Identification of New Porphyry Potential Undercover

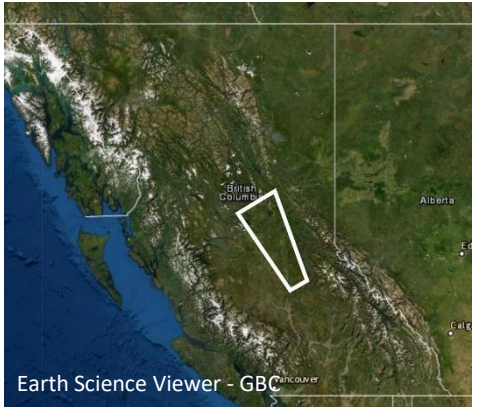
Digging Deeper Into Central Quesnel Terrane Geophysical Data

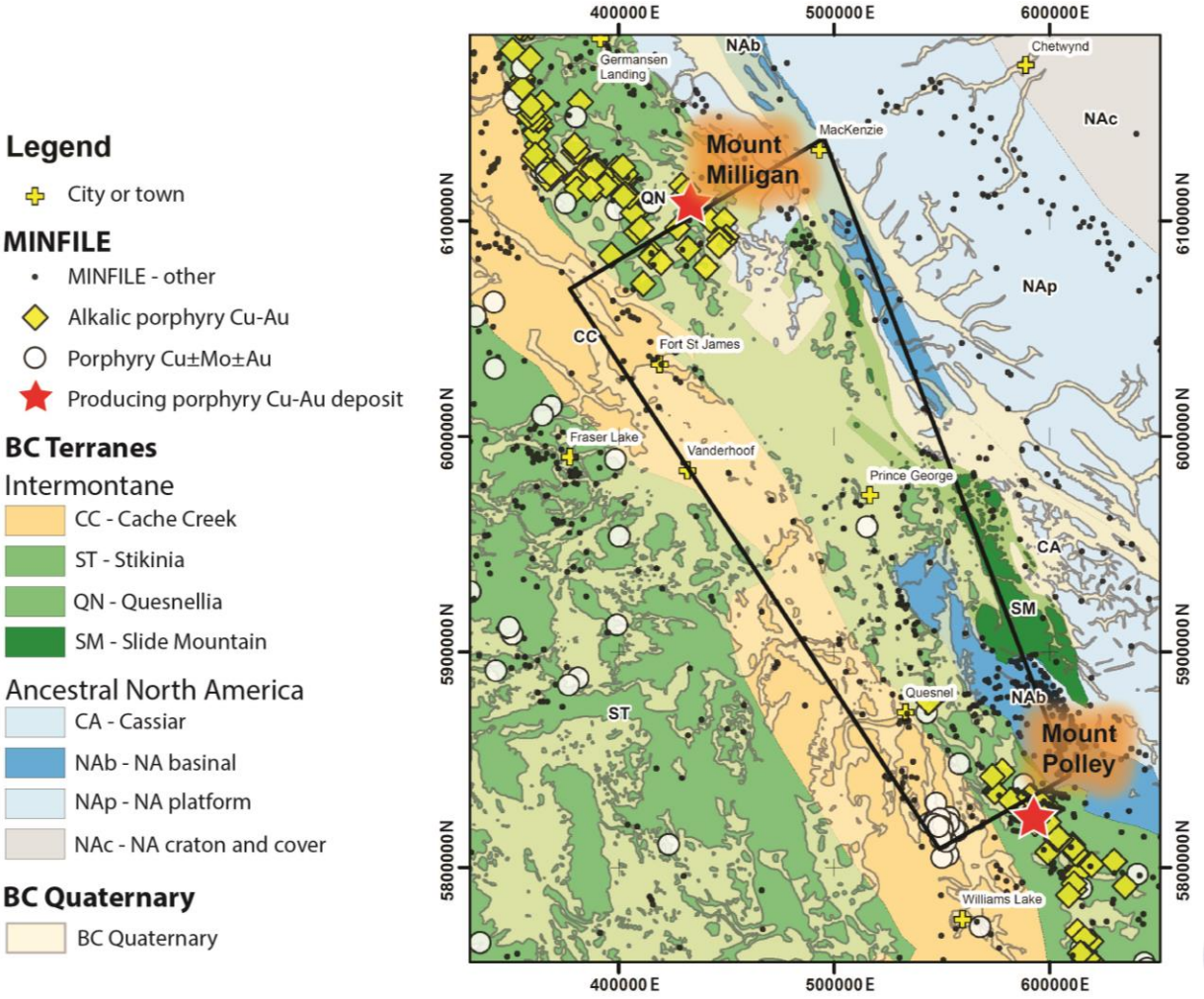
Dianne Mitchinson
Research Associate, Mineral Deposit Research Unit, UBC

