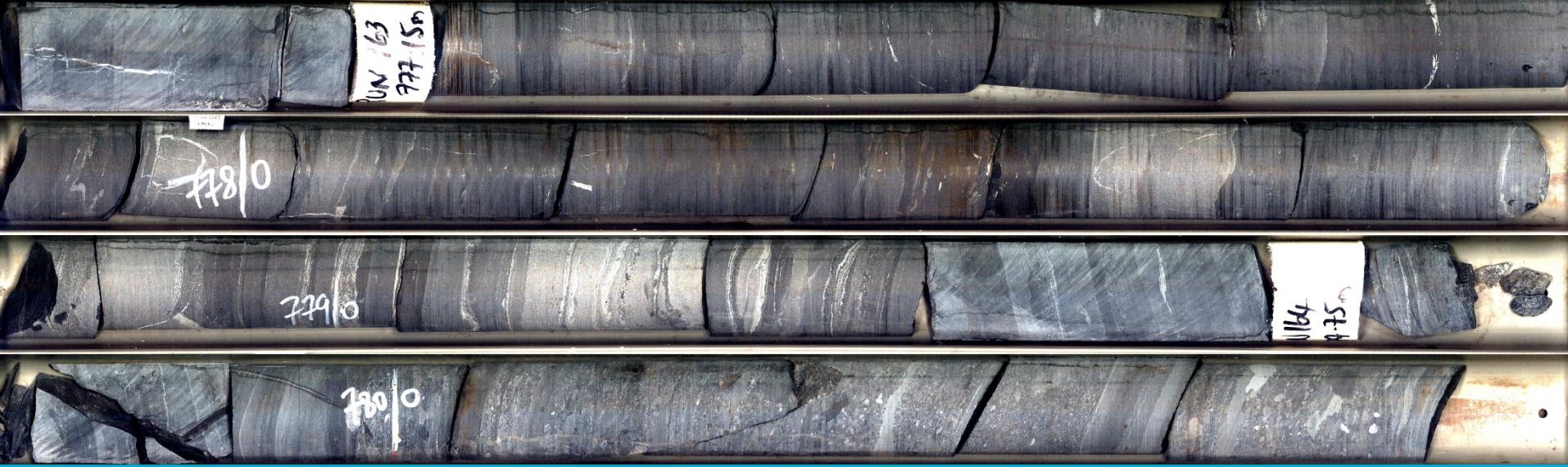


Sedimentological and biogeochemical controls on sediment-hosted base metal deposits in the McArthur Basin



Marcus Kunzmann (CSIRO/NTGS), Teagan Blaikie (CSIRO/NTGS)
Susanne Schmid (CSIRO) and Sam Spinks (CSIRO)



Sedimentological and biogeochemical controls on sediment-hosted base metal deposits in the McArthur Basin

