



A geological overview of the northern Gawler Craton and the Musgrave Province

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Government of South Australia
Primary Industries and Resources SA



Northern Territory Government



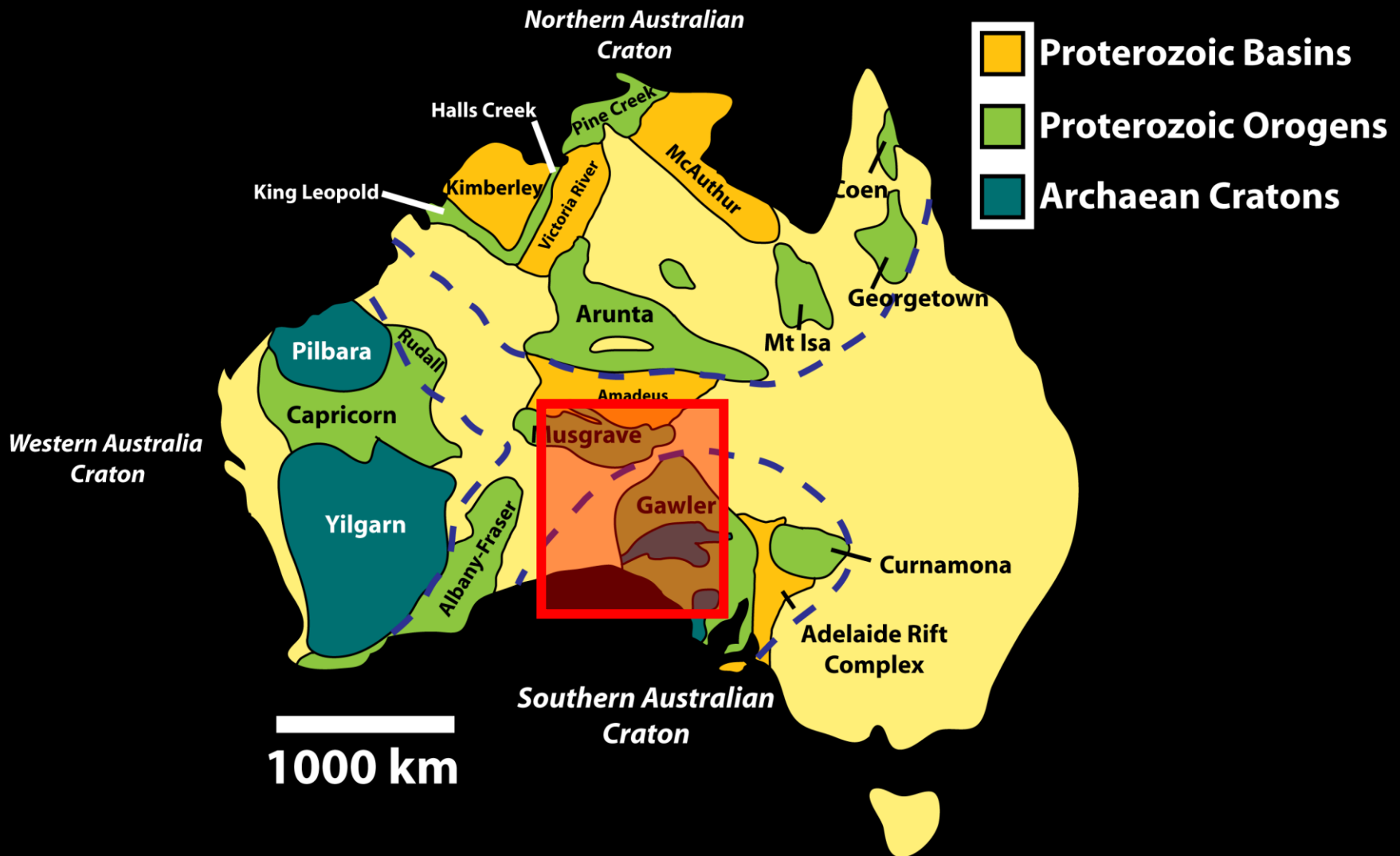
Australian Government
Geoscience Australia



