Overview of the Tanami Region Geology

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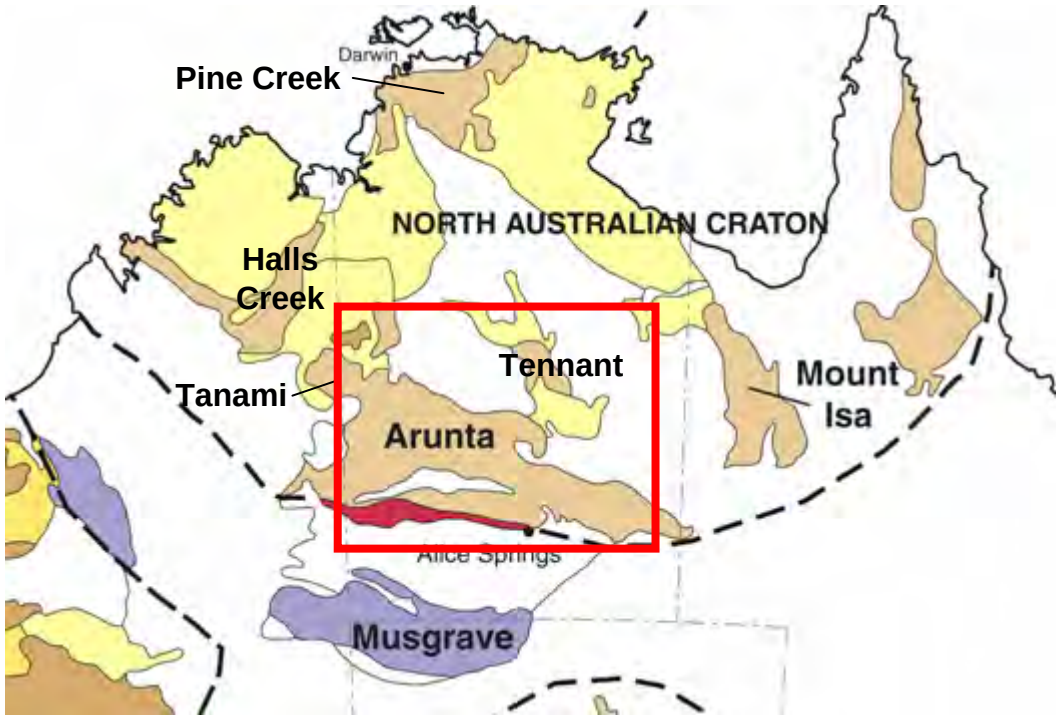
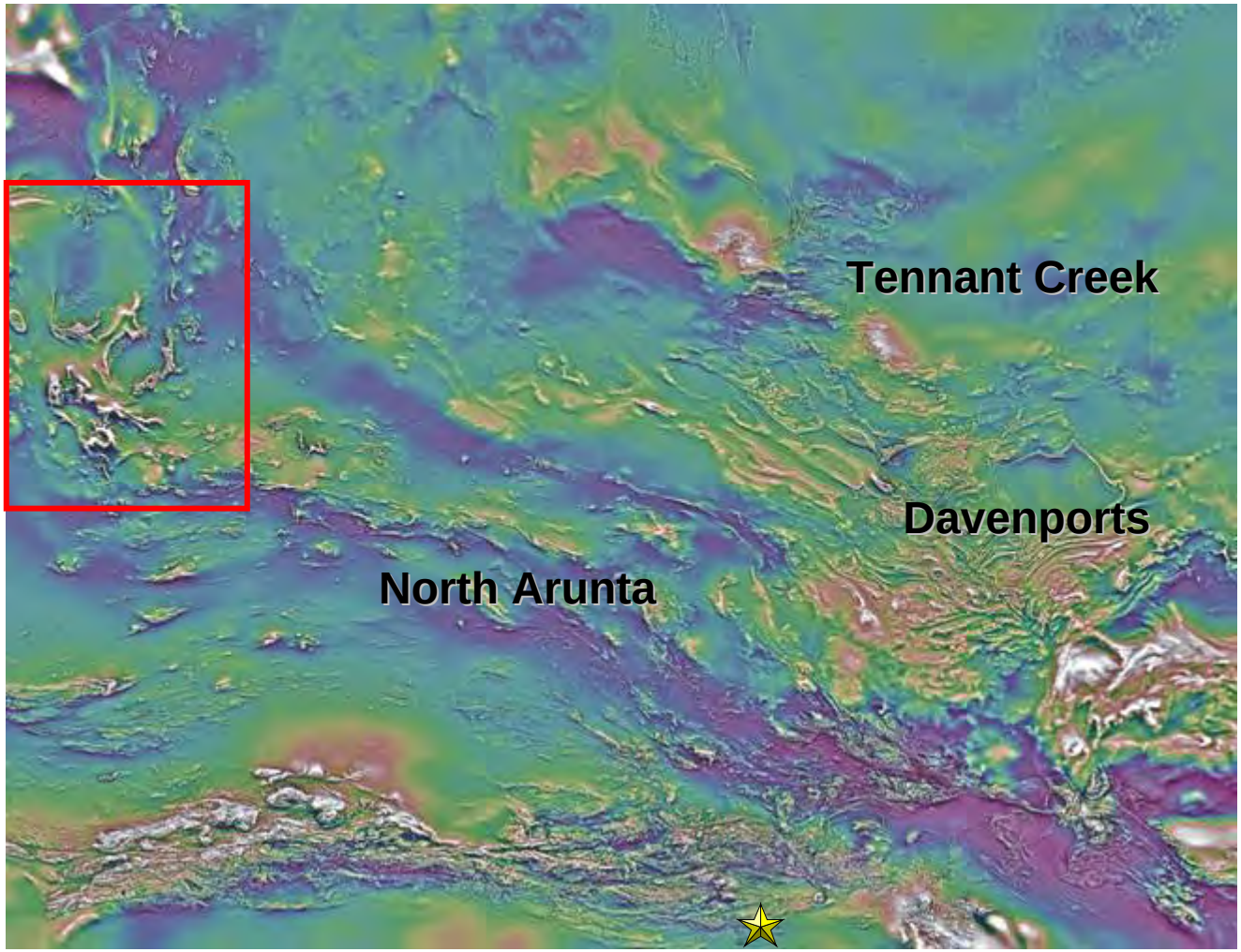
- Mineralisation: Terry Mernagh, David Huston
- Stratigraphy: Nic Williams, Lex Lambeck
- Geophysics Modelling: Tony Meixner

