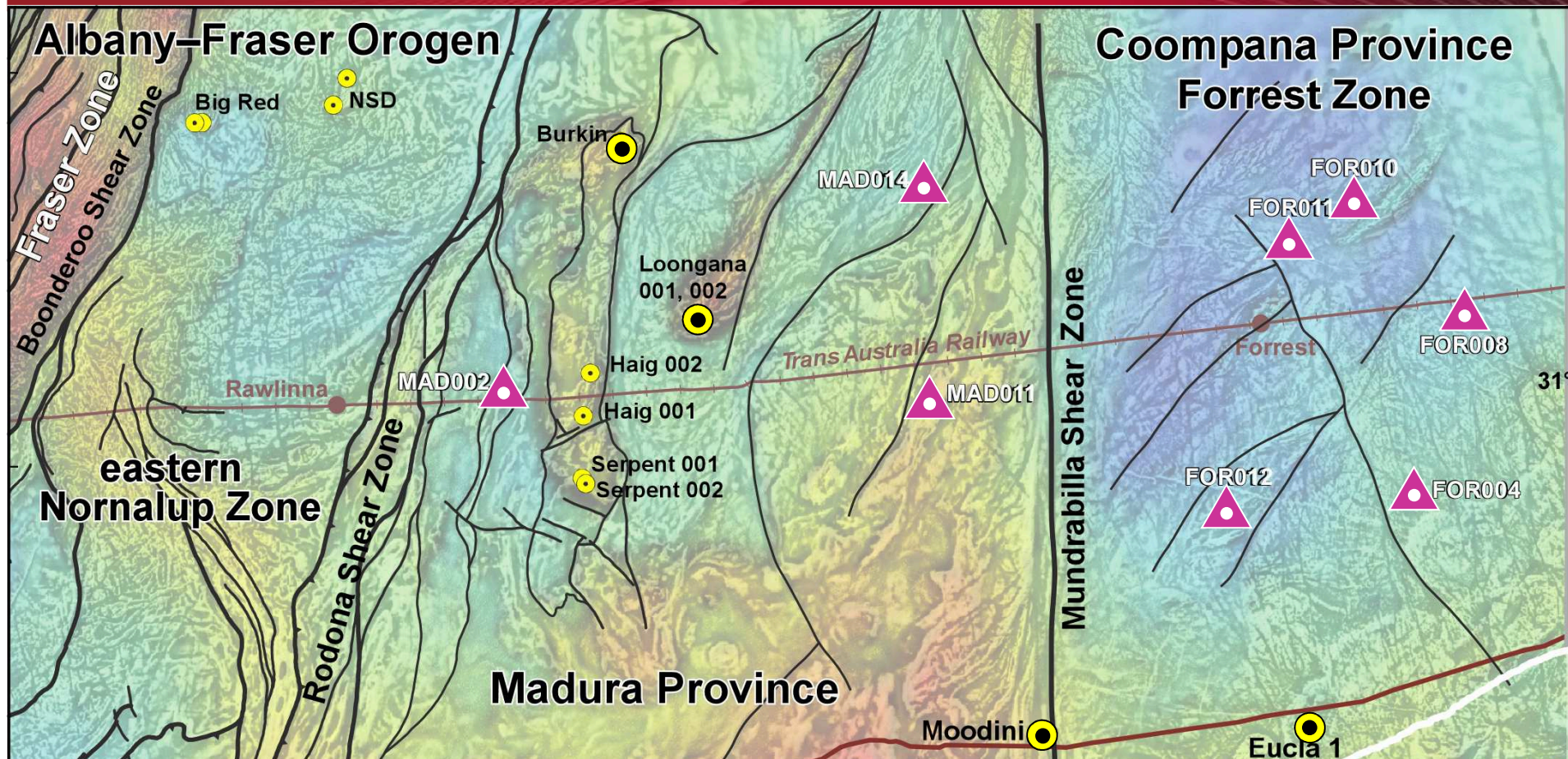


Eucla Basement Stratigraphic Drilling – Results Release

10 September, 2015



GSWA geochronology samples



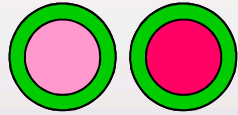
- ▲ GSWA
- Industry

Madura Province (12 samples)
4 samples from 3 GSWA drillholes
8 samples from 3 industry drillholes

Forrest Zone (15 samples)
14 samples from 5 GSWA drillholes
1 sample from 1 industry drillhole

Forrest Zone

Metamorphic zircon growth
c. 1179–1150 Ma



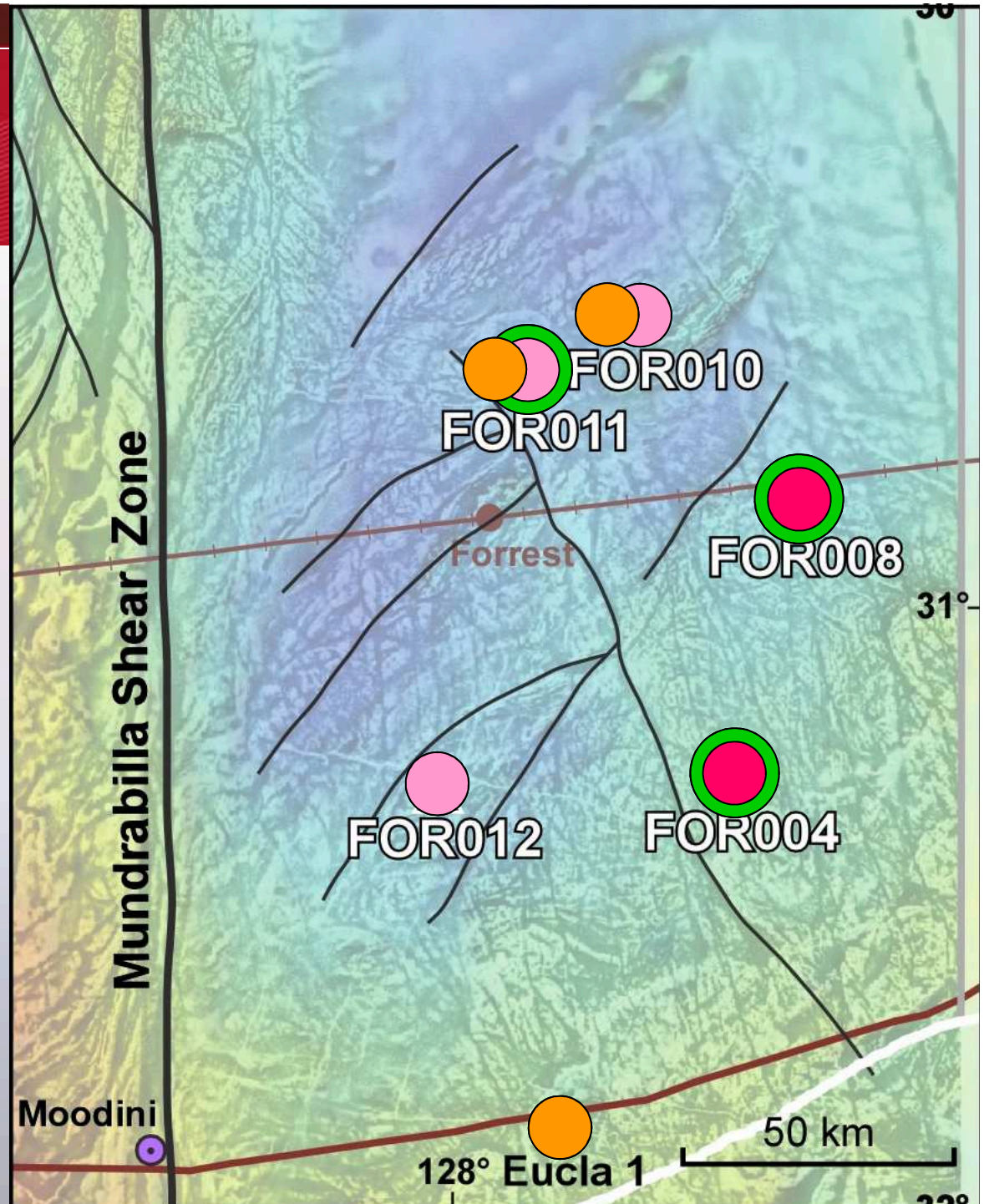
Moodini Supersuite
1192–1140 Ma
(6 samples)



Undawidgi Supersuite
c. 1490 Ma
(5 samples)

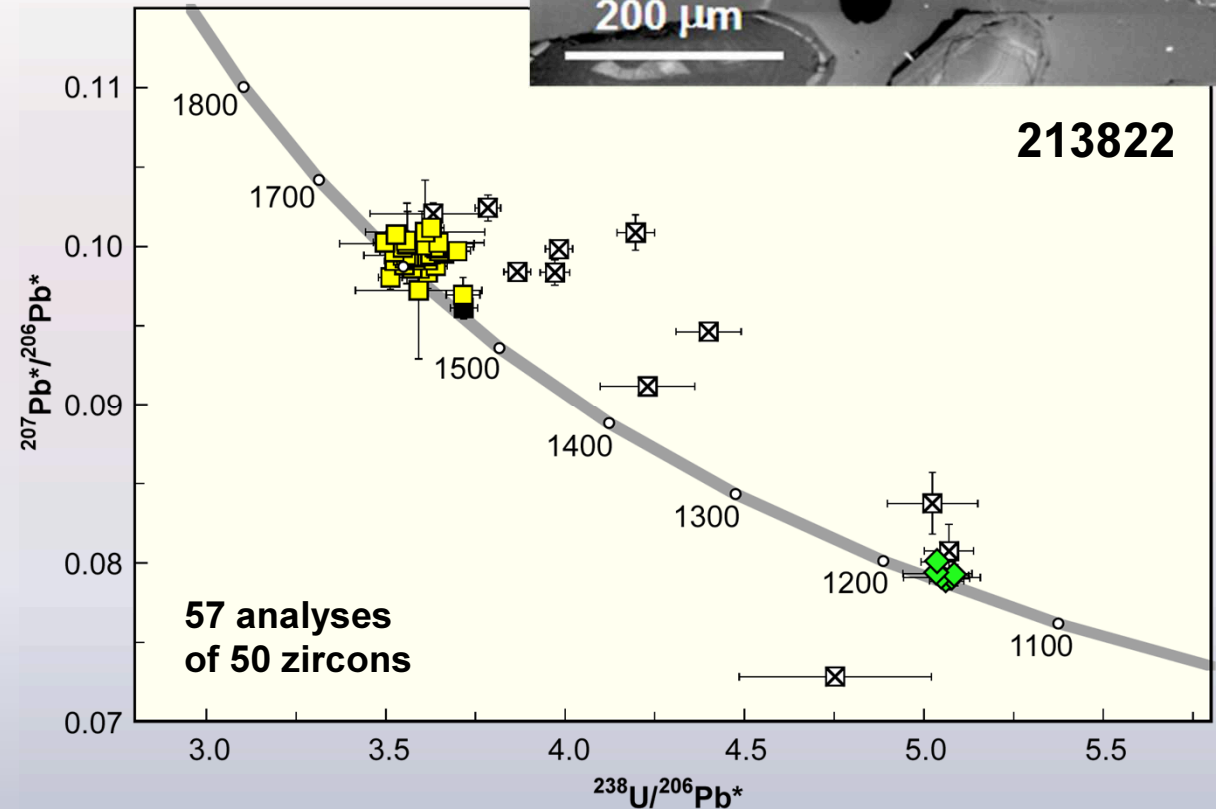
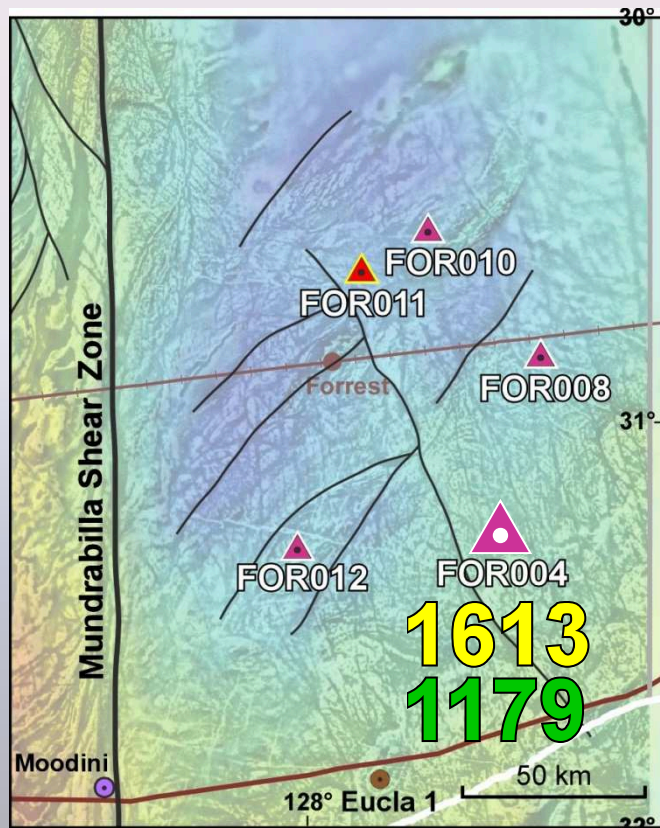
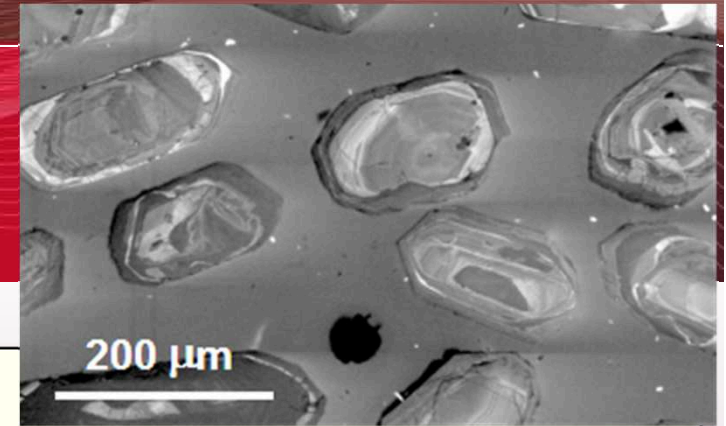


Toolgana Supersuite
c. 1610 Ma
(4 samples)



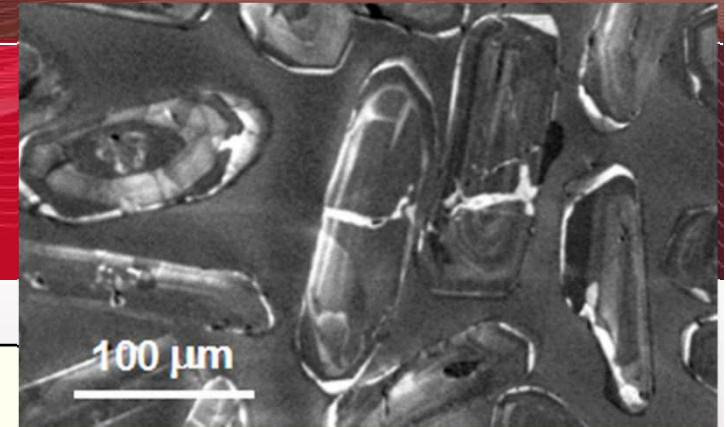
FOR004, 484.54 – 485.10 m

213822: leucogranite, Toolgana Supersuite
zircon cores with high-U,
low-Th/U rims

