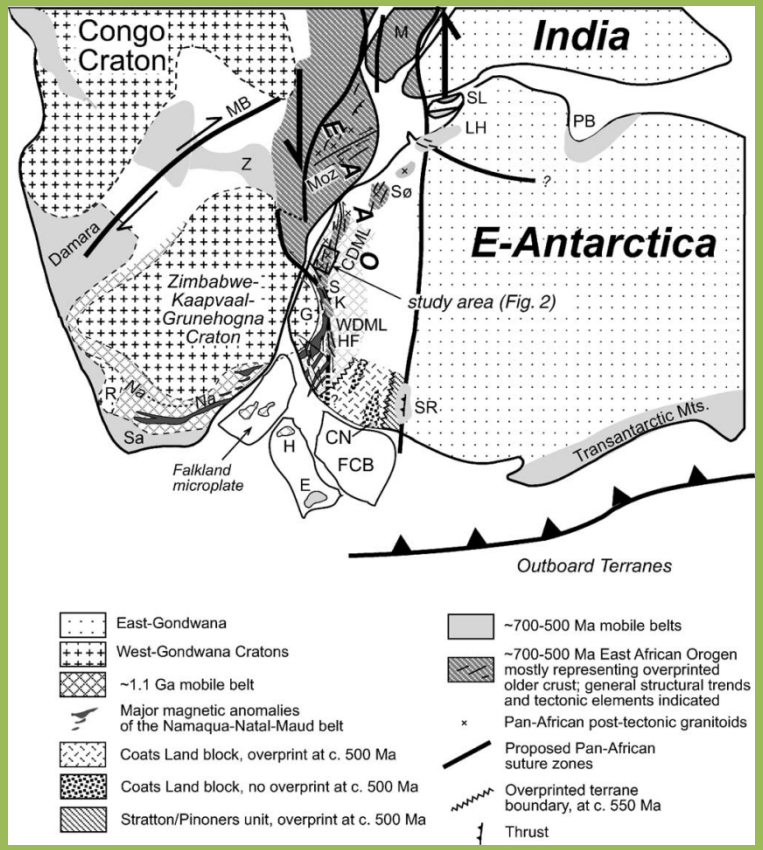
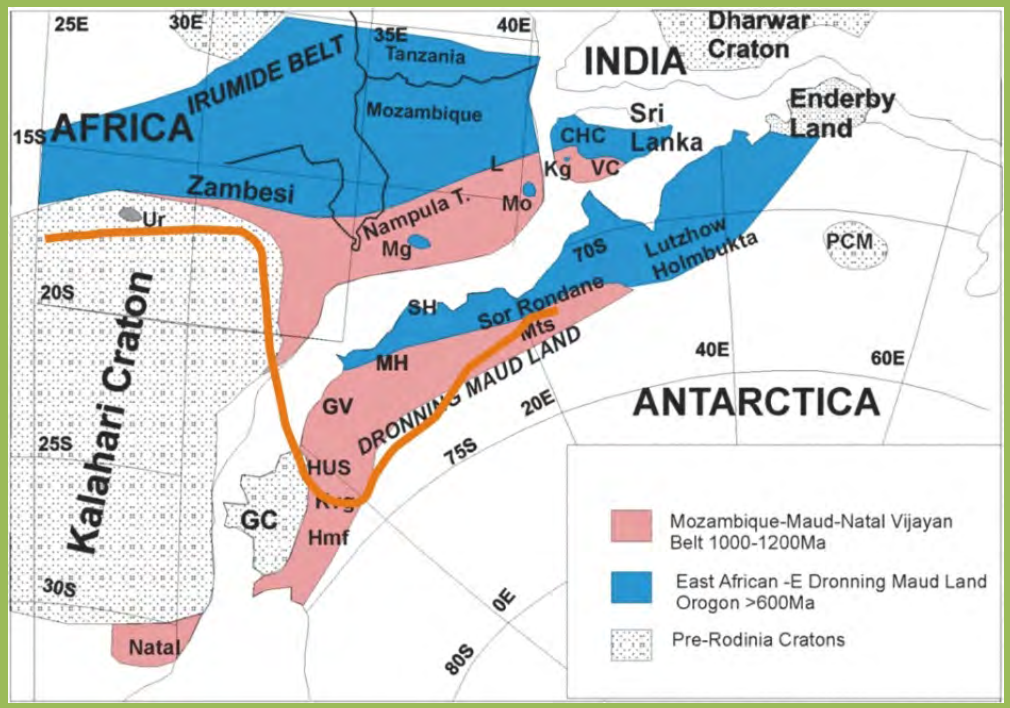
Geological Research in SANAP