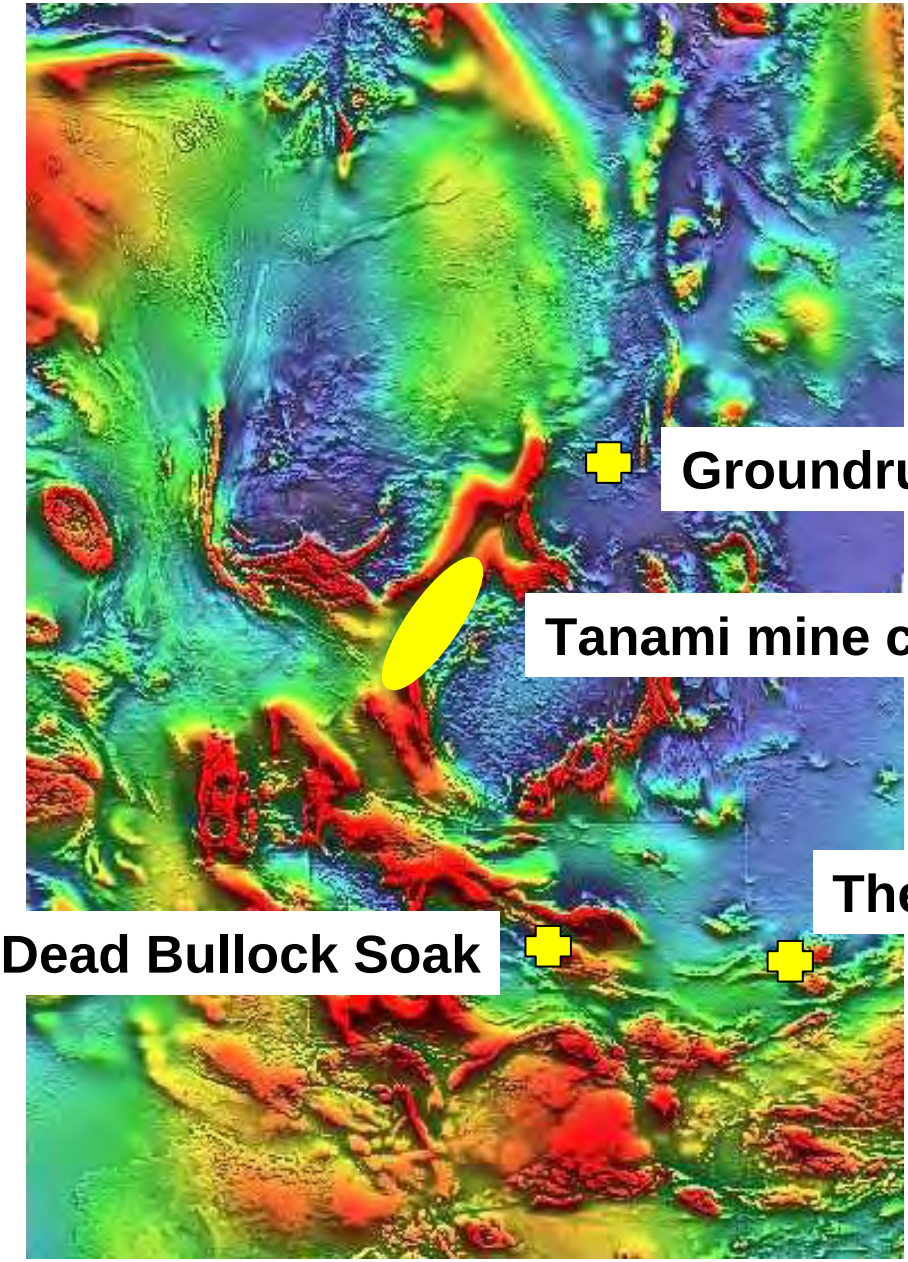
North Australian Craton…

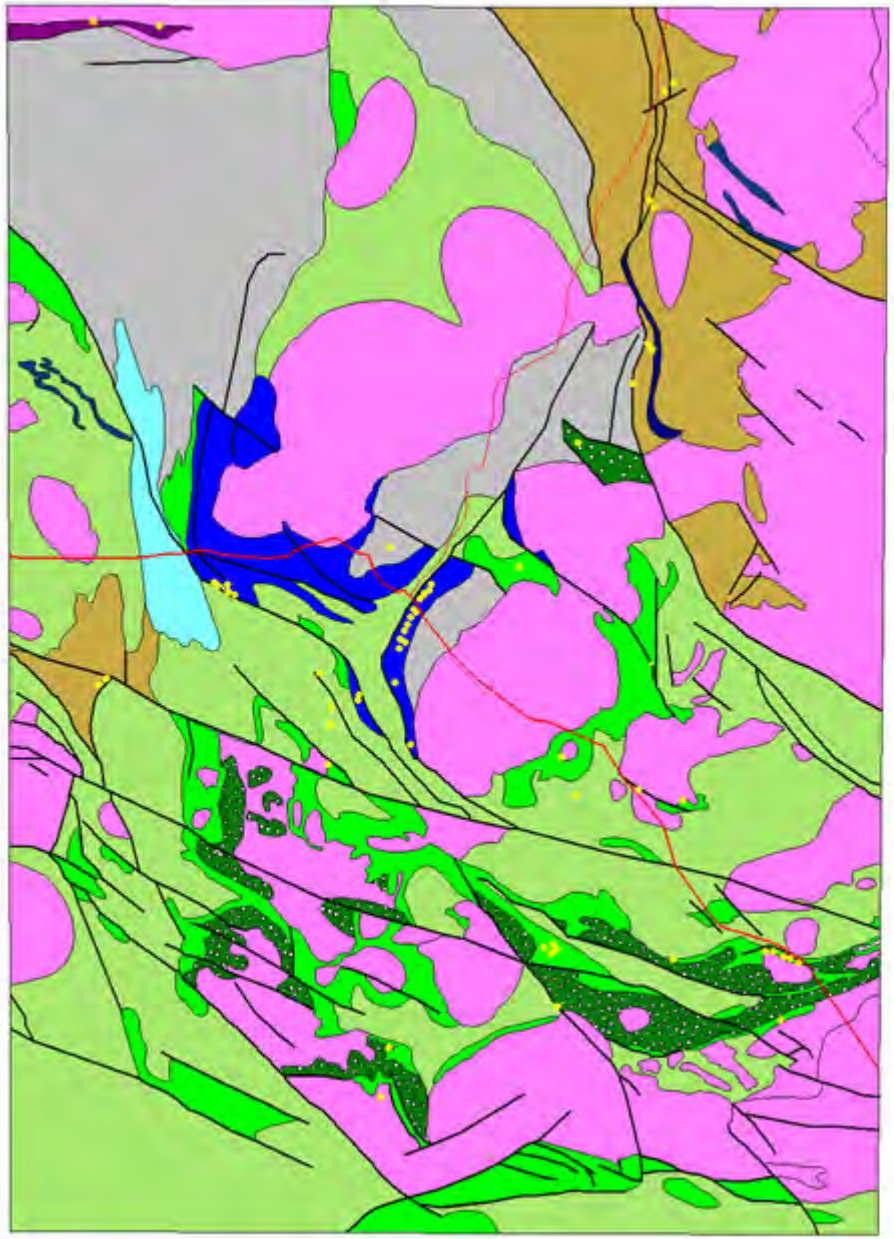


- Centrally located within the NAC
- Cycle 1 – Tanami Group
- Cycle 2 – Ware Group and Mt Charles Fm
- Cycle 3 – Pargee Sst and Birrindudu Group

Regional Magnetics




Groundrush
Tanami mine corridor
The Granites
Dead Bullock Soak



Pargee Sandstone

Dolerite

Granite

Mount Charles Formation

Ware Group

Undivided Tanami Group

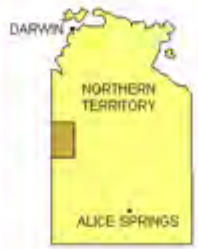
Killi Killi Formation

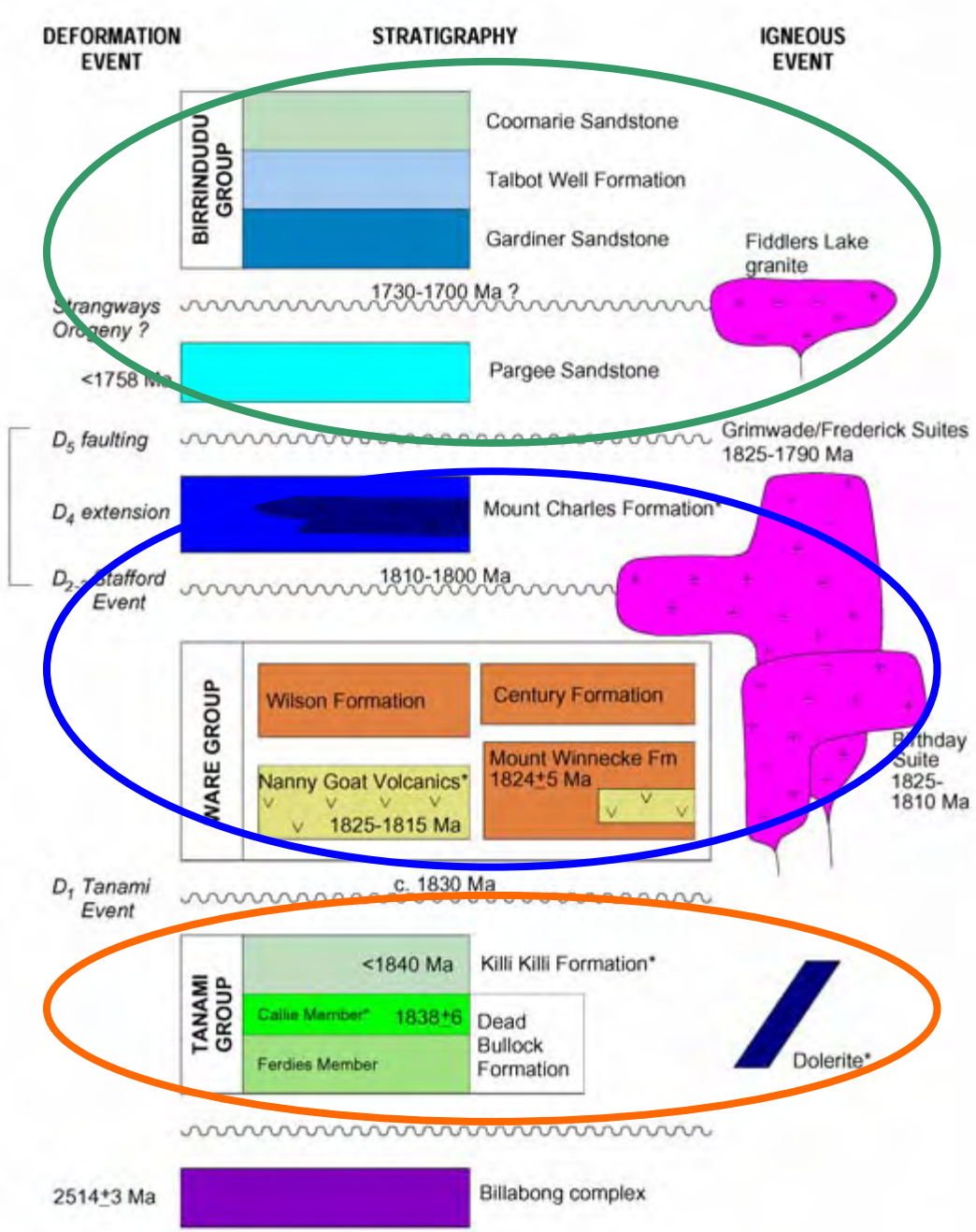
Callie Member
Ferdies Member
Dead Bullock Formation