Government of South Australia
Primary Industries and Resources SA

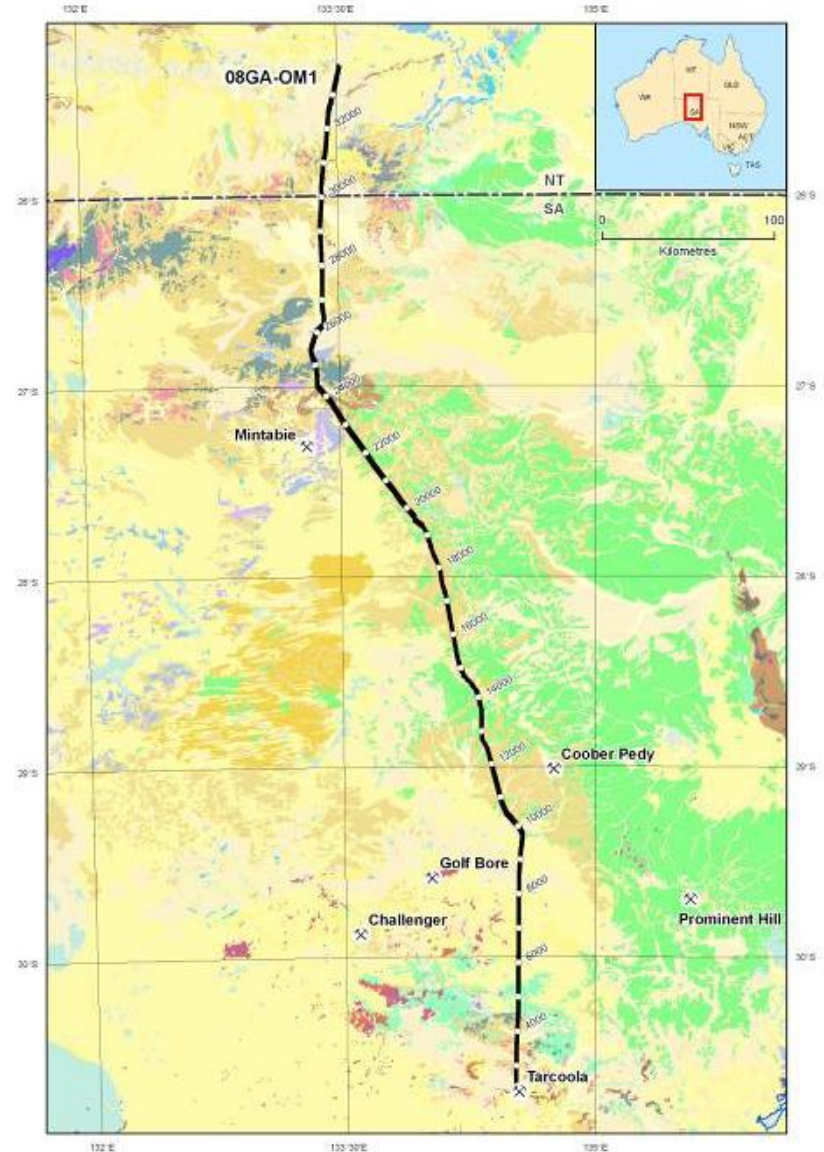
www.minerals.pir.sa.gov.au

Proterozoic Australia

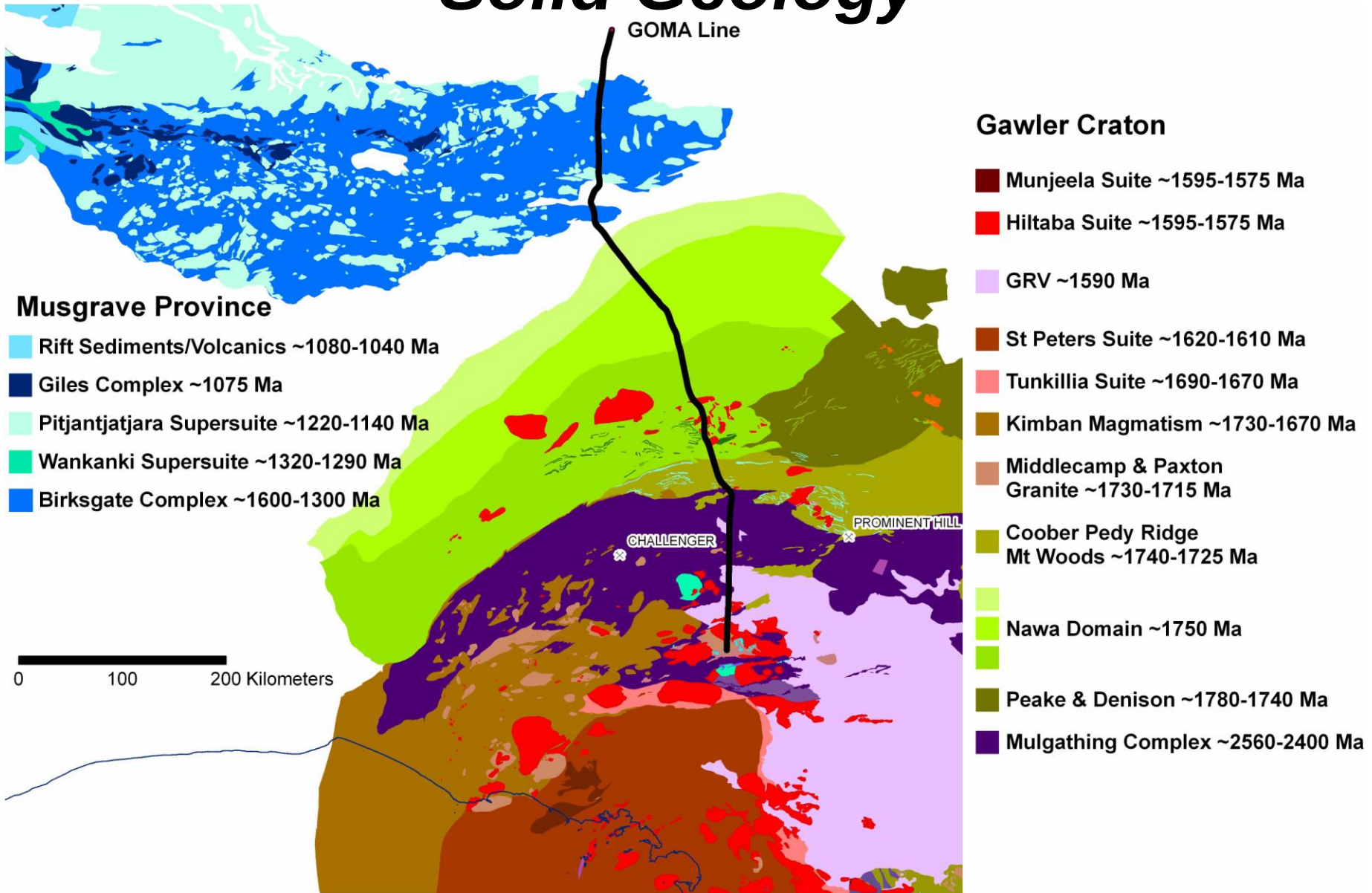