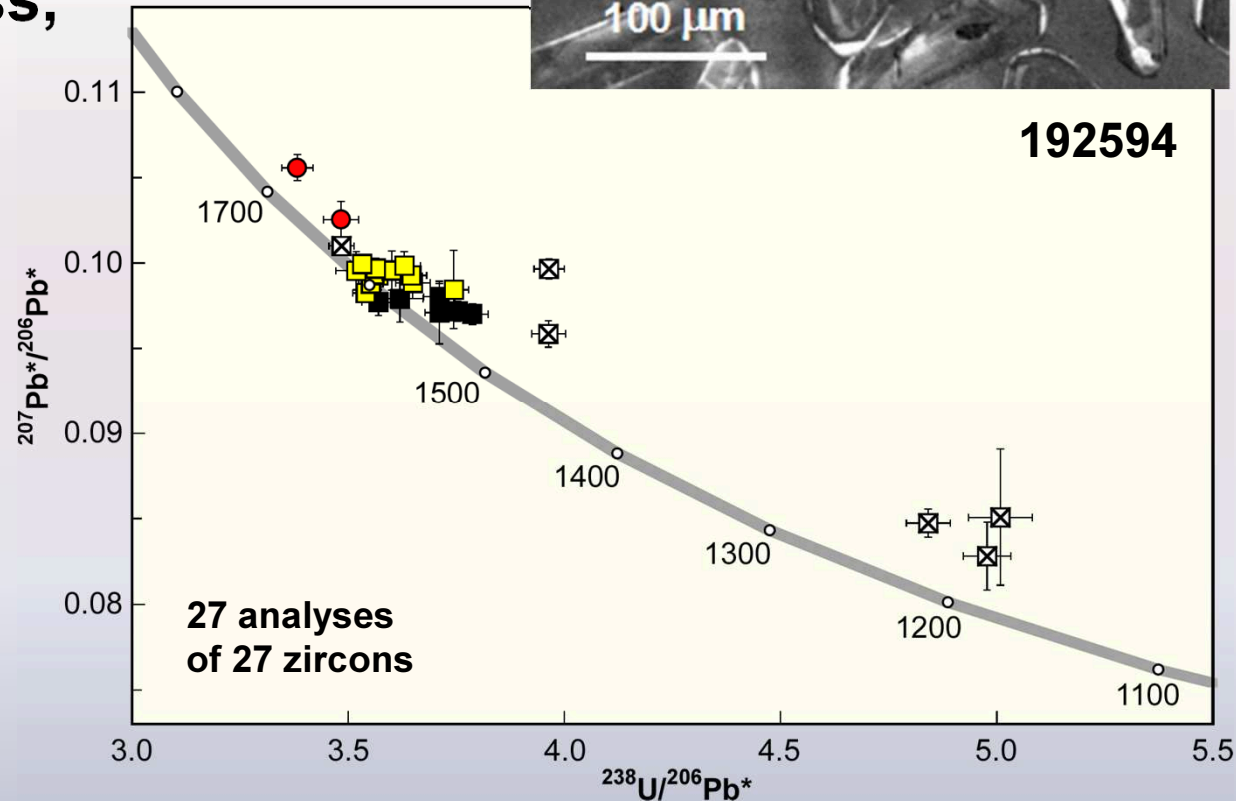
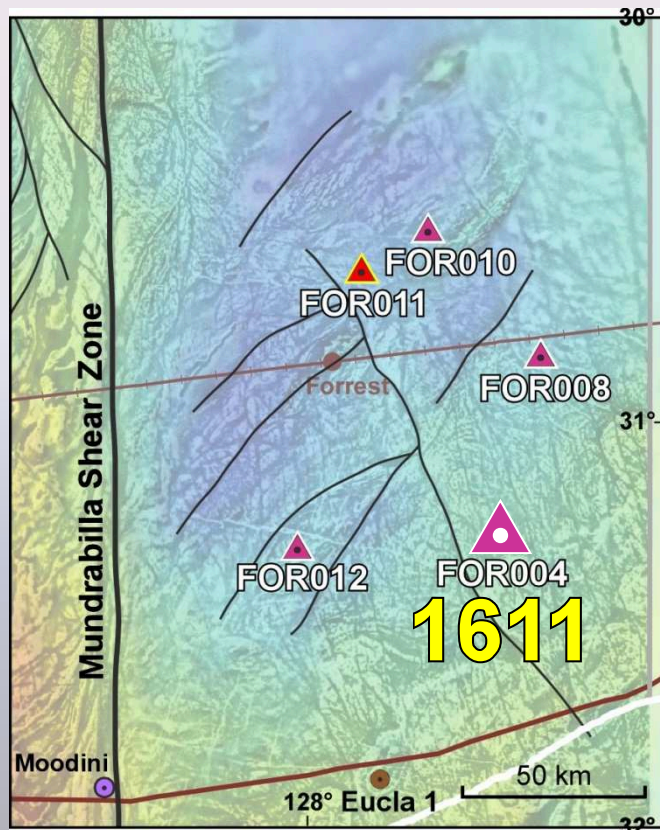


- crystallization: 1613 ± 4 Ma
- metamorphism: 1179 ± 10 Ma

FOR004, 497.67 – 498.18 m



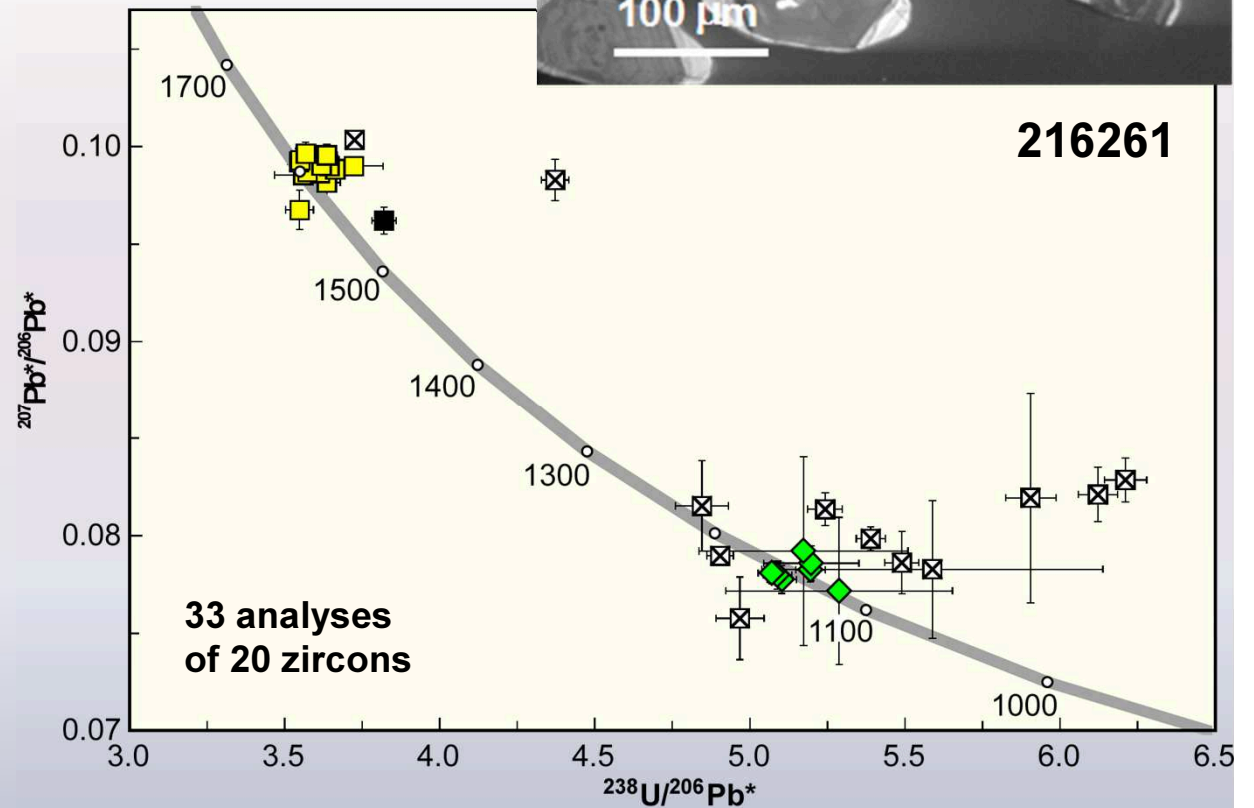
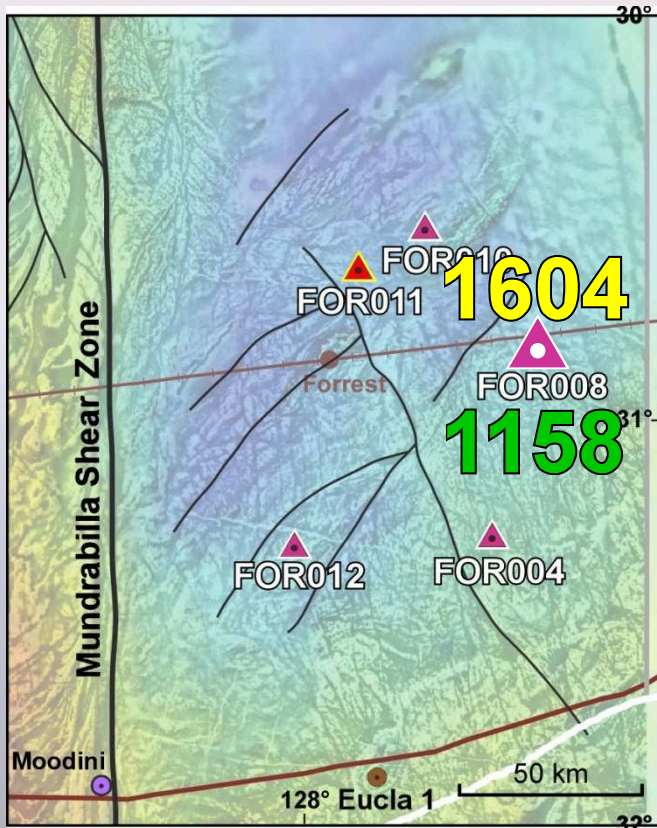
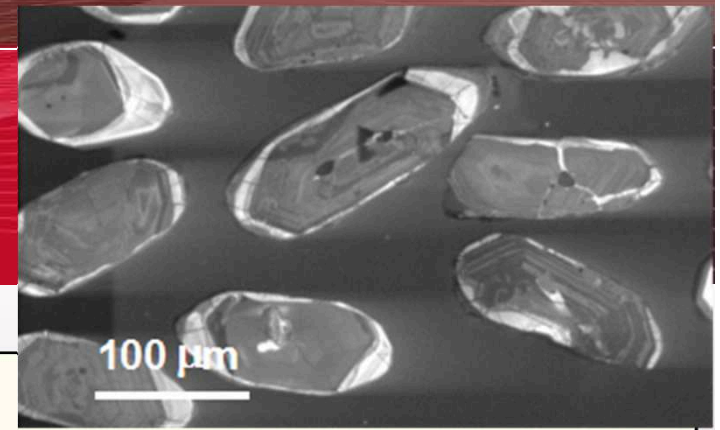
**192594, granitic gneiss,
Toolgana Supersuite**
zircons have thin rims and
fracture-fill of low-U zircon



- **crystallization: 1611 ± 7 Ma**
- **Pb loss (metamorphism?) $\ll 1610$ Ma**
- **inheritance: 1724, 1671 Ma**

FOR008, 476.31 – 476.81 m

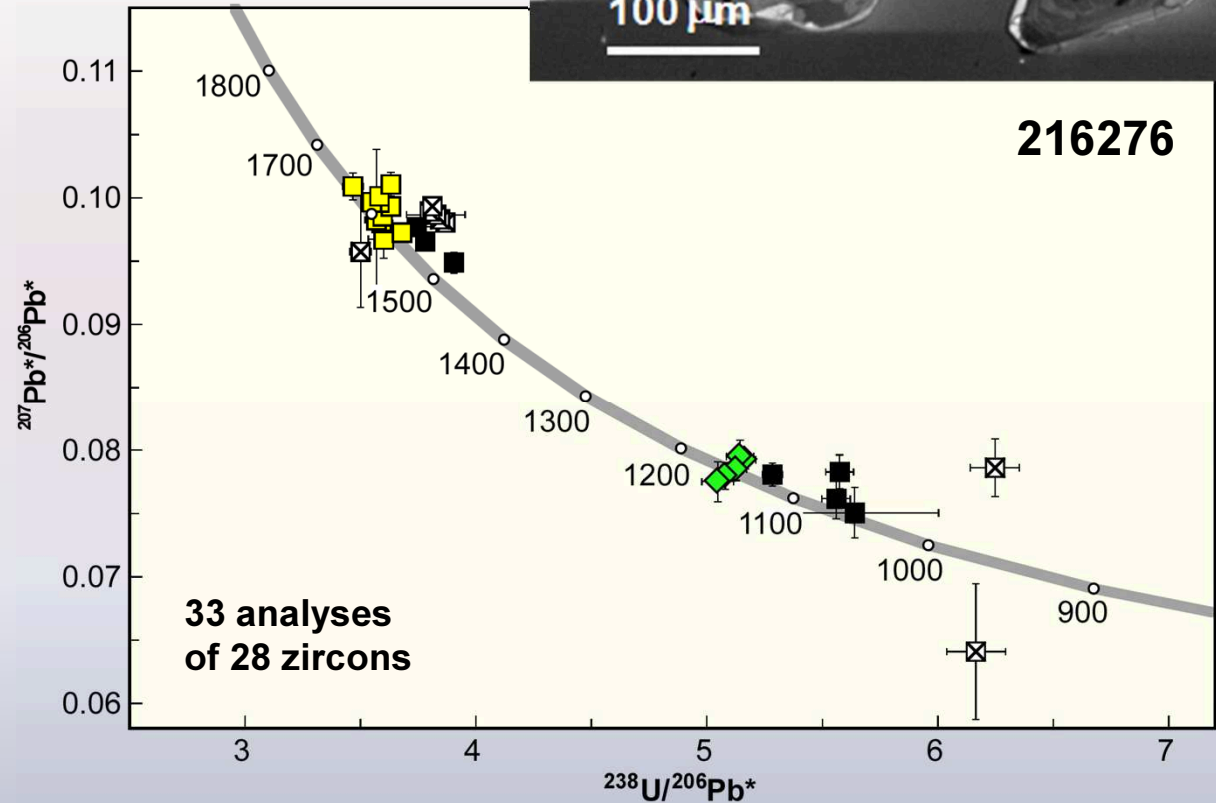
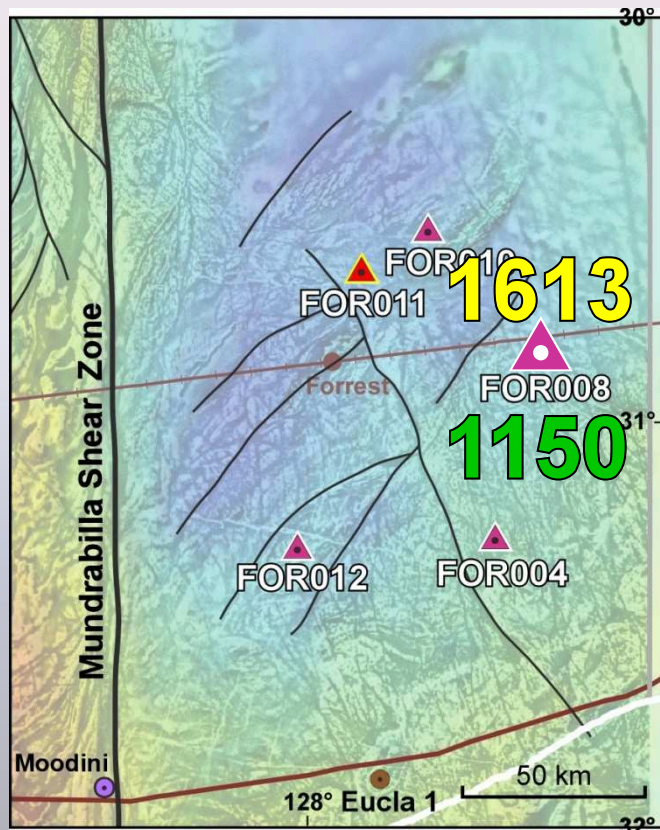
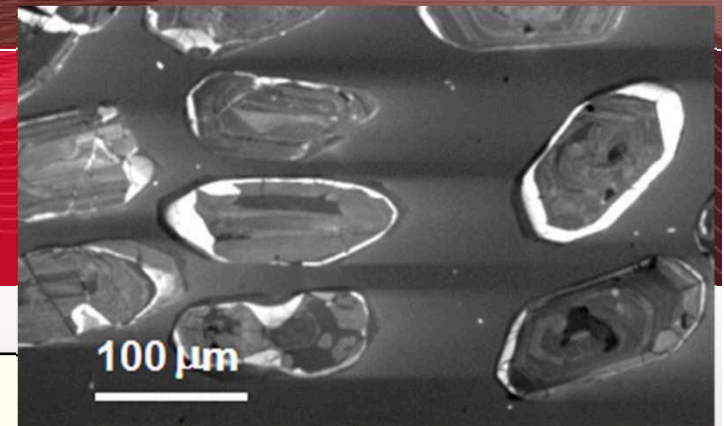
**216261: migmatite,
Toolgana Supersuite**
zircons have thin rims and
fracture-fill of low-U zircon