Archaean

GOLD DEPOSIT

ROAD





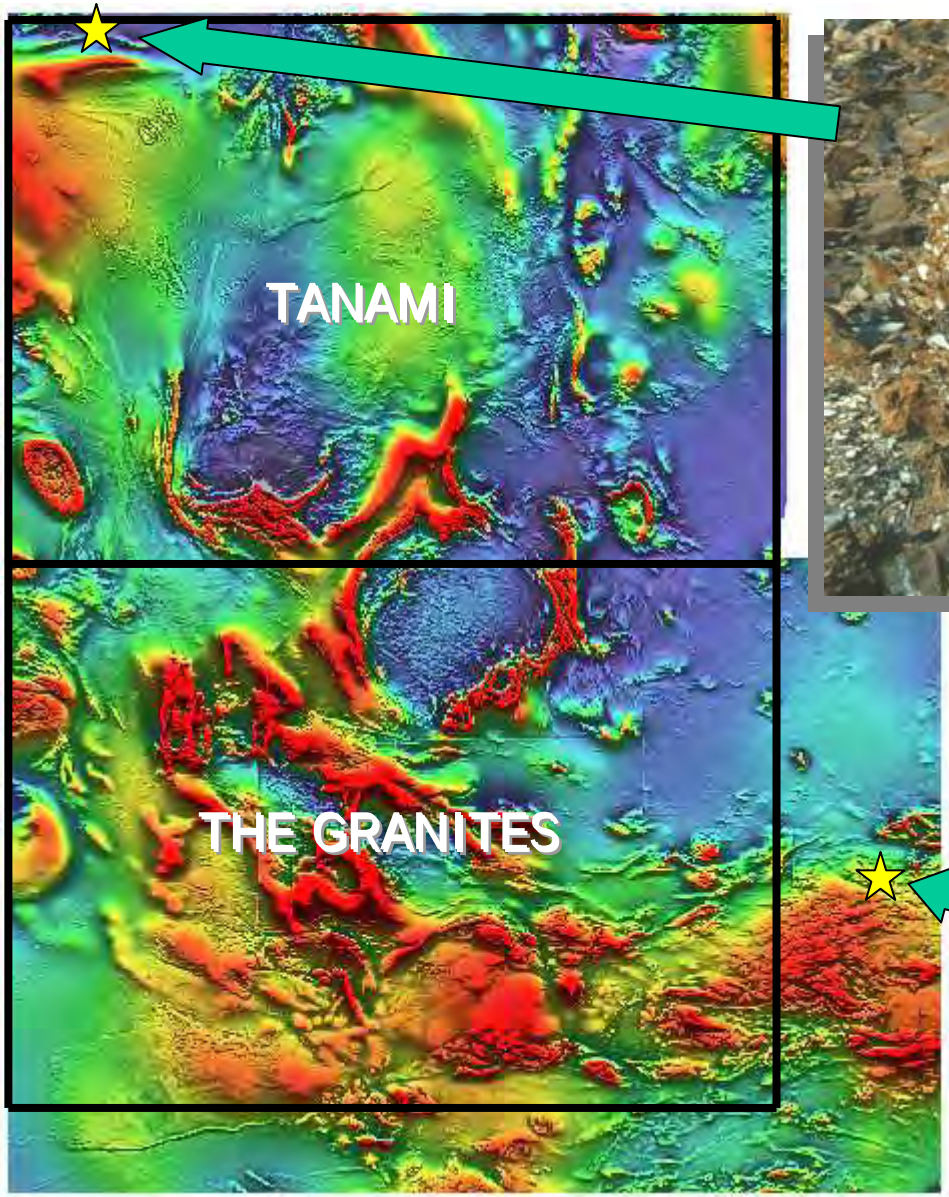
Tanami Stratigraphy

Cycle 3 platform

Cycle 2 extension?

Cycle 1 ‘R-S-T’

Archaean Basement (Page et al. 1995)

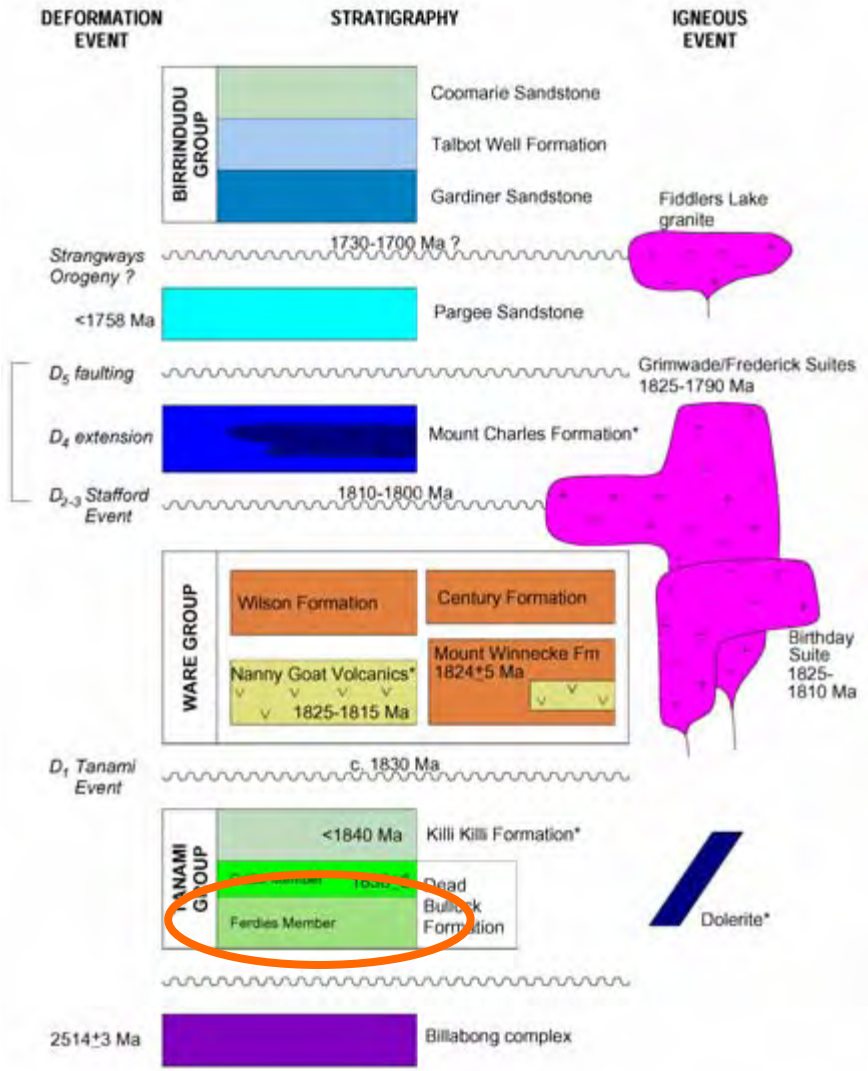


- granitic gneiss, schist
- 2530-2500 Ma
- Possibly inheritance in Prot. granitoid