Geoff Grantham

Council For Geoscience

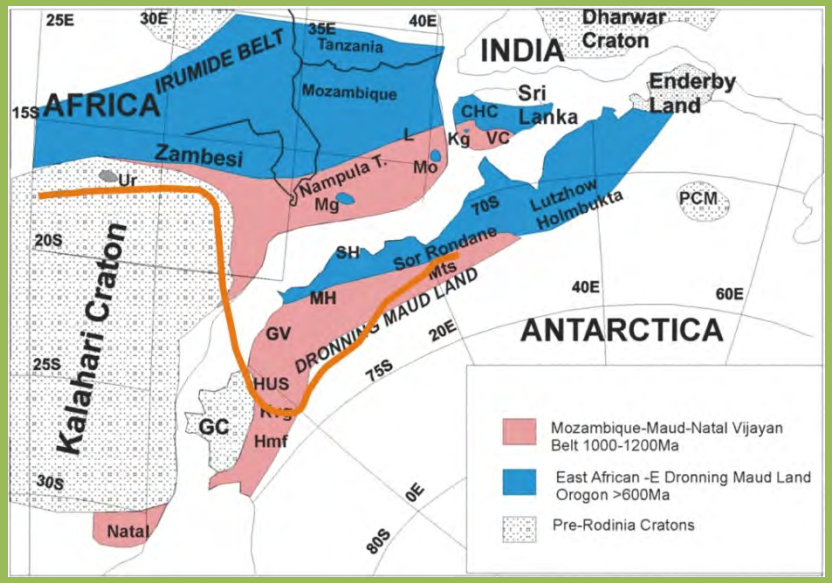
Amalgamation of Gondwana processes

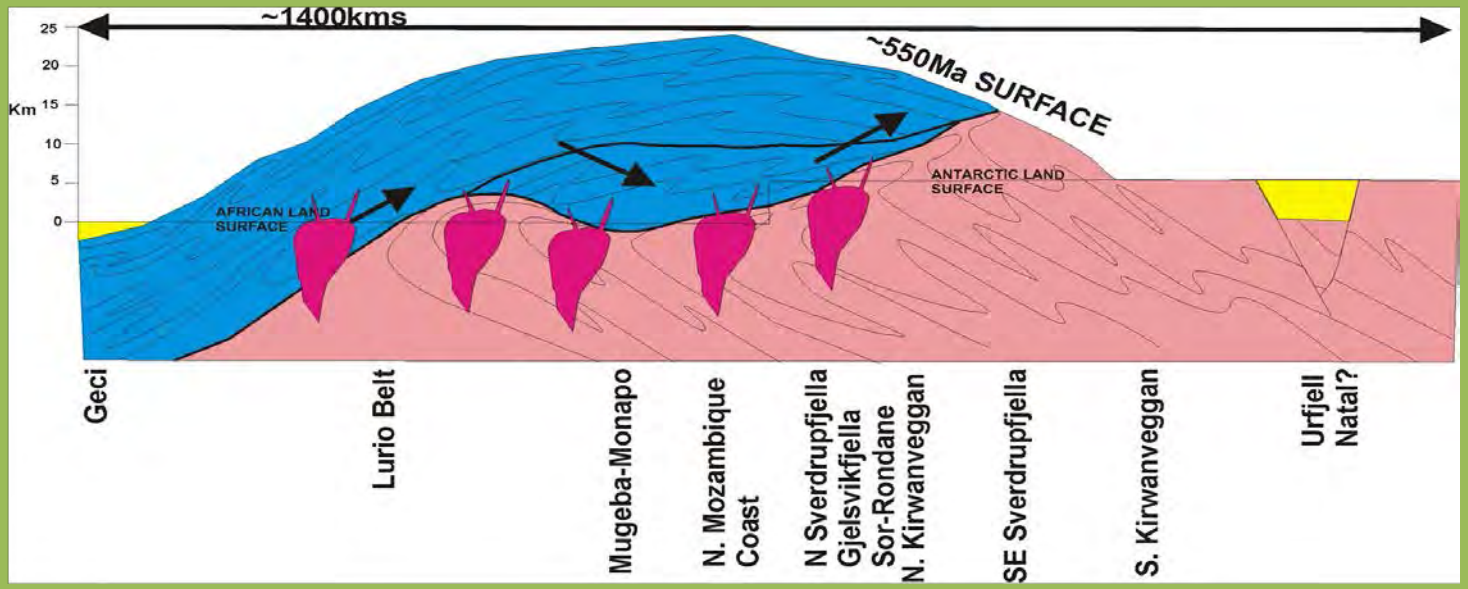




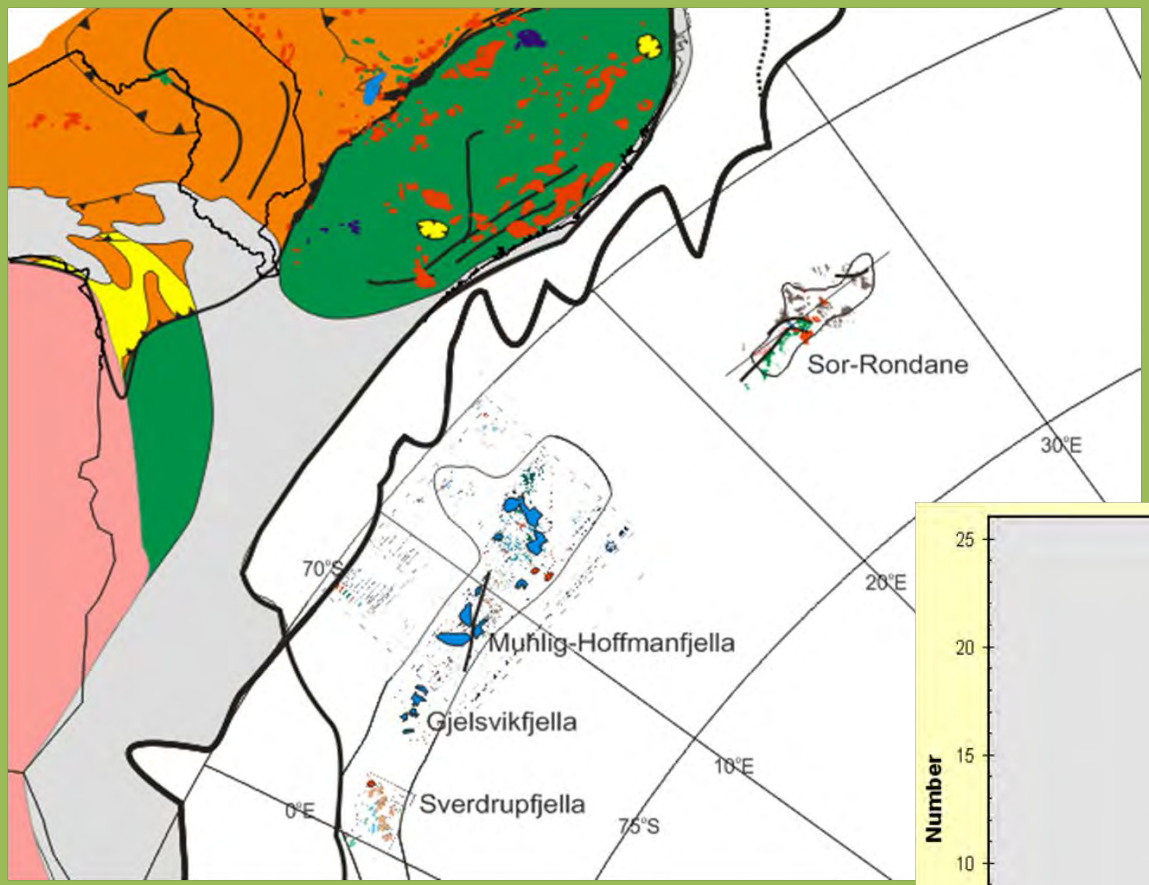
Current Research Focus
Mega-thrust model Kuunga Orogeny

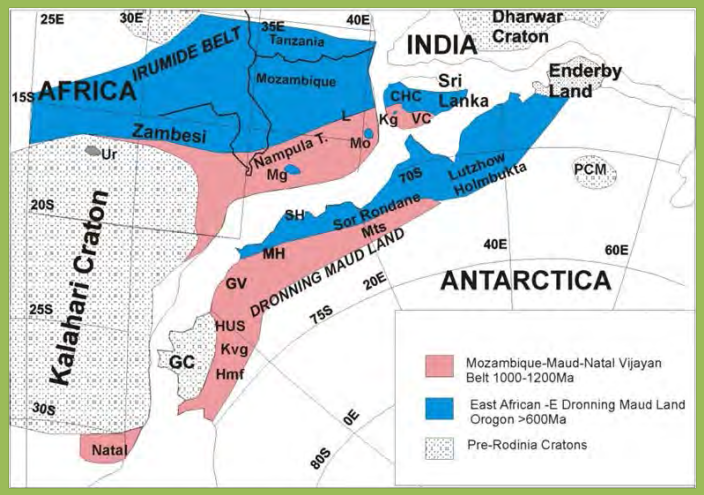
- Granitoid emplacement style and history (Sverdrupfjella)
- Craton - mobile belt relationship (Straumsnutane – Sverdrupfjella)
- Uplift history (Sverdrupfjella-Kirwanveggan
- Extent of overthrust block (Klippen Outliers –Sverdrupfjella
- Correlation between Straumsntane Fm (DML) and Espungaberra Fm (Mozambique)

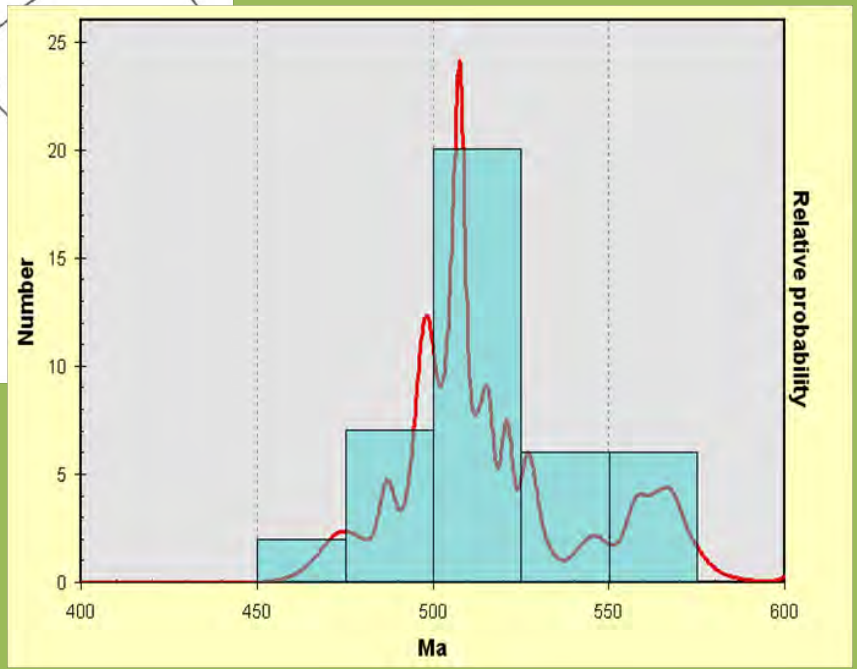




Neoproterozoic to Cambrian granites of WDML, Antarctica - Mozambique







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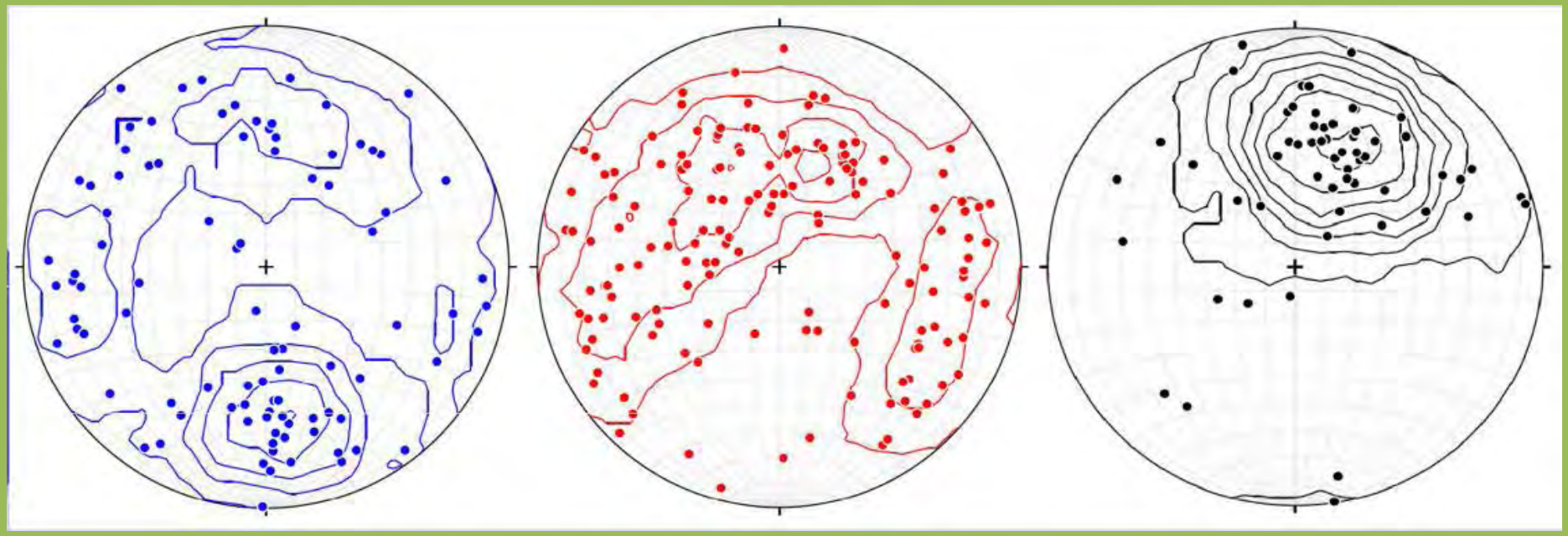
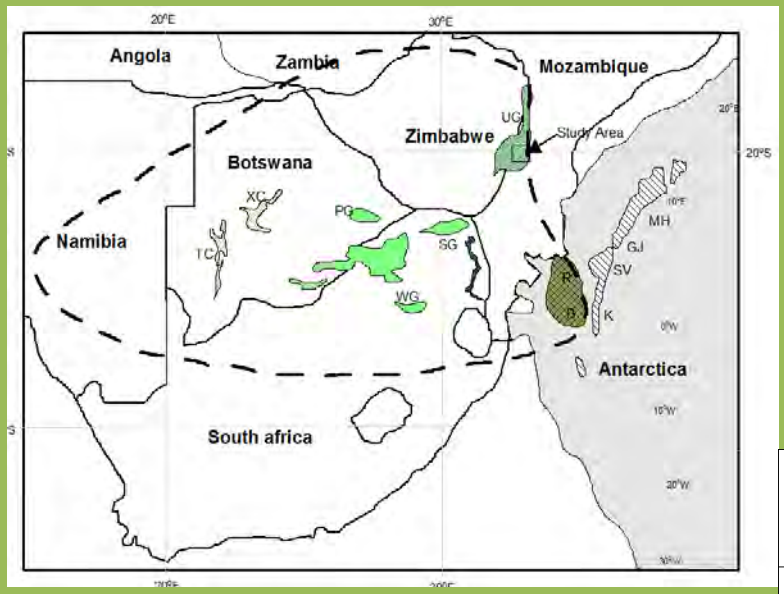