- crystallization: 1604 ± 6 Ma
- metamorphism: 1158 ± 12 Ma

FOR008, 552.21 – 552.91 m

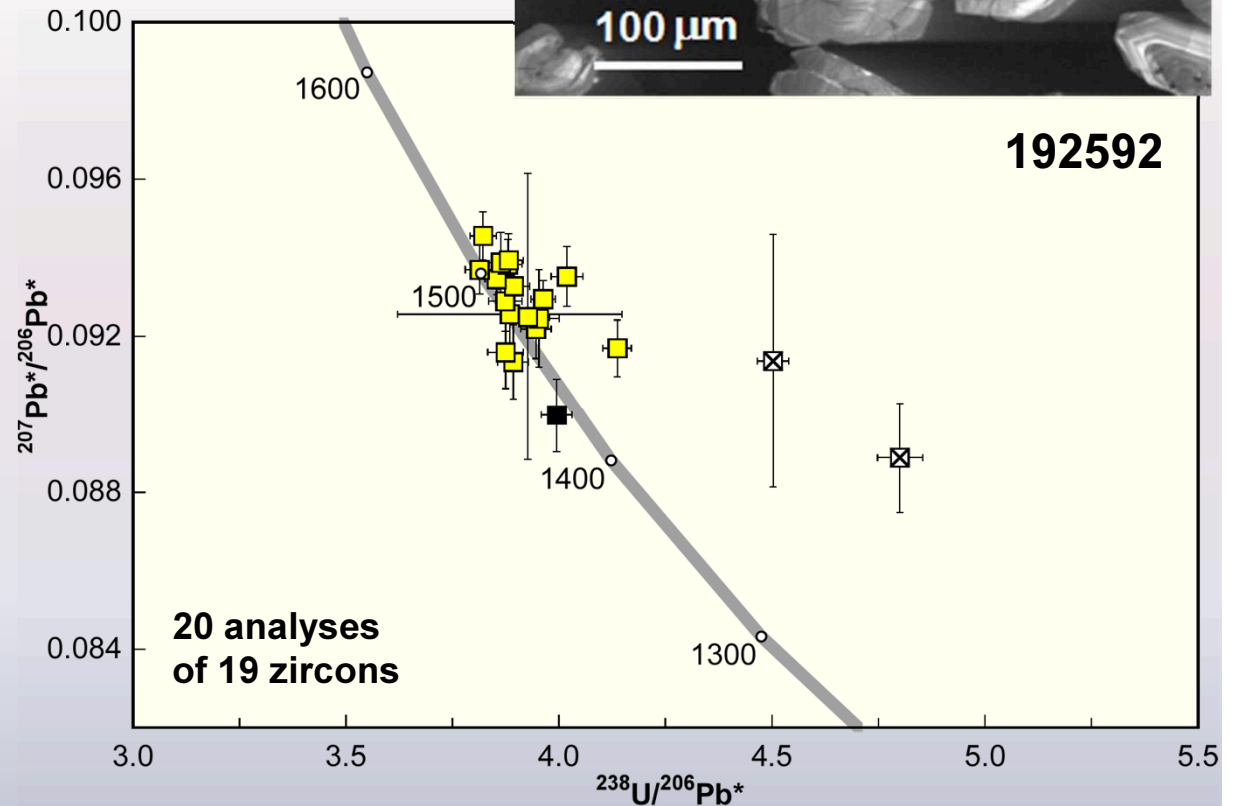
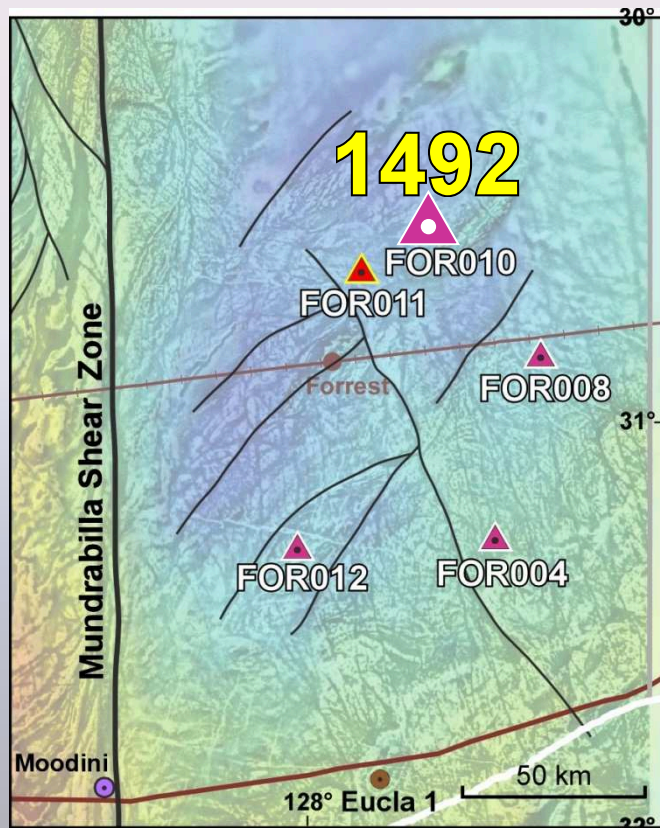
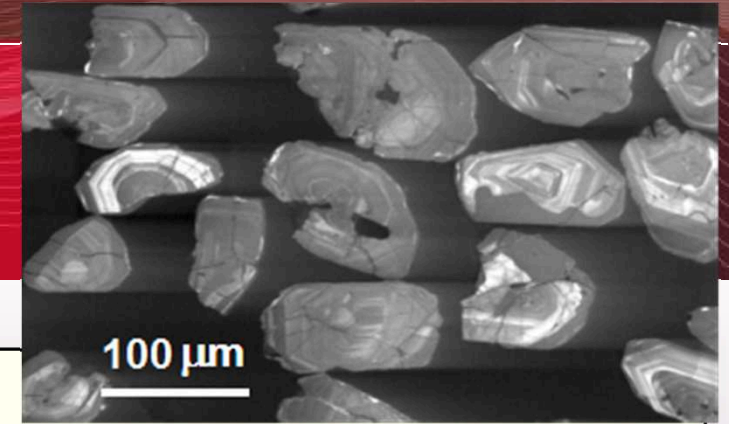
216276: migmatite, Toolgana Supersuite
zircons have thin rims and fracture-fill of low-U zircon



- crystallization: 1613 ± 13 Ma
- metamorphism: 1150 ± 10 Ma
- minor radiogenic-Pb loss

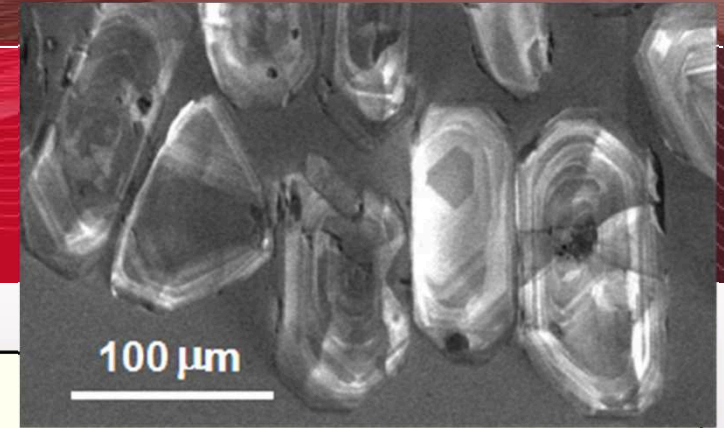
FOR010, 432.75 – 433.10 m

206751: metagranite,
Undawidgi Supersuite
zoned zircons

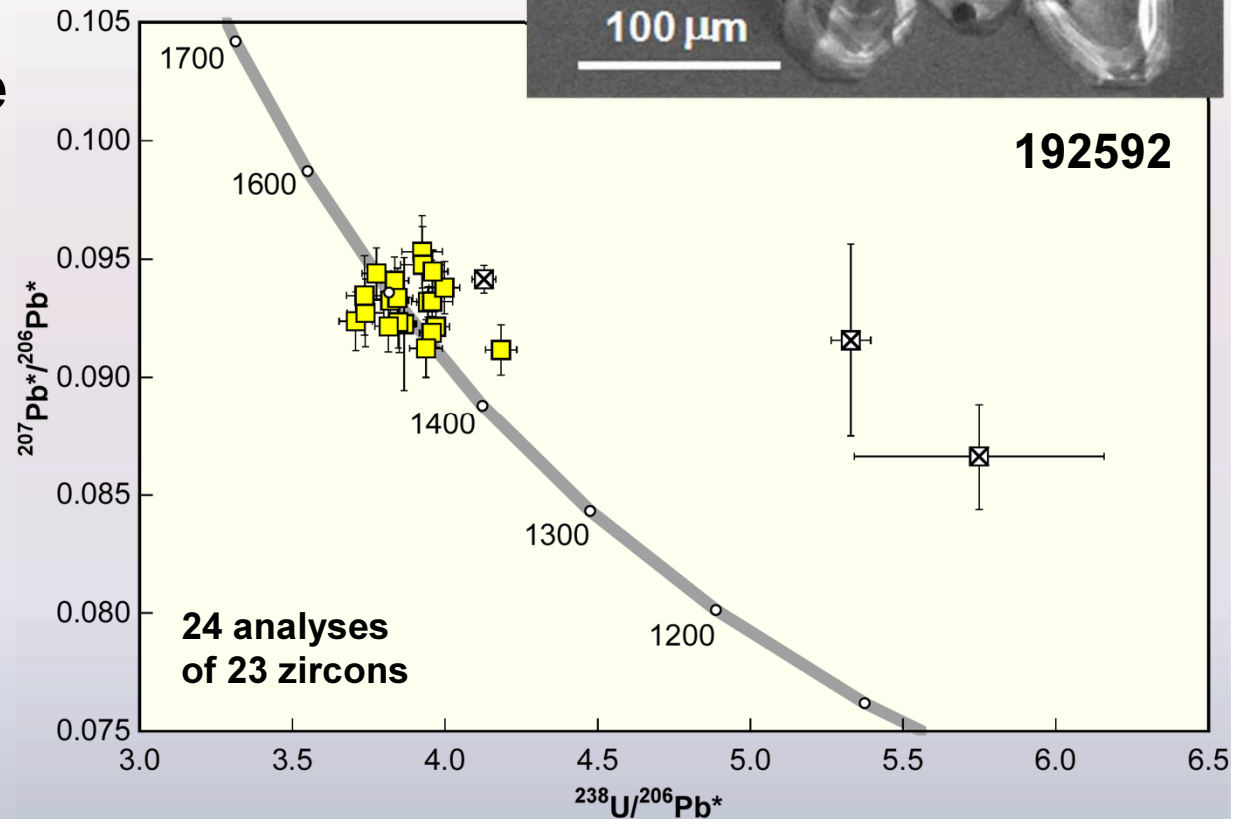
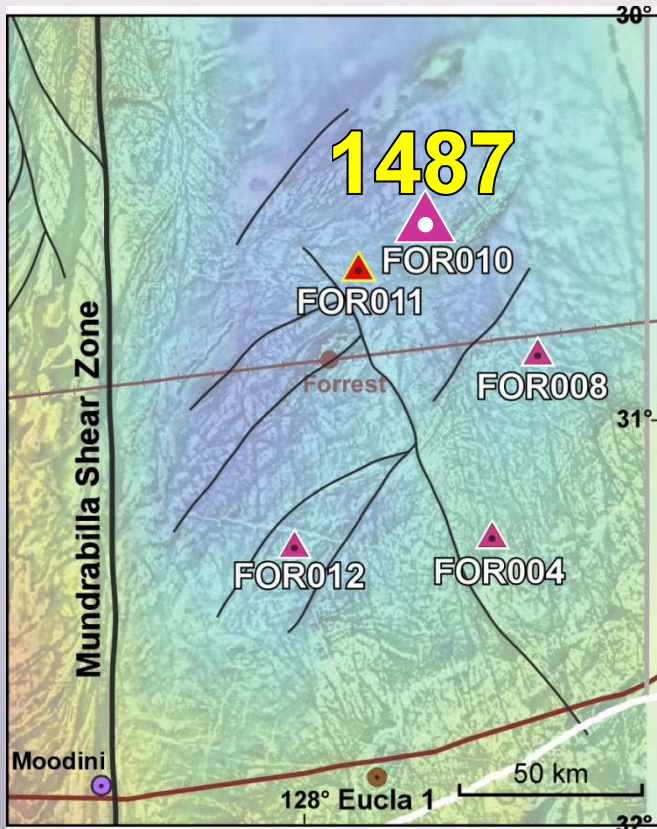


- crystallization: 1492 ± 9 Ma
- apparent rims same age

FOR010, 474.32 – 475.09 m



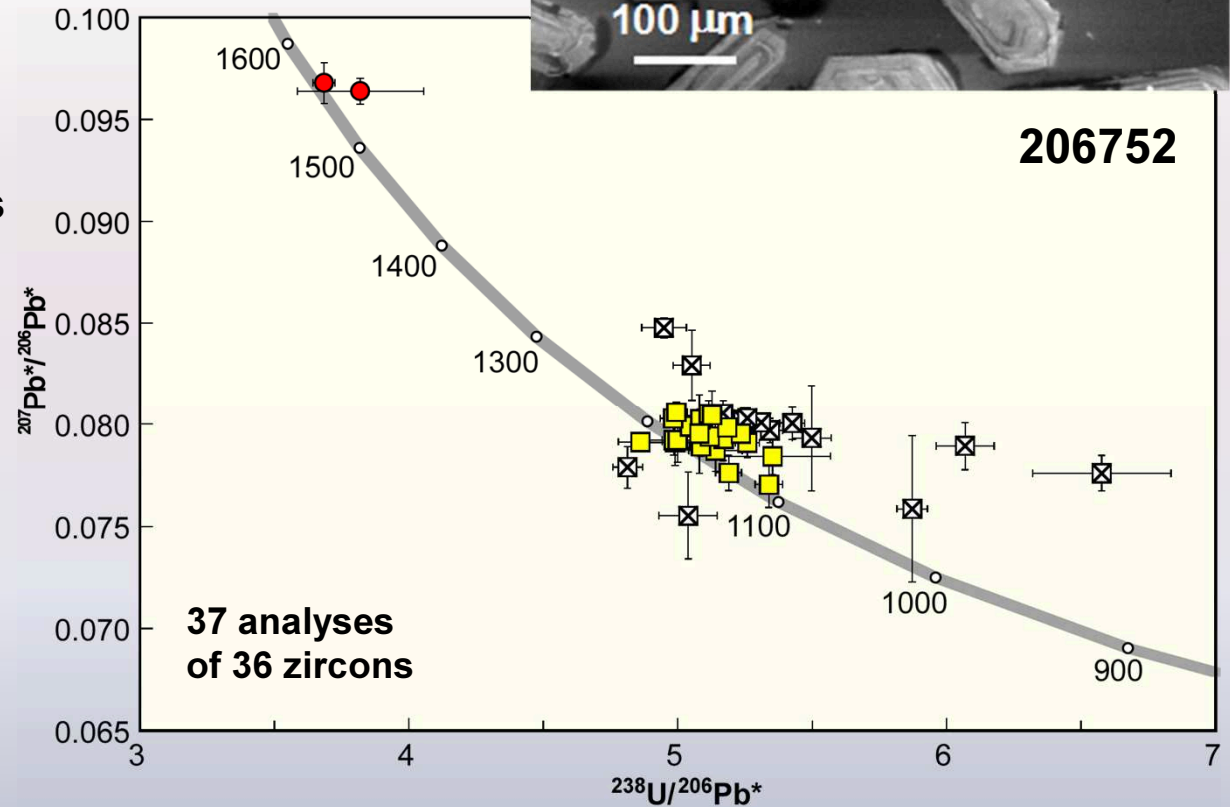
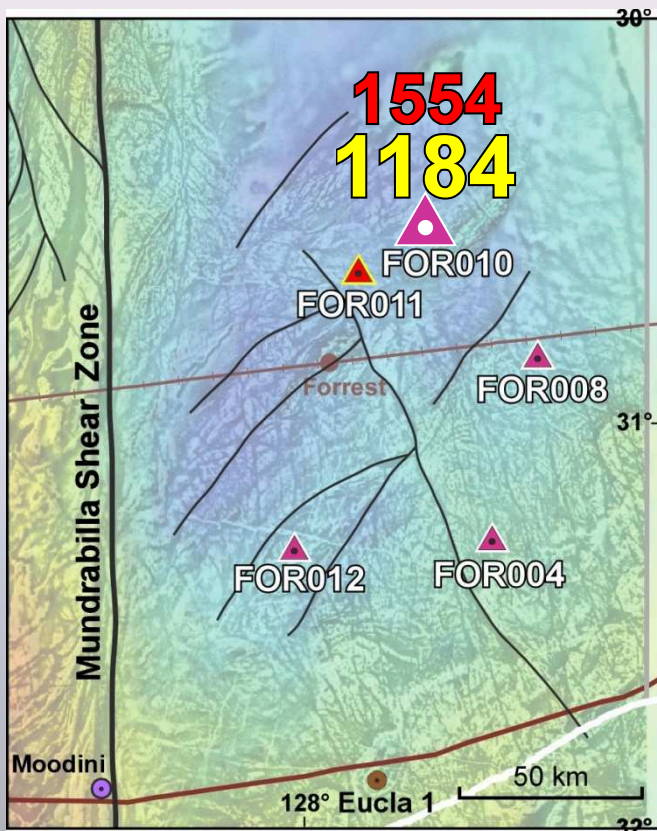
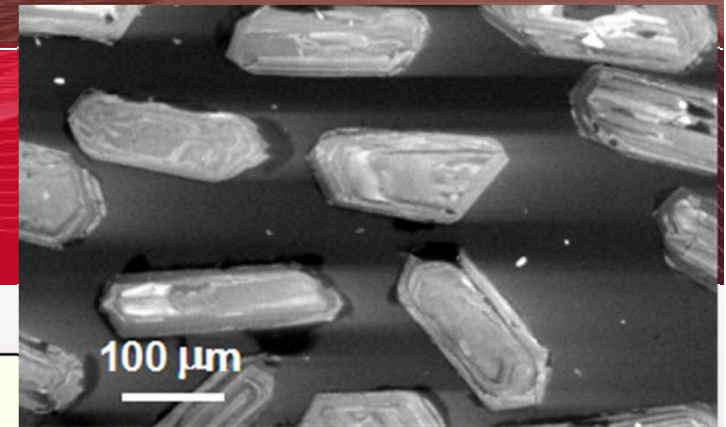
192592: metagranite, Undawidgi Supersuite
zoned zircons; no obvious rims