Kamloops Exploration Group Virtual Lecture Series
April 27, 2021

Motivation

- Nothing? Really?





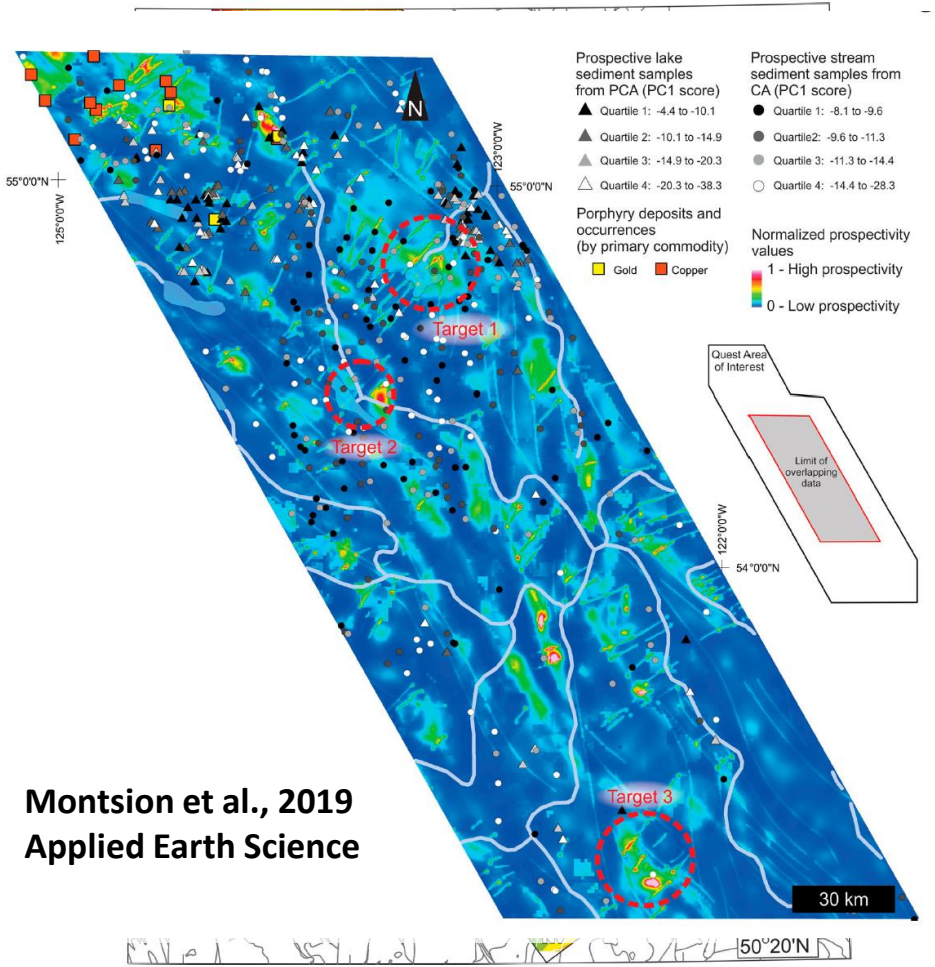
Terrane map: Colpron and Nelson, 2011; Quaternary overburden: Cui et al., 2017

Geoscience BC

MDRU

Quesnel Terrane geophysical data – It's a goldmine!