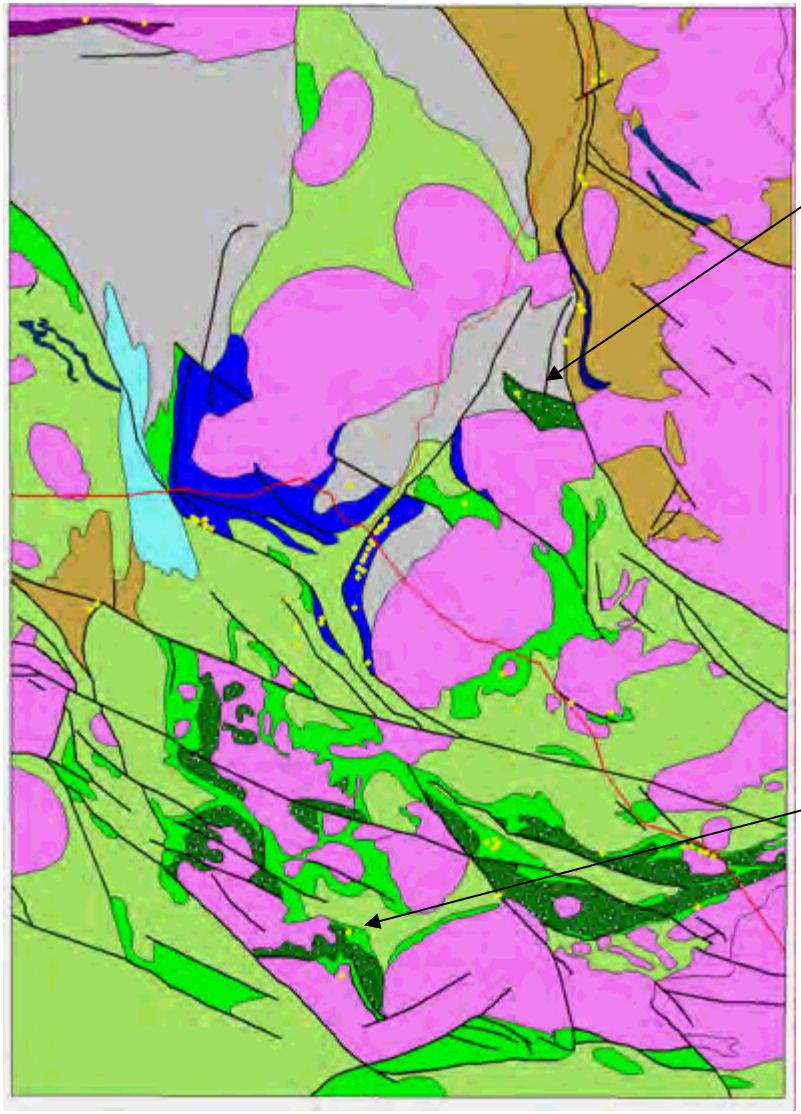
Ferdies Member

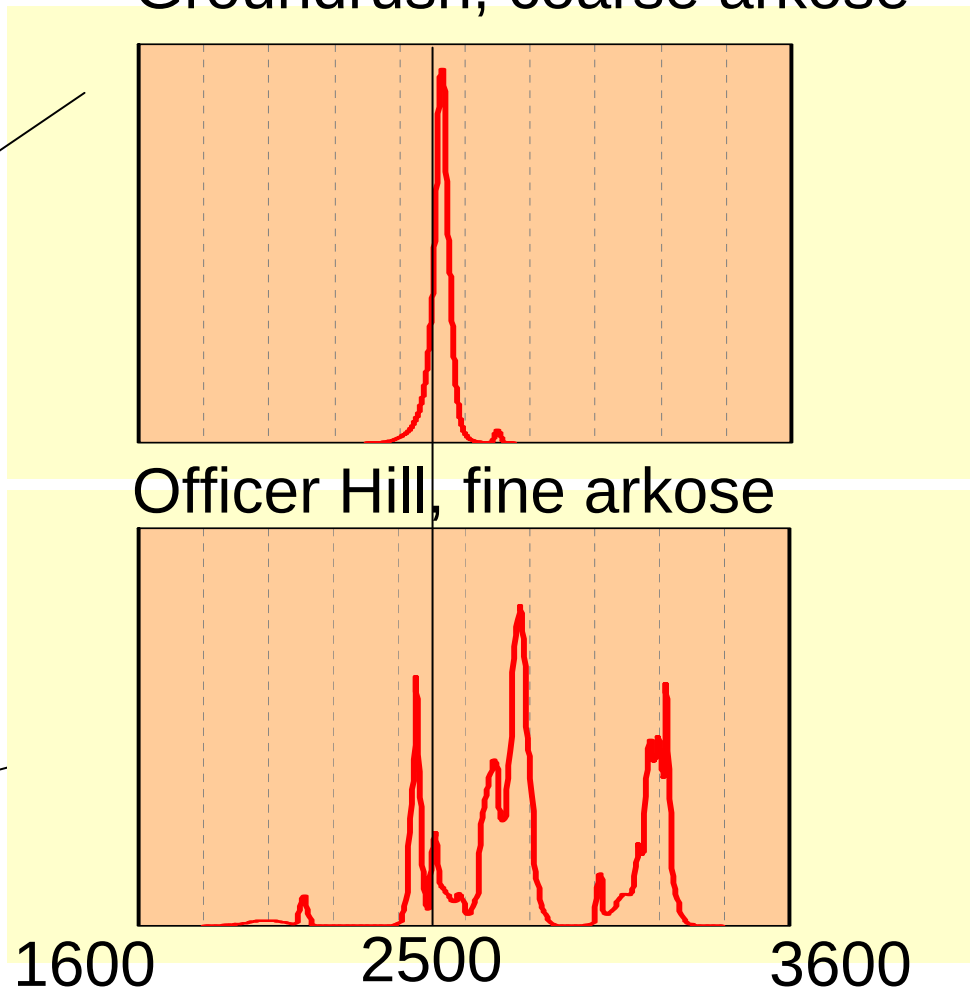
- granitic conglomerate
- siltstone
- Metamorphosed to lower amphibolite facies
- Distinct age spectra

GROUNDRUSH PIT, 2003



Ferdies Member, detrital spectra





Callie Member

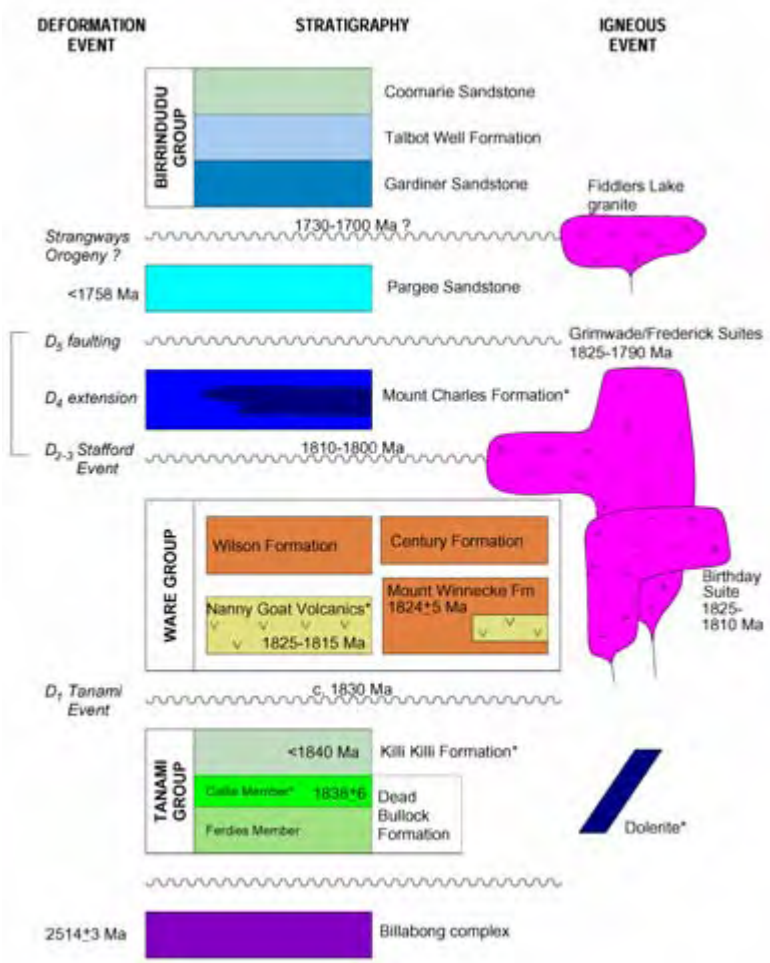
Dead Bullock Formation

- siltstone and dolerite
- high magnetic signature (dolerite sills)
- reactive package (carbonaceous, iron formation)
- low sediment input in deep water environment

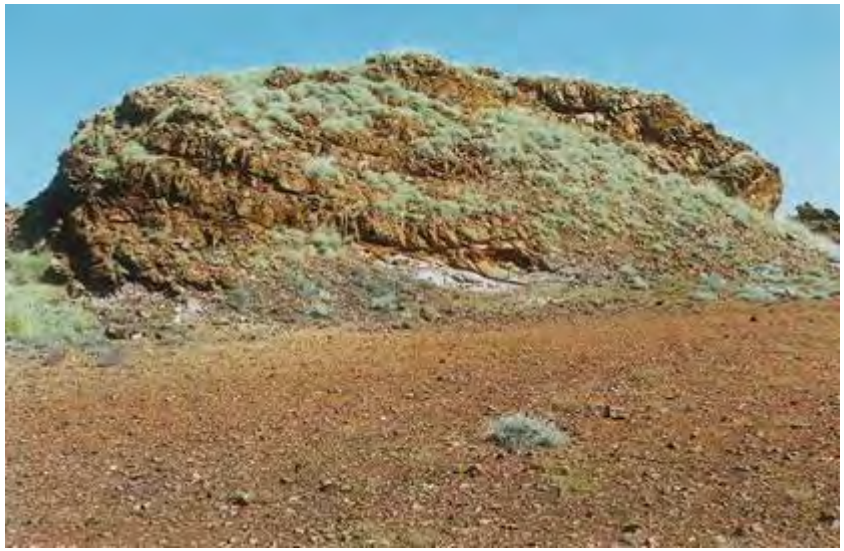
Callie Member

Dead Bullock Formation

- Intruded by 1844 ± 3 Ma granite?
- Tuffaceous sandstone, Black Hills 1838 ± 6 Ma
- Seems young – maybe be within Killi Killi Fm (chert member)
- Test possible with geochemistry



