Geochemical sampling of cover sequence materials throughout the Gawler Craton



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1. DET CRC (MinEx CRC), Future Industries Institute, University of South Australia
2. Geological Survey of South Australia
3. DET CRC; Department of Earth Sciences, University of Adelaide
4. Northern Territory Geological Survey


AngloAmerican


BARRICK
AUSTRALIA


BHP


BOART
LONGYEAR™


Government of South Australia
Department of State Development


imdex
LIMITED


VALE


CSIRO


Curtin University


THE UNIVERSITY
OF ADELAIDE
AUSTRALIA


Australian Government
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OLYMPUS
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South Australia


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WESTERN AUSTRALIA


Australian Government
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Innovation and Science


Business
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HEATHGATE


BUREAU VERITAS
1828
BUREAU
VERITAS


HiSeis


NSW DEPARTMENT OF
PRIMARY INDUSTRIES


Northern Territory Government
Department of Primary Industry, Fisheries and Mines


INVESTIGATOR
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leapfrog


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KSN
KINGSTON
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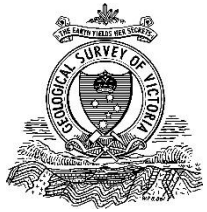
EPSLOG
ENGINEERING


SANDVIK


GEOLOGICAL SURVEY OF VICTORIA


MINOTAUR
EXPLORATION


GLOBALTECH
DOWNUNDER
MINING & EXPLORATION


wassara
STRAIGHT
FORWARD
DRILLING


Government of Western Australia
Department of Mines and Petroleum


Australian Government
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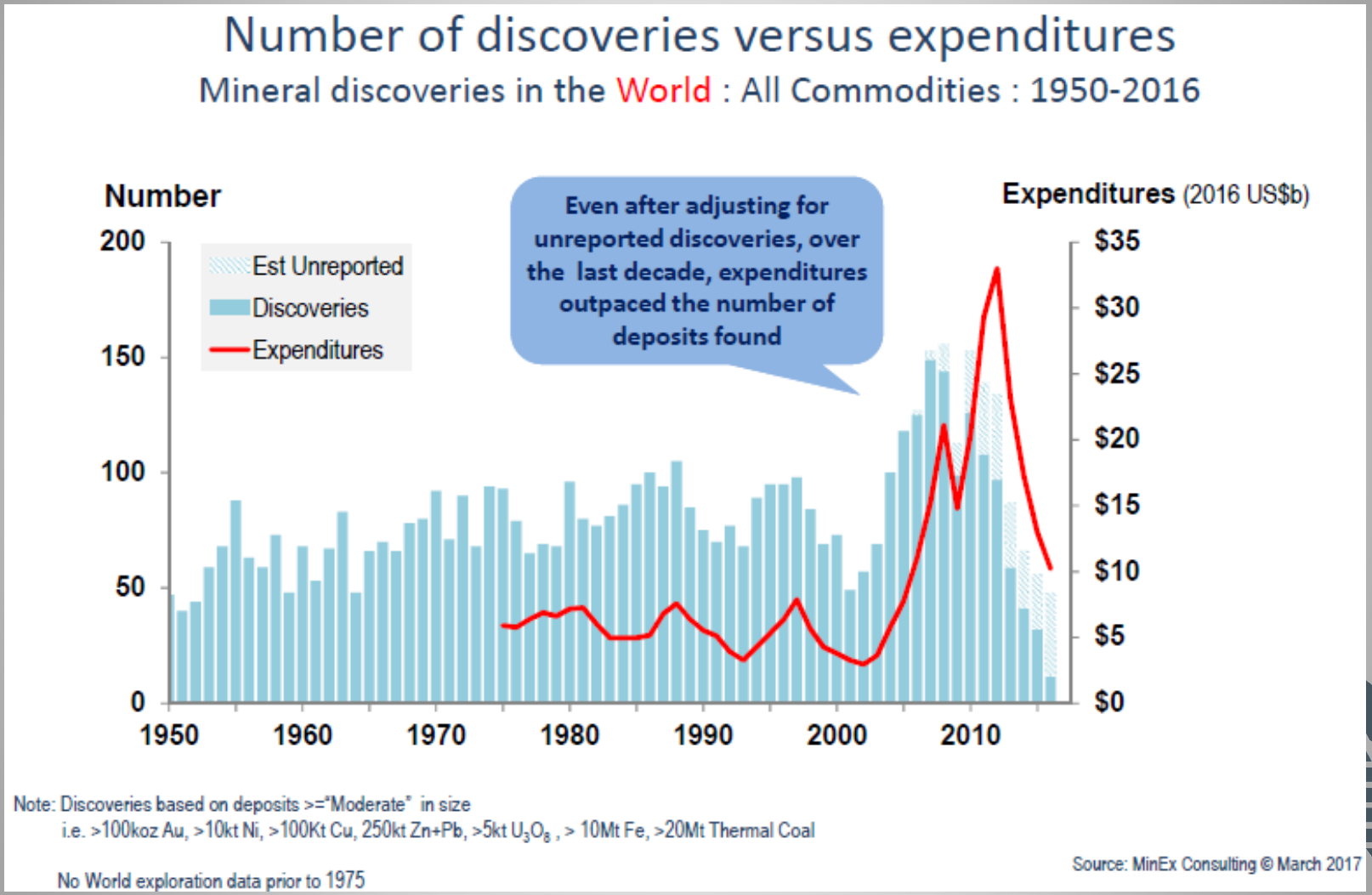
Why?