- So much data, lots of work already done to evaluate, consider, and follow up on!
- NPP - Digging down a bit more, with focus on specific targets

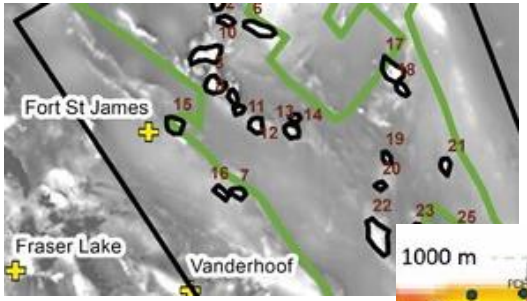


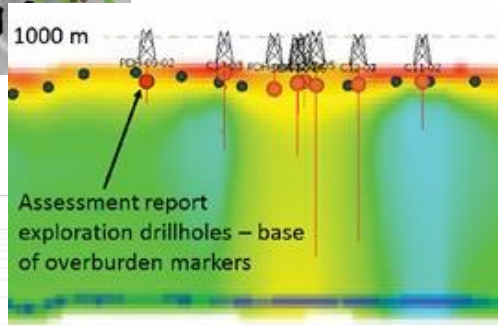
Montsion et al., 2019
Applied Earth Science

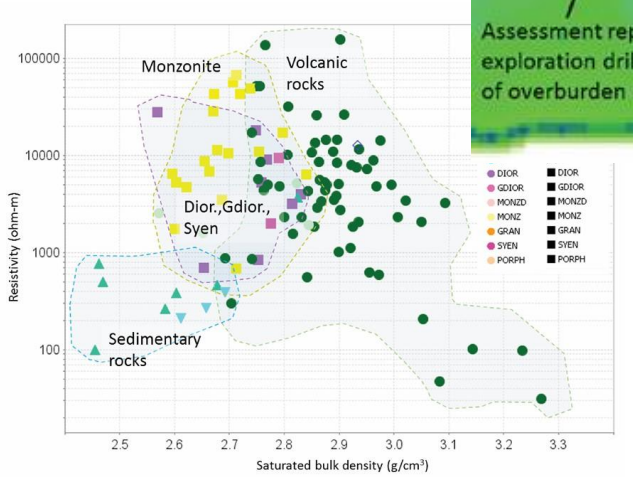
Geoscience BC

Geoscience BC-MDRU New Porphyry Potential Project

- Goals
  - Identify a suite of targets using magnetics
  - Assess thickness of overburden
  - Further define geophysical/petrophysical character of targets
  - Assess prospectivity based on geophysical characteristics, thickness, and other data