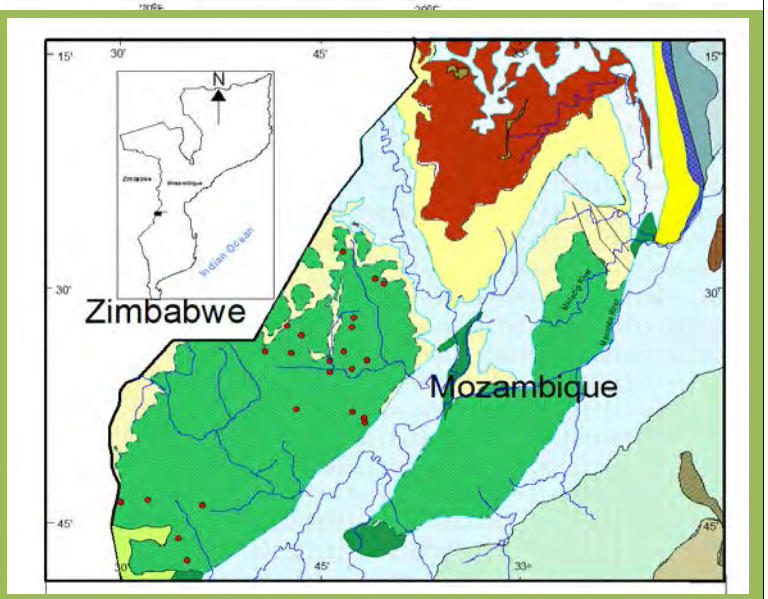
Early deformed pegmatite – poles to veins
Age unknown (Top to NW- Mesoproterozoic) – Dip dominantly steeply (~60º) N – extensional.

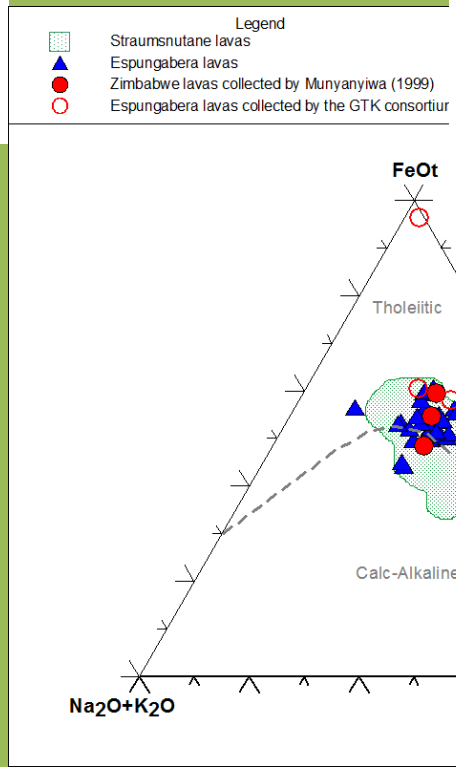
Dalmatian Granite – ~480-500Ma
Dip dominantly SE at intermediate angles (~45º) suggest compressional

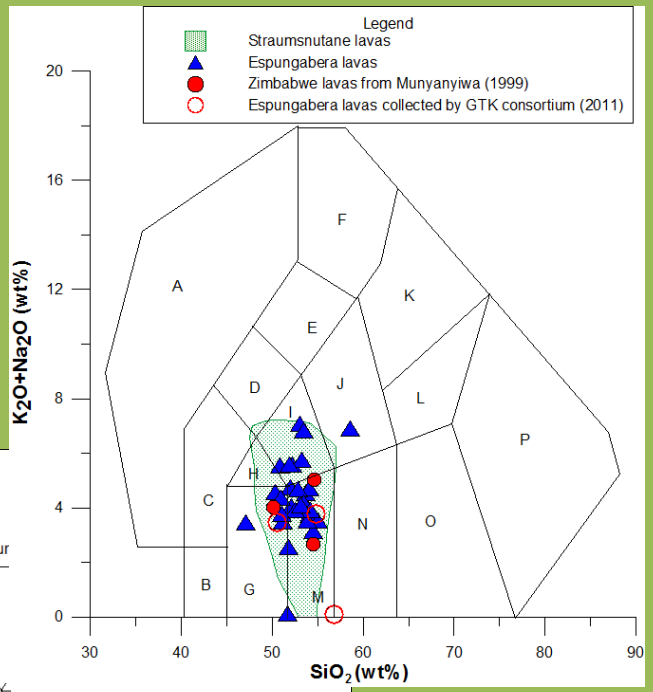
Younger undeformed pegmatites – Dip dominantly intermediate S (~45o)
Similar to Dalmatian Granite – compresional?

Correlation of Espungaberra Fm (Mozambique) and Straumsnutane Fm (WDML, Antarctica)