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https://www.youtube.com/watch?v=vv1vXoGRv4g

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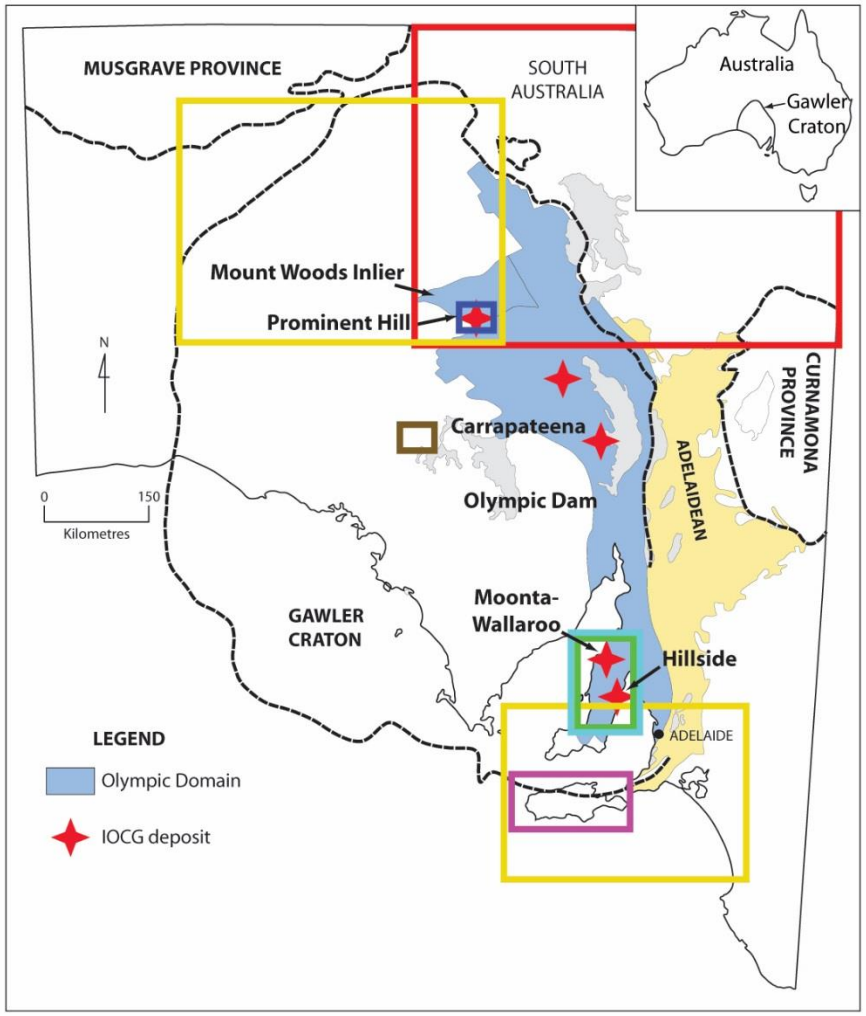
Where? (Gawler only)



- Ben van der Hoek PhD project
  - van der Hoek et al. 2012: GEEA
- Eline Baudet PhD project
- Forbes et al. 2015: JGE
- Katherine Stoate PhD project
- Keryn Wolff PhD project
  - Wolff et al. 2017: JGE
  - Wolff et al. 2018: JGE
  - Wolff et al. submitted: JGE
- Kym Custance/Rebecca Hill honours projects
- Verity Normington PhD project

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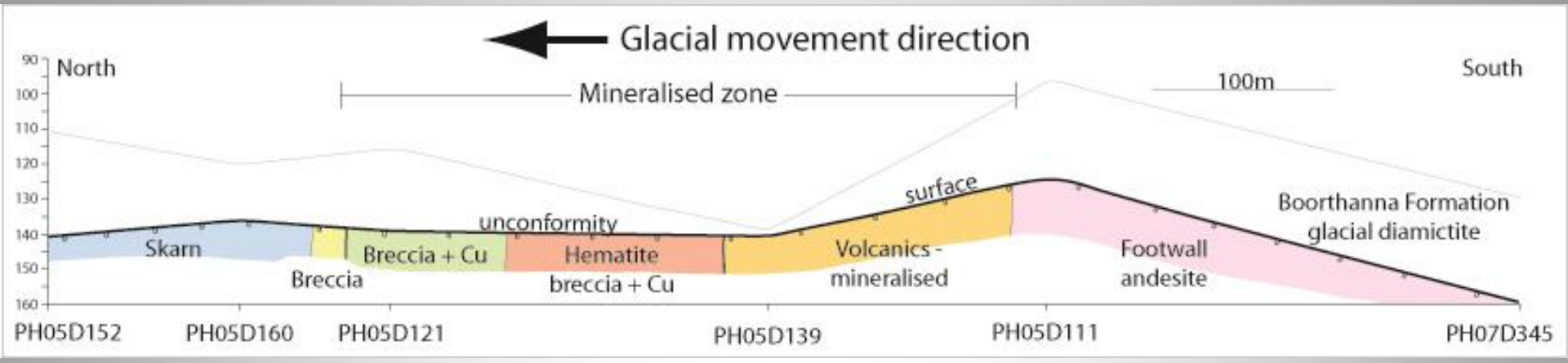
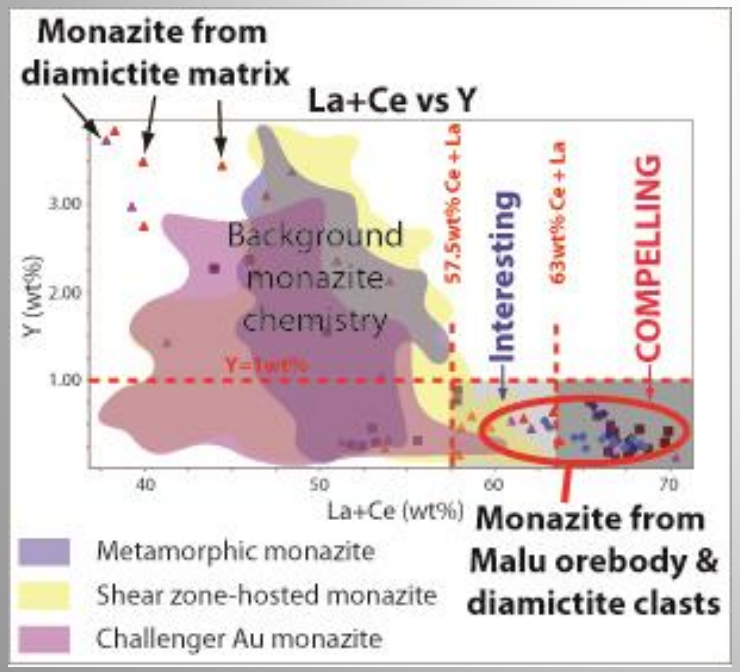
Mechanical dispersion in Permian rocks