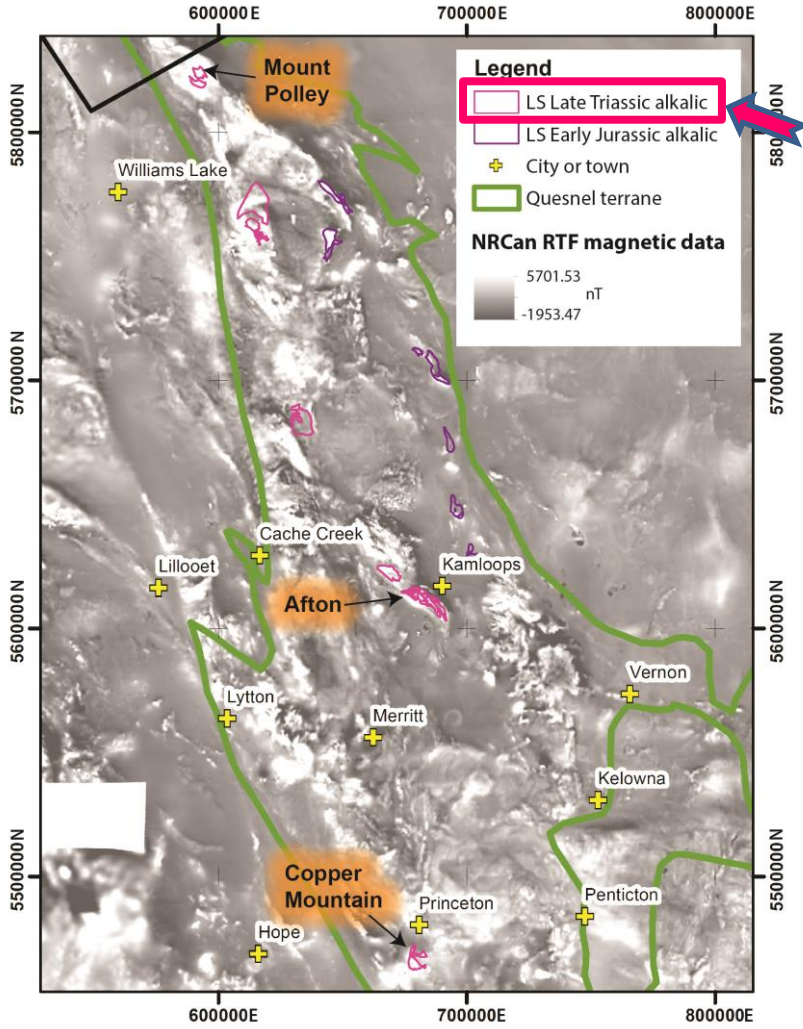


Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Identify interesting intrusive targets in central Quesnel Terrane

- In this case, geophysically interesting! (At least to start with)
- Guided by geophysical patterns in Southern and Northern Quesnel



Mainly ~205-202 Ma monzodiorite, diorite, monzonite, syenite

Logan, J.M. and Schiarizza, P. (2011)

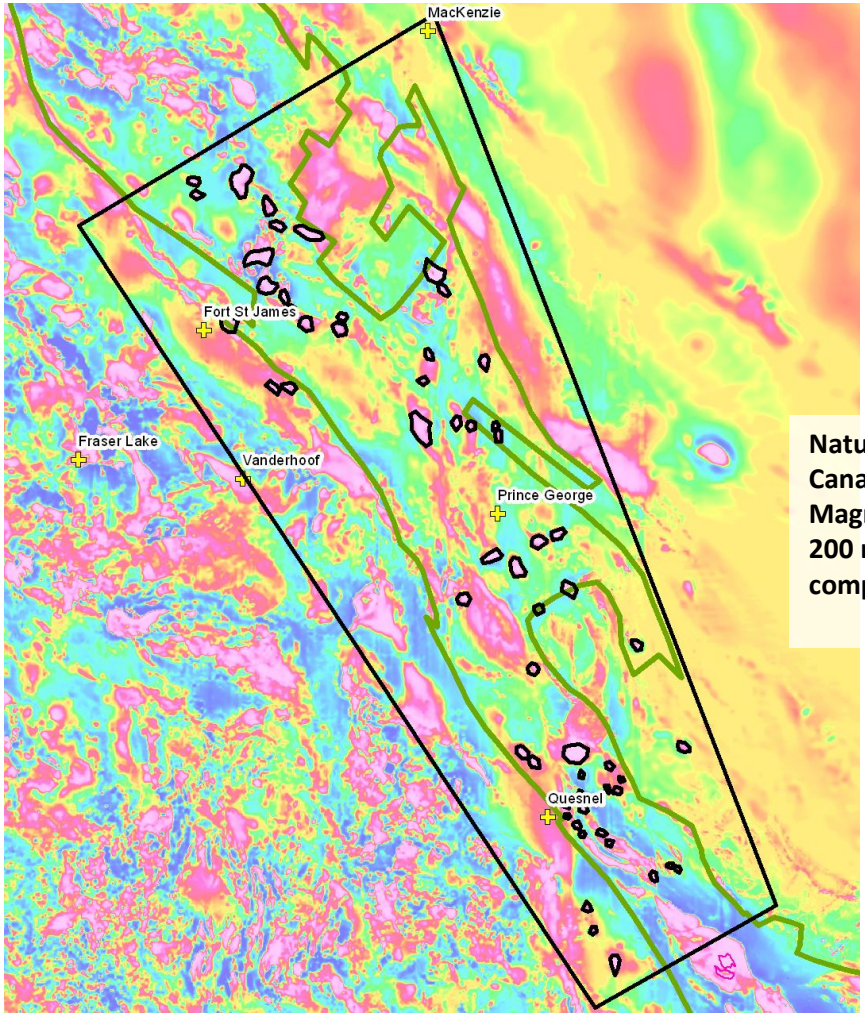
Natural Resources Canada RTF Magnetic data, 200 m grid compilation