- **crystallization: 1487 ± 3 Ma**

FOR010, 482.42 – 483.02 m

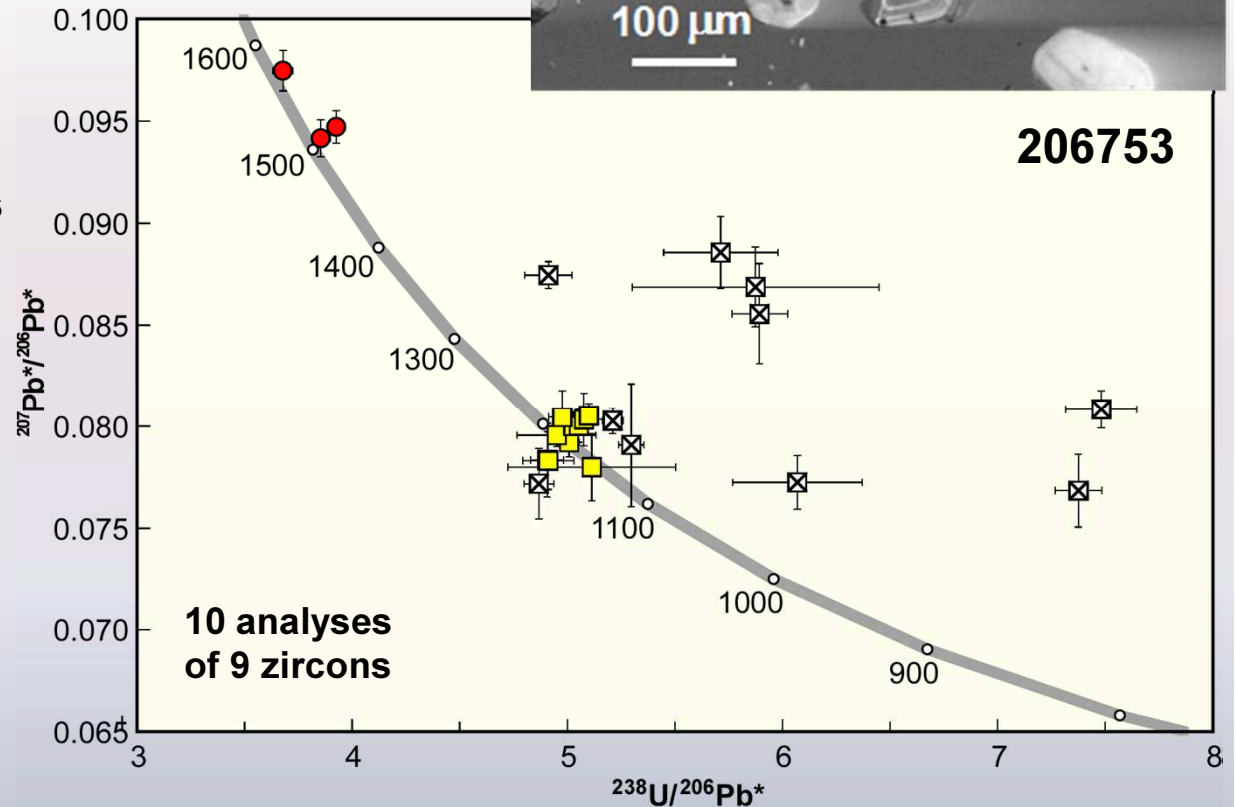
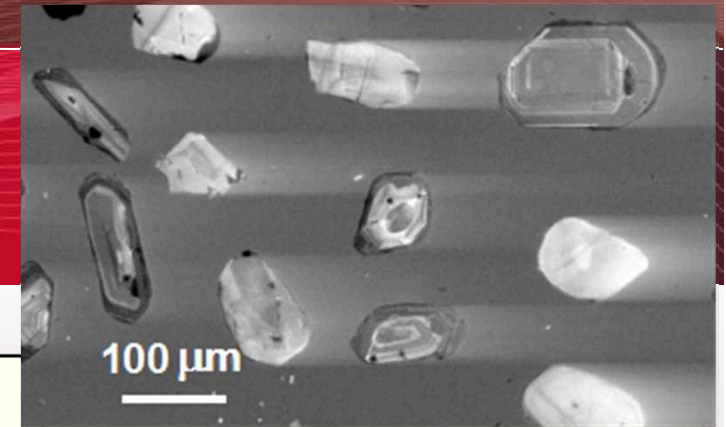
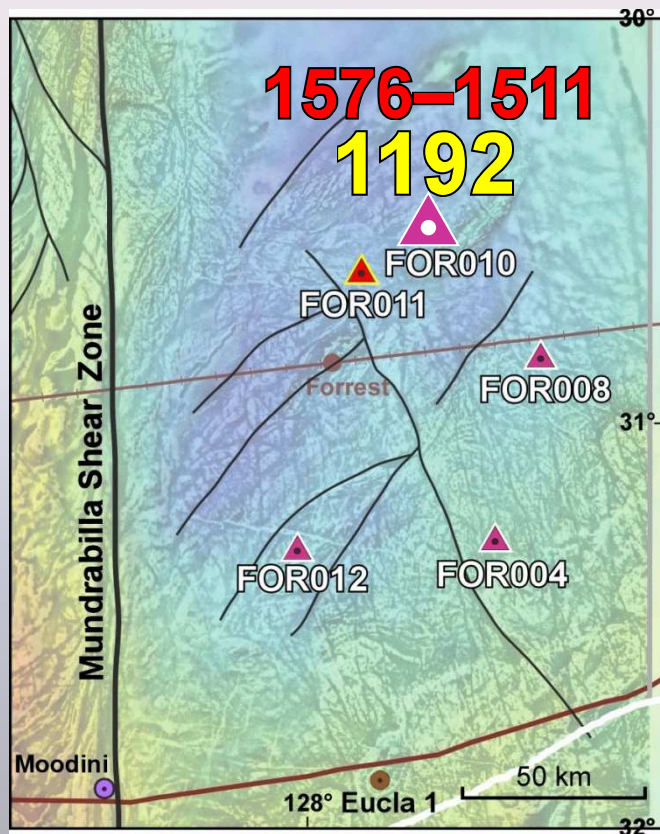
**206752: granite,
Moodini Supersuite
Bottle Corner Shoshenite
zoned zircons; some older cores**



- **crystallization: 1184 ± 8 Ma**
- **inheritance: 1554 Ma (1 zircon core)**

FOR010, 490.14 – 490.48 m

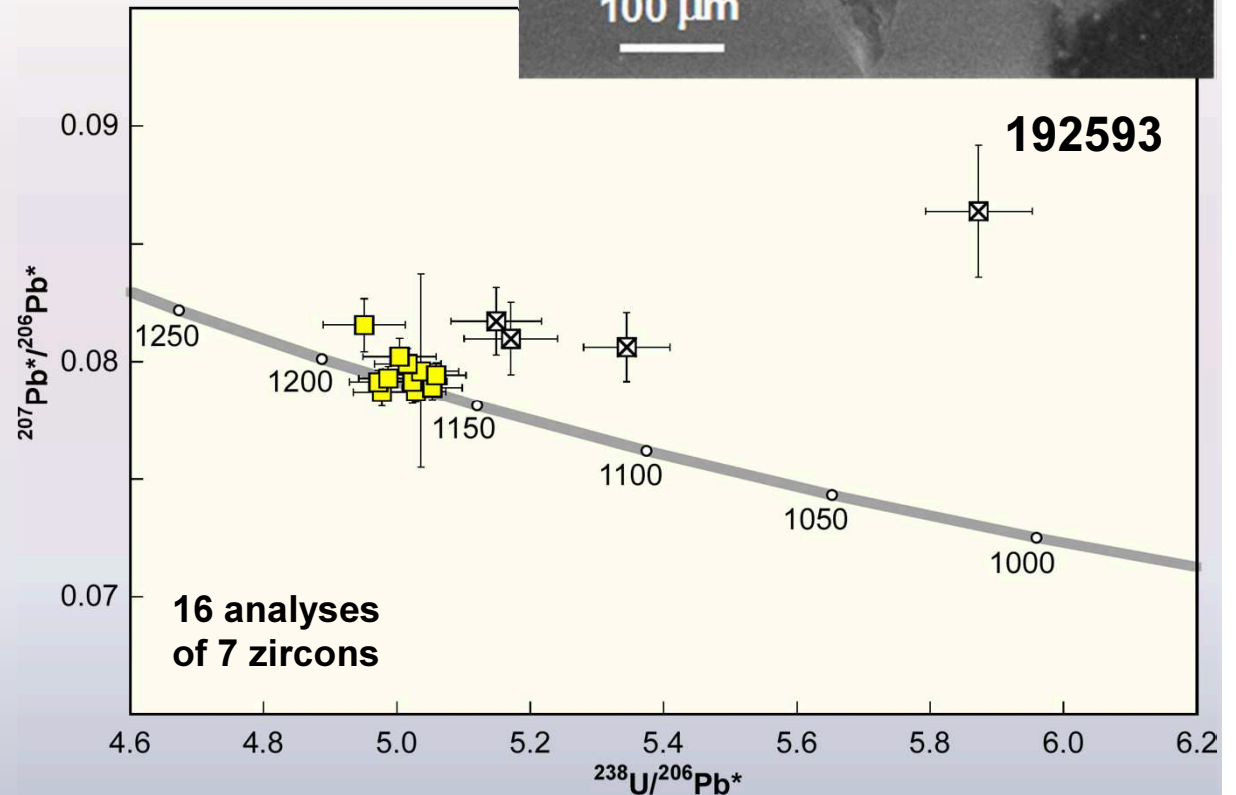
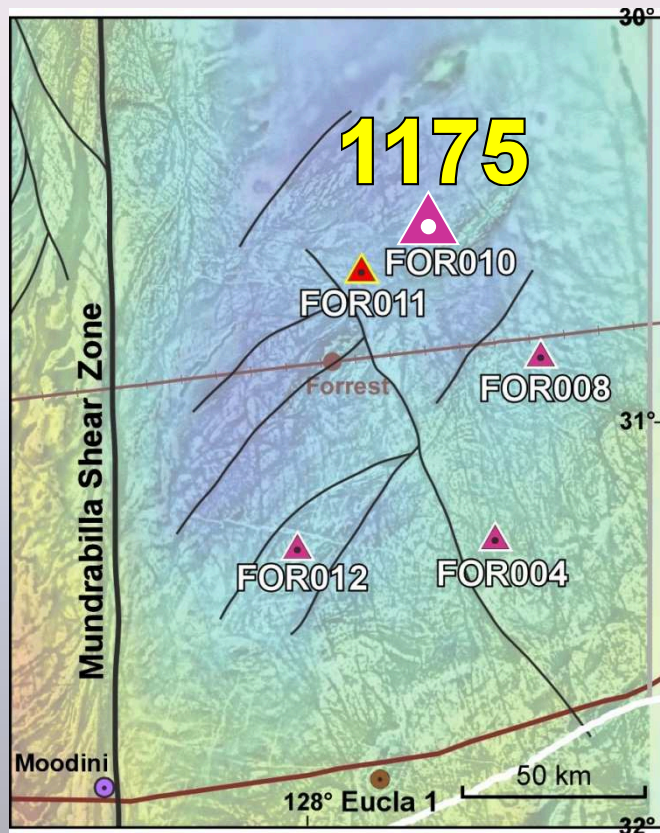
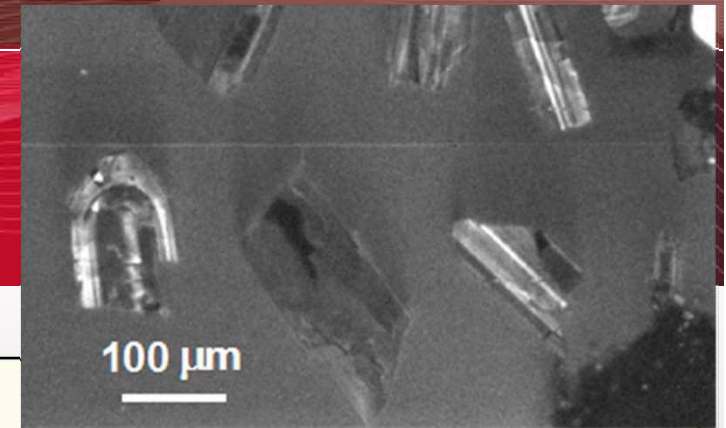
**206753: granite,
Moodini Supersuite
Bottle Corner Shoshenite
zoned zircons; some older cores**