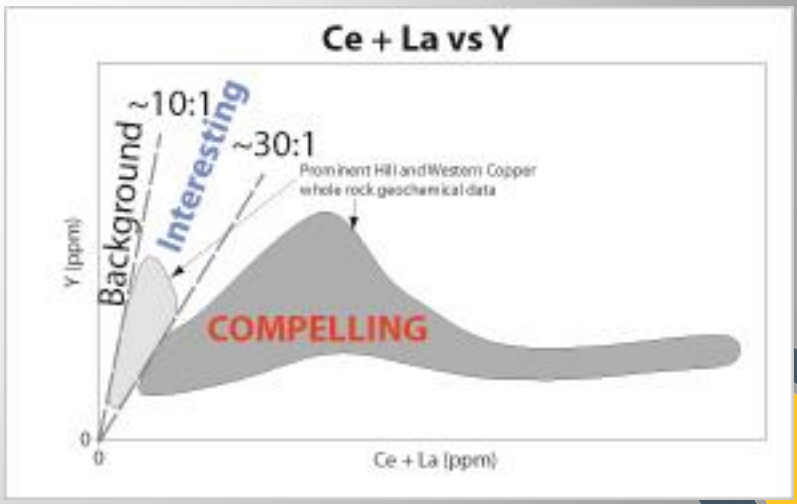
Cover sequence overlying the Prominent Hill orebody