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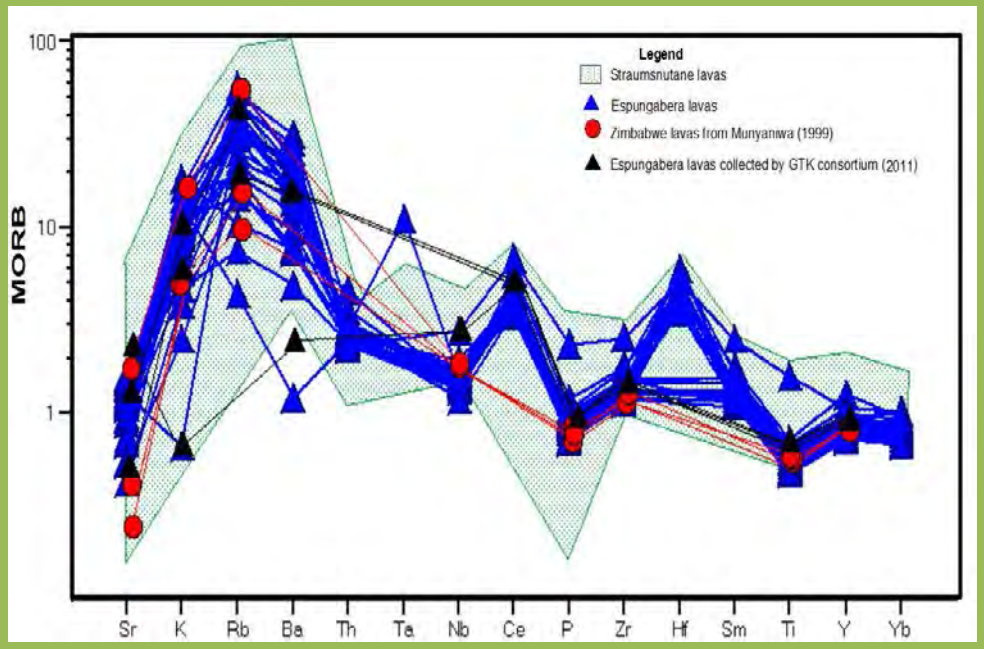
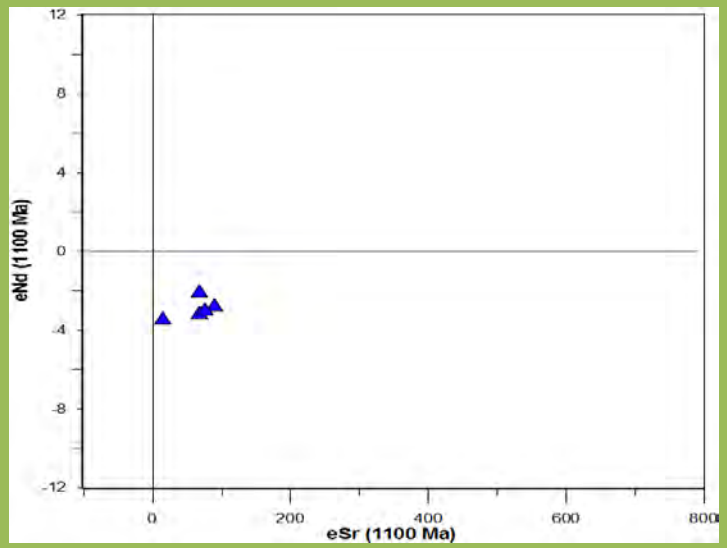
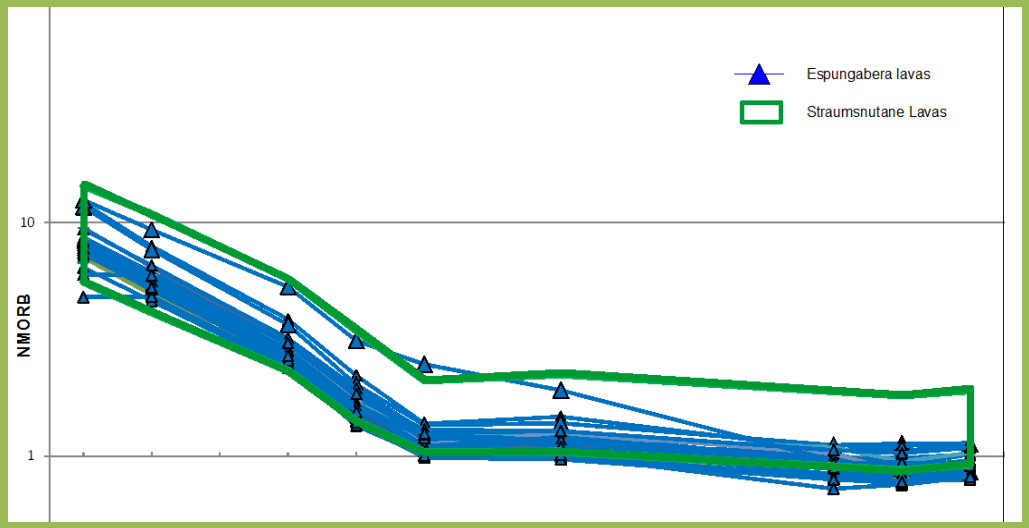
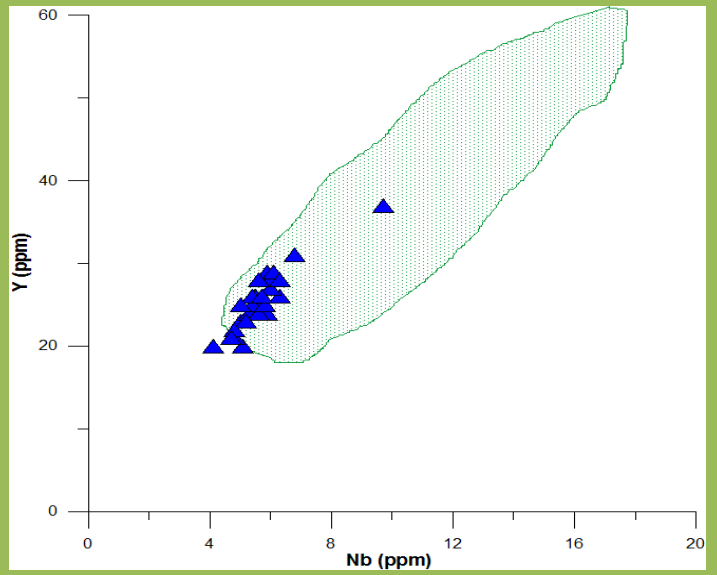
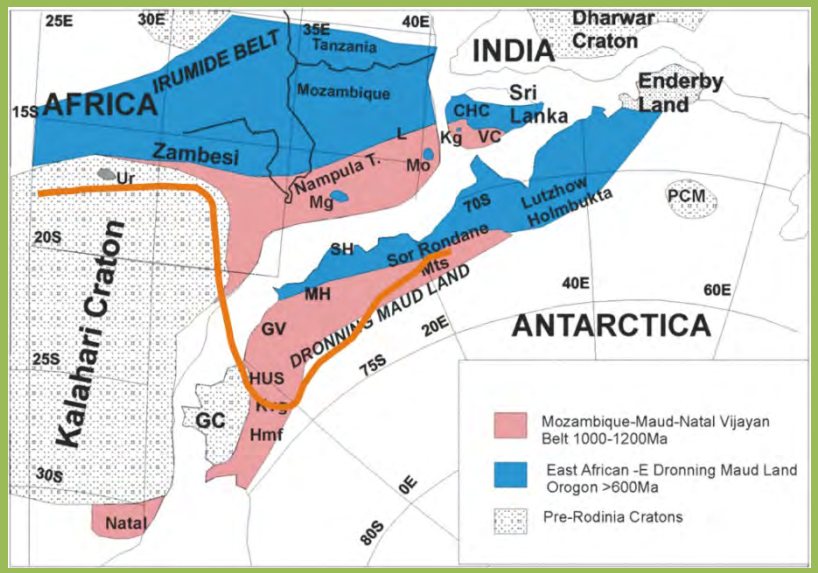


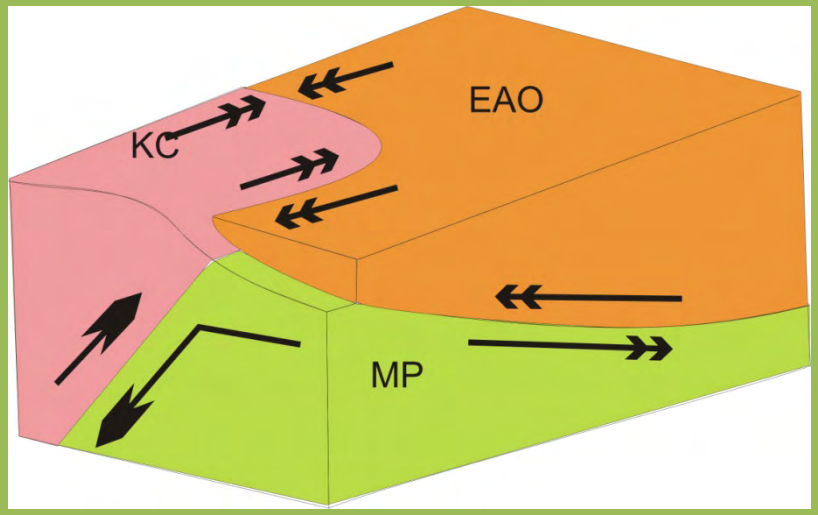






Structural Evolution of Straumsnutane Formation (WDML, Antarctica)





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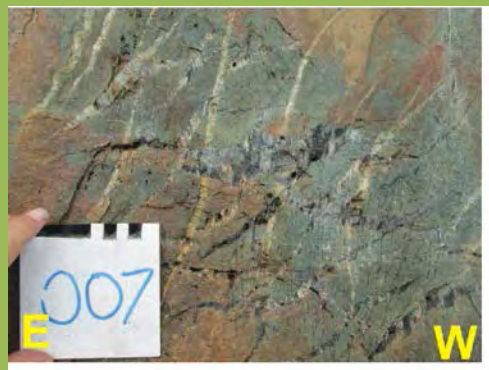
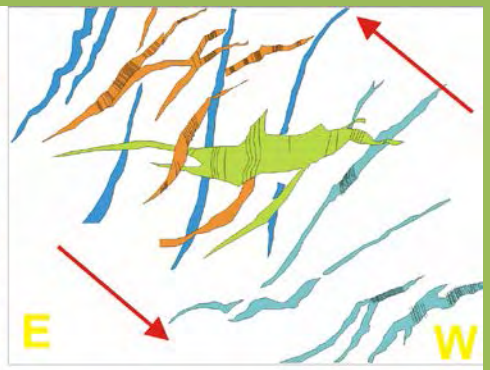
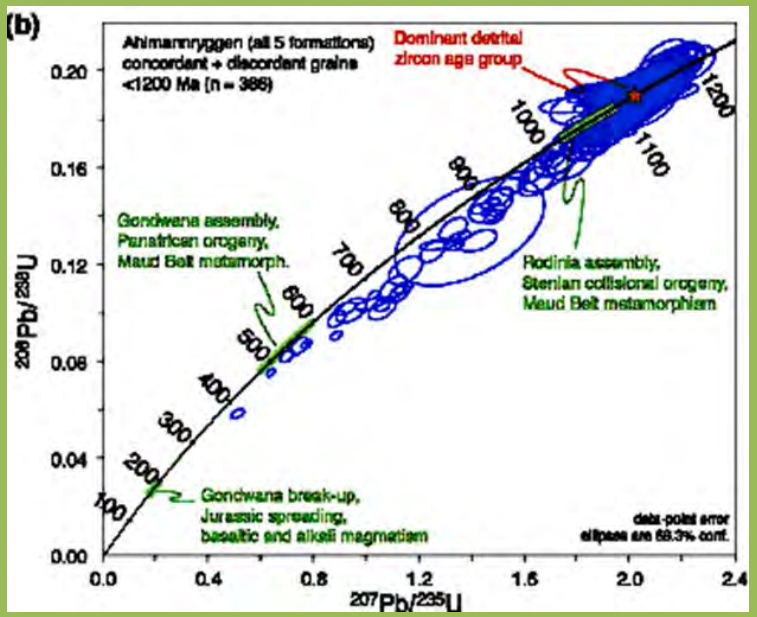
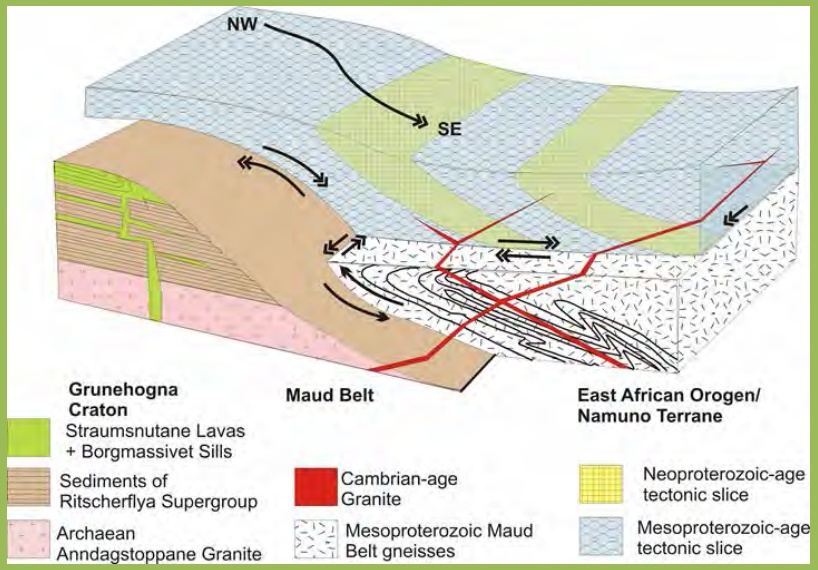