Marcus Kunzmann, Teagan Blaikie, Susanne Schmid, Sam Spinks
AGES 2017

MINERAL RESOURCES
www.csiro.au

Northern Territory
Government



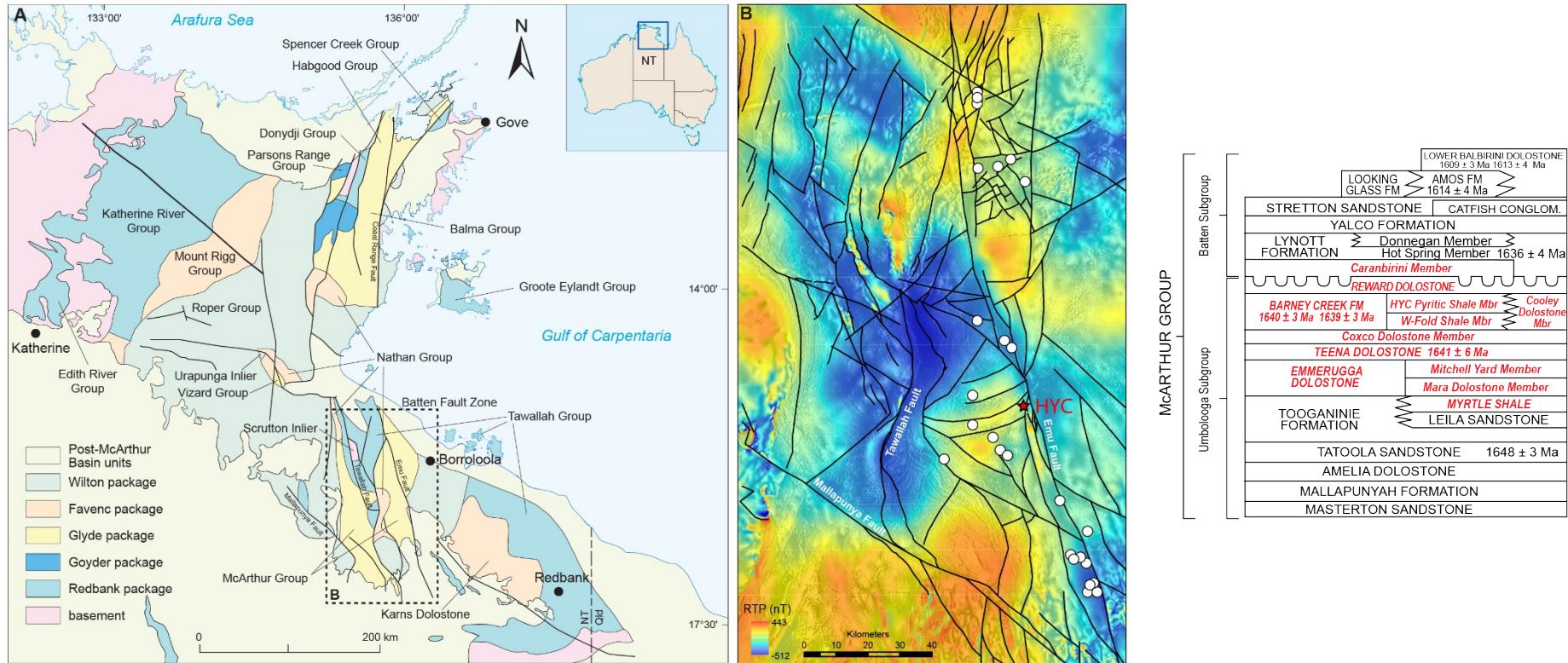
Problems

- What was the architecture of the McArthur Basin?
- What were the major structures and fluid pathways?
- What depositional environments existed? How did they evolve?
- We need to better understand the host rock geochemistry and identify reliable distal footprints.
- We need to better understand existing deposits (e.g., HYC).

Major Projects

- Tectonostratigraphic evolution of the middle McArthur Group
- 3D redox evolution and distal footprint evaluation of the Barney Creek Formation
- Zn isotopic and mineralogical characterisation of the HYC deposit
(please see abstract)

Tectonostratigraphic evolution of the middle McArthur Group

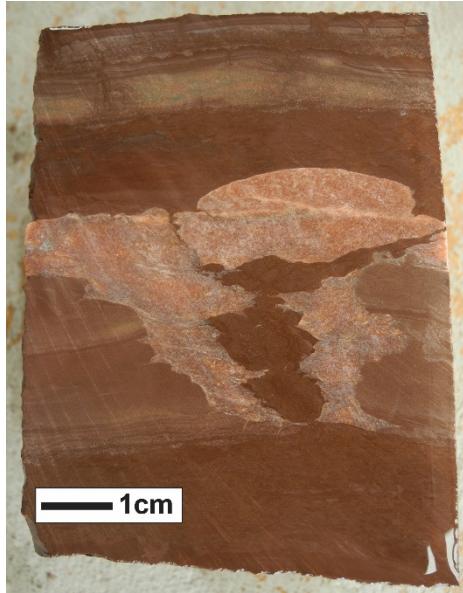


Tectonostratigraphic evolution of the middle McArthur Group

FA 1: Supratidal	FA 2: Peritidal	FA 3: Shallow Subtidal	FA 4: Deep Subtidal	FA 5: Slope
n = 3	n = 6	n = 4	n = 4	n = 2

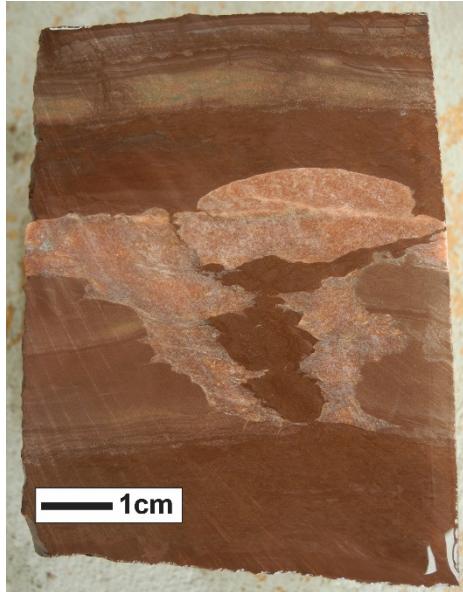
Tectonostratigraphic evolution of the middle McArthur Group

FA 1: Supratidal	FA 2: Peritidal	FA 3: Shallow Subtidal	FA 4: Deep Subtidal	FA 5: Slope
n = 3	n = 6	n = 4	n = 4	n = 2