Geoscience BC

MDRU

Potential Intrusive Targets

- Rounded magnetic bodies, cross-cutting, of size similar to anomalies under Mount Milligan, Mount Polley, Afton
- Avoid anything already mapped as unrelated (e.g. magnetic ultramafic rocks), avoid stratigraphic magnetic anomalies (magnetic volcanic stratigraphy)



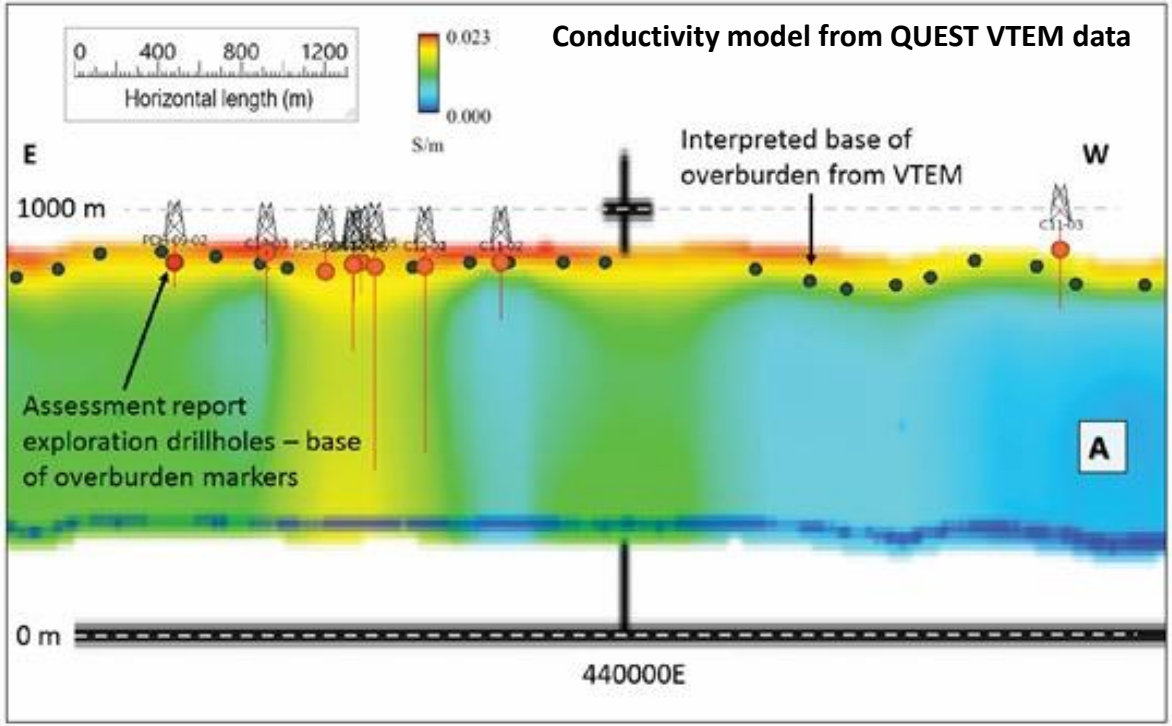
Natural Resources Canada RTF Magnetic data, 200 m grid compilation

Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Assess prospectivity by modeling cover material

- Addition of observations from EM modeling to update previous efforts (e.g. Andrews and Russell, 2008)



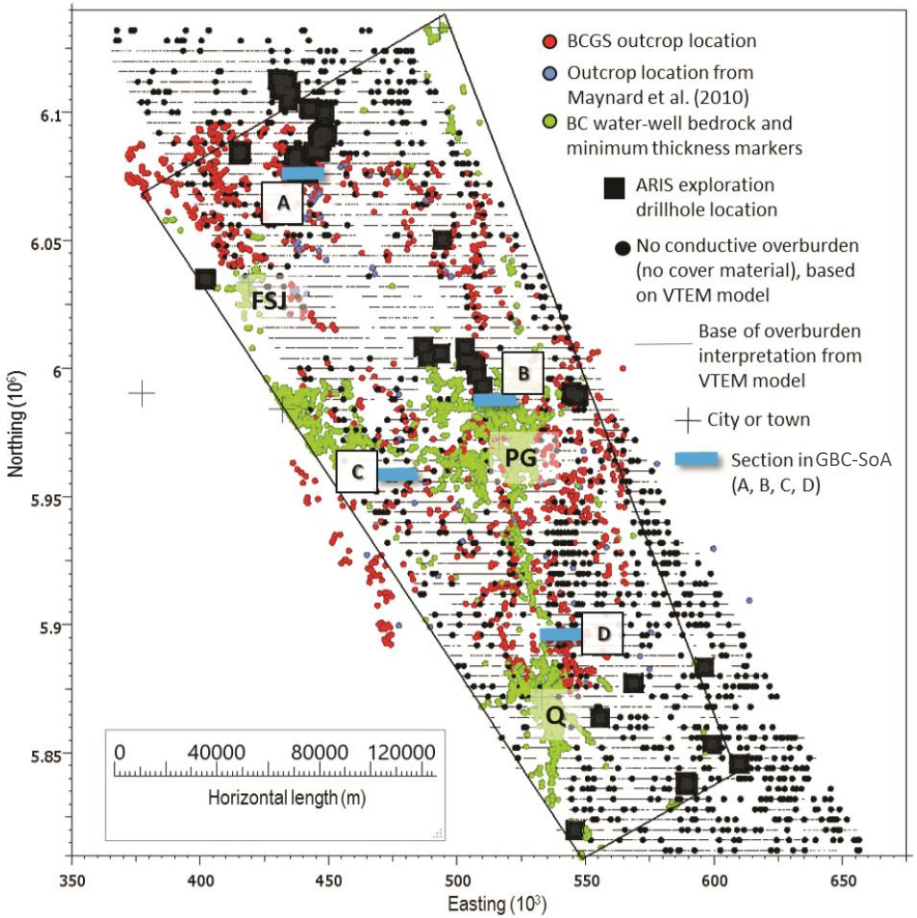
Mira Geoscience Ltd., 2009
Geoscience BC Report 2008-009

Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Assess prospectivity by modeling cover material