- **crystallization: 1192 ± 13 Ma**
- **inheritance: 1576–1511 Ma**

FOR010, 459.77 – 460.25 m

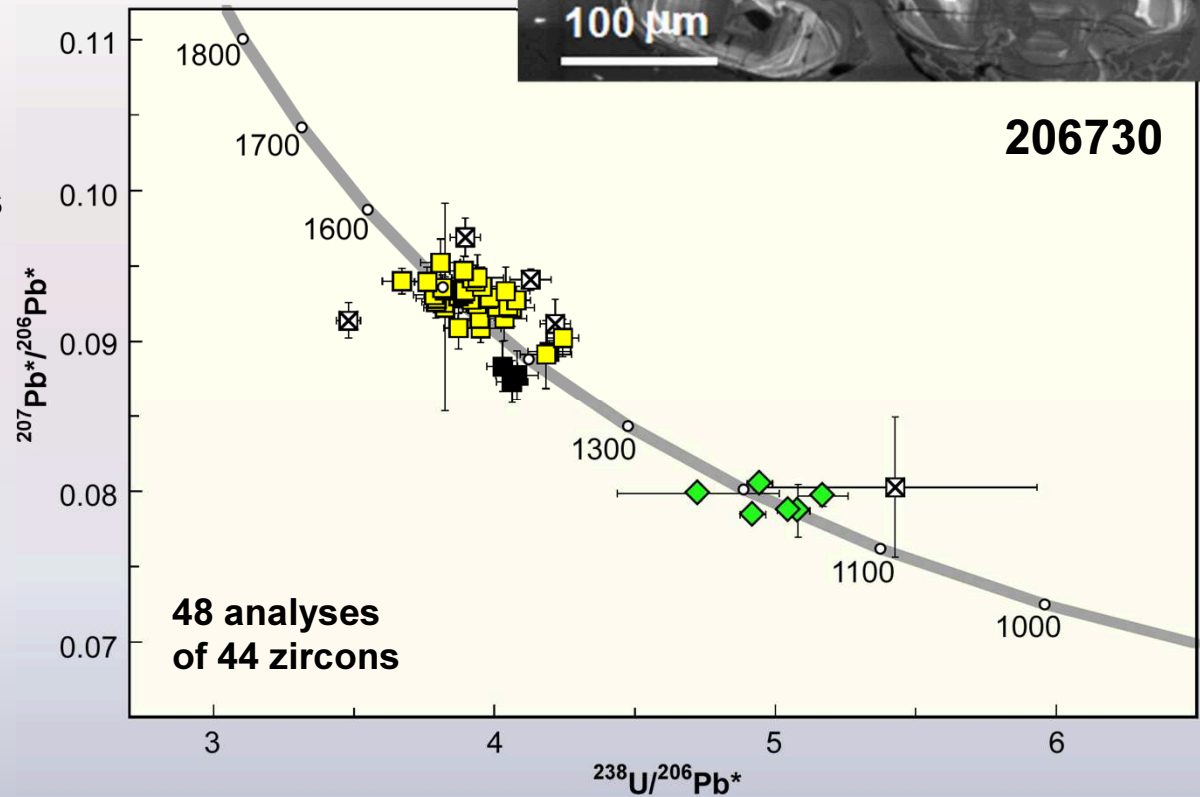
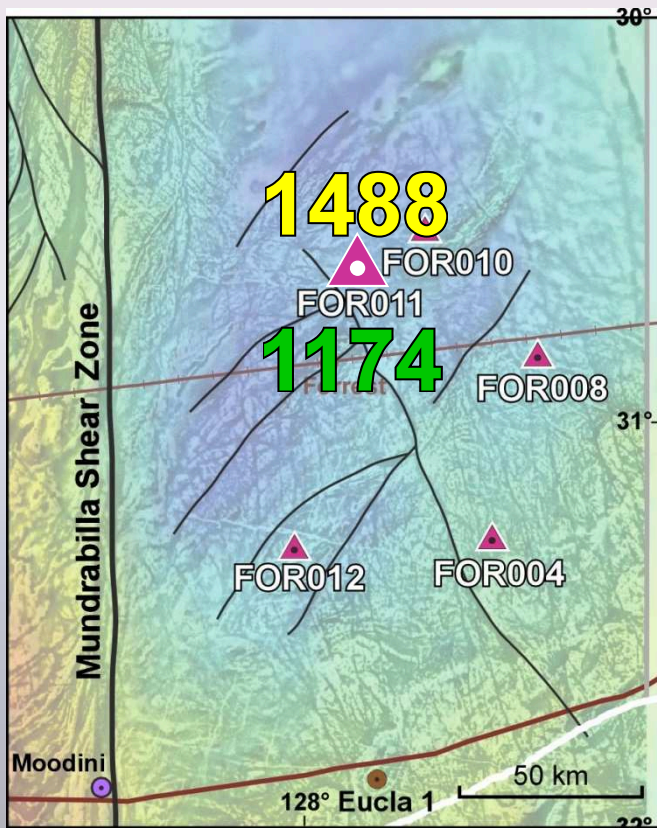
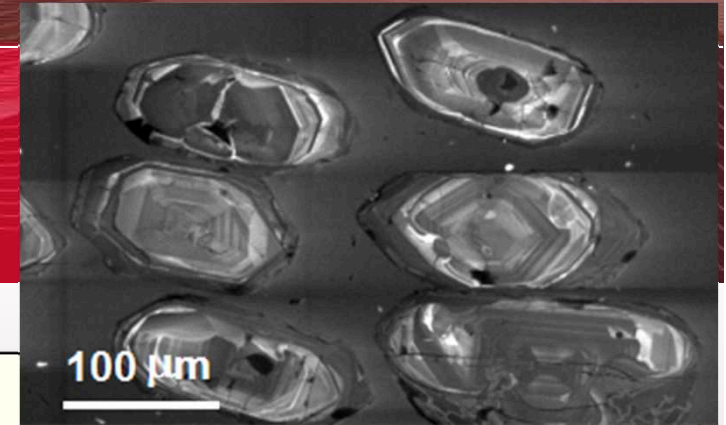
192593: granite,
Moodini Supersuite
Bottle Corner Shoshenite
zoned zircons



- crystallization: 1175 ± 5 Ma

FOR011, 419.20 – 419.40 m

206730: metagranite,
Undawidgi Supersuite
cut by dated granite vein
zoned zircons with low-Th/U rims



- crystallization: 1488 ± 7 Ma
- minor Pb-loss (?)
- metamorphism: 1174 ± 12 Ma

387.77 M

206730

1488 Ma
metagranite
Undawidgi
Supersuite

213838

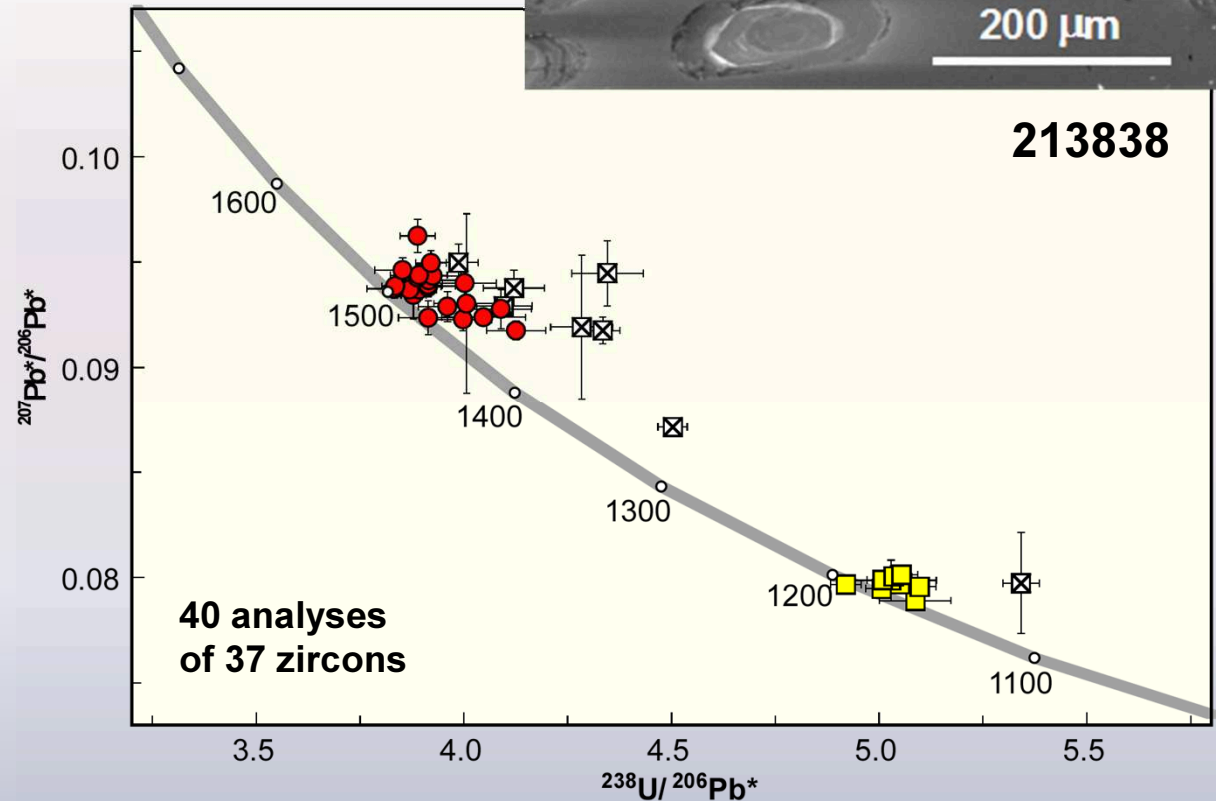
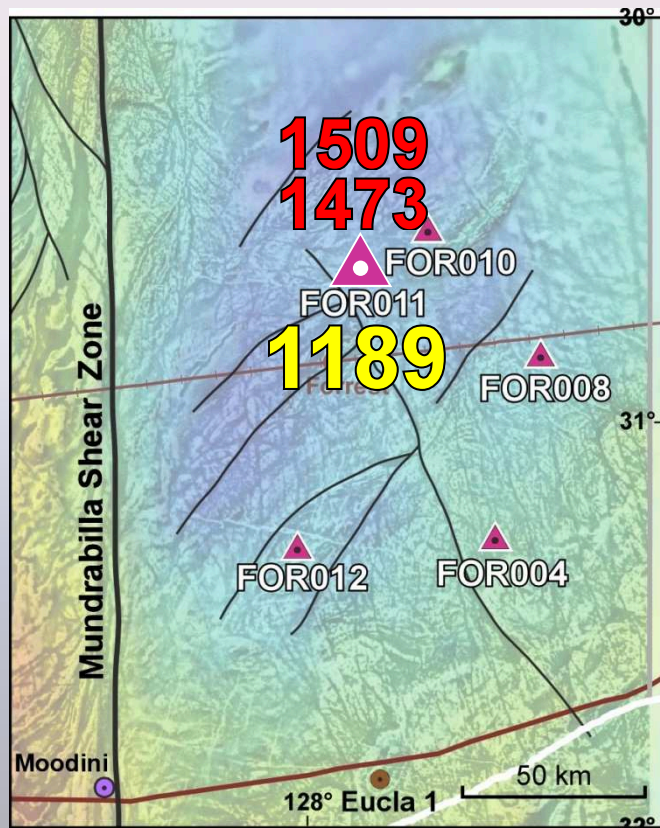
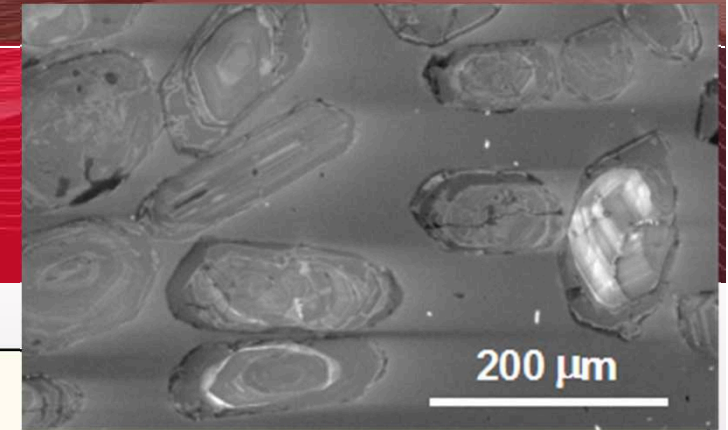
1189 Ma
granite vein
Moodini
Supersuite

FOR OIL



FOR011, 388.02 – 388.26 m

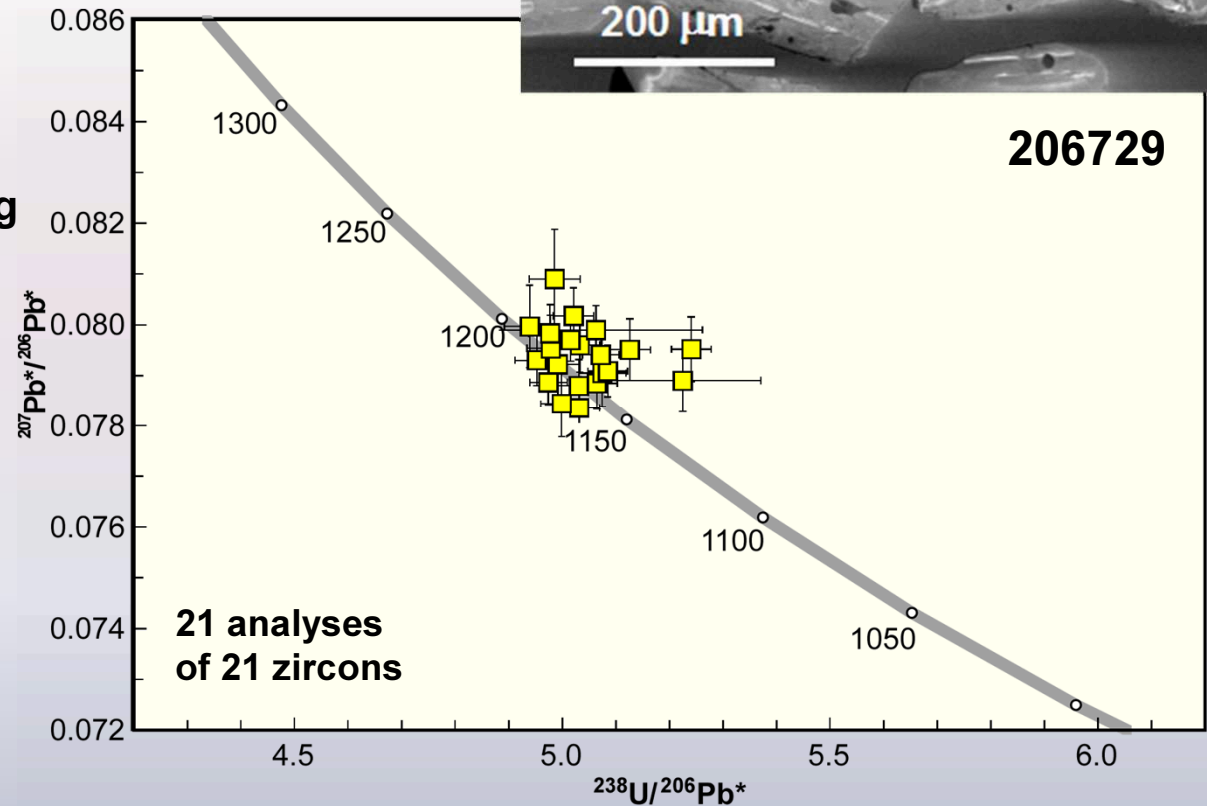
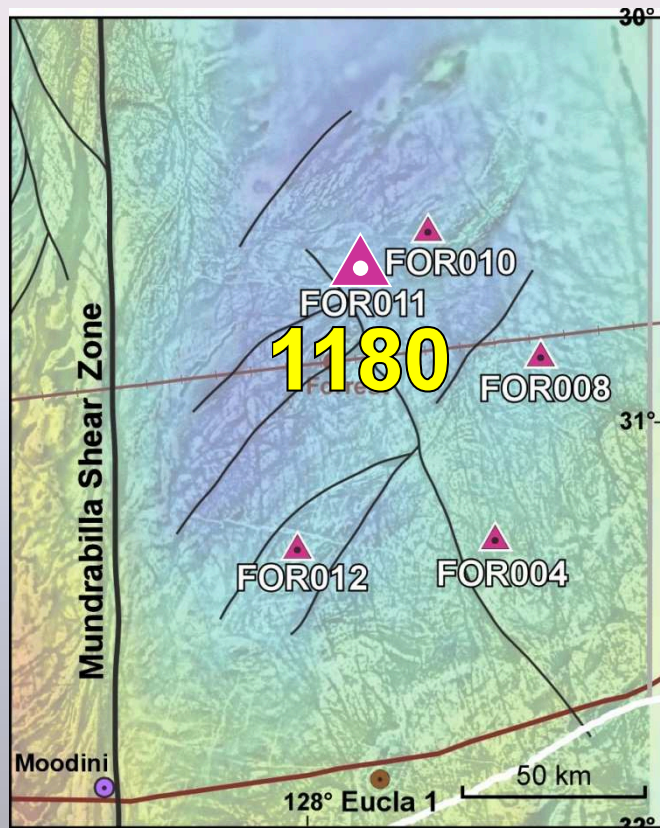
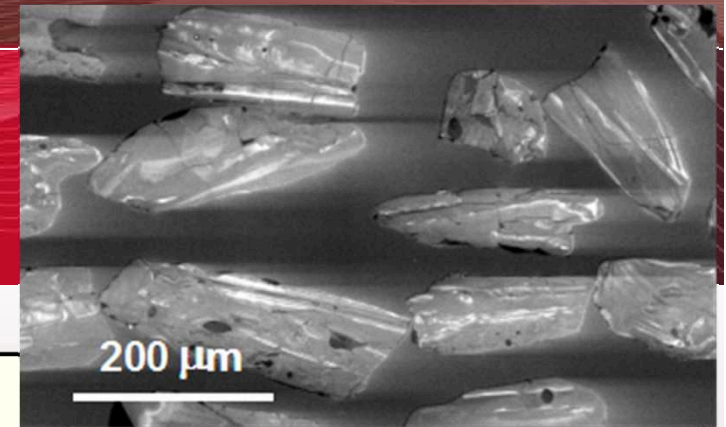
**213838: granite vein,
Moodini Supersuite
cuts 1488 Ma metagranite
zoned cores; low-Th/U rims**