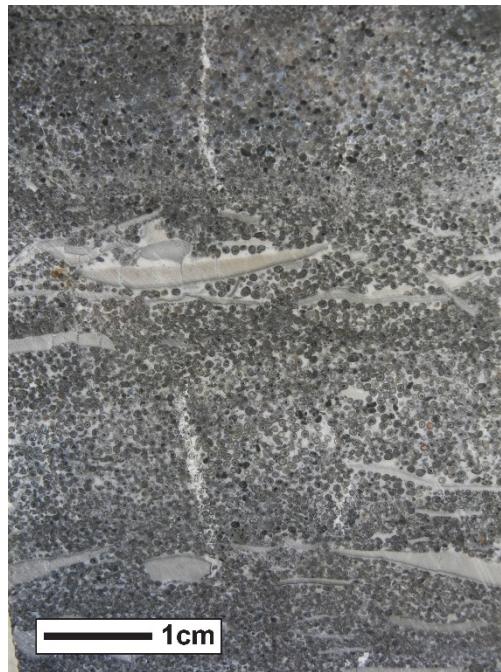
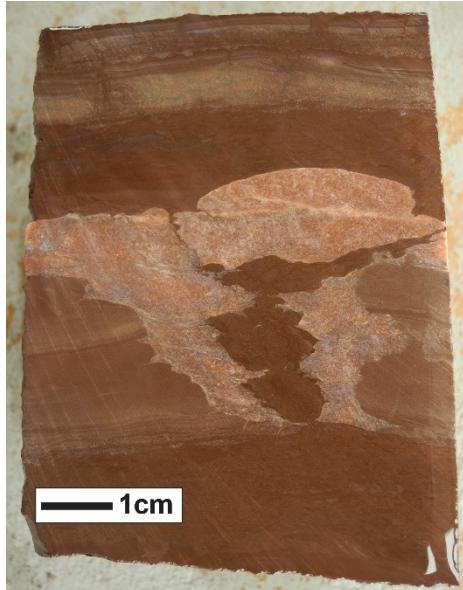
Tectonostratigraphic evolution of the middle McArthur Group

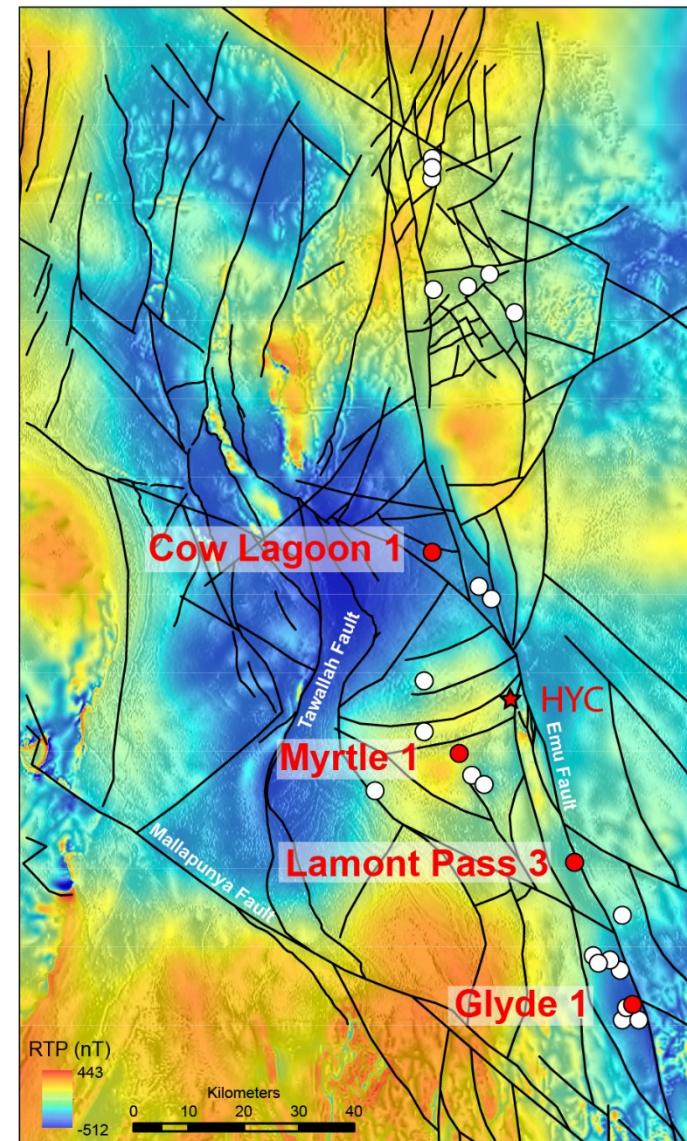