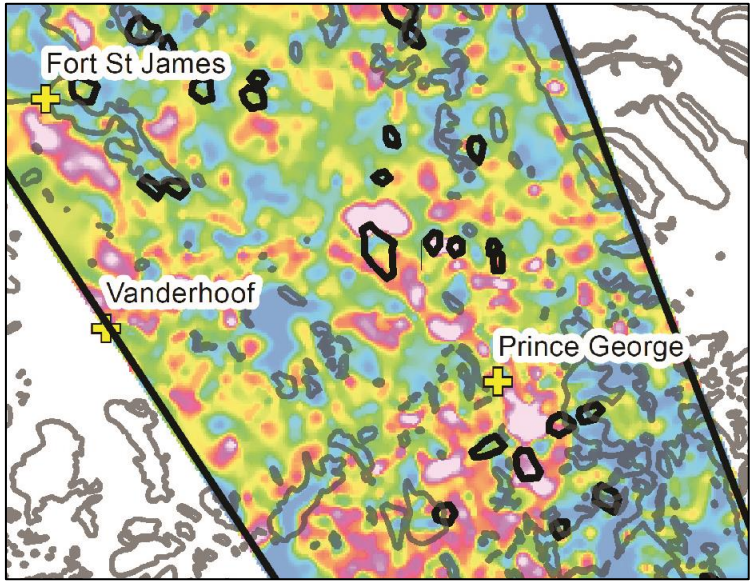
- Addition of observations from EM modeling to update previous efforts (e.g. Andrews and Russell, 2008)

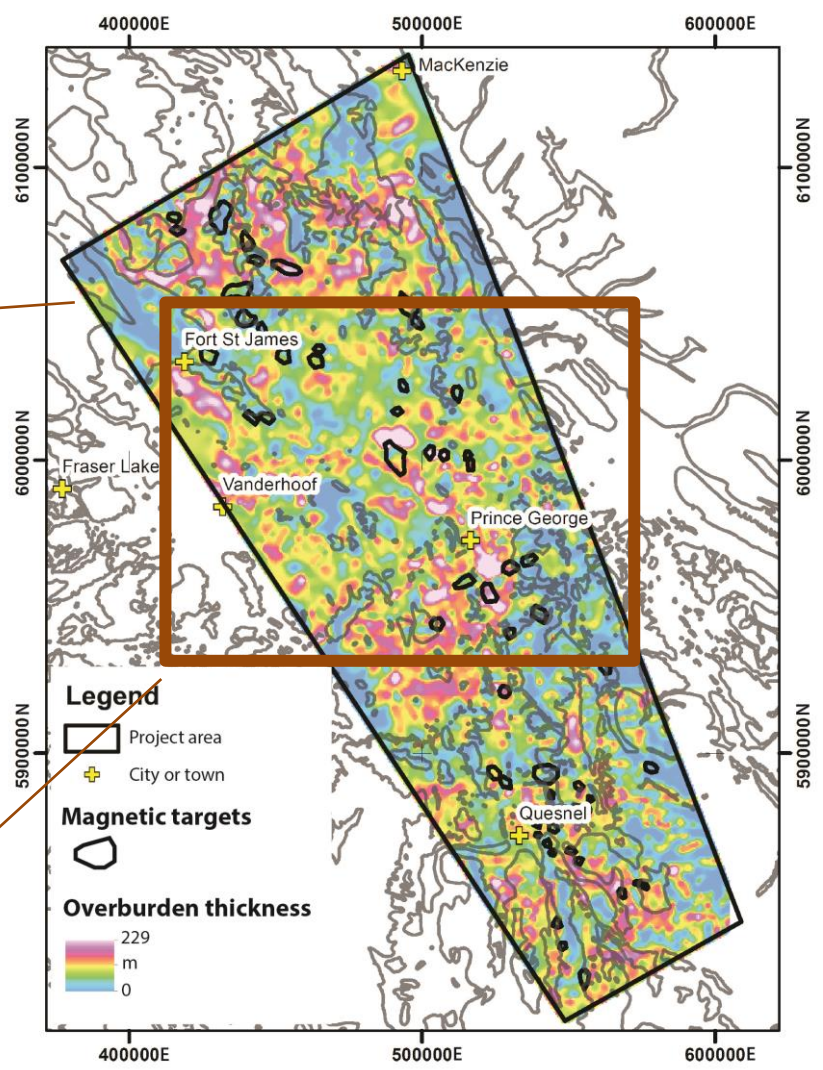


Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Updated central Quesnel Terrane drift thickness model