Surface Geology

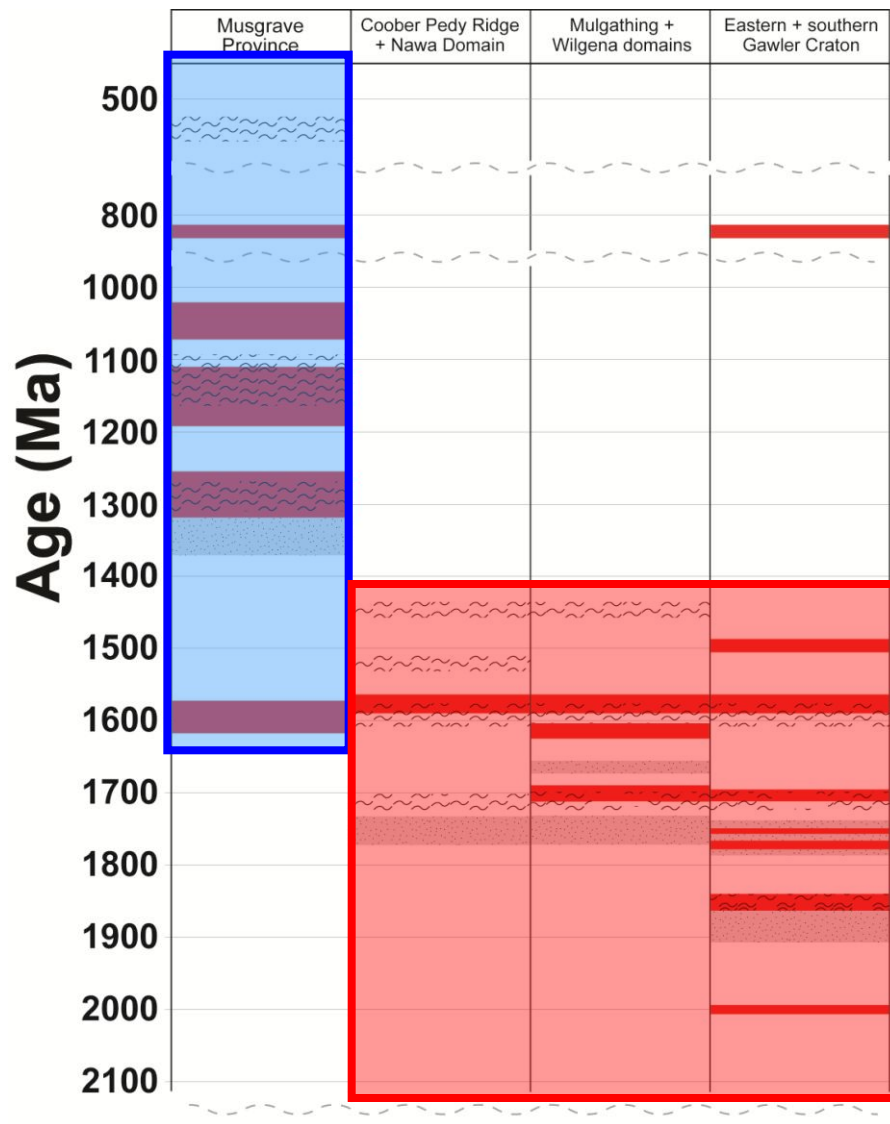
- Neoproterozoic –
Cainozoic sedimentary
cover
- Restricted Access in
Musgrave Province
- Nature of the
relationship between
them is poorly
understood