Monazite chemistry criteria



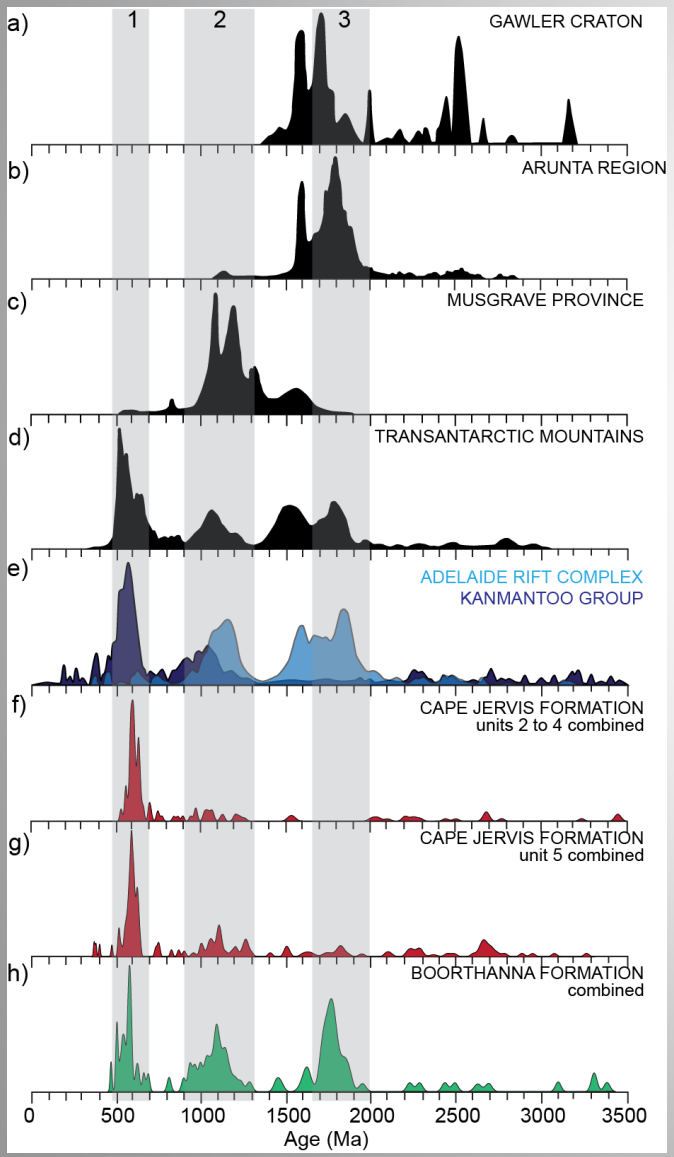
Whole rock criteria

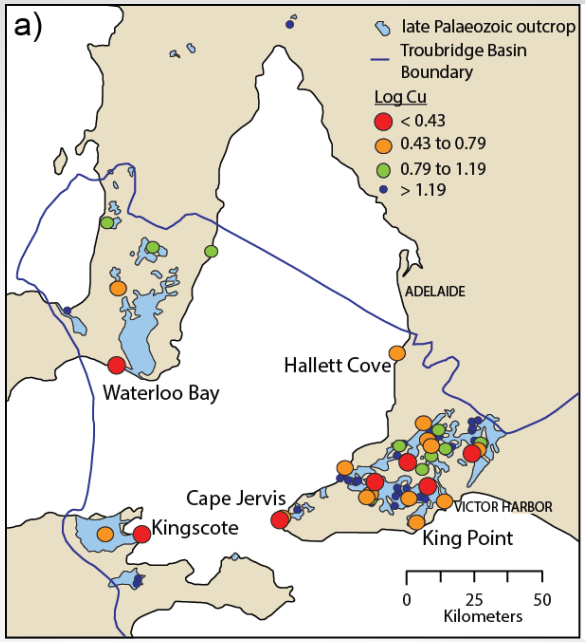


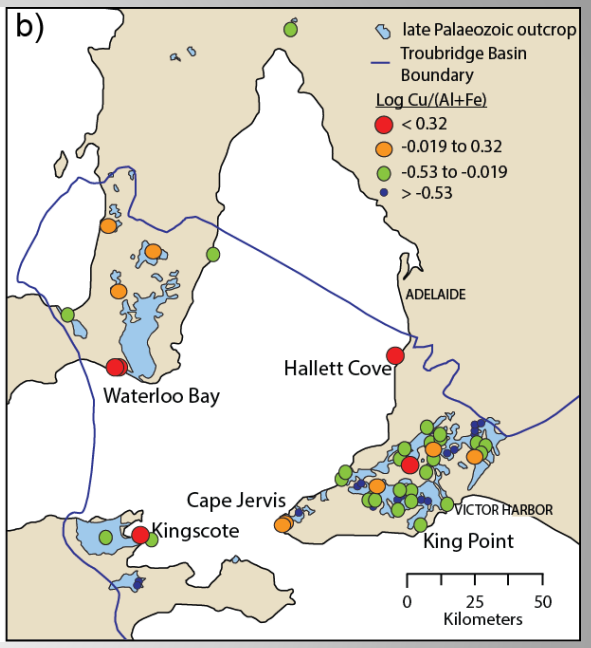
Forbes et al. 2015

Adrienne Brotodewo PhD project: zircon chemistry

Provenance and geochemistry of Permian glacial rocks





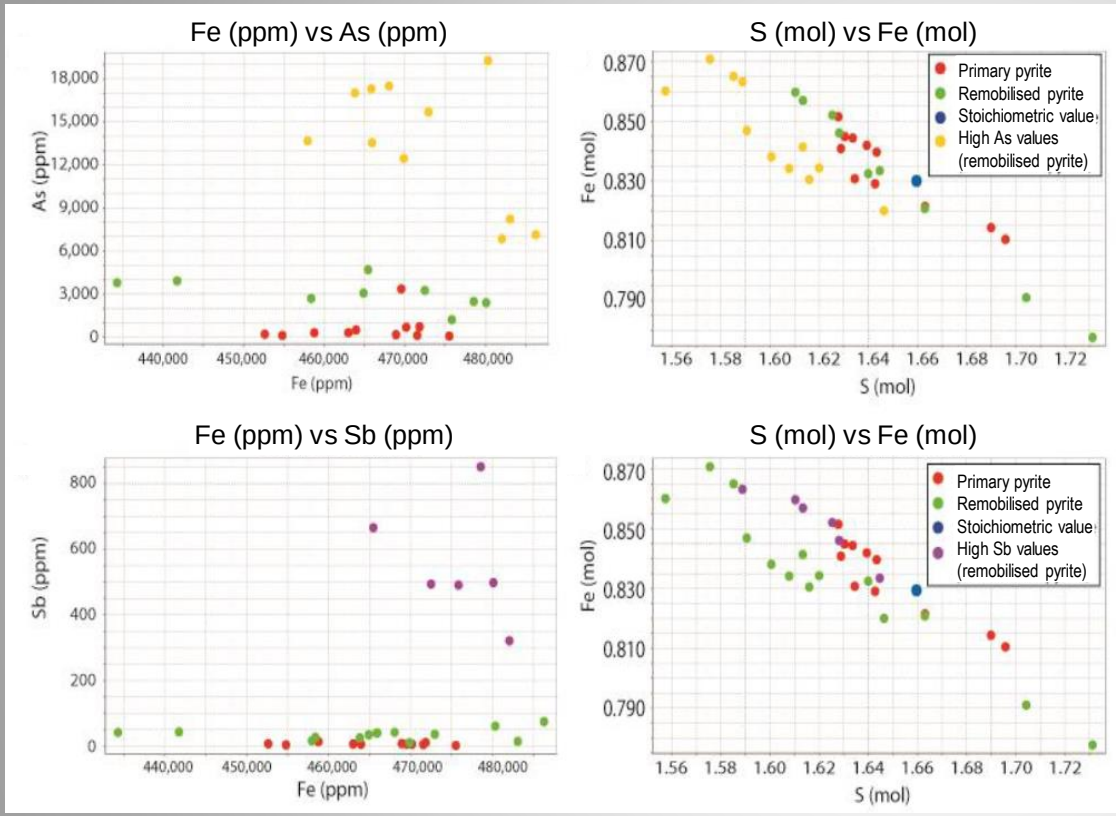


Influence of depositional/weathering processes and source rock composition on background geochemistry