Killi Killi Formation

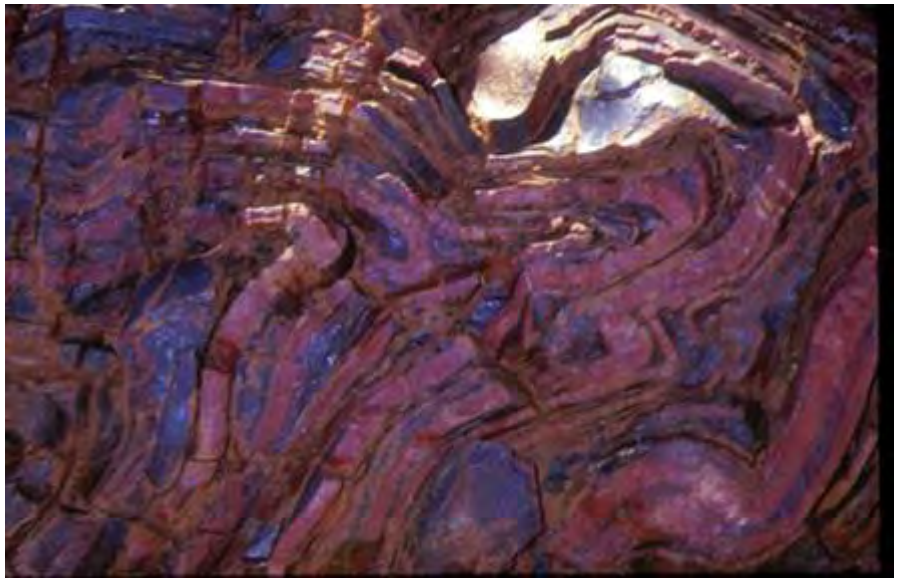


- turbidite package
- micaceous greywacke and siltstone
- uplift in source area and onset of orogeny
- low magnetic signature

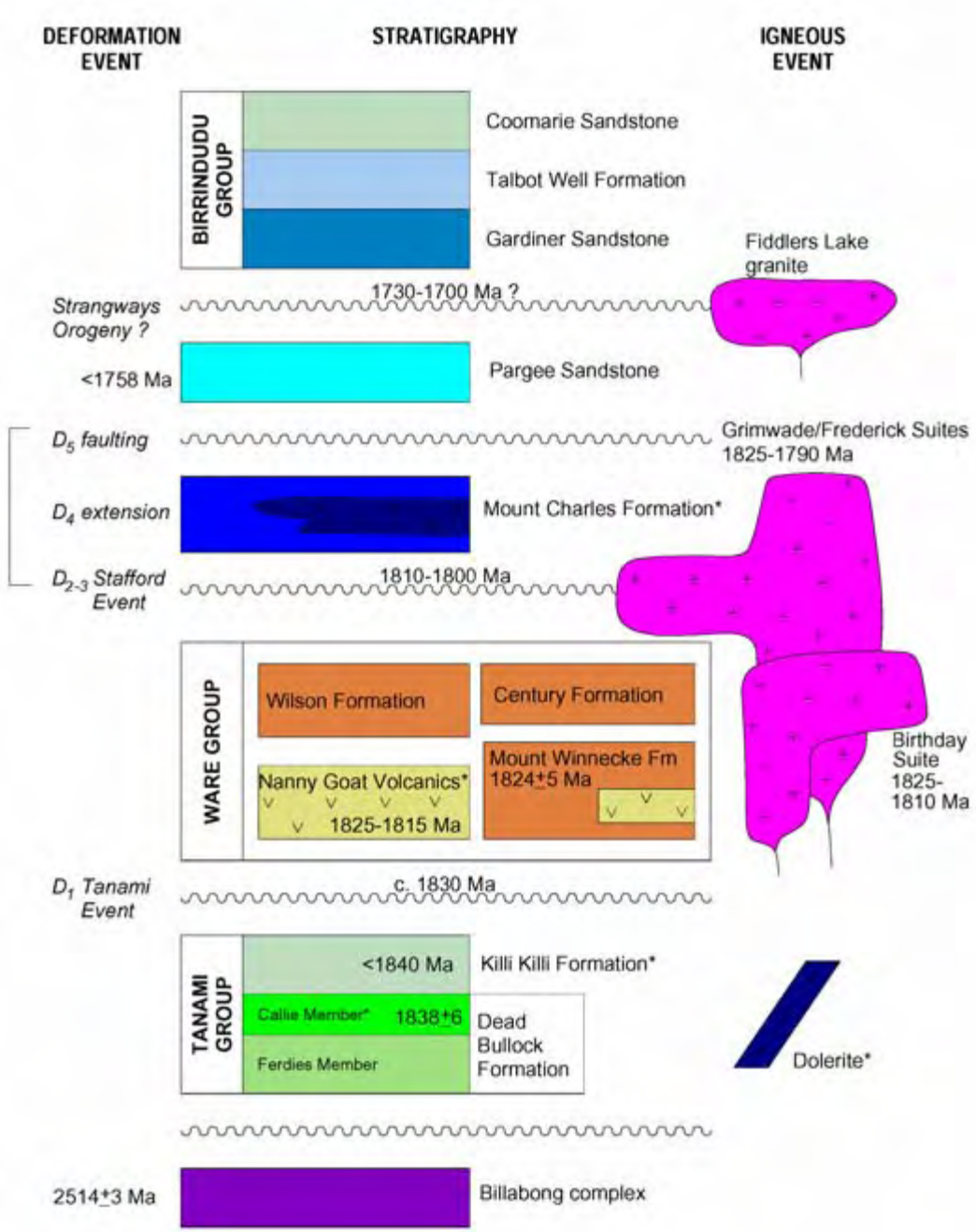
Killi Killi Formation

Jasper chert member

- May be more than one
- Dead Bullock look-a-like
- Represents a temporary shut-down of sedimentation



Tanami Stratigraphy



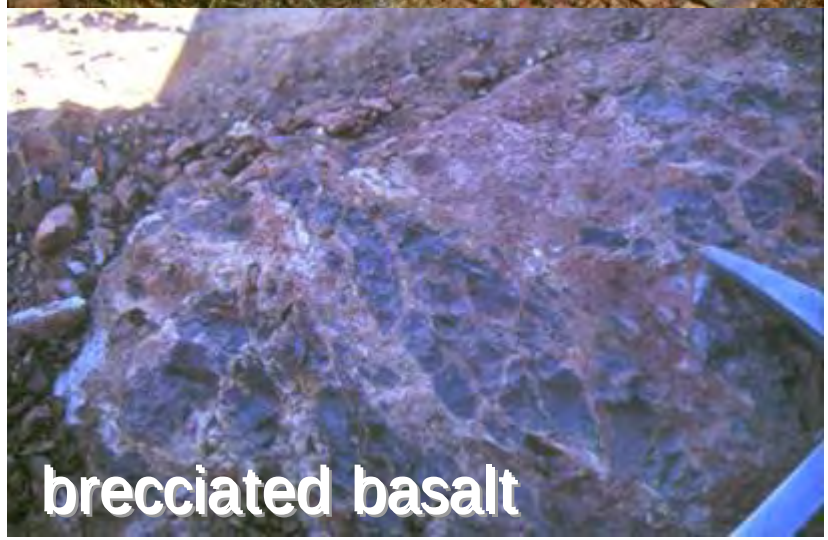
Cycle 3 platform

Cycle 2 extension?