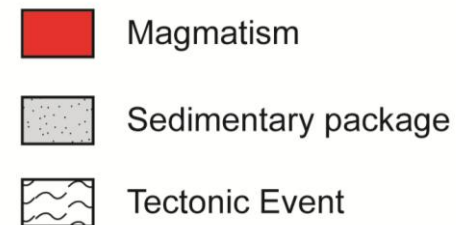
Solid Geology



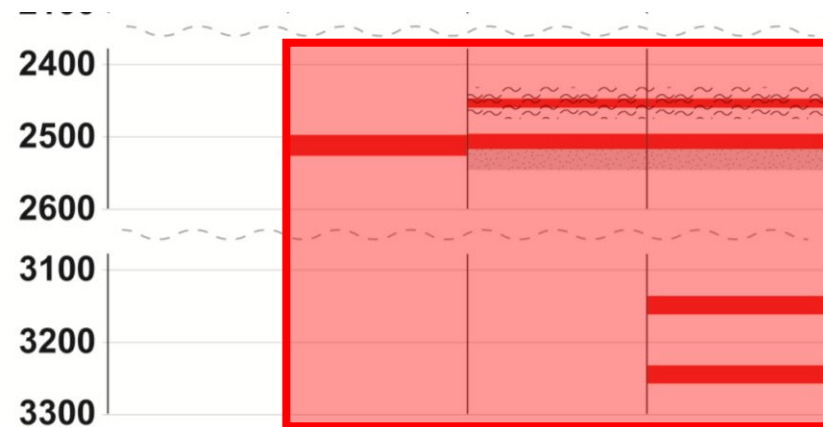
Musgrave Gawler



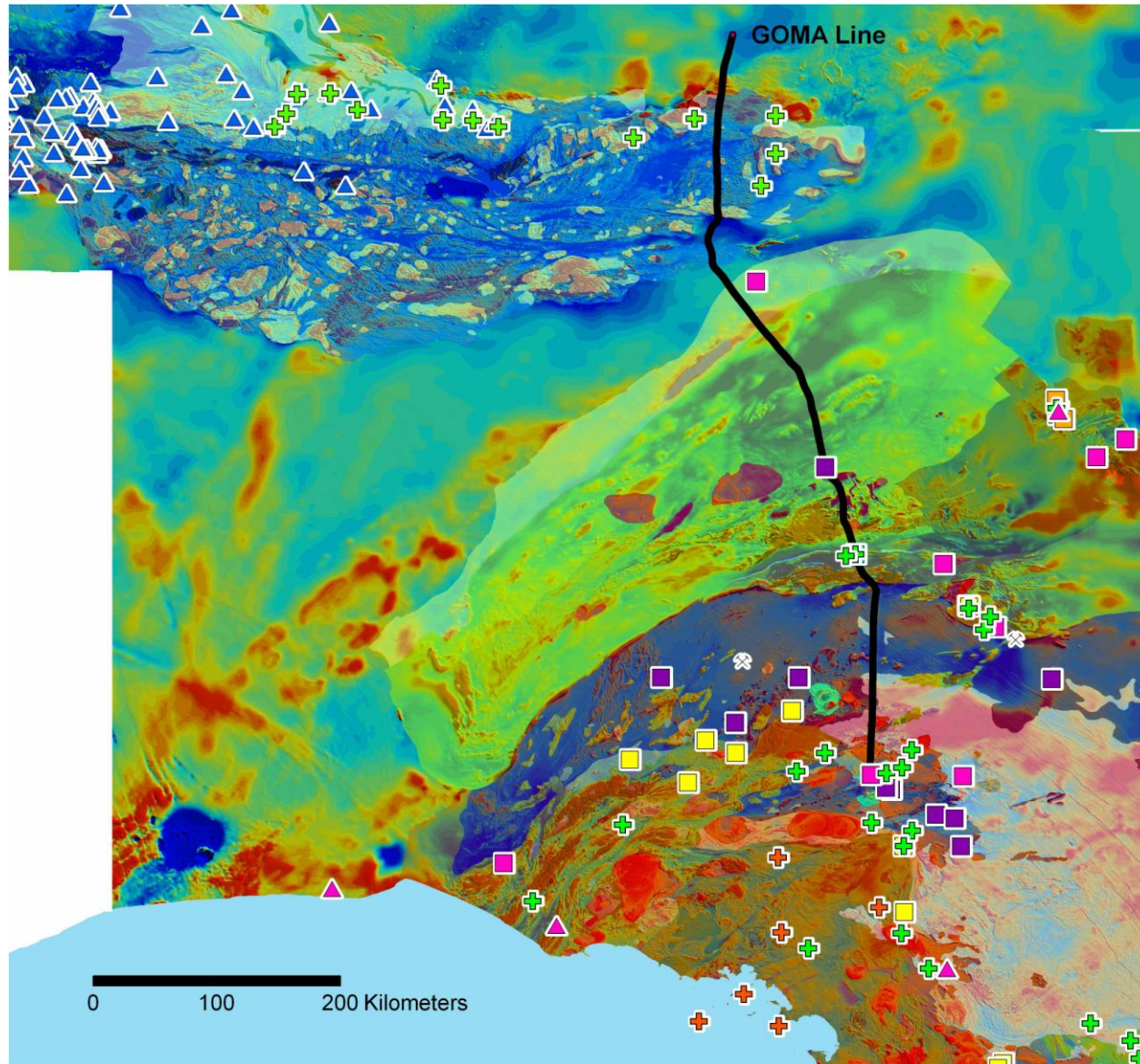
Time Space Plot



Musgrave Gawler



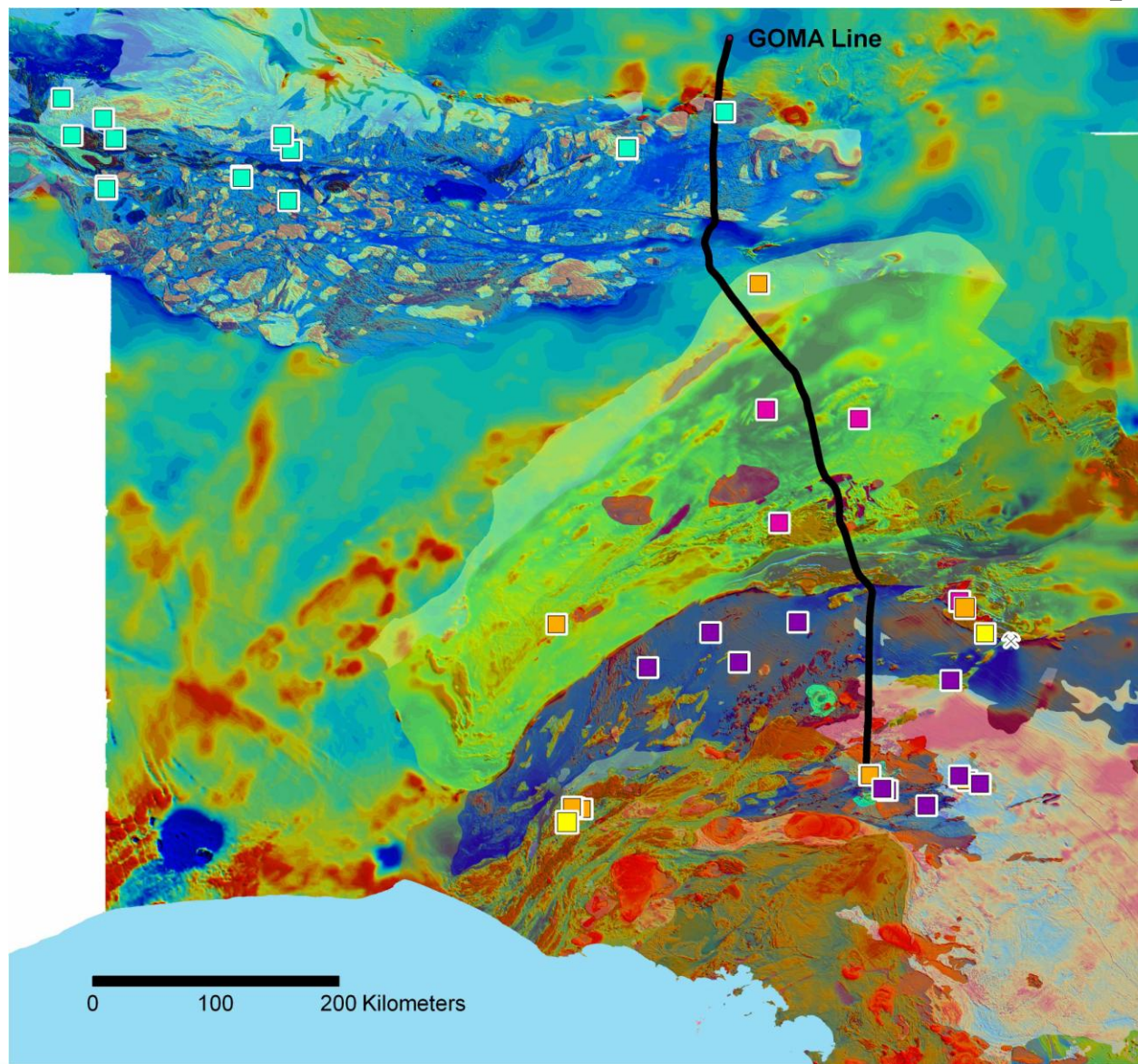
Magmatism



- ▲ ~1330-1040 Ma
- ▲ ~1550-1450 Ma
- + ~1600-1550 Ma
- + ~1650-1610 Ma
- ~1690-1670 Ma
- ~1740-1715 Ma
- ~1800-1780 Ma
- ~1920 Ma
- ~2560-2400 Ma