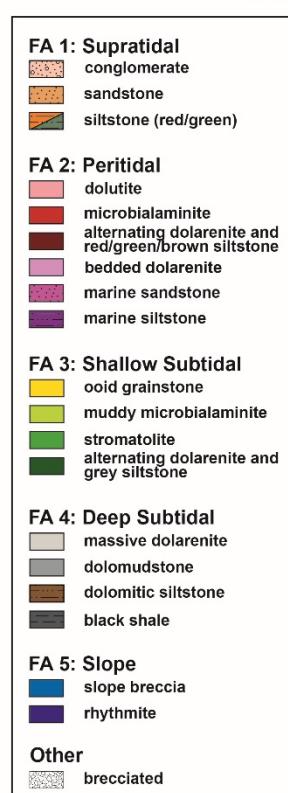
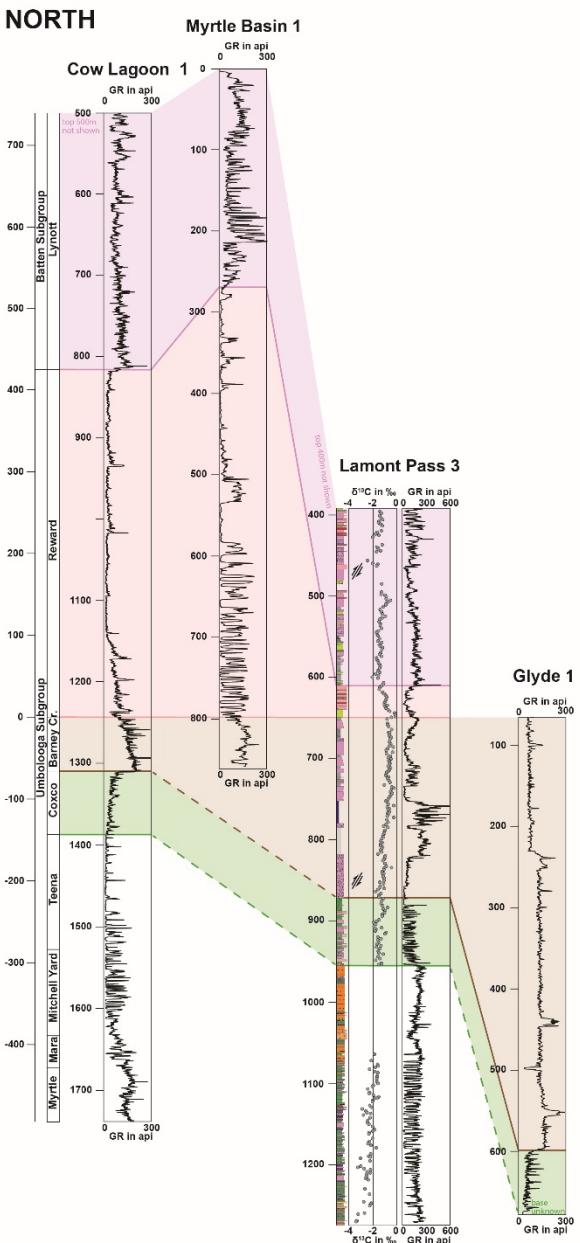
FA 1: Supratidal	FA 2: Peritidal	FA 3: Shallow Subtidal	FA 4: Deep Subtidal	FA 5: Slope
n = 3	n = 6	n = 4	n = 4	n = 2