- crystallization: 1189 ± 6 Ma
- inheritance: 1509, 1473 Ma

FOR011, 415.80 – 416.19 m

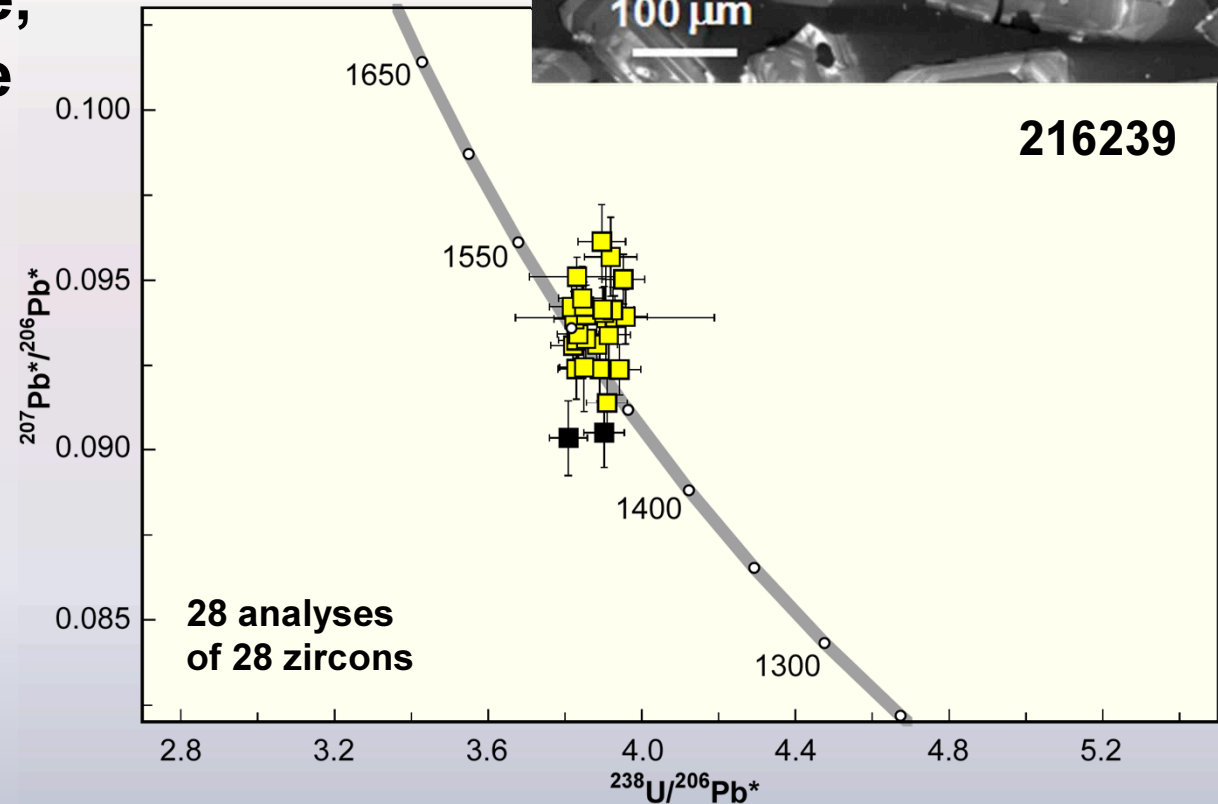
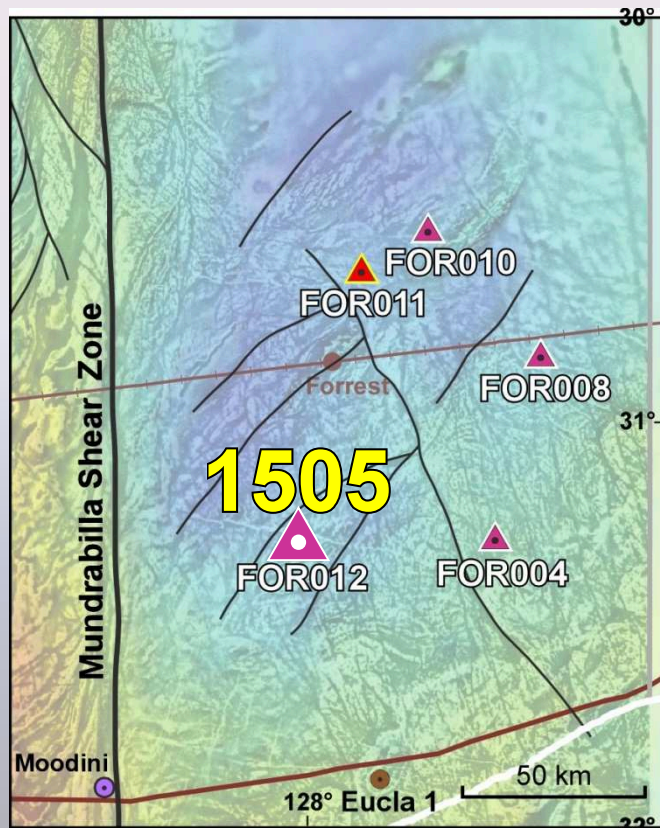
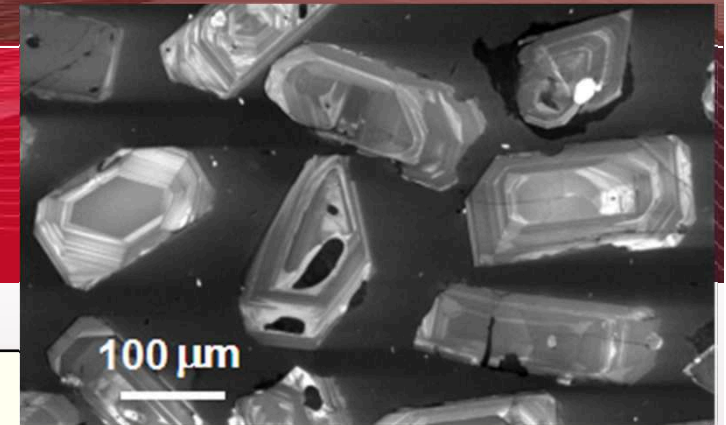
**206729: metagranite,
Moodini Supersuite
Bottle Corner Shoshenite
anhedral zircons; irregular zoning**



- **crystallization: 1180 ± 6 Ma**

FOR012, 341.59 – 342.05 m

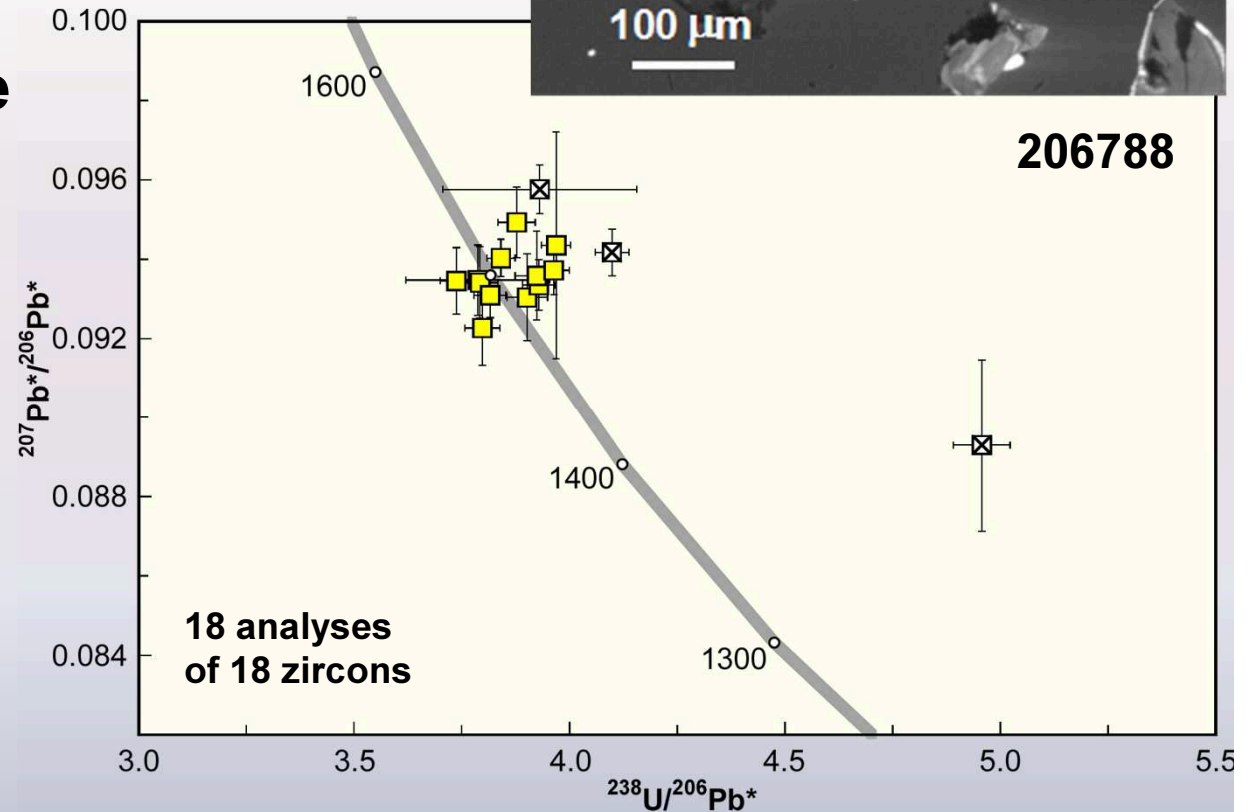
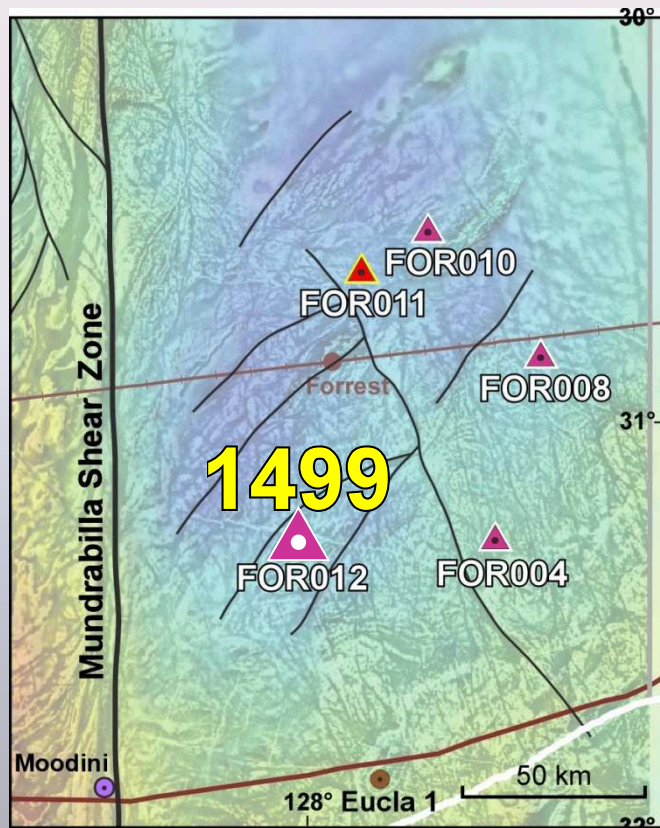
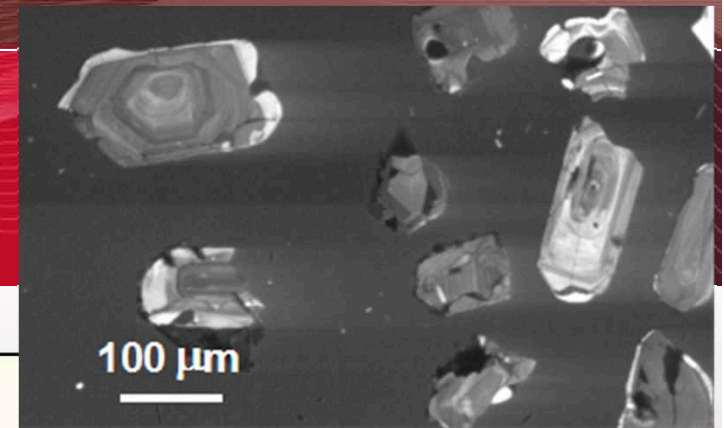
216239: monzogranite,
Undawidgi Supersuite
zoned zircons



- crystallization: 1505 ± 8 Ma

FOR012, 433.00 – 433.50 m

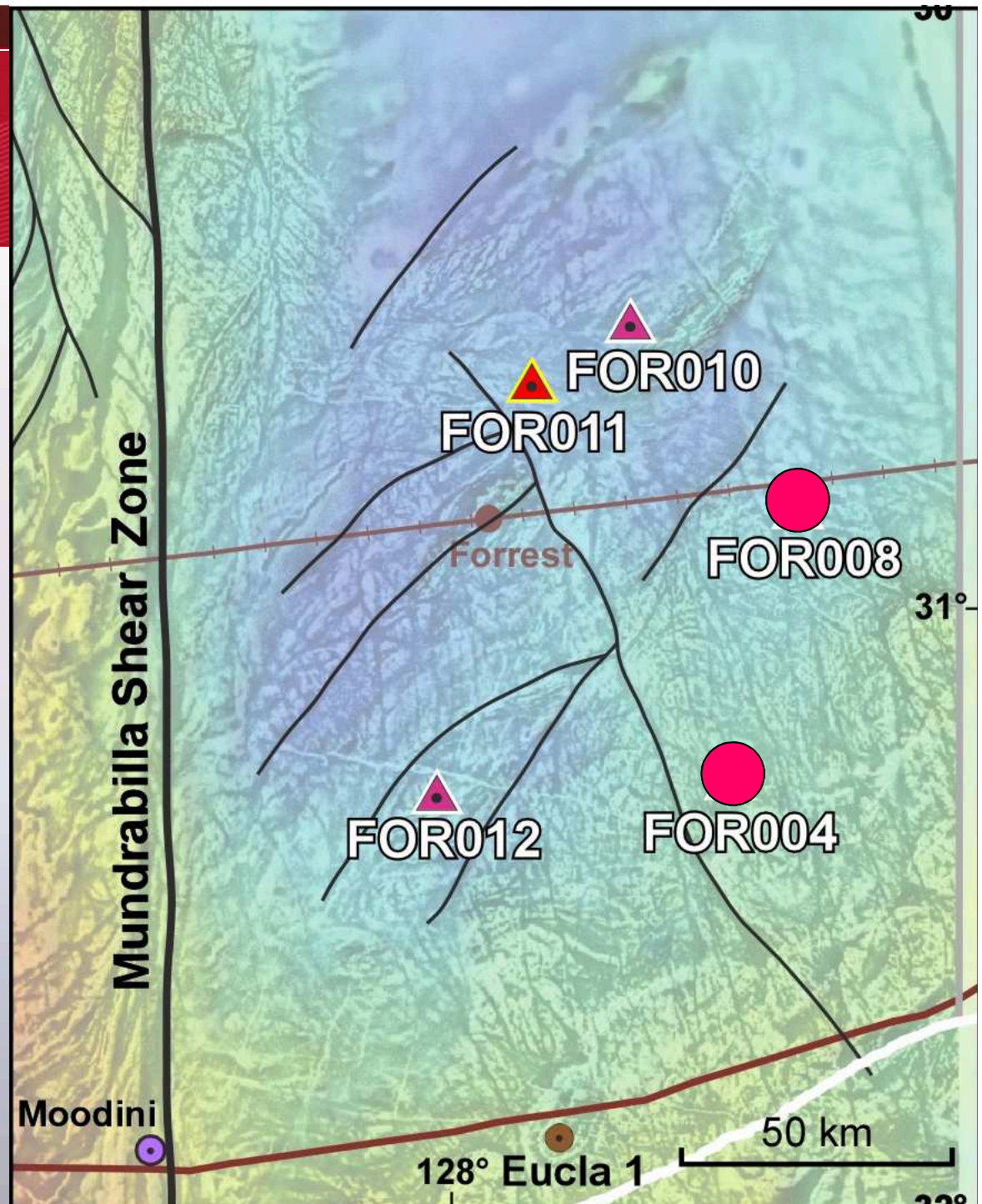
206788: felsic schist,
Undawidgi Supersuite
zoned zircons