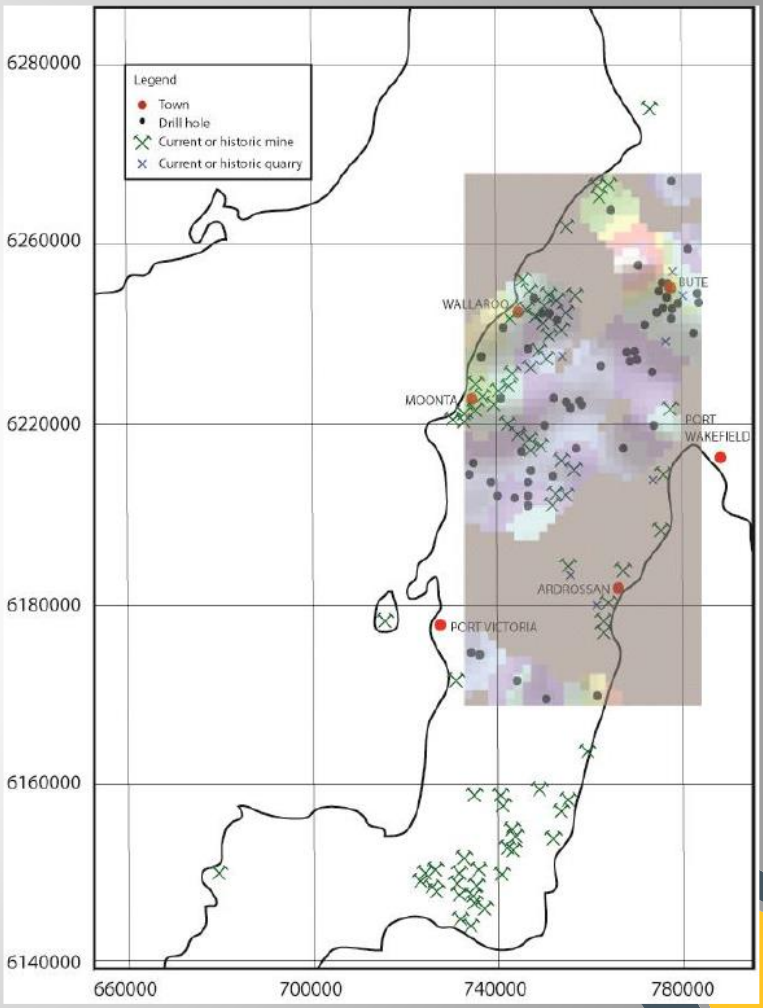
Expected age histograms for potential source regions of glacigene sedimentary rocks in the Troubridge and Arckaringa basins

Verity Normington PhD project

Chemical dispersion in basal cover sequence over Yorke Peninsula



As and Sb within remobilised pyrite preserved within the cover sequence



Basal cover sequence over Yorke Peninsula gridded for modified IOCG prospectivity index of Fabris et al. (2013) using As, Co, S, Sb, Cu, Au, Ce and La

Rebecca Hill Honours project
Nurtasha Ahmed Masters project

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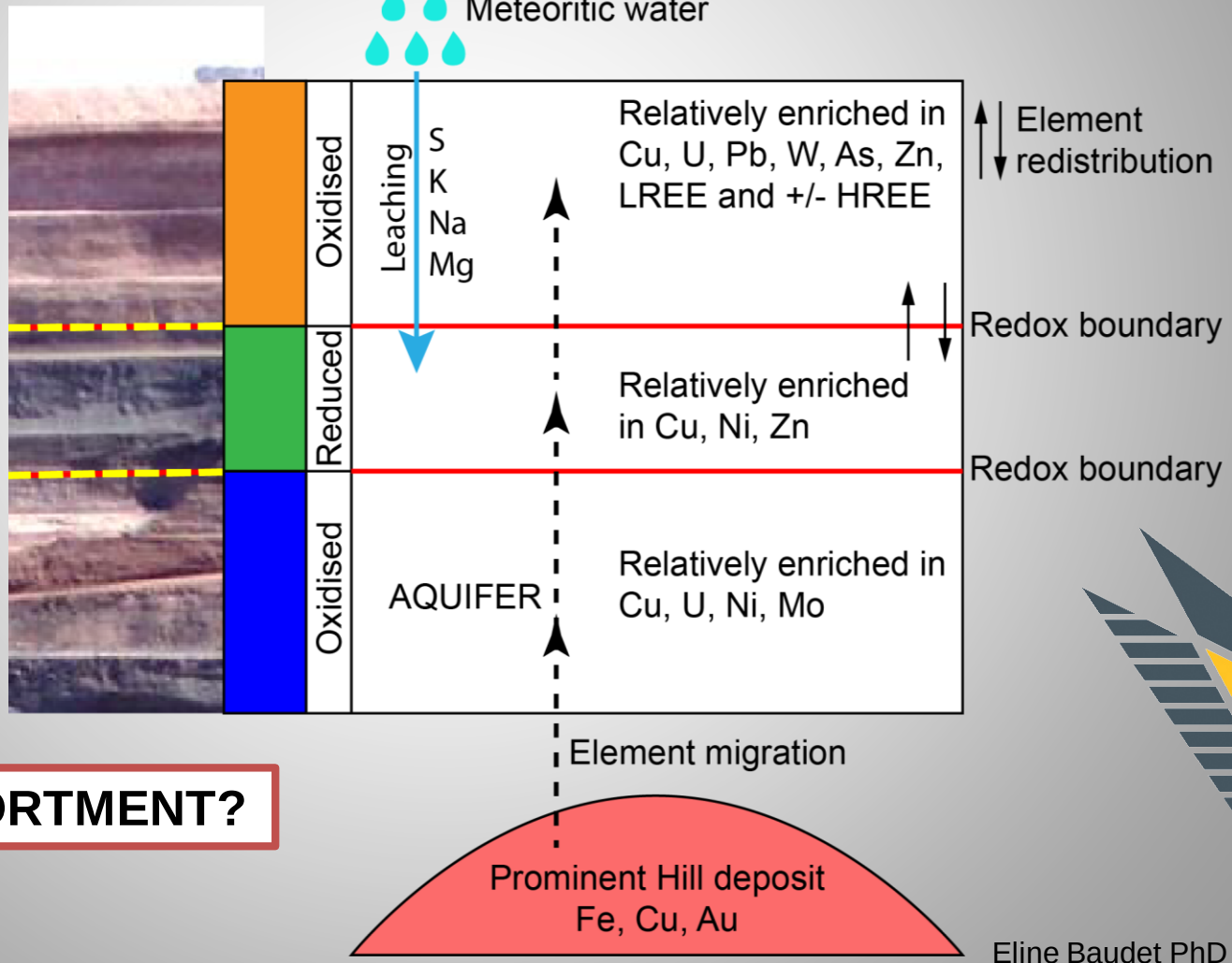
Chemical dispersion in Early Cretaceous shales and sandstones