Cycle 1 ‘R-S-T’

Ware Group volcanic

- rhyolite lava, subaerial ignimbrites
- associated with granophyre (1815 ± 5 Ma)
- minor basalt
- unmetamorphosed
- volcanic age 1825-1815 Ma
- subaerial source for Ware Group sediments



Ware Group sediment

Wilson Formation

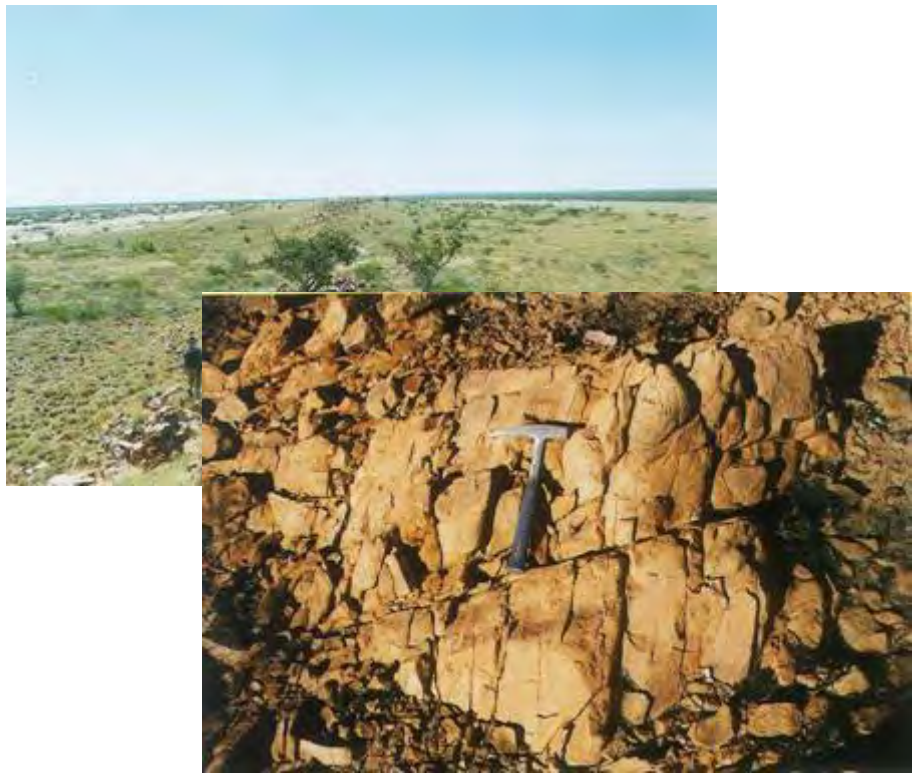
•greywacke, looks like Killi Killi Formation

•Detrital ages 1815 ± 13, 1831 ± 6 Ma

Century Formation

•Lithic sand and silt package

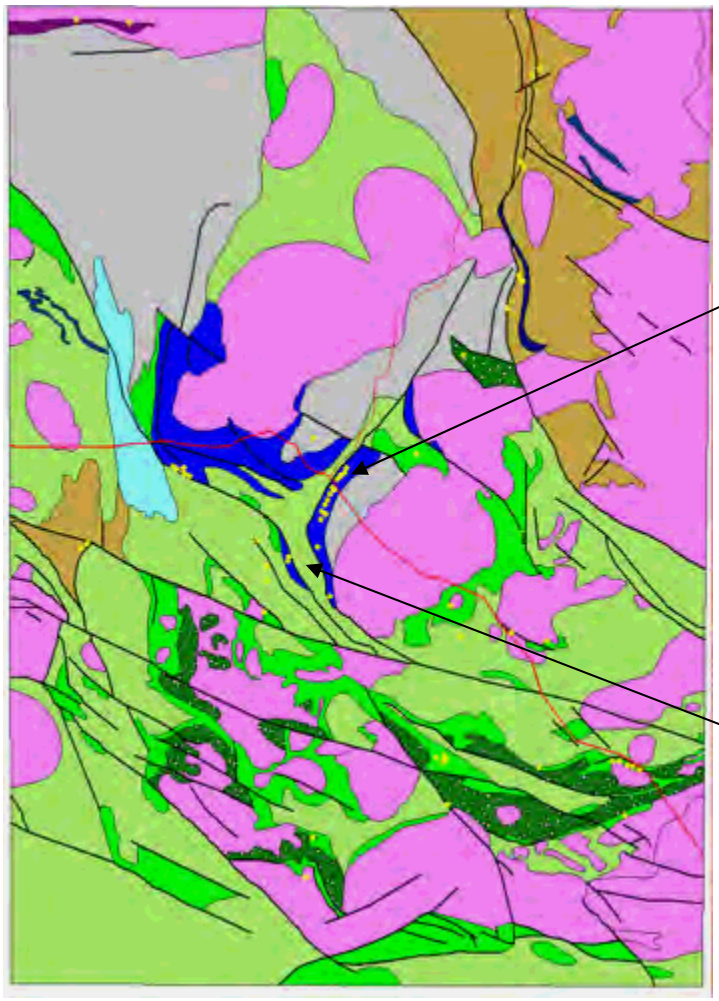
•Detrital age 1823 ± 4 Ma



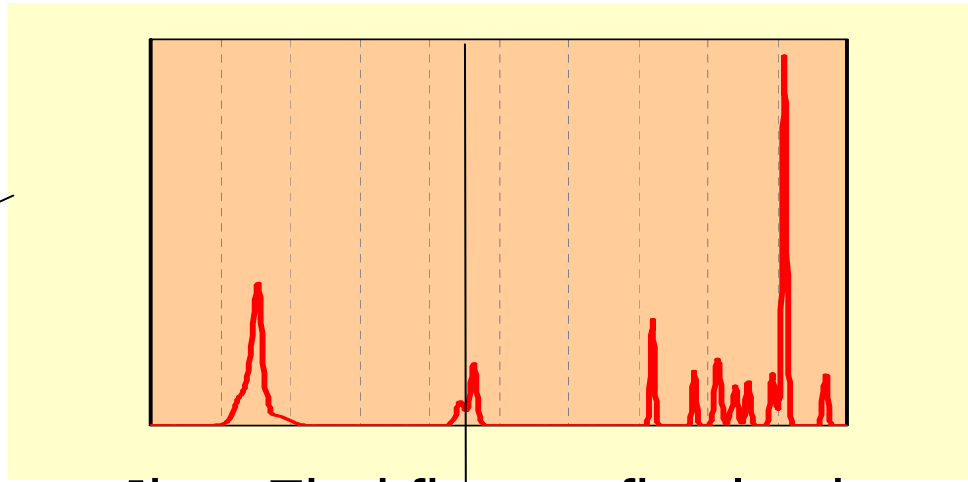
Mount Charles Formation

- basalt and volcaniclastic sediments
- pillow basalt and turbiditic sediments
- low metamorphic grade
- structurally simple
- intruded by felsic magmatism
- continental rift (Tunks, 1996)