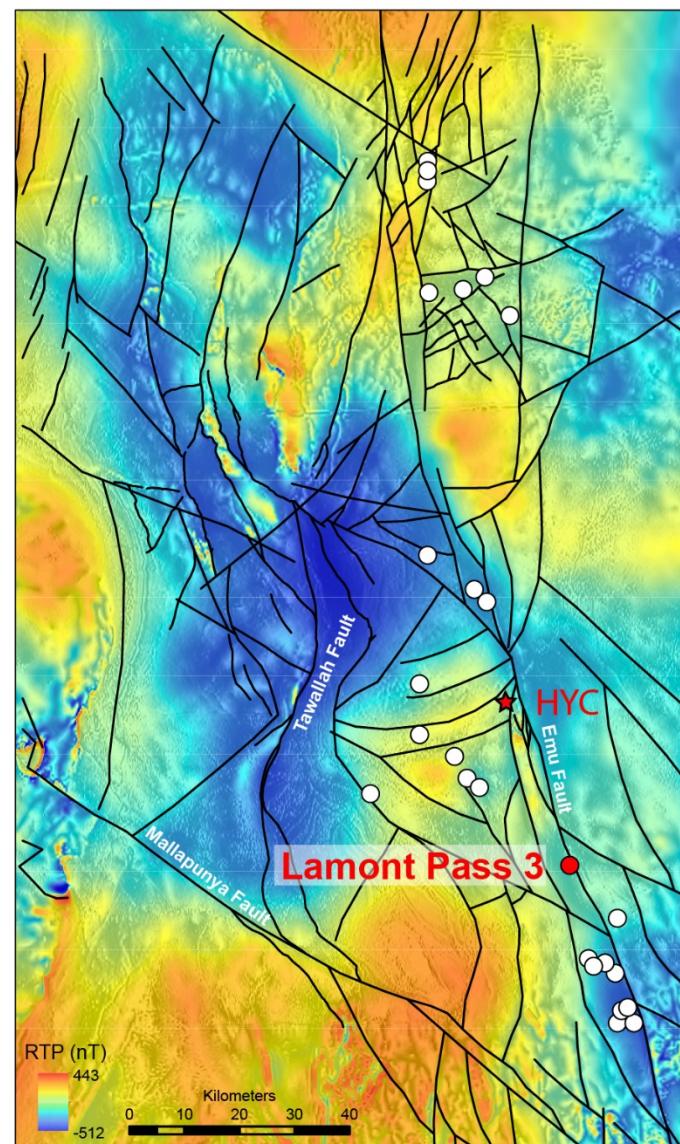
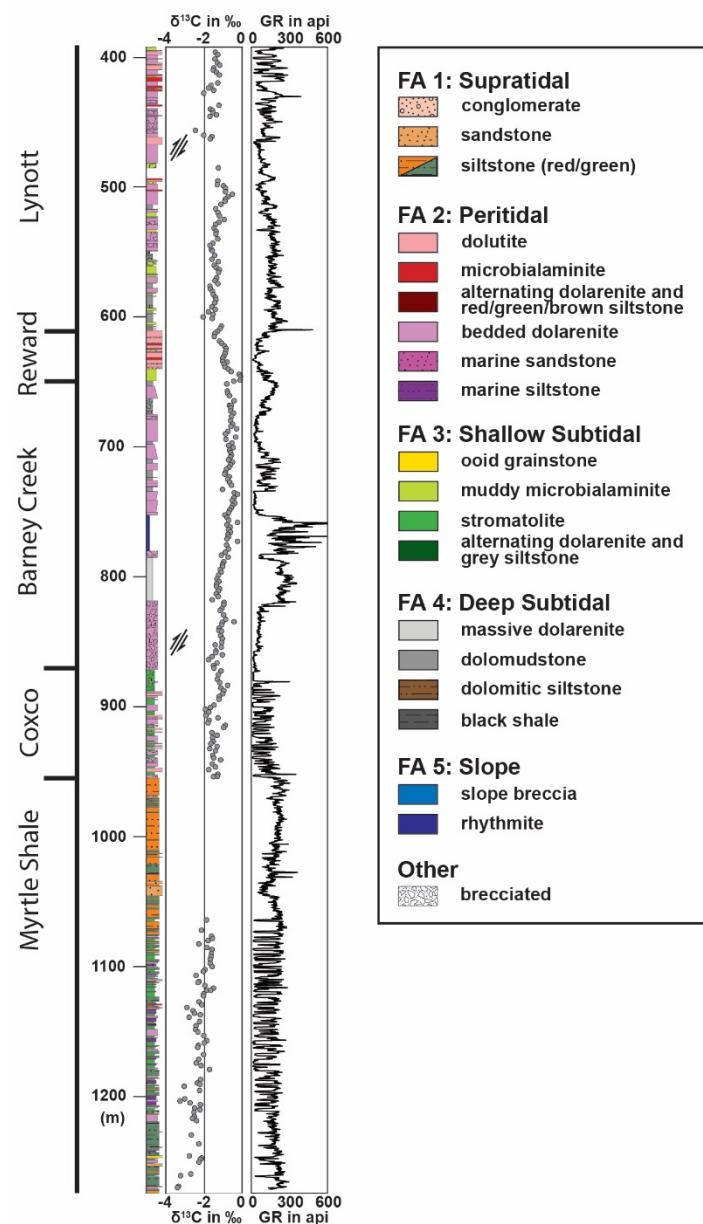
Tectonostratigraphic evolution of the middle McArthur Group