- Bulldog Shale and Cadna-owie Formation within the Eromanga Basin and over the Prominent Hill deposit

Weathered Bulldog Shale

Unweathered Bulldog Shale

Cadna-owie Formation



ELEMENT DEPORTMENT?

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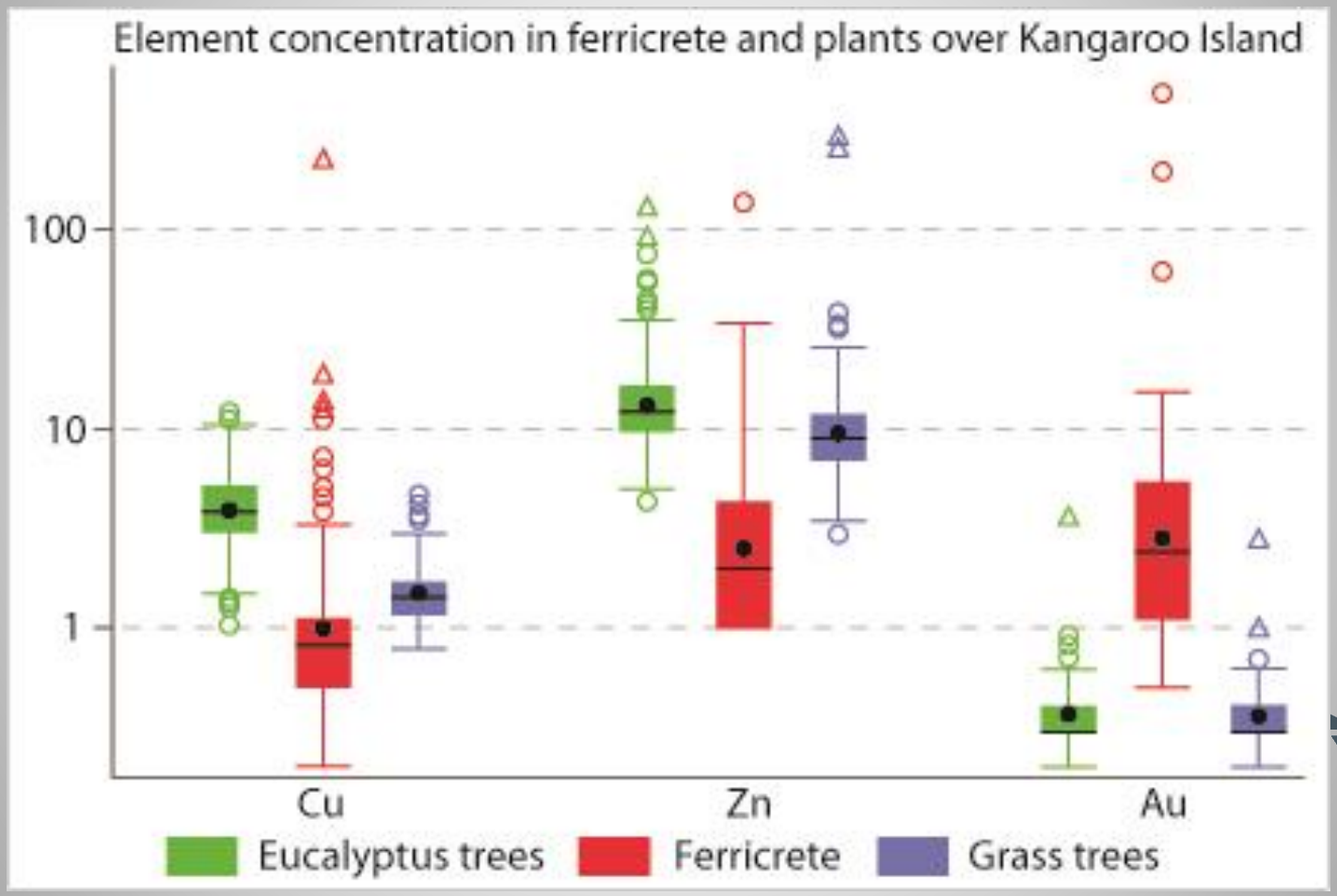
Eline Baudet PhD project