Sedimentation – Max Dep Ages



■ ~1515-1245 Ma

■ ~1700-1650 Ma

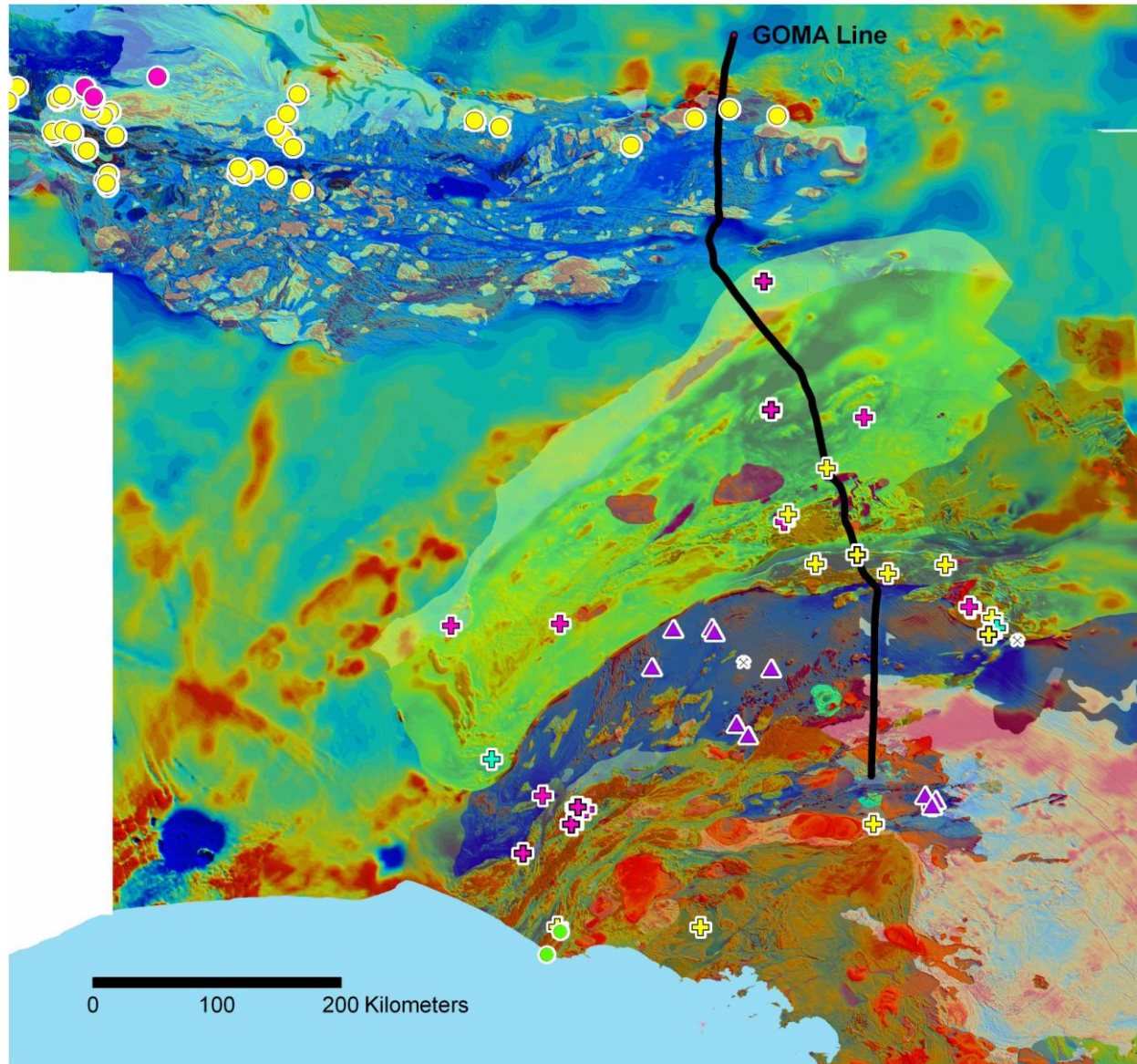
■ ~1750-1700 Ma

■ ~1800-1750 Ma

■ ~2560-2440 Ma



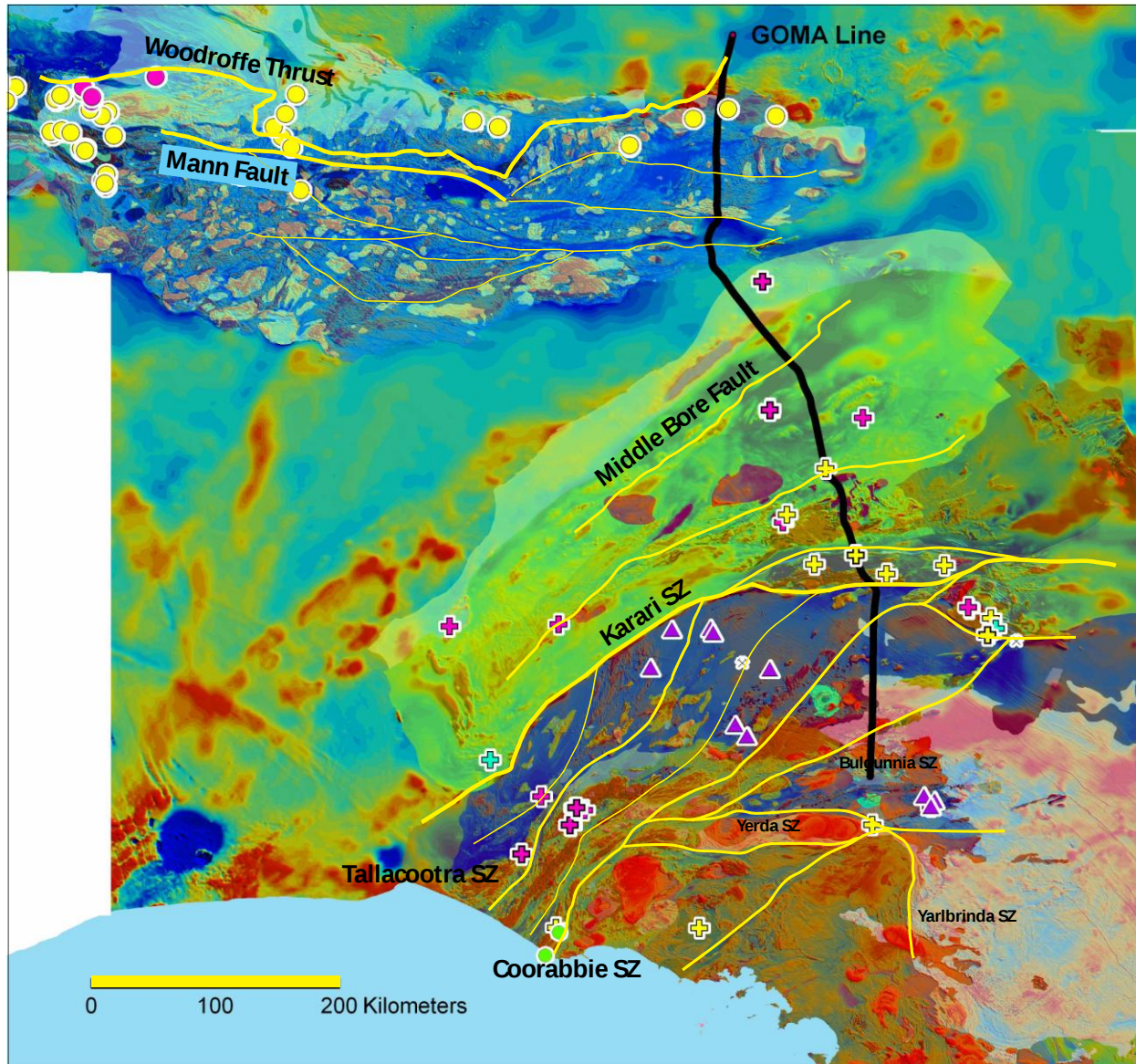
Metamorphism



-  **Petermann Orogeny**
~630-530 Ma
-  **Musgravian Orogeny**
~1220-1140 Ma
-  ~1520-1450 Ma
-  **Kararan Orogeny**
~1595-1540 Ma