FA 1: Supratidal	FA 2: Peritidal	FA 3: Shallow Subtidal	FA 4: Deep Subtidal	FA 5: Slope
n = 3	n = 6	n = 4	n = 4	n = 2





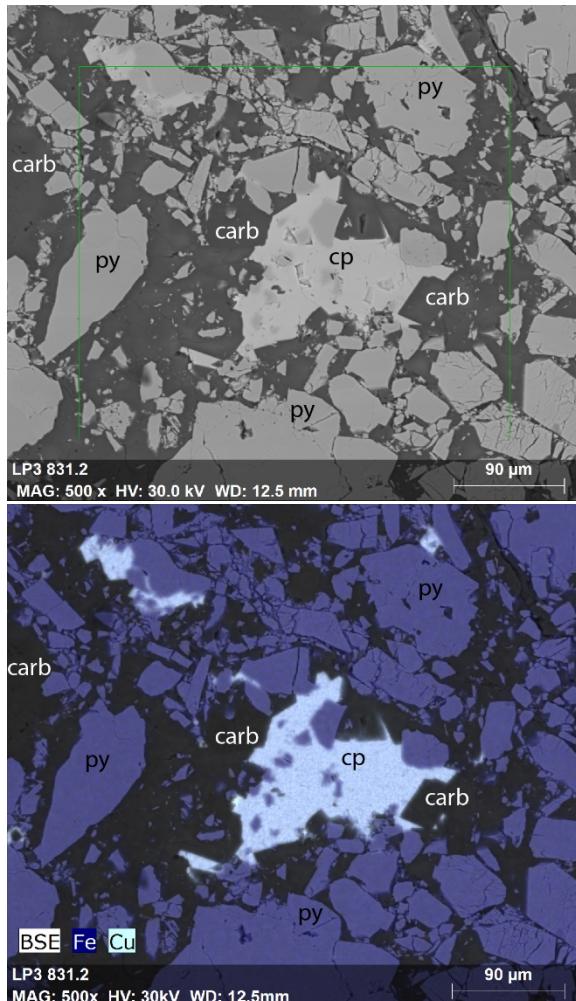
Lamont Pass 3



Fault zone – Lamont Pass 3

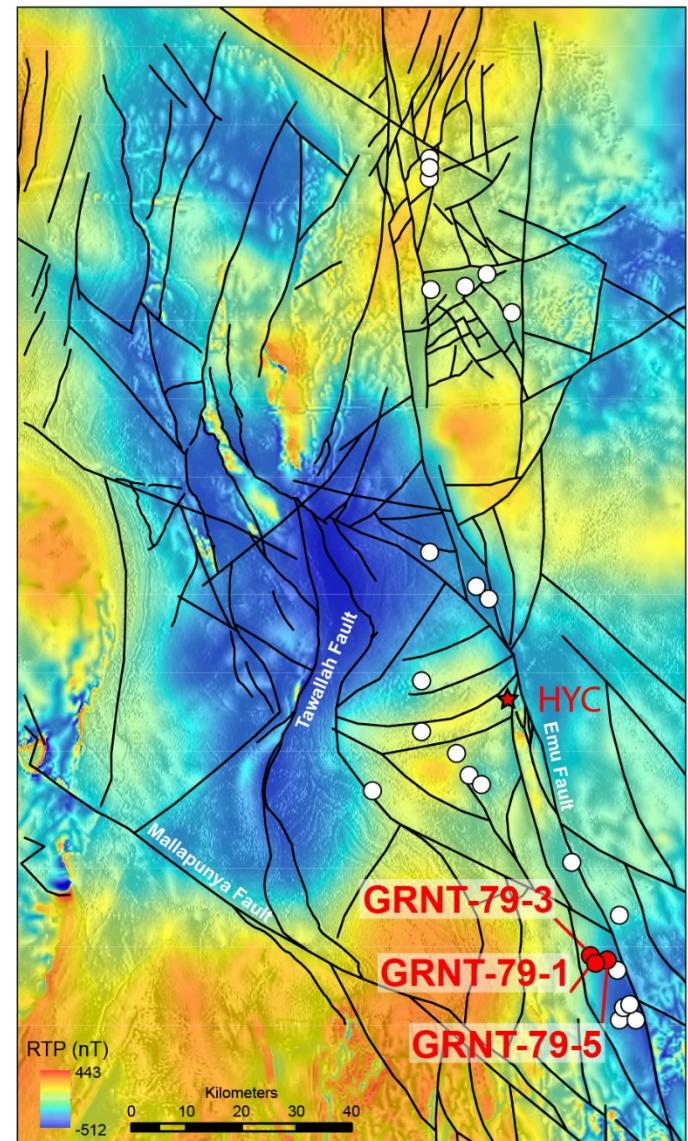
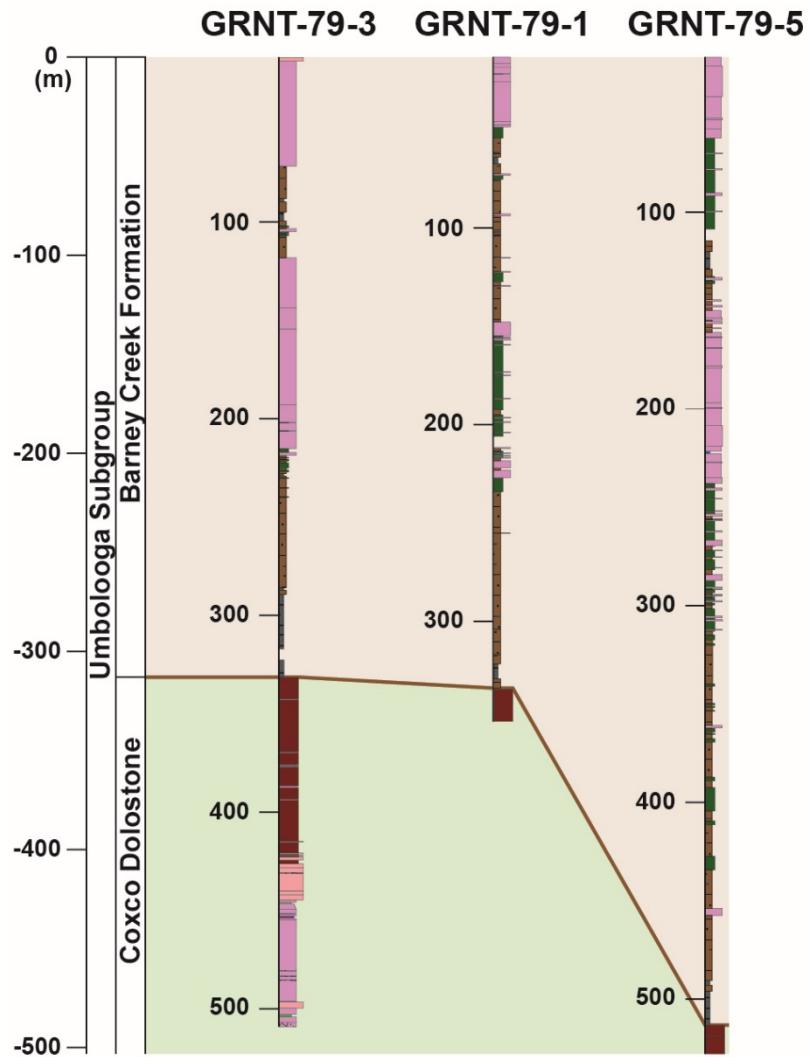