- crystallization: 1499 ± 9 Ma

Forrest Zone

Toolgana Supersuite
c. 1610 Ma
(4 samples)

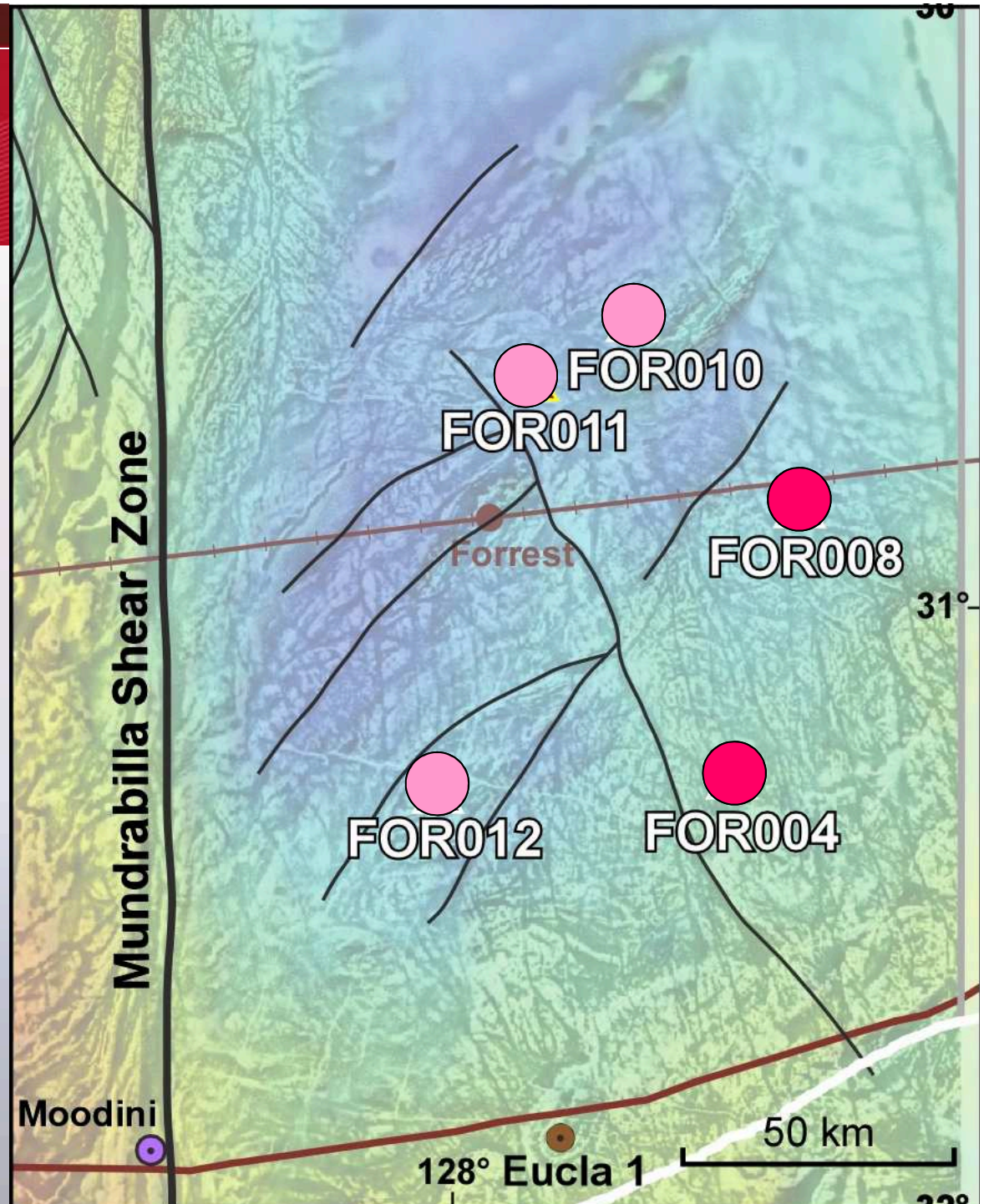


Forrest Zone

Undawidgi Supersuite
c. 1490 Ma
(5 samples)



Toolgana Supersuite
c. 1610 Ma
(4 samples)



Forrest Zone

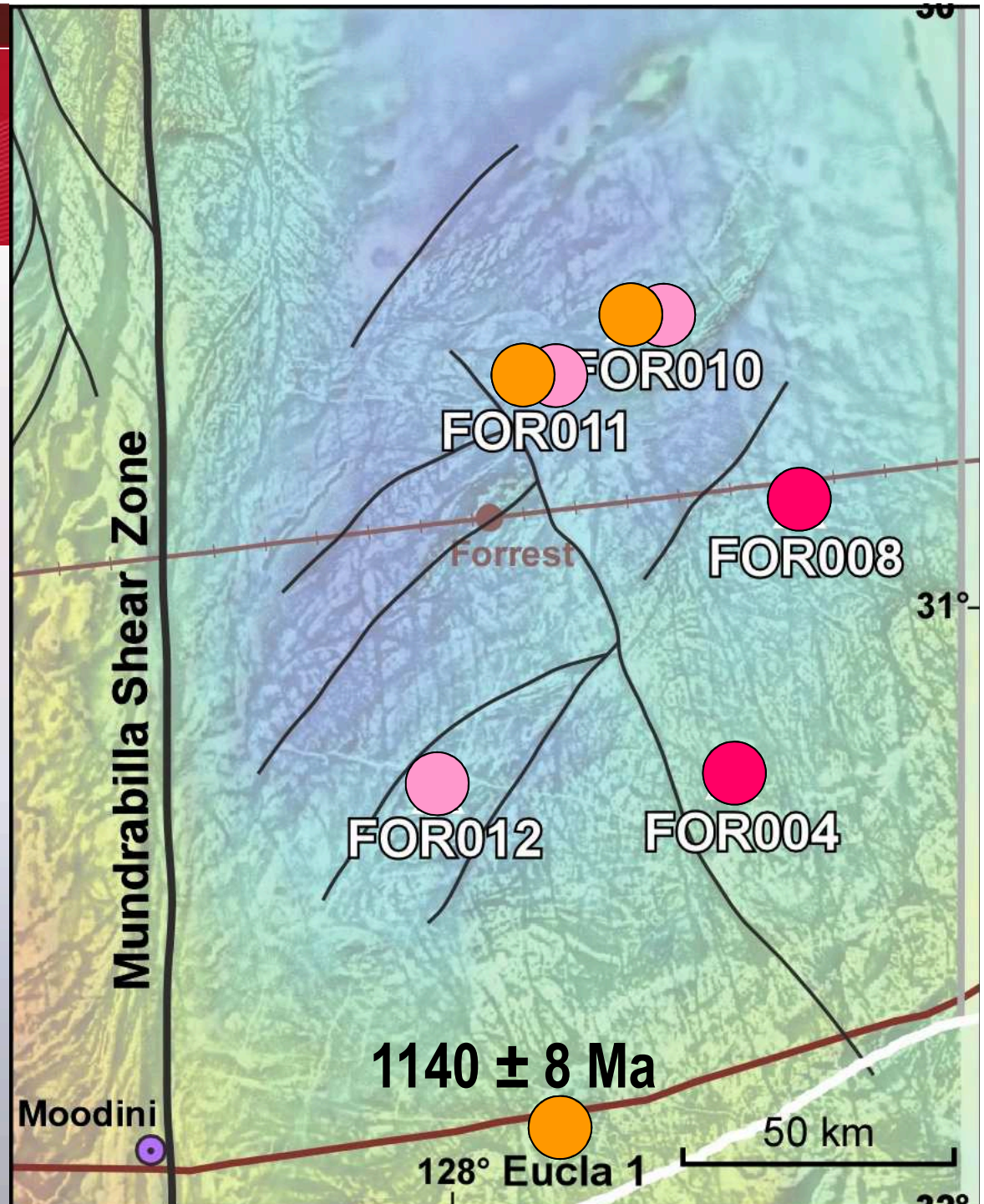
Moodini Supersuite
1192–1140 Ma
(6 samples)



Undawidgi Supersuite
c. 1490 Ma
(5 samples)

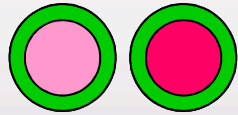


Toolgana Supersuite
c. 1610 Ma
(4 samples)



Forrest Zone

Metamorphic zircon growth
c. 1179–1150 Ma



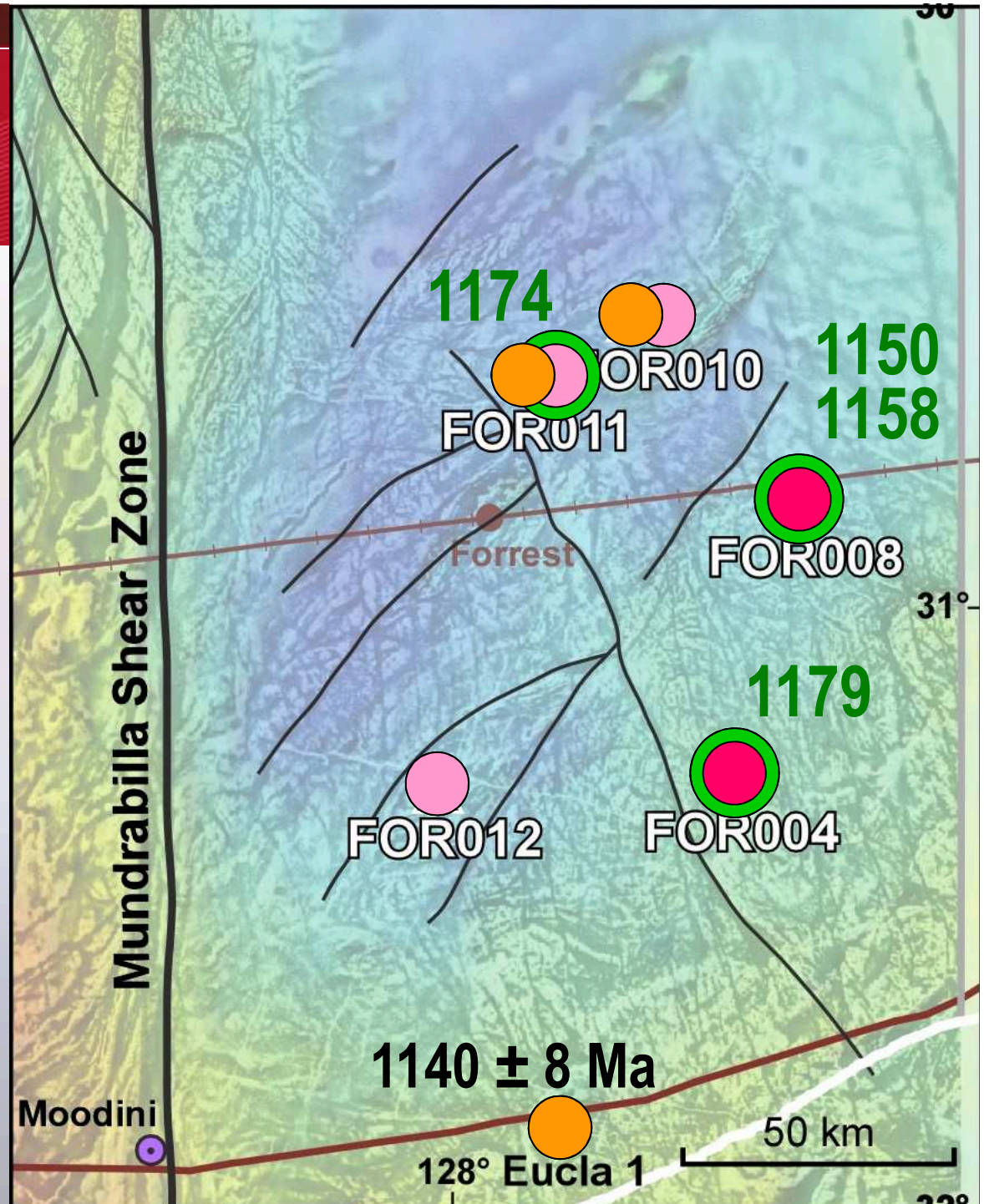
Moodini Supersuite
1192–1140 Ma
(6 samples)



Undawidgi Supersuite
c. 1490 Ma
(5 samples)

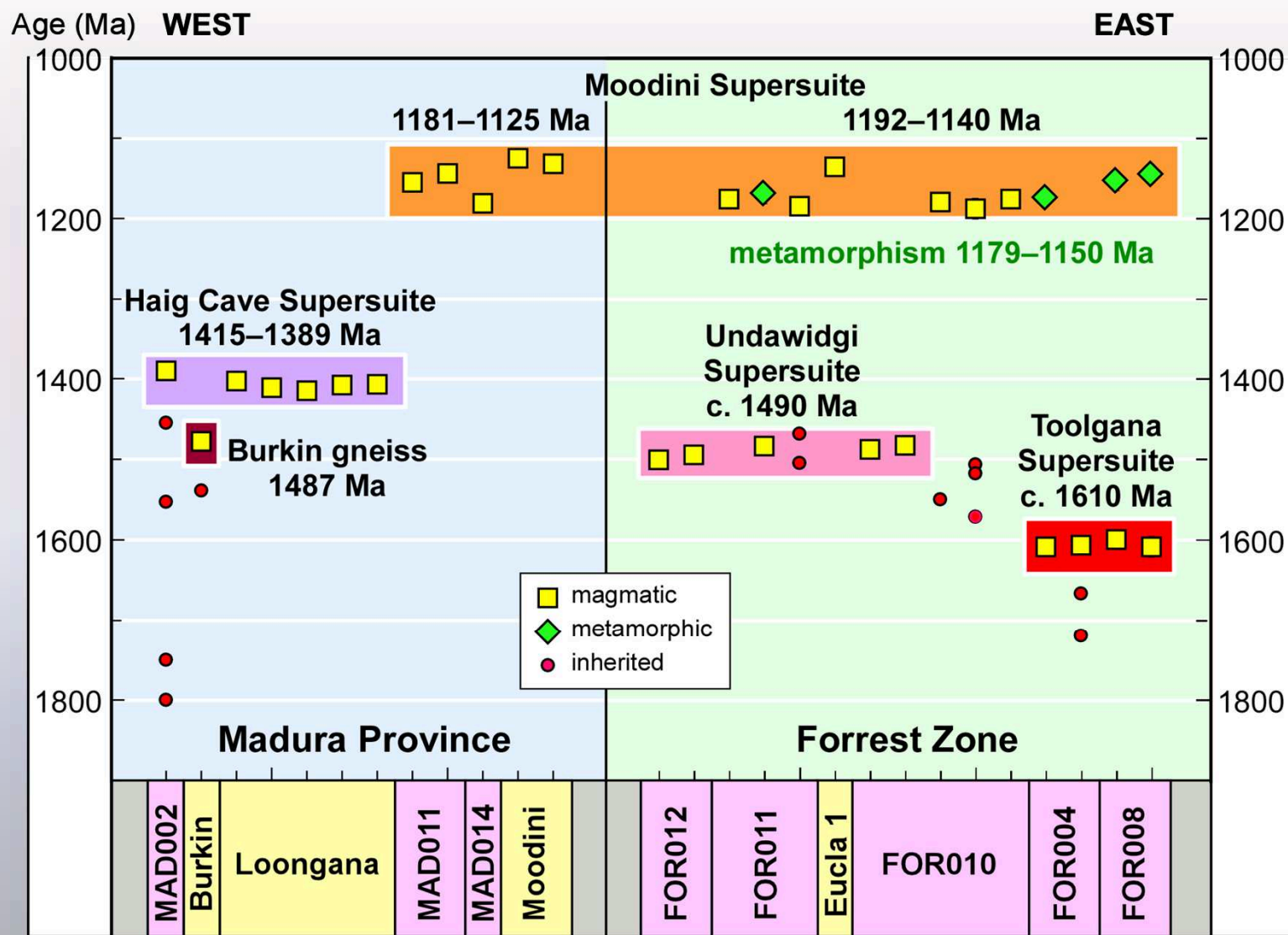


Toolgana Supersuite
c. 1610 Ma
(4 samples)