-  ~1650 Ma
-  **Kimban Orogeny**
~1730-1670 Ma
-  **Sleafordian Orogeny**
~2480-2420 Ma



Major Structures



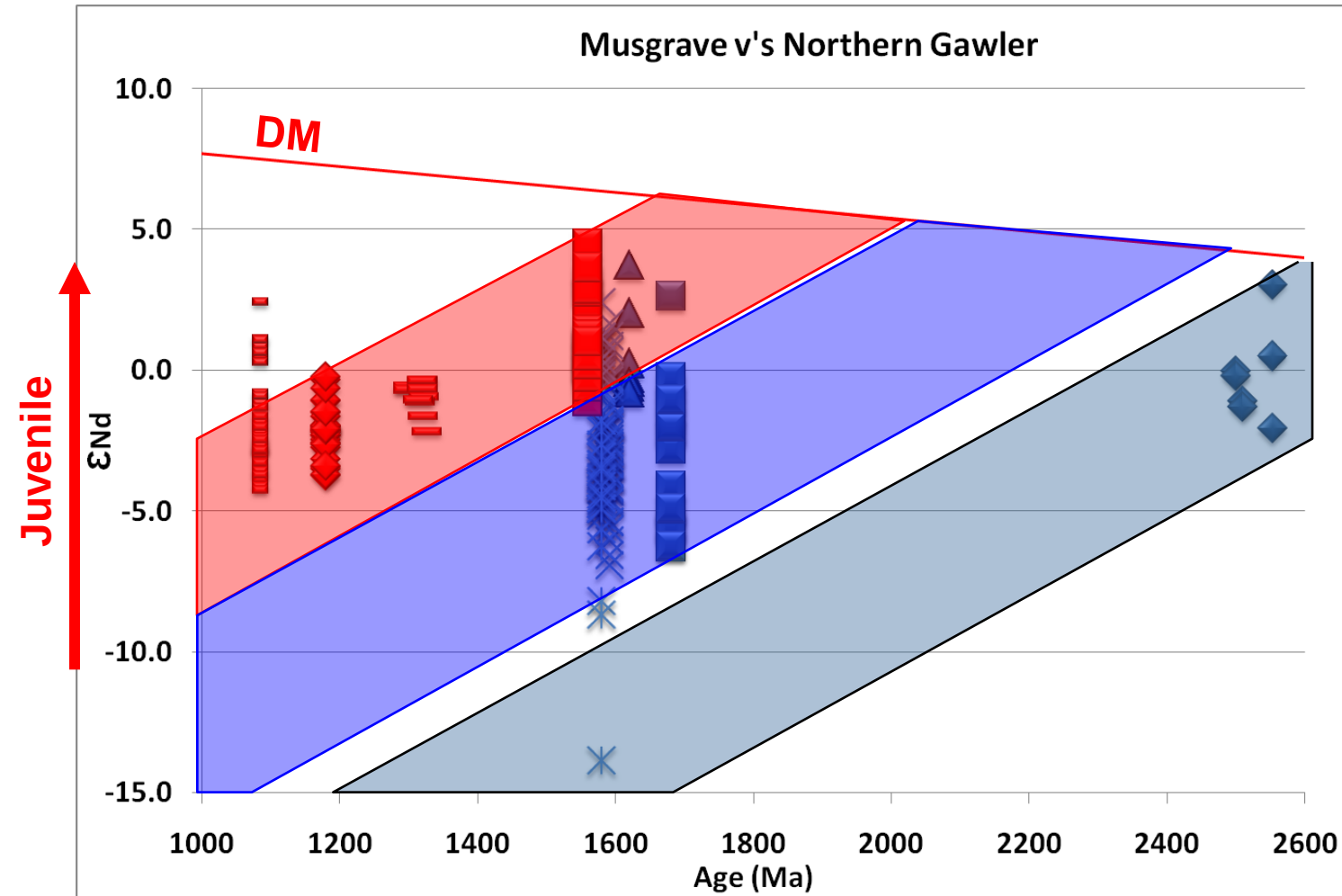
- Petermann Orogeny
~630-530 Ma
- Musgravian Orogeny
~1220-1140 Ma
- ~1520-1450 Ma
- + Kararan Orogeny
~1595-1540 Ma
- + ~1650 Ma
- + Kimban Orogeny
~1730-1670 Ma
- ▲ Sleafordian Orogeny
~2480-2420 Ma