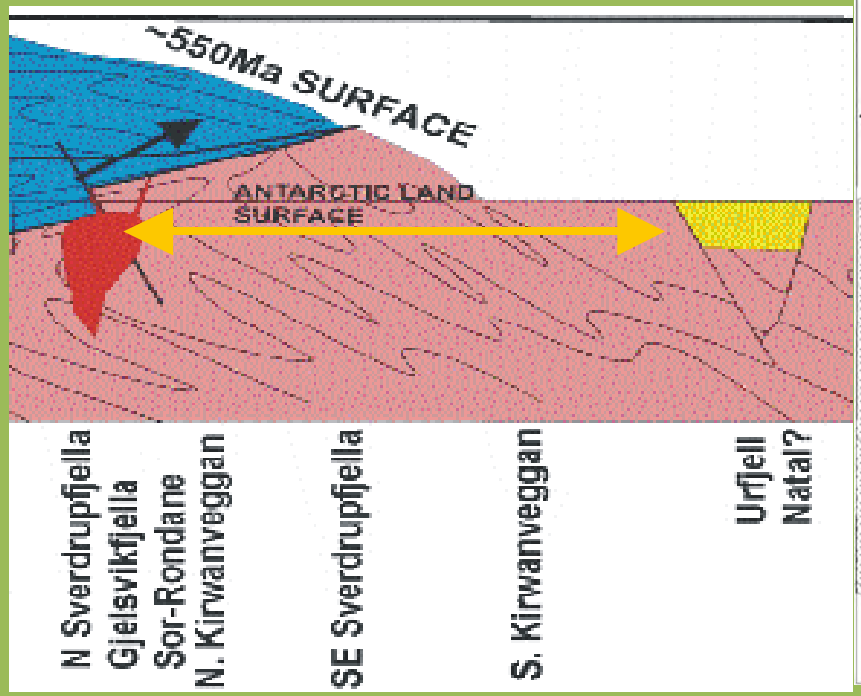


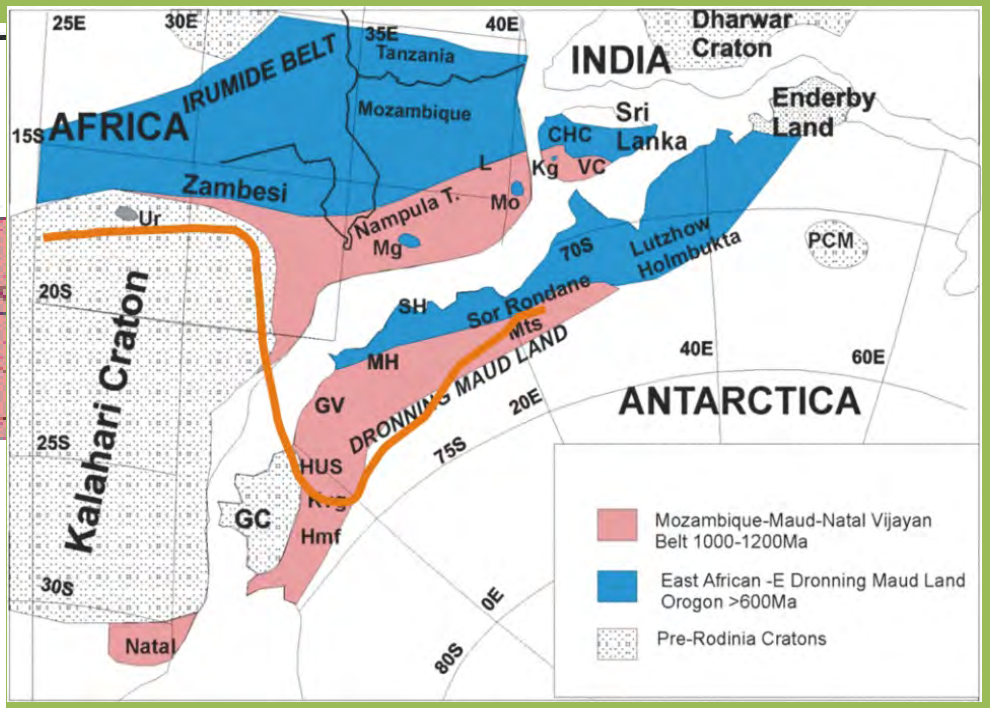




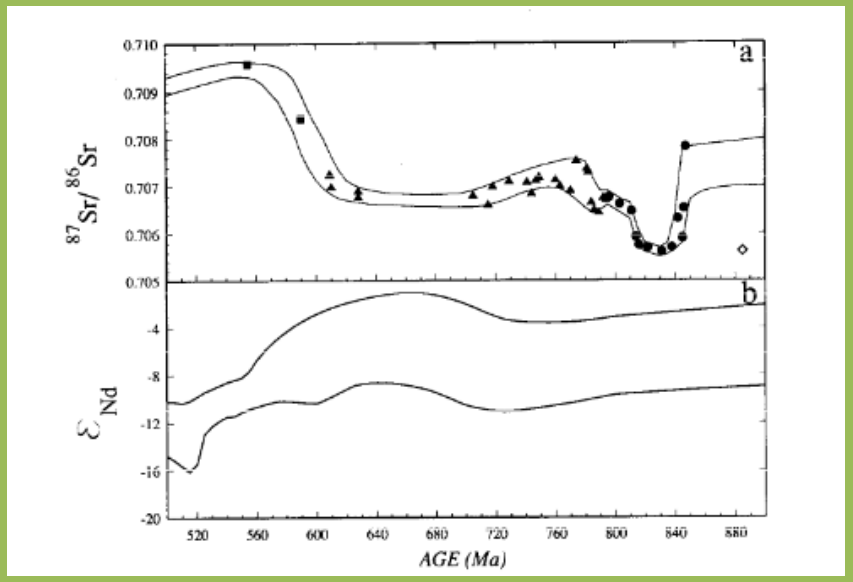
Uplift history WDML, Antarctica

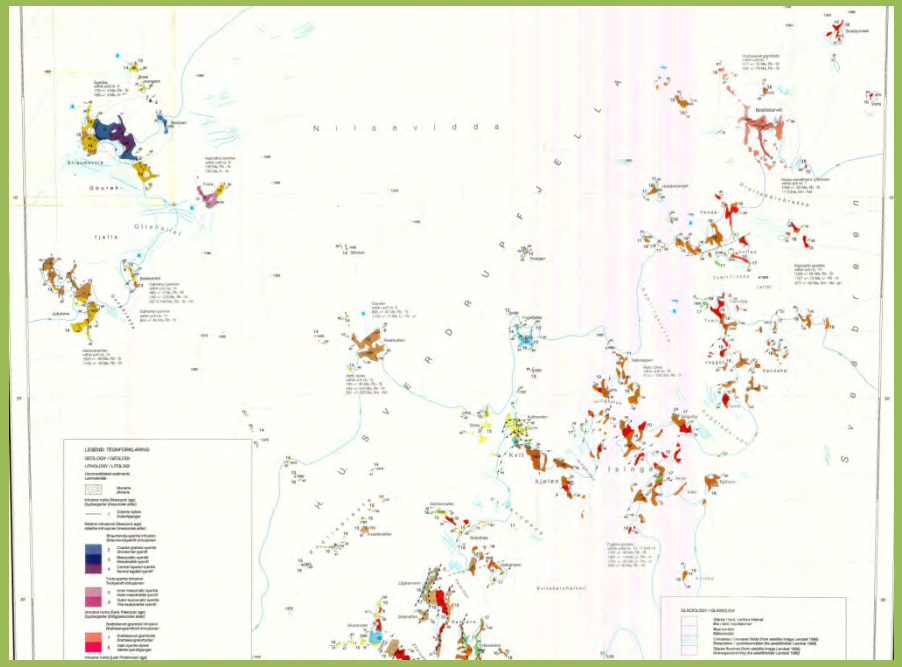
Ar-Ar study from N Sverdrupfjella to S Kirwanveggan on Mica (~300ºC or ~10km) and Hbl (~500ºC or ~17km).
Samples from Kirwanveggan selected with mineral separates in progress.