Surface material sampling

- Ferricrete and plants over Kangaroo Island



Elements can be host in various potential sampling media at variable concentrations; the element of interest (and scale of the survey) may therefore dictate the best sample media

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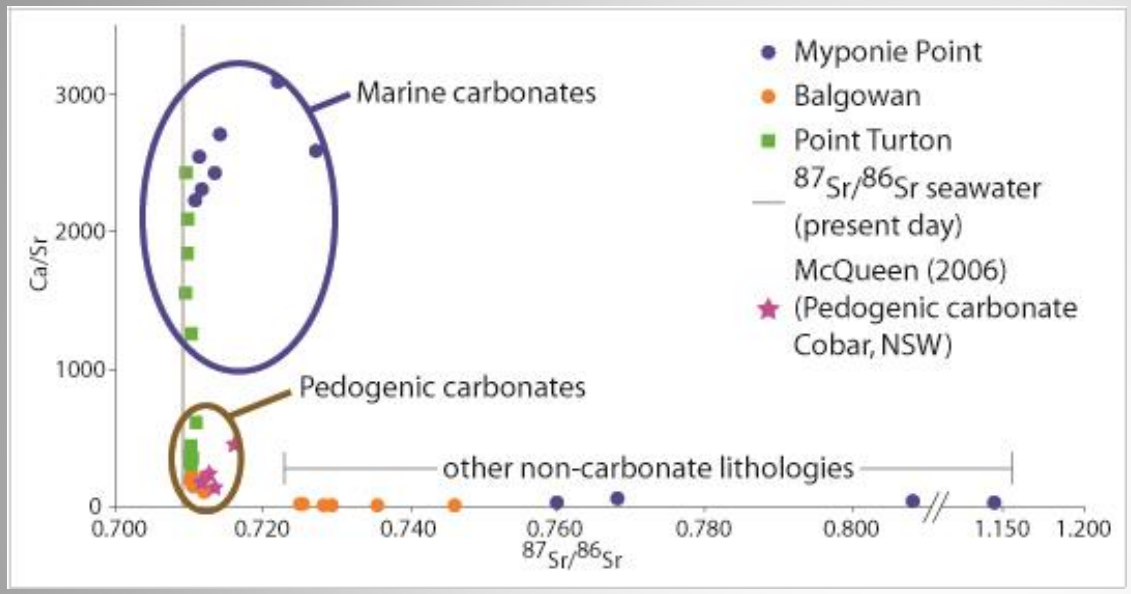
Katherine Stoate PhD project

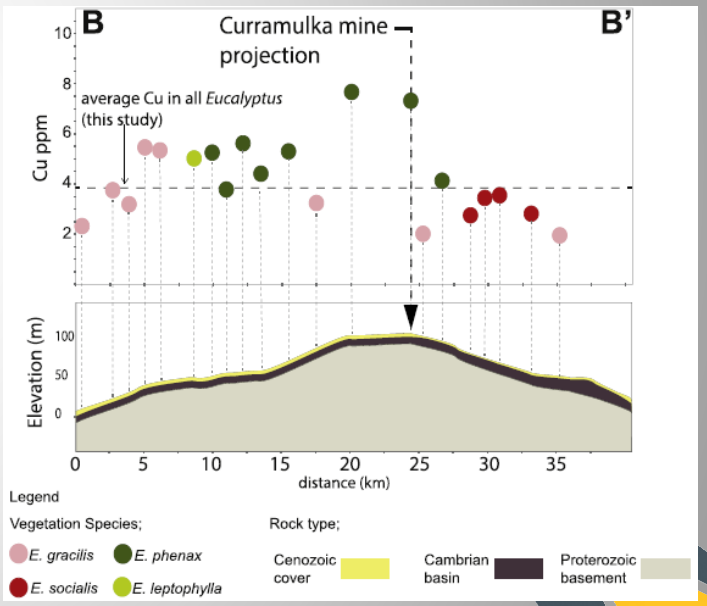
Surface material sampling

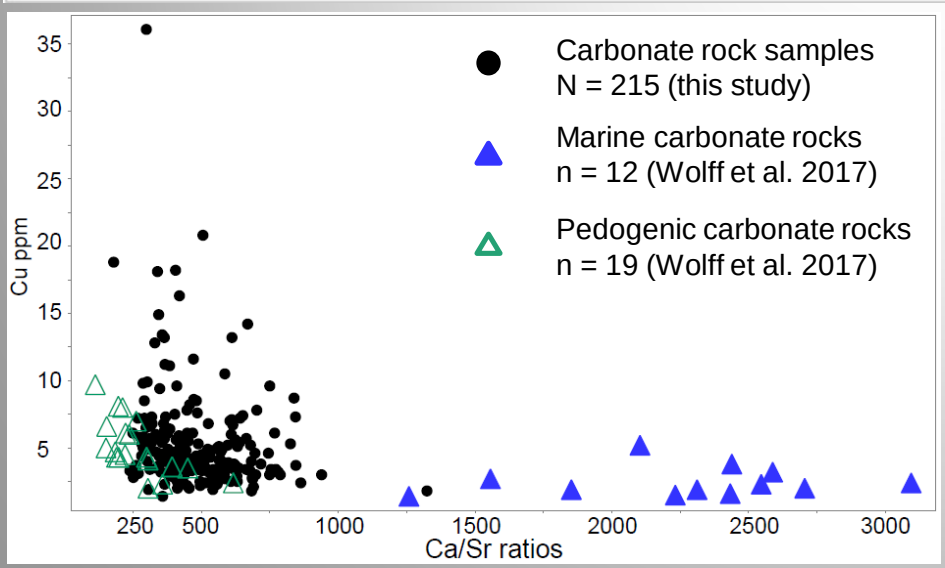
- Calcrete and plants over the Yorke Peninsula