Isotopic Evolution - Magmatic

Gawler

Musgrave v's Northern Gawler

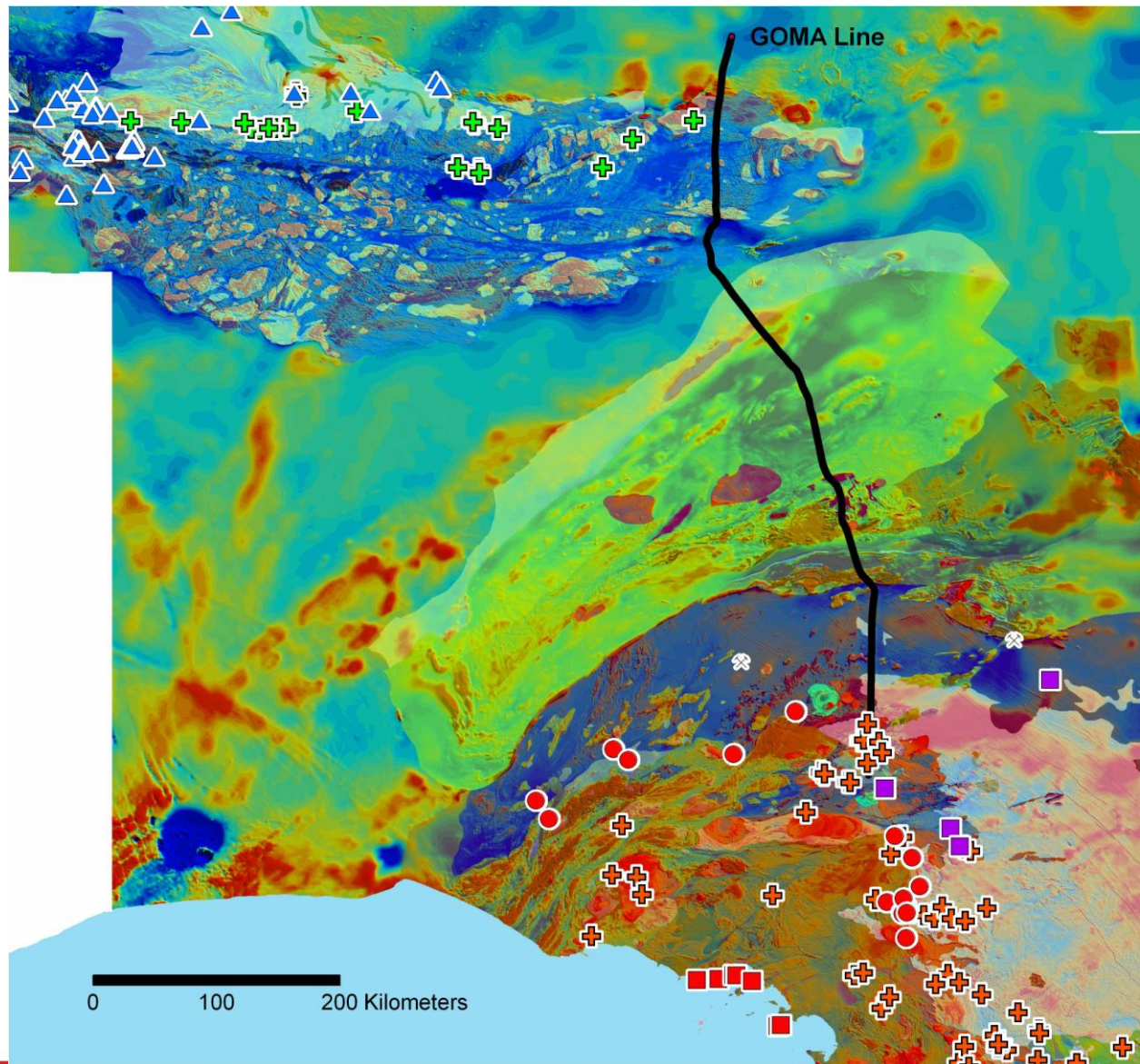


Musgrave

- Unnamed 1600-1540 Ma
- Wankanki Supersuite
- ◆ Pit Supersuite
- Giles Event



Distribution of Sm-Nd data (magmatic)