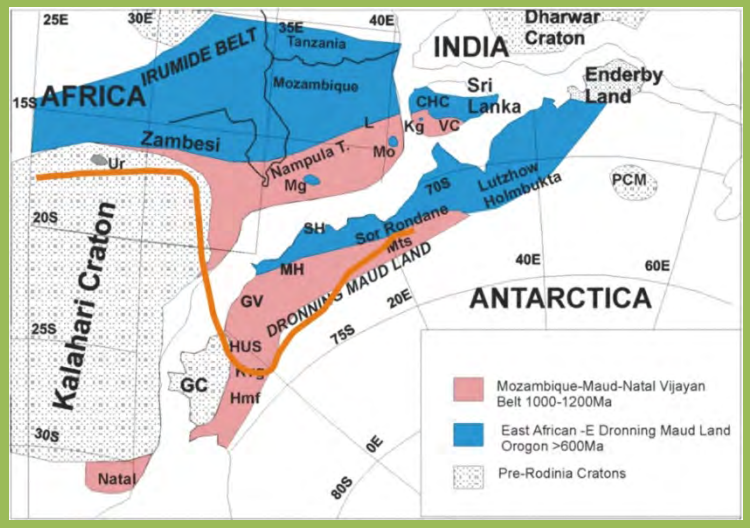


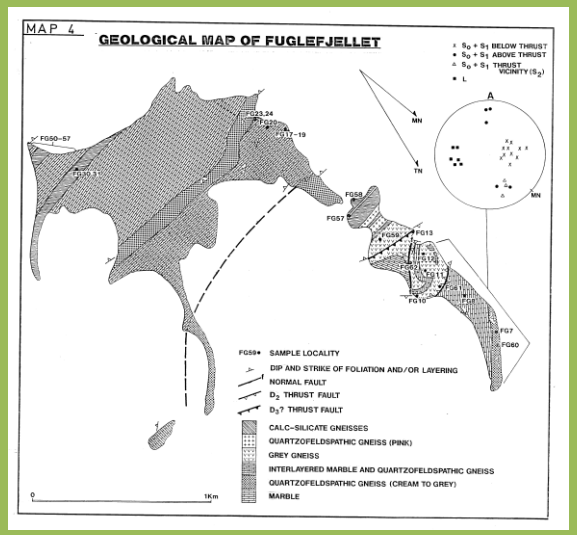


Extent of overthrust block in Sverdrupfjella



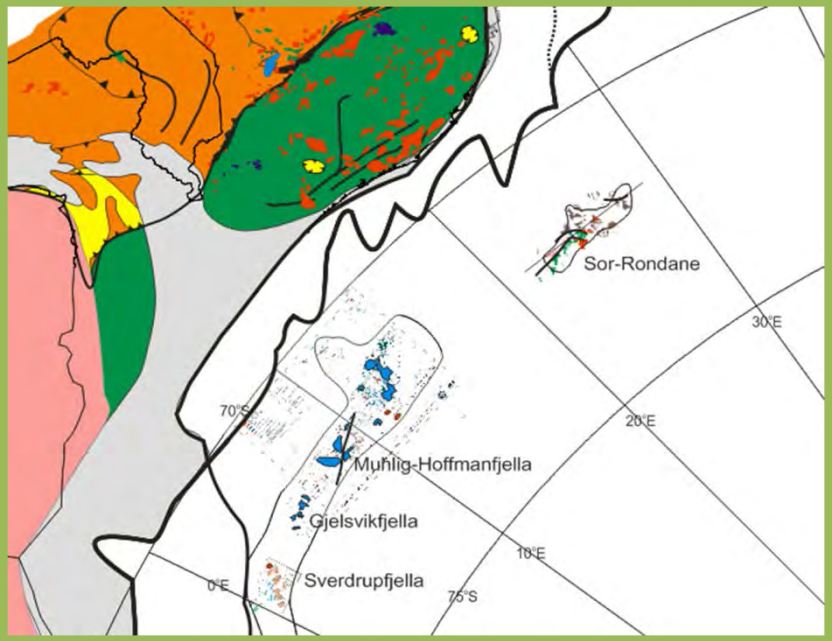


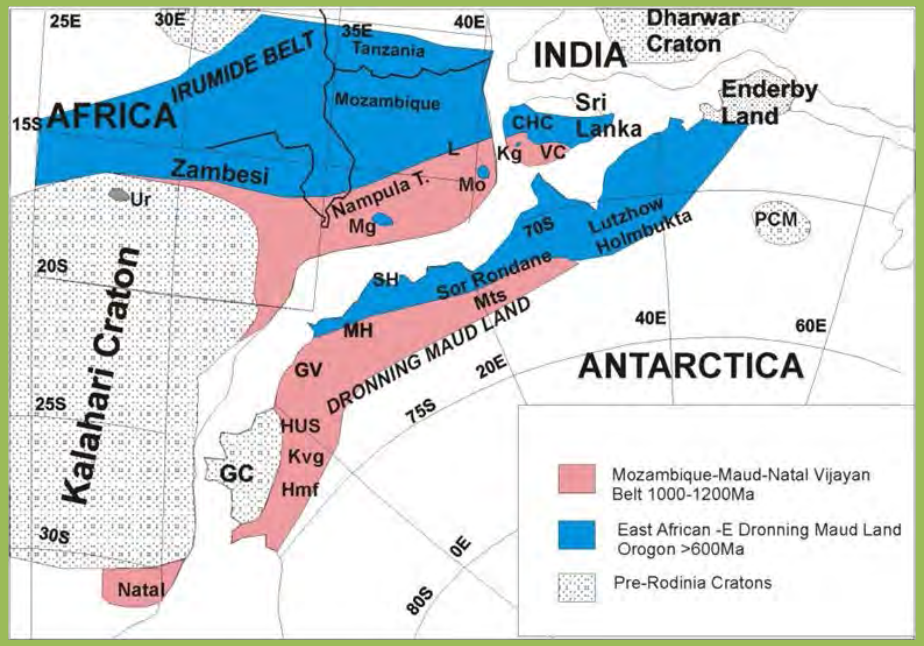




Samples collected from Fuglefjellet 2013/2014 to constrain age of Fuglefjellet Formation supracrustals

Future Possibilities





- Extending granite study to Gjelsvikfjella and
- Constraining age of deformation using geochronology of melts in shears (WDML and EDML) and constraining ages of decompression assemblages using mineral separates and P-T work.
- Samples available from Sor Rondane from 2010

Collaboration with NPI, Germany, NIPR Japan and India.

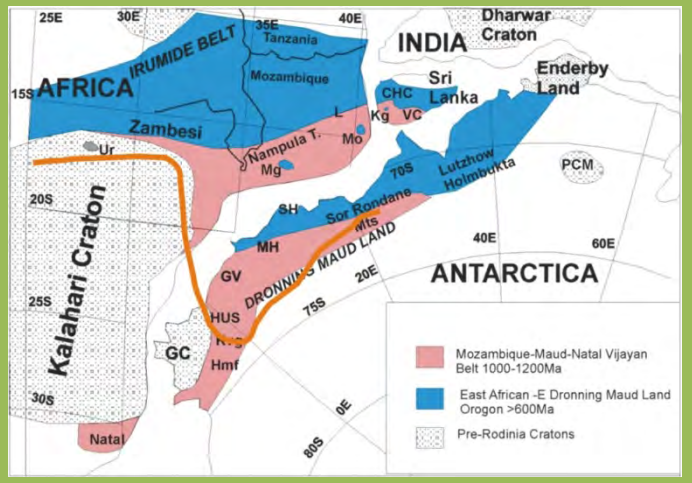
- 4 year NPI mapping initiative to produce digital maps – CDML least understood area of Antarctica followed by Sor Rondane
- SCAR Action Group Geology initiated 2012. For geological mapping in support of recently completed geophysics.