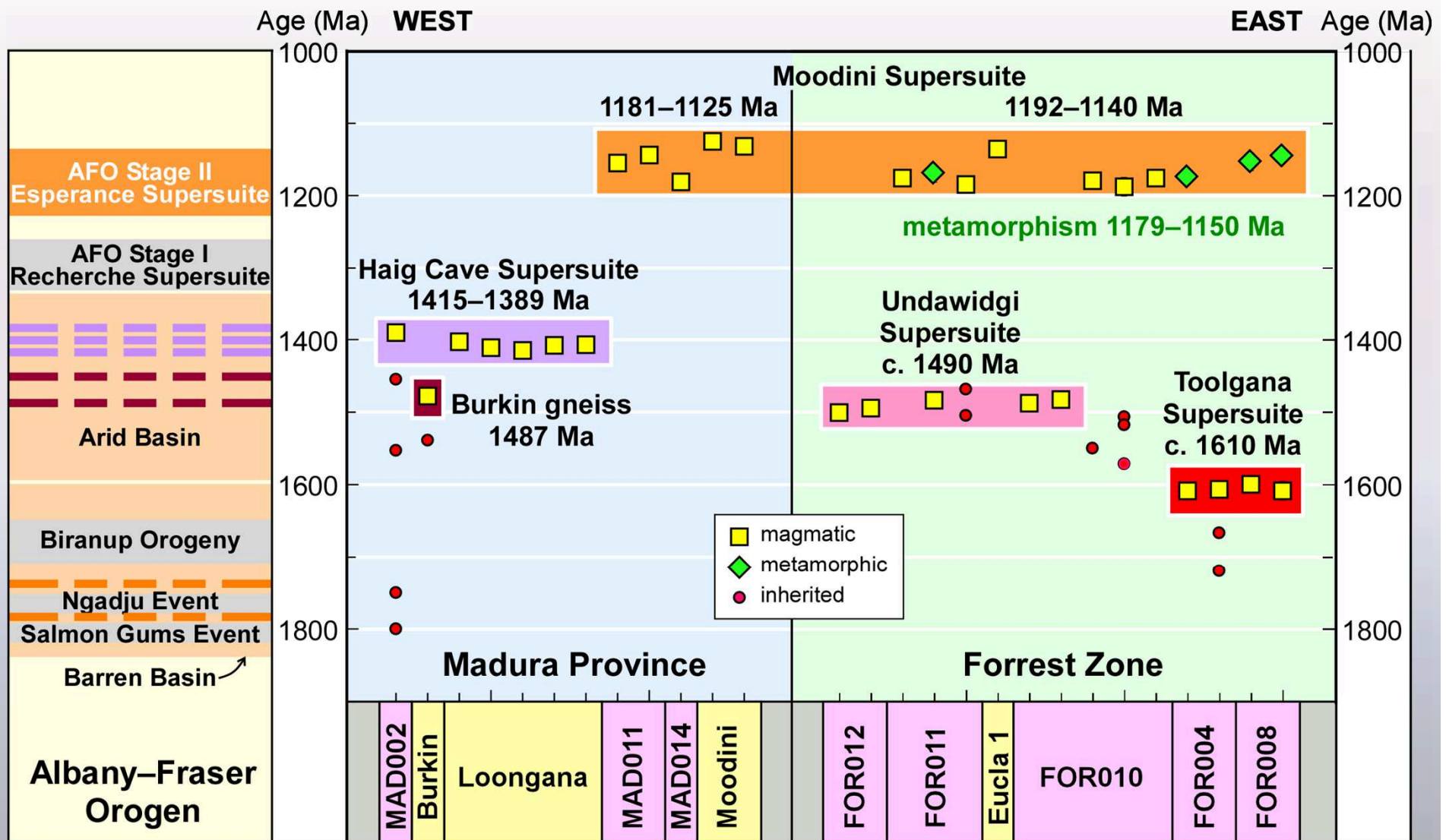




Forrest Zone & Madura Province

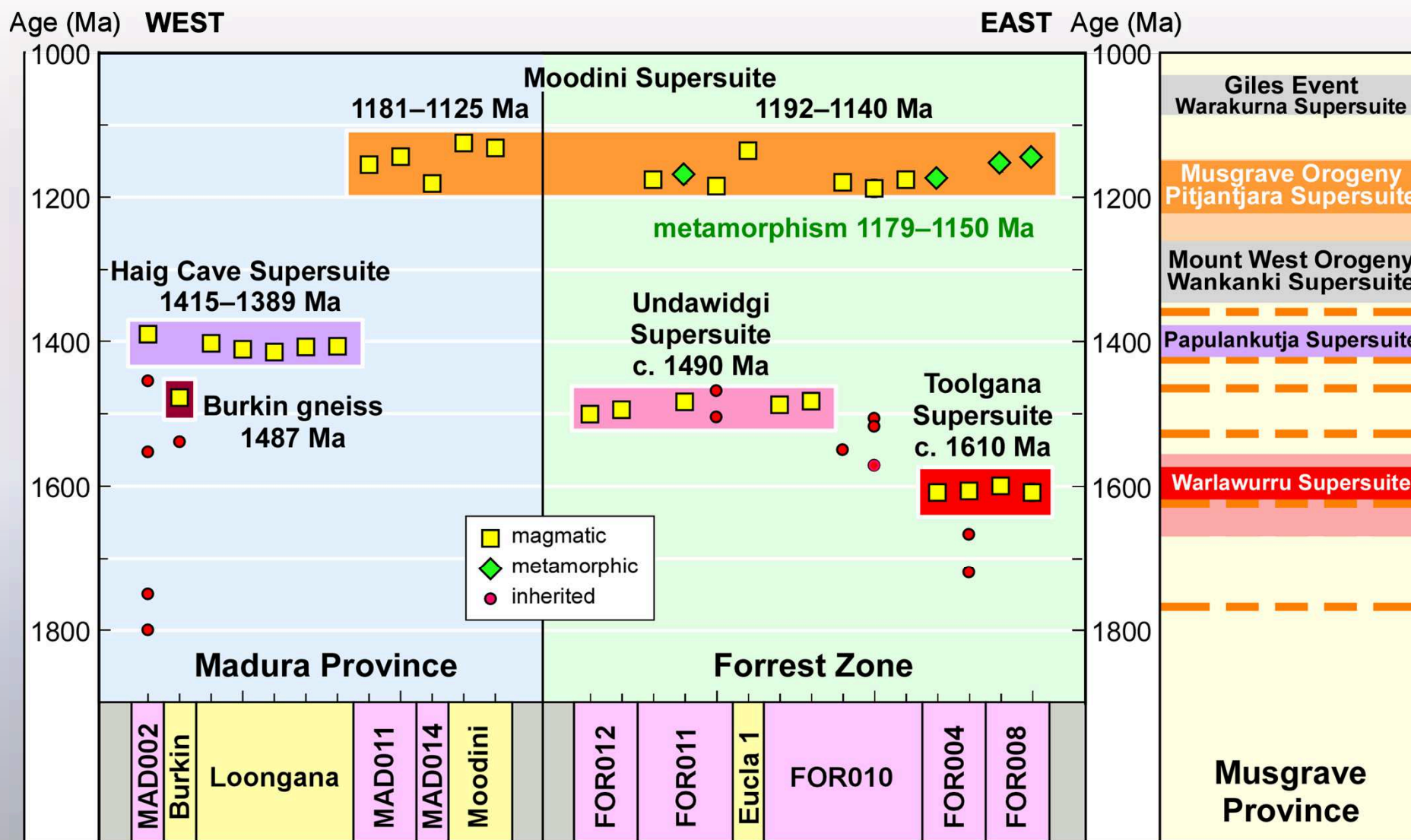


Comparison with Albany–Fraser Orogen



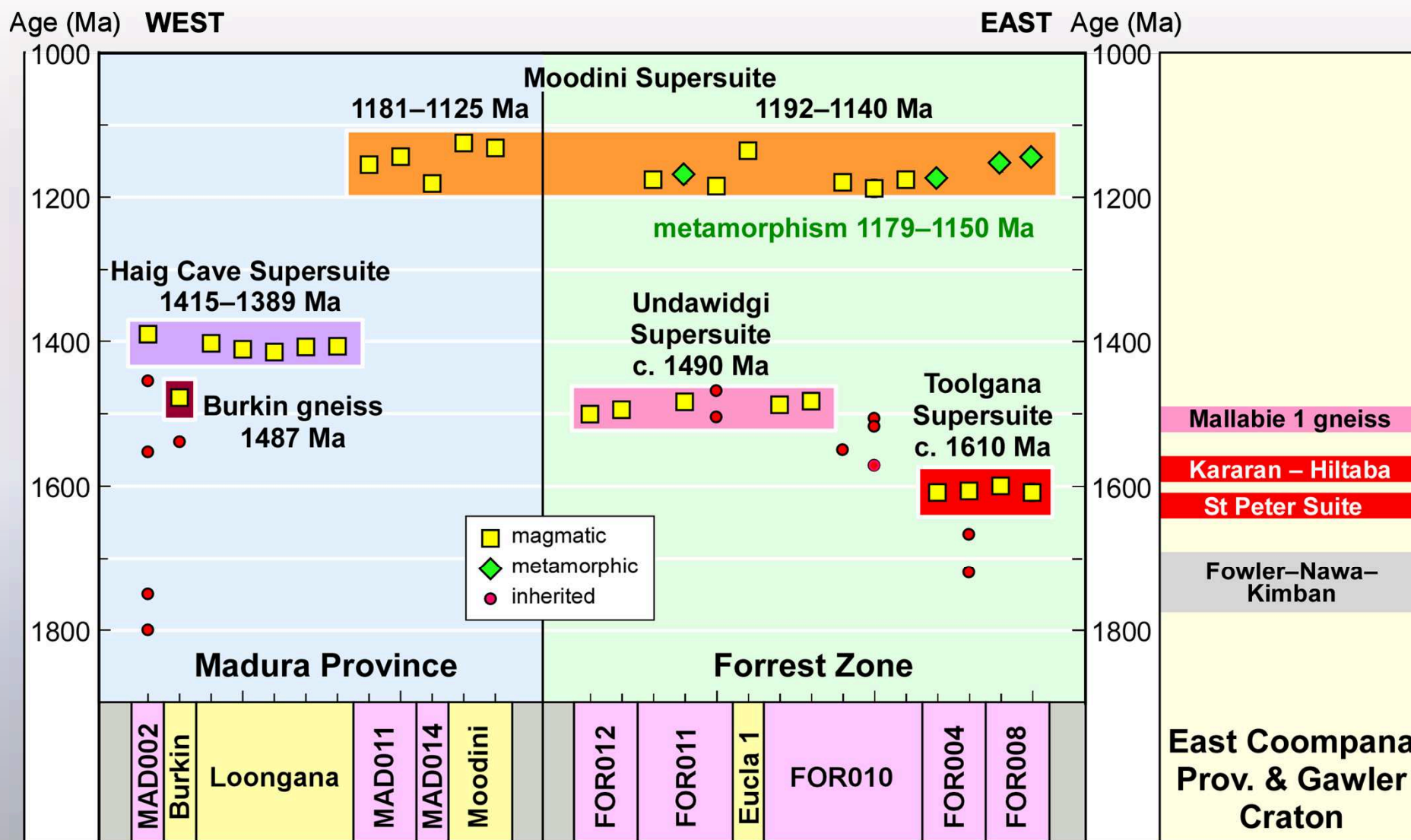


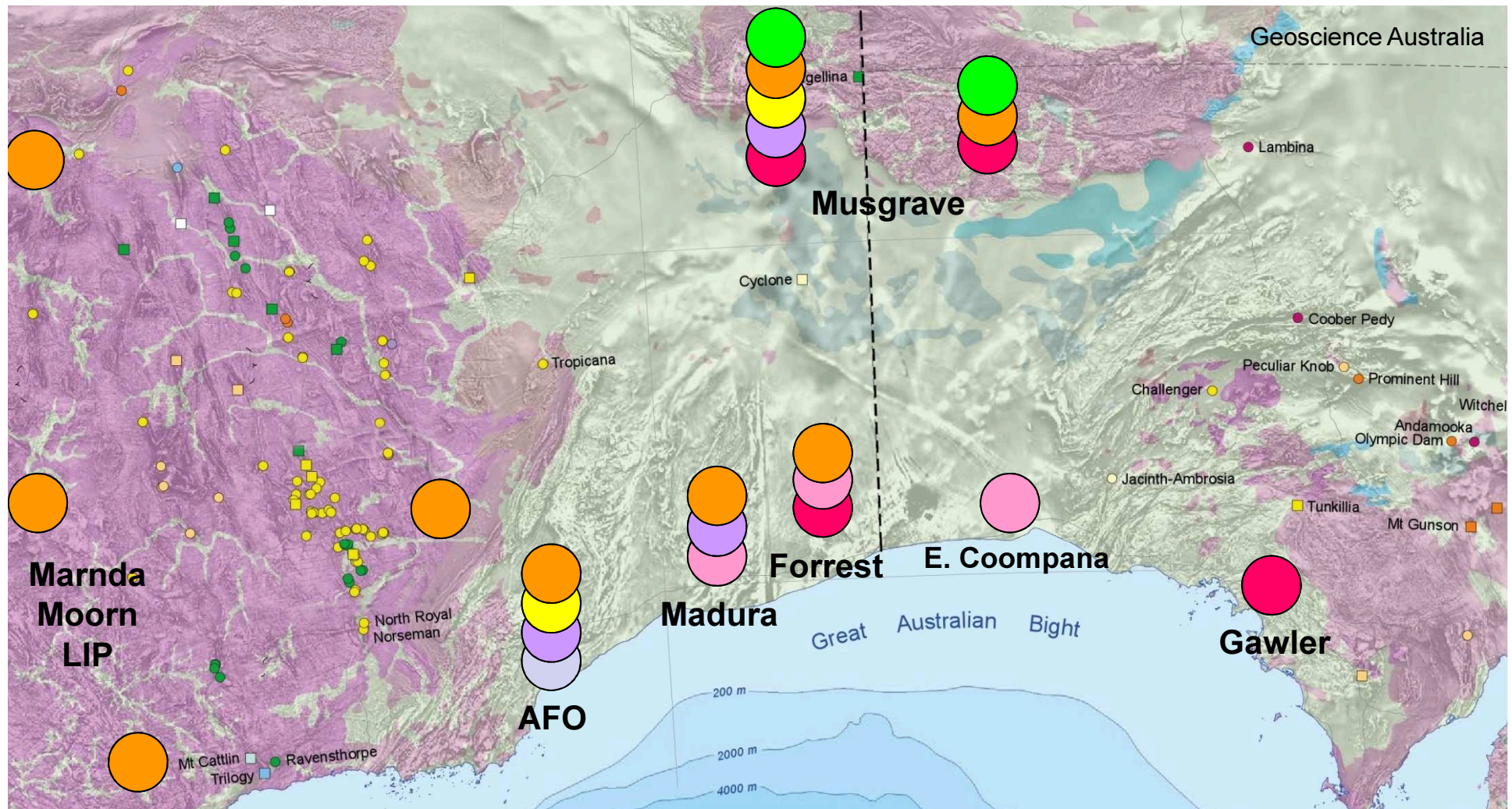
Comparison with Musgrave Province





Comparison with Gawler Craton





Ma	Albany–Fraser Orogen	Madura Province	Forrest Zone	Musgrave Province	E. Coompana – Gawler Craton
1000				Warakurna	
1100				Pitjantjara	
1200	Esperance	Moodini	Moodini	Wankanki	
1300	Recherche			Papulankutja	
1400	Arid Basin	Haig Cave			
1500		Burkin gneiss	Undawidgi		Mallabie 1 gneiss
1600			Toolgana	Warlawurra	St Peter
1700	Biranup				