Musgrave

▲ ~1330-1040 Ma

✚ ~1600-1540 Ma

Gawler

✚ ~1595-1575 Ma

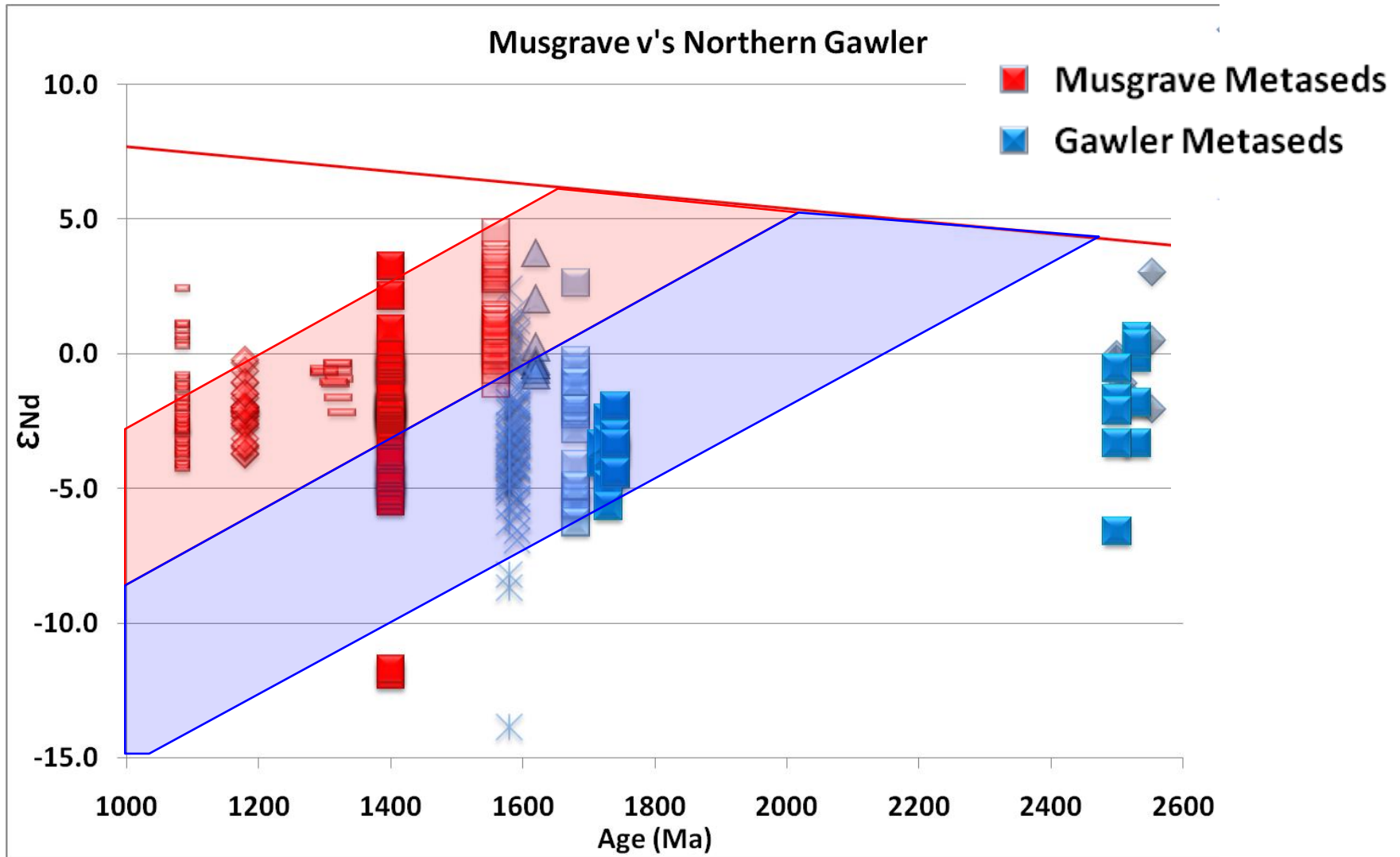
■ ~1620-1610 Ma

● ~1690-1670 Ma

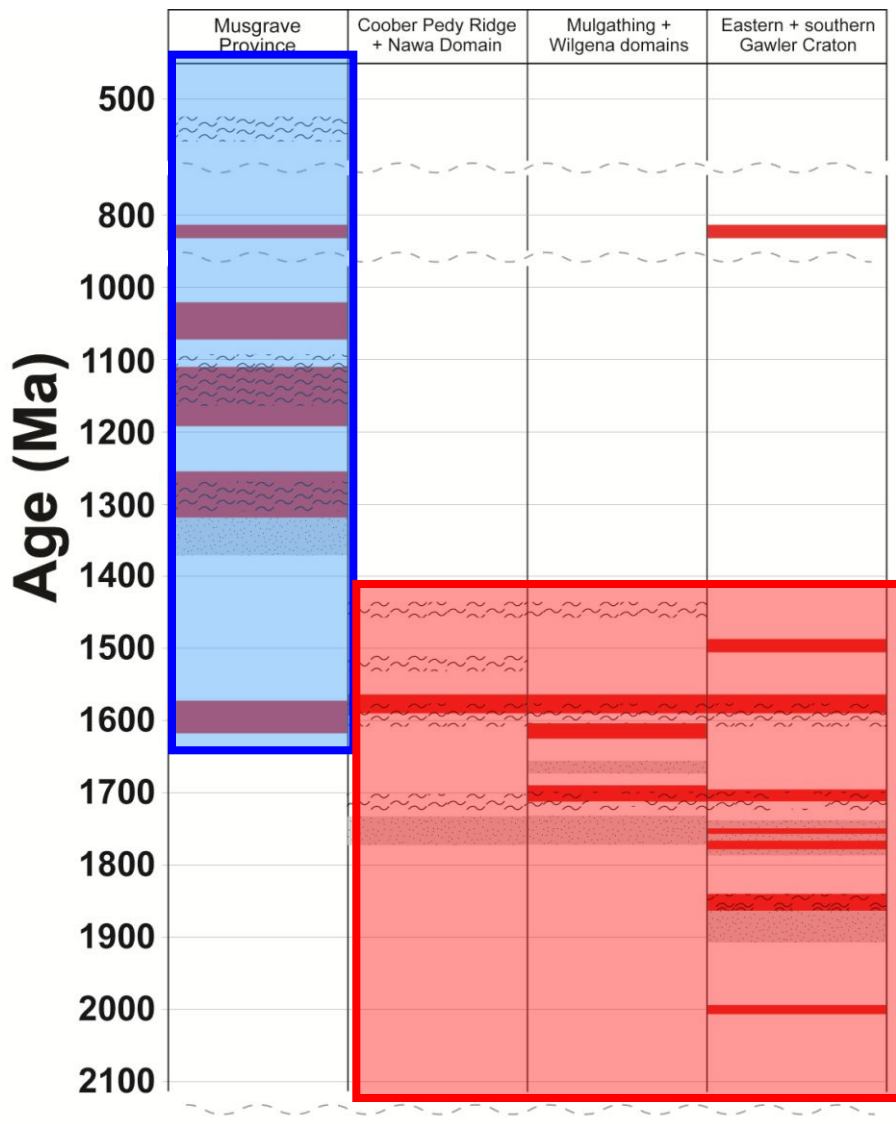
■ ~2560-2400 Ma



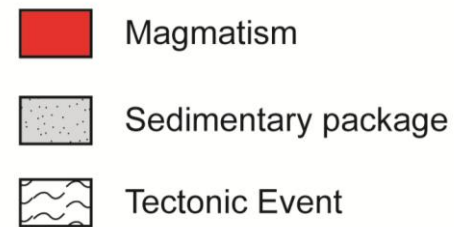
Isotopic Evolution - Sedimentary



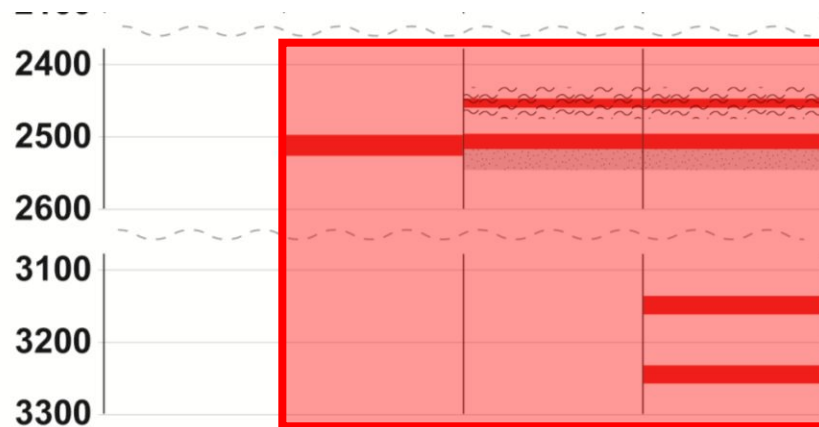
Musgrave Gawler



Time Space Plot



Musgrave Gawler



Acknowledgements

Justin Payne

Caroline Forbes

Katherine Howard

Ben Wade

Kathryn Cutts

Graham Baines

Martin Hand

Kate Selway

Karin Barovich

Wolfgang Preiss

David Kelsey

Michael Szpunar

Alan Aitken

Steve Petrie