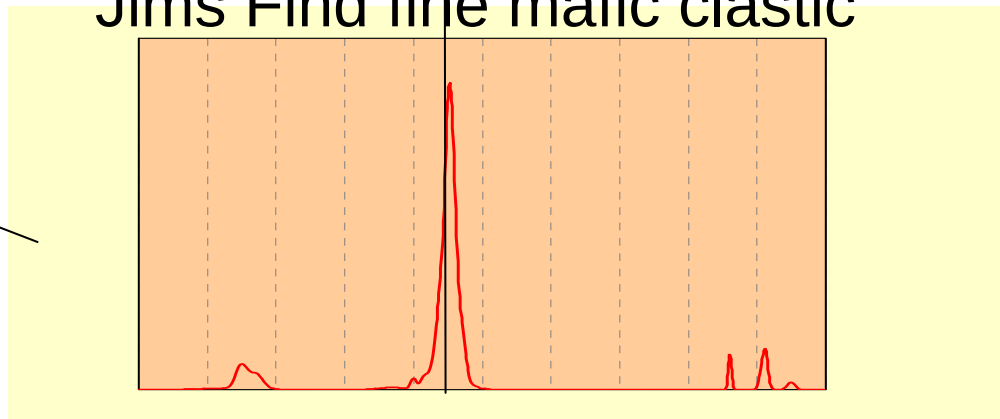
Mount Charles Formation geochron



Hurricane sediment, arkose

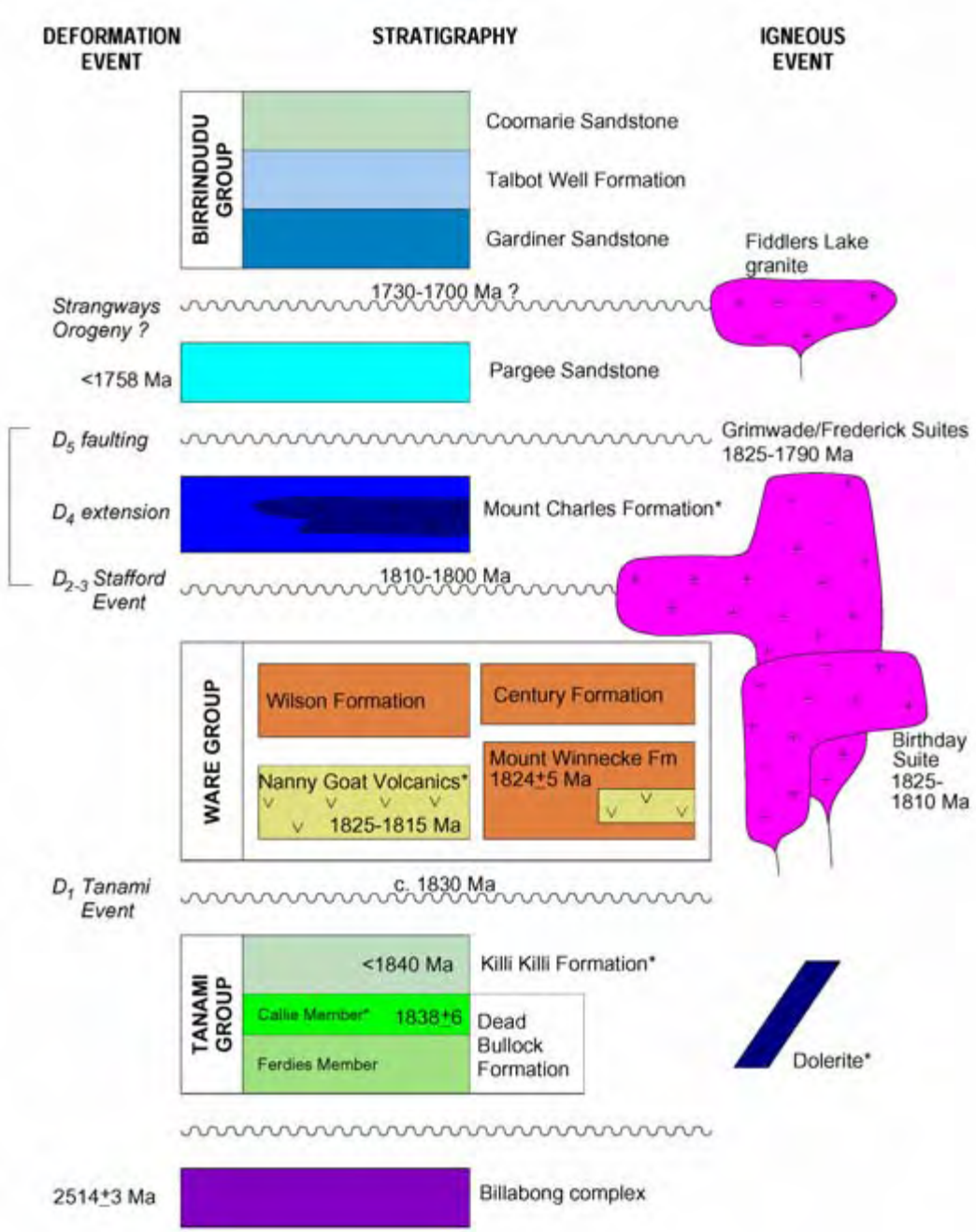


Jims Find fine mafic clastic



1600 2500 3600

Tanami Stratigraphy

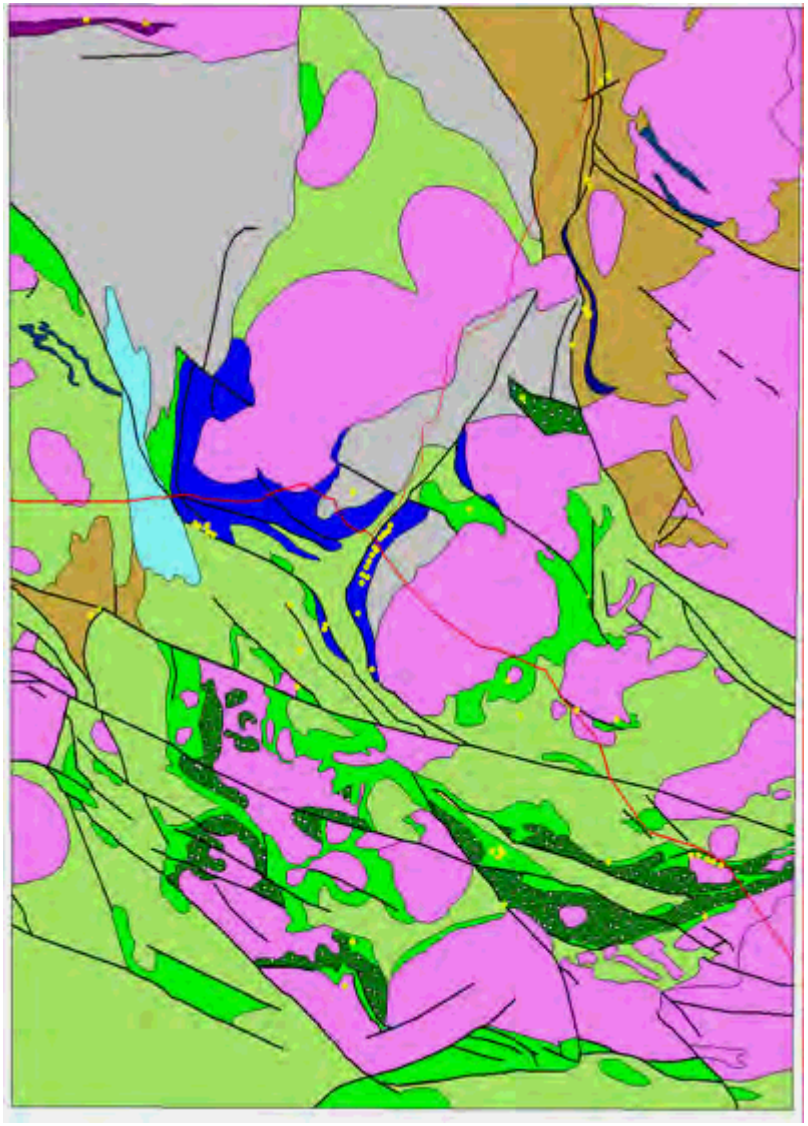


Cycle 3 platform

Cycle 2 extension?

Cycle 1 ‘R-S-T’

Tanami Granites



Tanami Granites continued

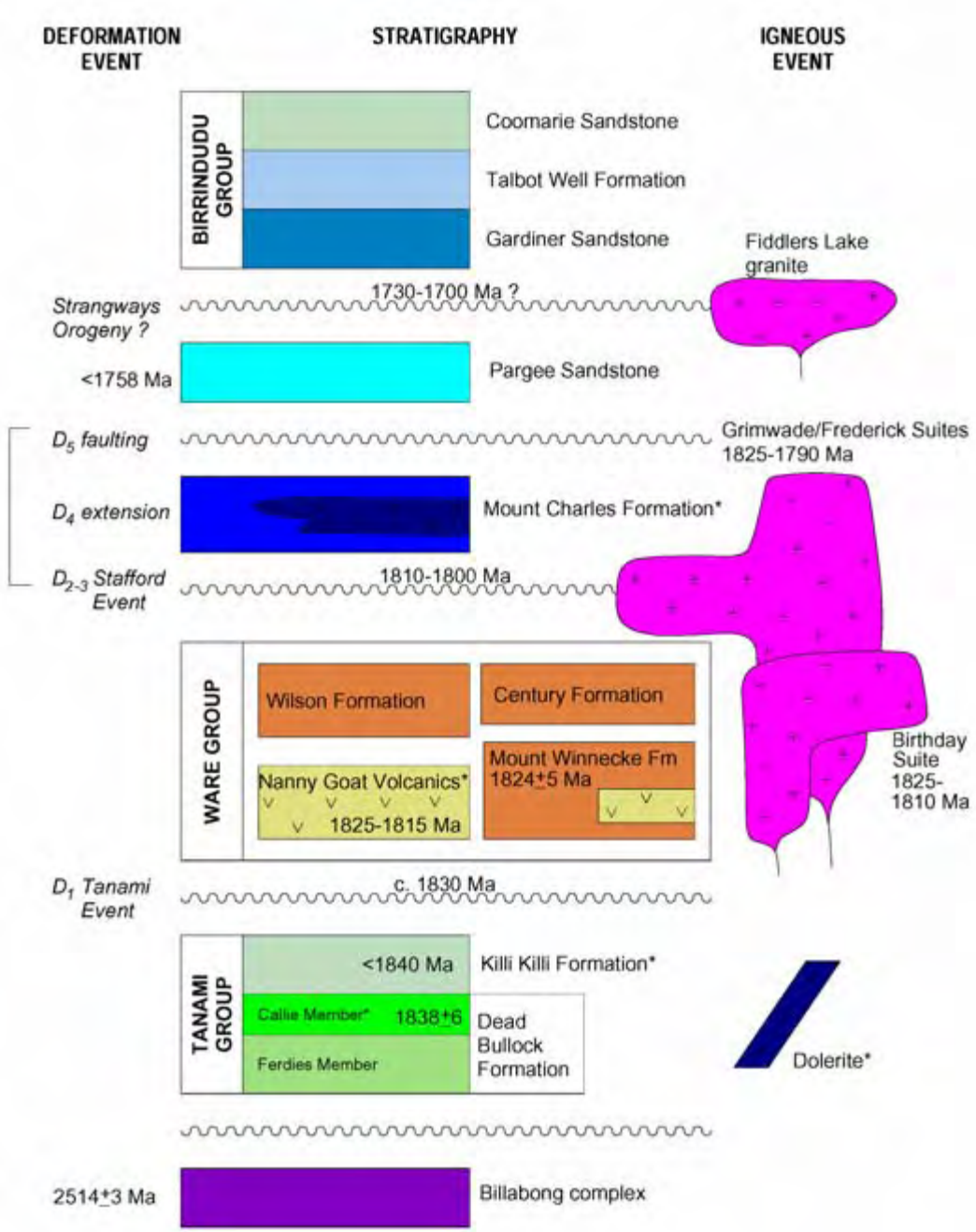
In general
- Peraluminous
- 1825-1791 Ma
- Al_2O_3 > most NAC granites
- K_2O < most NAC granites
- CaO > most NAC granites