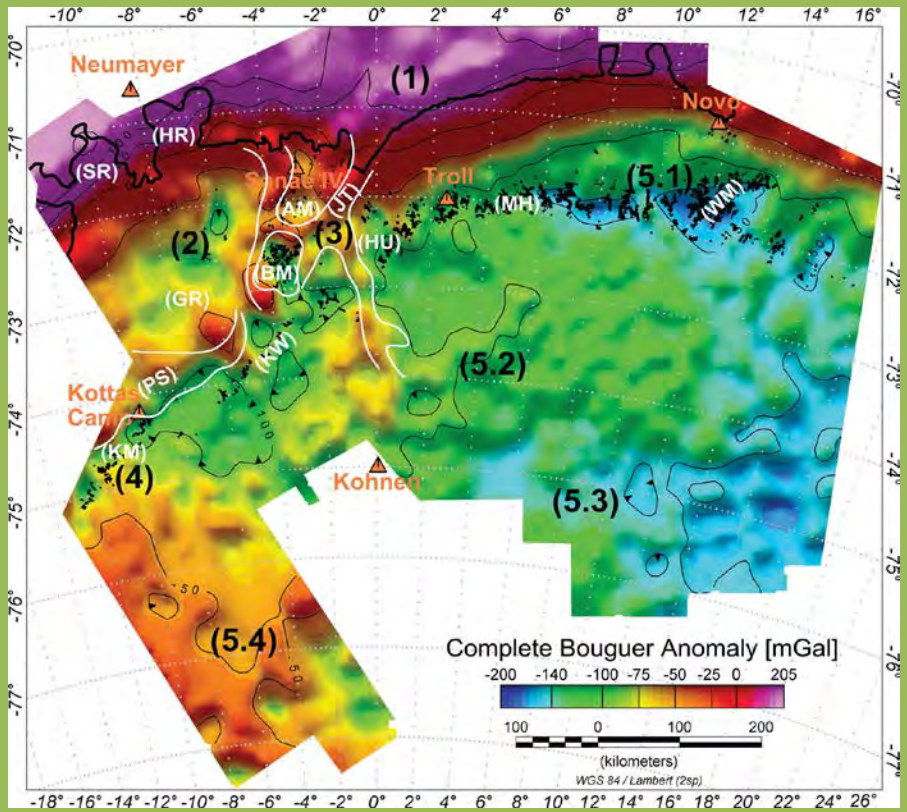
Mapping tectonic provinces with airborne gravity and radar data in Dronning Maud Land, East Antarctica

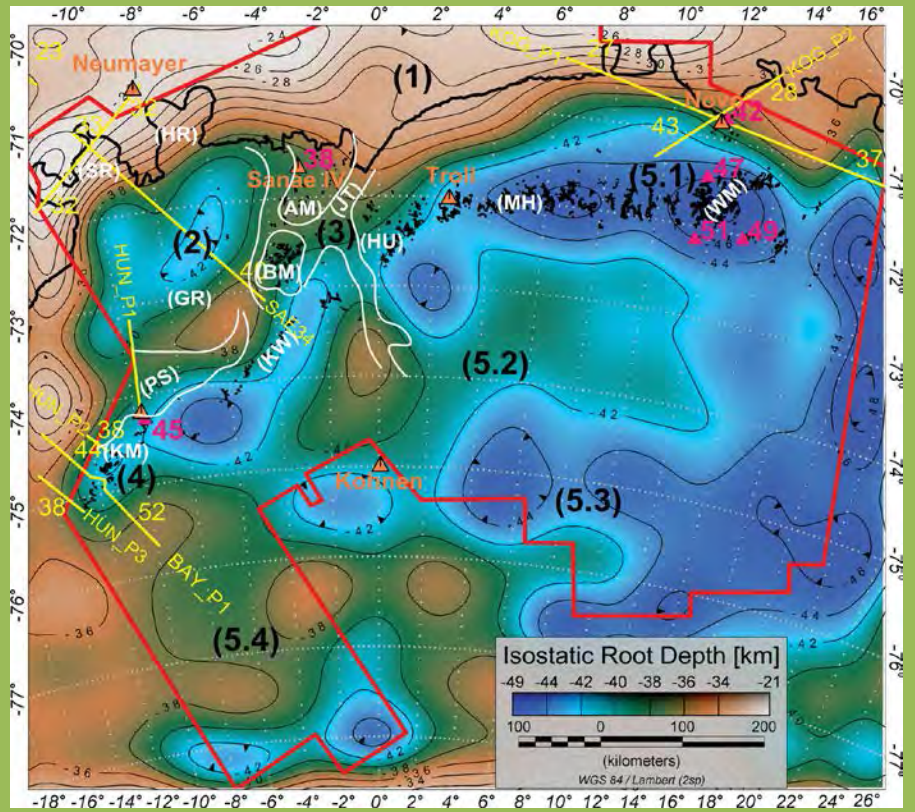
S. Riedel,∗ W. Jokat and D. Steinhage

Geophys. J. Int. (2012) ***189, 414–427.***

- Shows thickened crust over CDML –
- consistent with mega-nappe model.