Fault zone – Lamont Pass 3



WEST

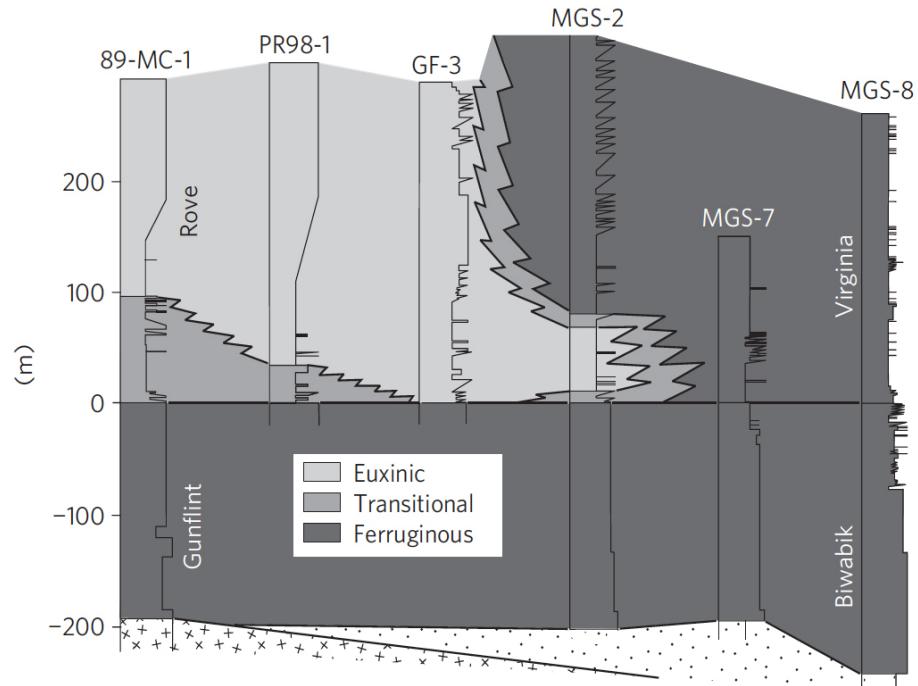
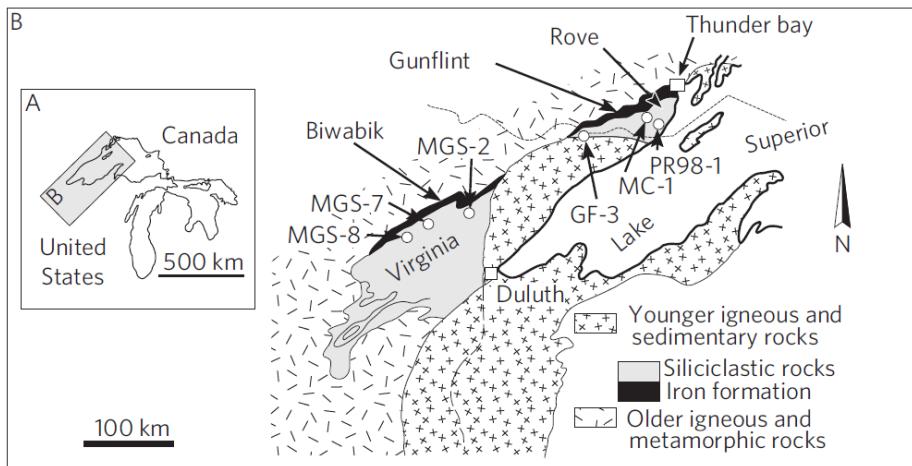
EAST



3D redox evolution and distal footprint evaluation of the Barney Creek Formation

- Iron speciation
- Major and trace element geochemistry (e.g., Fe, Al, Mo, U, V)
- Multiple sulphur isotopes
- Systematic element distribution for distal footprint evaluation