Birthday Suite
- Magnetic
- Strongly potassic
- Highest silica
- Alkali-calcic
- Coeval with Ware Group volcanics

Grimwade Suite
- Non-magnetic
- Range of silica values
- Calcic
- WA to Aileron province
- Texturally variable

Frederick Suite
- Magnetic
- Abundant zircon inheritance
- Calc-alkalic
- Peraluminous

Tanami Stratigraphy



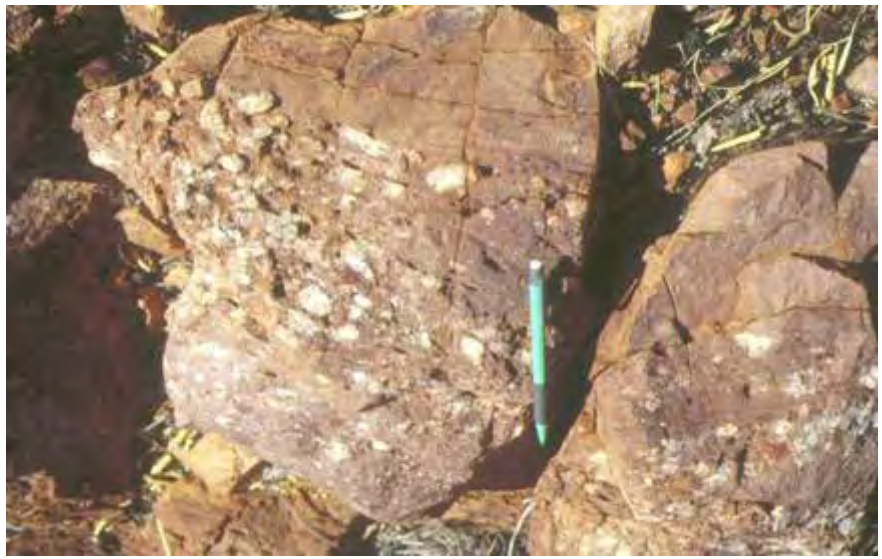
Cycle 3 platform

Cycle 2 extension?

Cycle 1 ‘R-S-T’

Pargee Sandstone

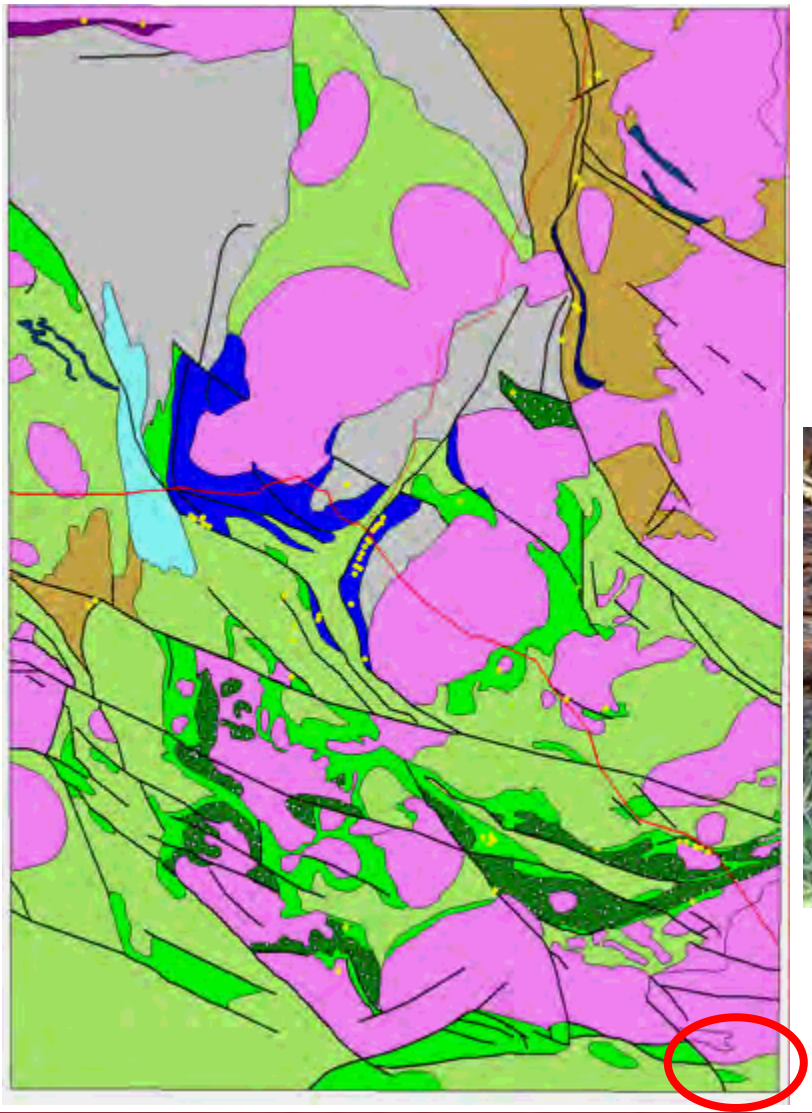
- >1100m sandstone and conglomerate package
- unconformable on Killi Killi Formation
- Likely erosion of all older units
- Vein quartz and jasper clasts common
- Basalt and felsic volcanic clasts present
- 1768 ± 14 Ma maximum age



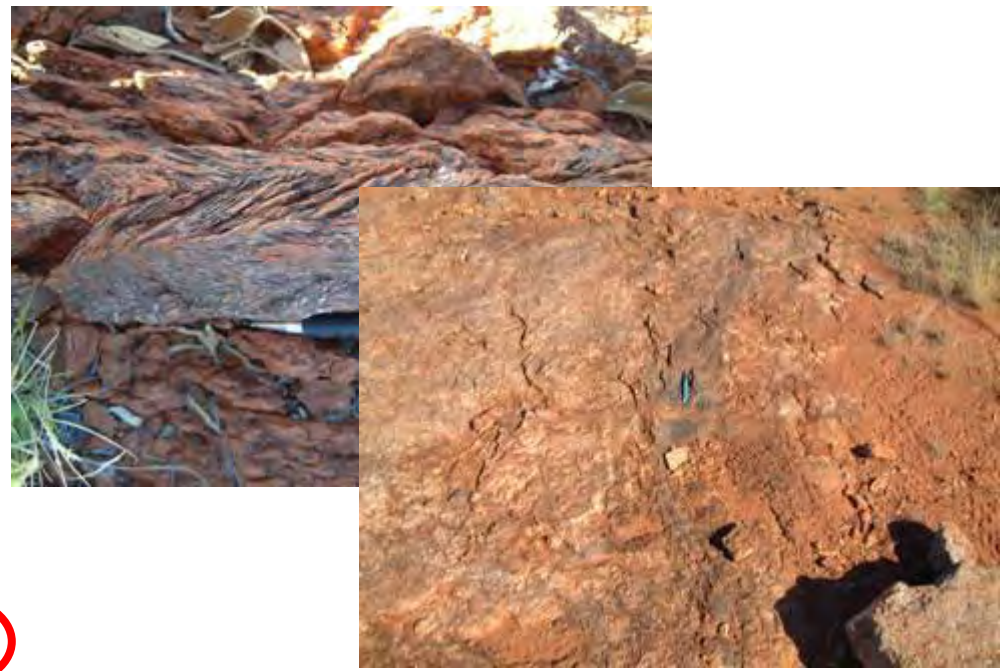
Birrindudu Group

- Widespread, near flat siliciclastic package
- Sandstone, dolomite, sandstone succession
- Thickness varies, 3-6km
- Sandstone cobbles common
- Cleaner, less lithic than Pargee
- 1812 ± 8 Ma measured maximum age
- Age between 1640 and 1760 Ma

Fiddlers Metamorphics



- Migmatitic psammo-pelite
- Intruded by S-type granite
- 1730 Ma inheritance
- Related to metamorphism in Aileron Province around 1730-1700 Ma



Conclusions

•Basement to the Tanami is not exposed, but likely to be dominated by neo-Archaean 2500 granitoids

•Tanami Group deposited on thinned crust (failed rift or passive margin)

•Tanami Event represents distal Halls Creek Orogeny

•Ware Group, Mount Charles Formation – further extension?

•Stafford Event – onset of subduction from south, mineralistion

•Later events focussed in Aileron Province