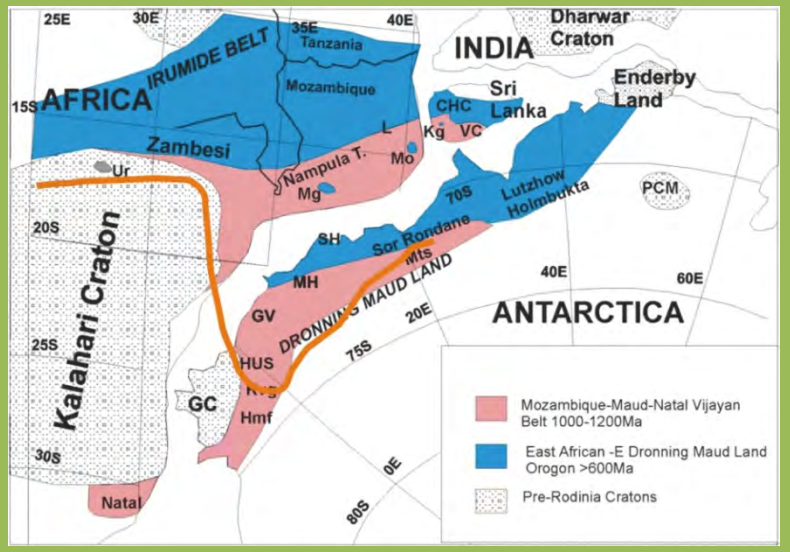


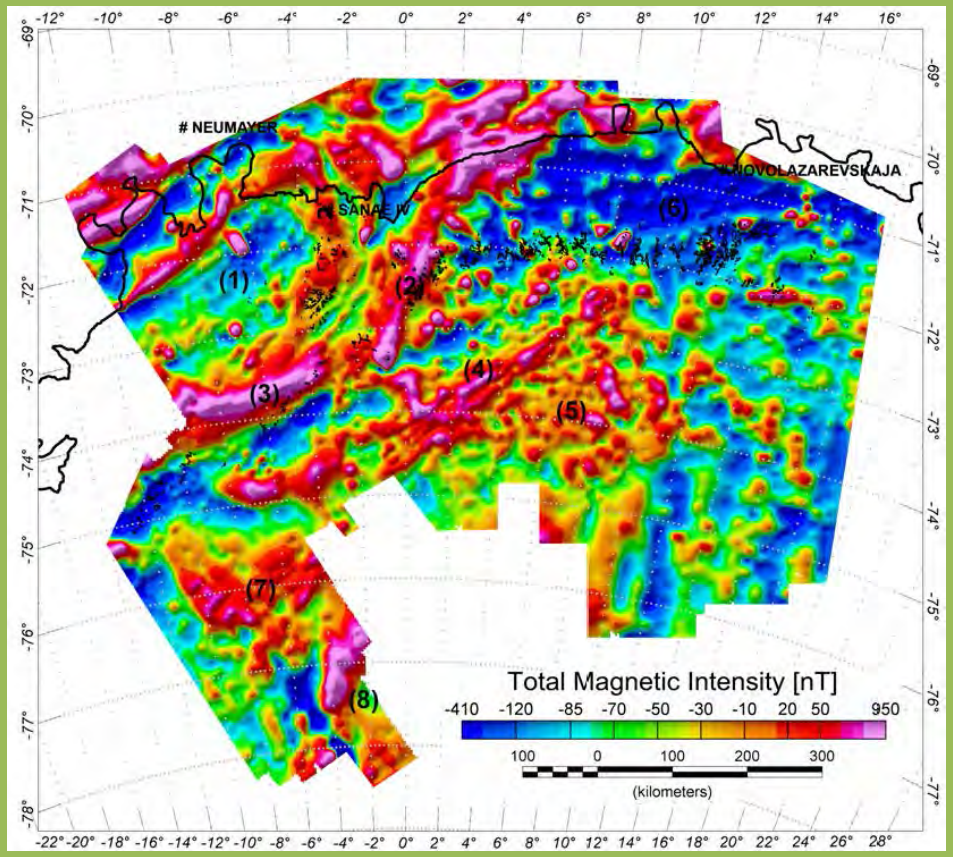


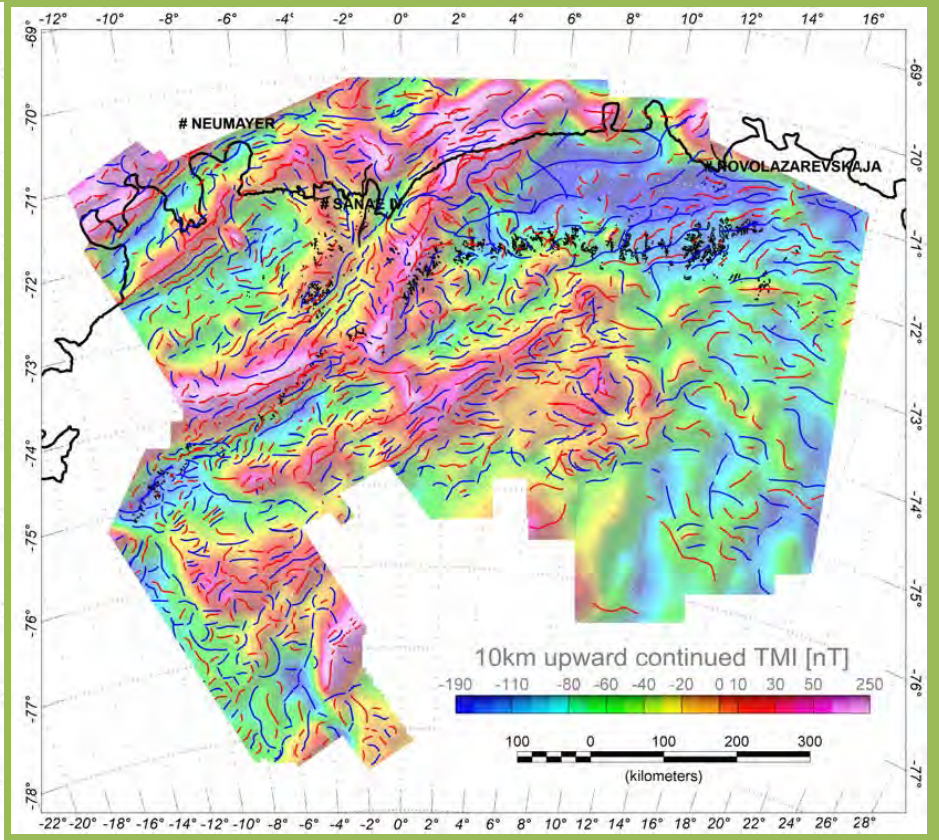
Interpretation of new regional aeromagnetic data over Dronning Maud Land, (East Antarctica)

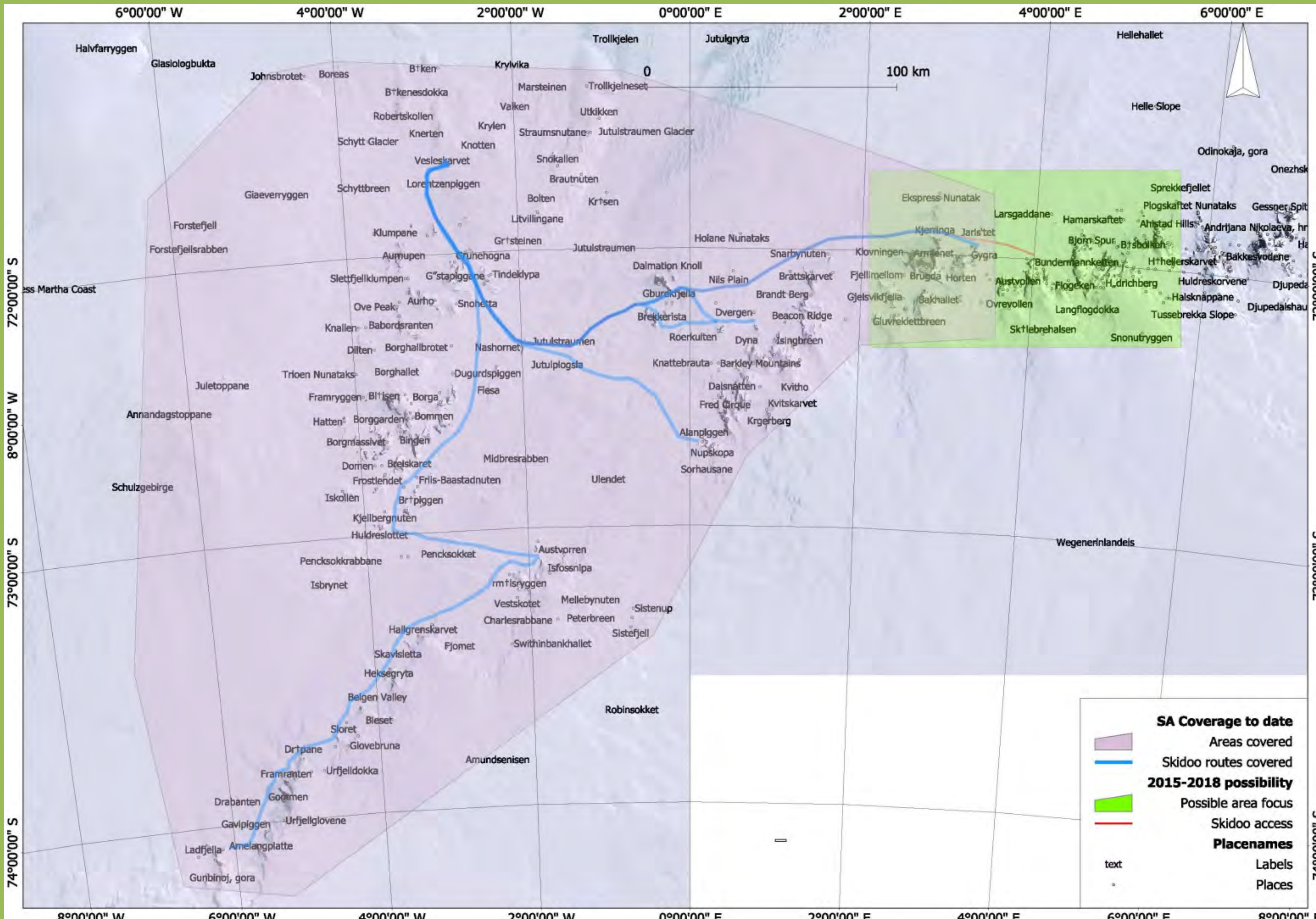
S. Riedel , J. Jacobs , W. Jokat

Tectonophysics 585 (2013) 161–171









6°00'00" W
4°00'00" W
2°00'00" W
0°00'00" E
2°00'00" E
4°00'00" E
6°00'00" E
72°00'00" S
73°00'00" S
74°00'00" S
8°00'00" W
8°00'00" E
0
100 km
Halvfarryggen
Glasiologbukta
Johnsbrotet
Boreas
B†ken
B†kenesdokka
Krylvika
Trollkjelen
Jutulgryta
Hellehallet
Marsteinen
Trollkjelneset
Robertskollen
Valken
Utkikken
Helle Slope
Knerten
Krylen
Straumsnutane
Jutulstraumen Glacier
Schytt Glacier
Knotten
Snokallen
Odinokaja, gora
Vesleskarvet
Onezhsk
Brautnuten
Schyttbreen
Lorentzenpiggen
Giaeverryggen
Bolten
Kr†sen
Sprekkefjellet
Ekspress Nunatak
Plogskaftet Nunataks
Gessner Spit
Forstefjell
Litvillingane
Larsgaddane
Hamarskaftet
Ahlstad Hills
Andrijana Nikolaeva, hr
Klumpane
Kjerringa
Jarls'tet
Forstefjellsrabben
Gr†steinen
Jutulstraumen
Holane Nunataks
Bjorn Spur
B†sbolkon
Aurnupen
Grunehogna
Snarbynuten
Klovningen
Armlenet
Gygra
Bundermannkelten
H†hellerskarvet
Bakkesvodene
Dalmation Knoll
Slettfjellklumpen
G"stapiggane
Tindeklypa
Brattskarvet
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Horten
Huldreskorvene
Djupeda
Nils Plain
Austvollen
Flogeken
H.drichberg
ss Martha Coast
Gburskjella
Brandt Berg
Gjelsvikfjella
Bakhallet
Halsknappane
Aurho
Ove Peak
Snonetta
Ovrevollen
Langflogdokka
Djupedalshau
Brekkerista
Dvergen
Beacon Ridge
Tussebrekka Slope
Knallen
Babordsranten
Gluvreklettbreen
Sk†ltebrehalsen
Dilten
Borghallbrotet
Nashornet
Jutulstraumen
Roerkulten
Dyna
Isingbreen
Snonutryggen
Jutulplogsla
Knattebrauta
Barkley Mountains
Trioen Nunataks
Borghallet
Dugurdspiggen
Juletoppane
Flesa
Dalsnatten
Kvitho
Framryggen
Bl†isen
Borga
Fred Cirque
Kvitskarvet
Annandagstoppane
Hatten
Borggarden
Bommen
Krgerberg
Alanpiggen
Borgmassivet
Bingen
Nupskopa
Midbresrabben
Domen
Brelskaret
Sorhausane
Frostlendet
Friis-Baastadnuten
Ulendet
Schulzgebirge
Iskollen
Br†piggen
Kjellbergnuten
Huldreslottet
Wegenerinlandeis
Austvorren
Pencksokket
Pencksokkrabbane
Isfossnipa
Isbrynet
rm†lsryggen
Vestskotet
Mellebynuten
Sistenup
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Hallgrenskarvet
Sistefjell
Fjomet
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Skavlsletta
Heksegryta
Belgen Valley
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Drabanten
Gommen
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Ladfjella
Amelangplatte
Gunbinoj, gora
SA Coverage to date
Areas covered
Skidoo routes covered
2015-2018 possibility
Possible area focus
Skidoo access
Placenames
text
Labels
Places