Distinguishing marine versus pedogenic carbonates

Biogeochemical expression of Cu mineralisation

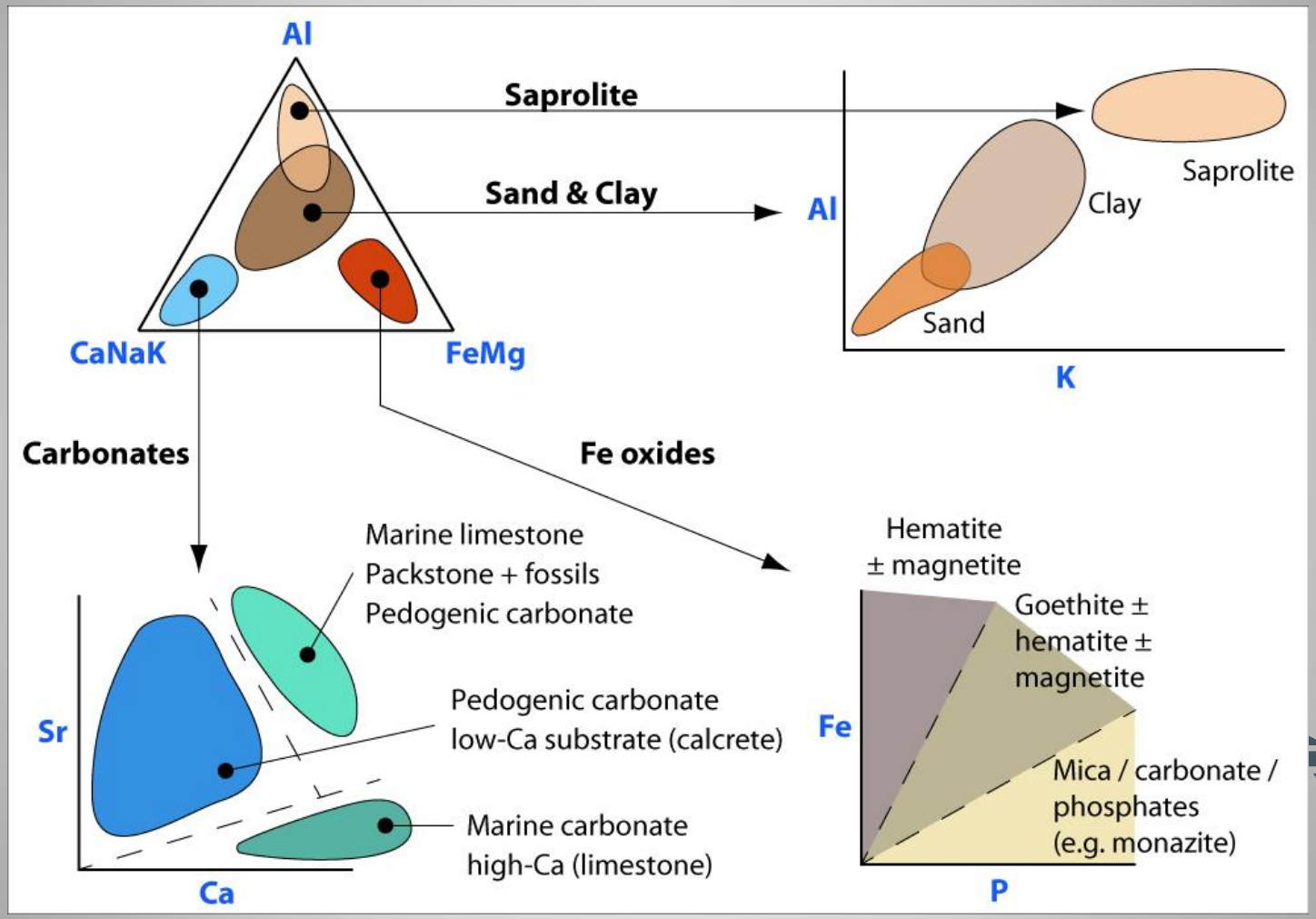




Vectoring towards Cu mineralisation using regional carbonate sampling surveys

Keryn Wolff PhD project
Wolff et al. 2017, 2018 and submitted, JGE

Lithogeochemistry for background



Forbes, C. J., van der Hoek, B., Gray, D., Hill, S., Normington, V., Anand, R., Dietman, B., Johnson, A., McLennan, S., Reid, N., Rollison, L., Salama, W., Stoate, K. & Wolff, K. 2013. DET CRC Report 2013/326

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3D DRILLING

Conclusions

- Increased understanding of utilising regolith materials for mineral exploration

….but lots more to do!!

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Acknowledgements

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This is DET CRC Presentation 2018/1099

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