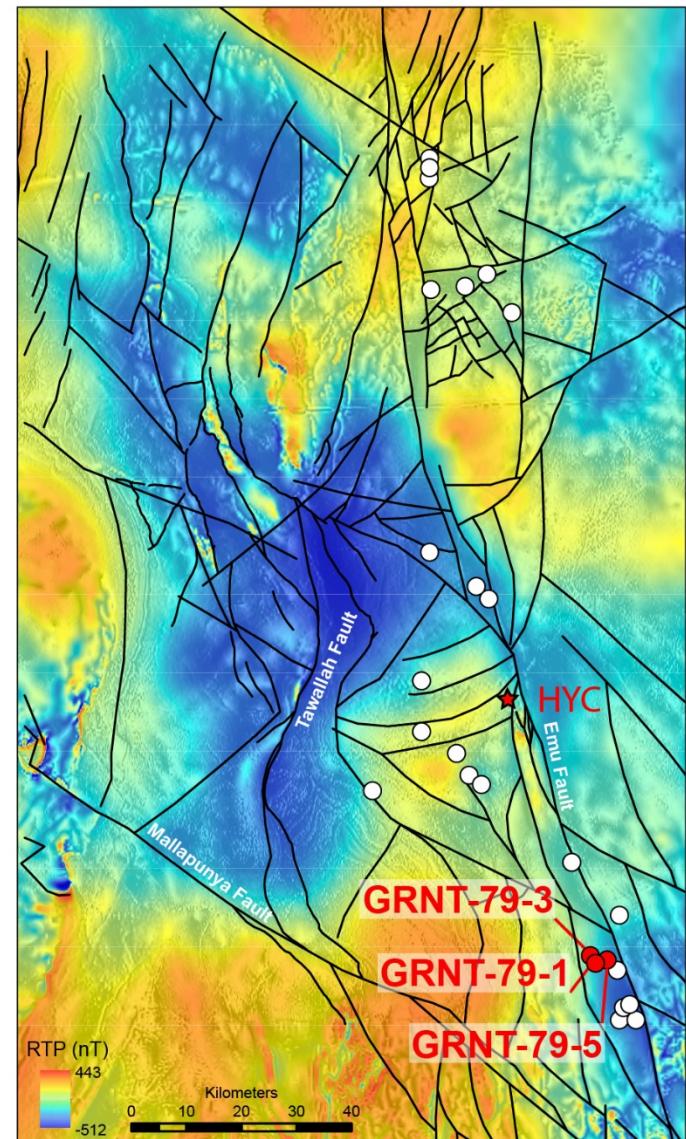
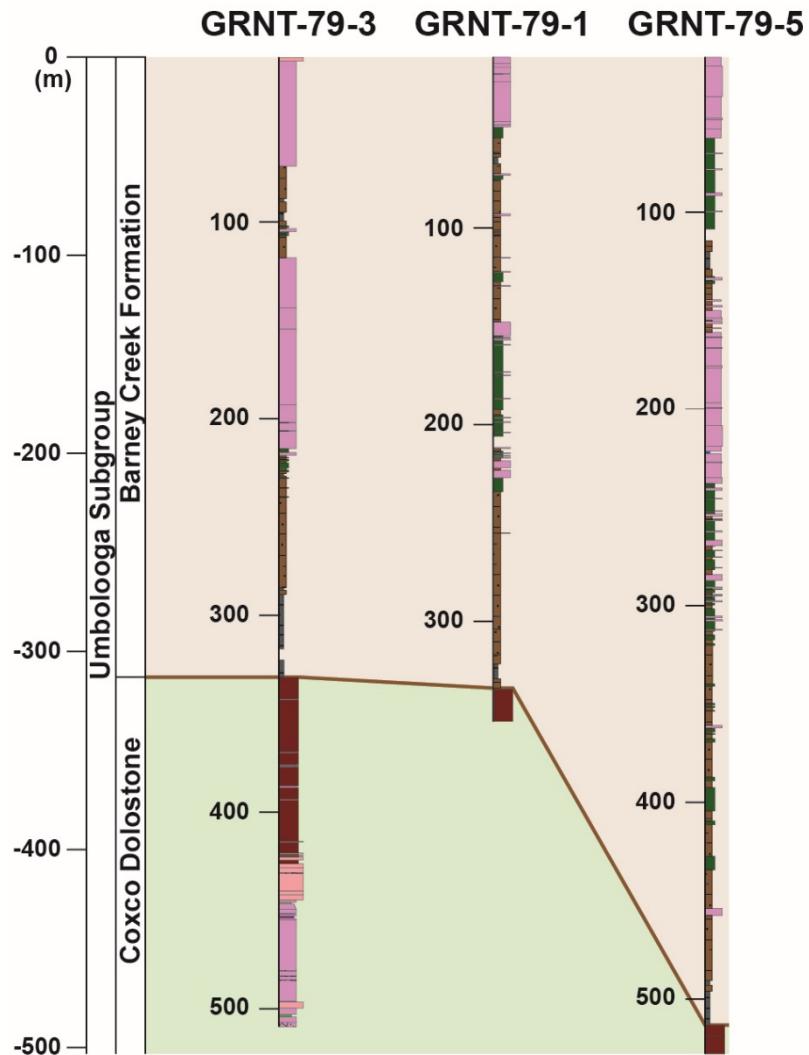
Basin redox transect – example from Canada



Poulton et al. (2010)

WEST

EAST



What can we offer at the end of this project?

- A predictive facies model and sedimentological assessment of the middle McArthur Group
- Tectonostratigraphic model for the middle McArthur Group
- Detailed geochemical characterisation of the Barney Creek Formation
 - stratigraphic and spatial identification of metal traps
 - distal footprint assessment

Thank you

Marcus Kunzmann

CSIRO Postdoc and NTGS Embedded
Researcher

t +61 8 8999 6031

e marcus.kunzmann@csiro.au

MINERAL RESOURCES

www.csiro.au