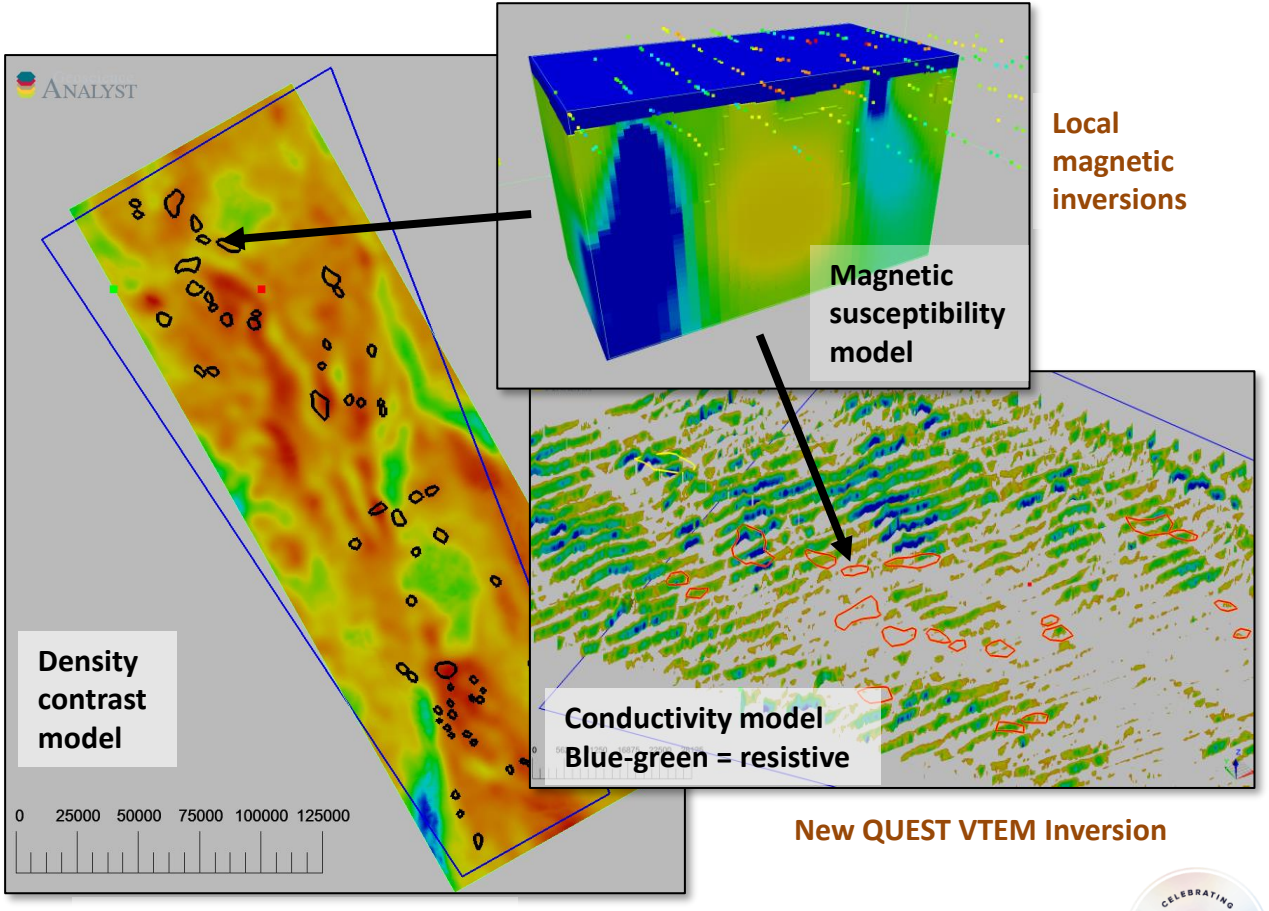


Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Next steps

- Establish full geophysical/ petrophysical character of identified targets
- Rule out magnetic mafic and ultramafic rocks, and focus in on intrusive targets that are ‘intermediate’ in nature
- Prioritize geophysical targets



Local magnetic inversions

New QUEST gravity Inversion

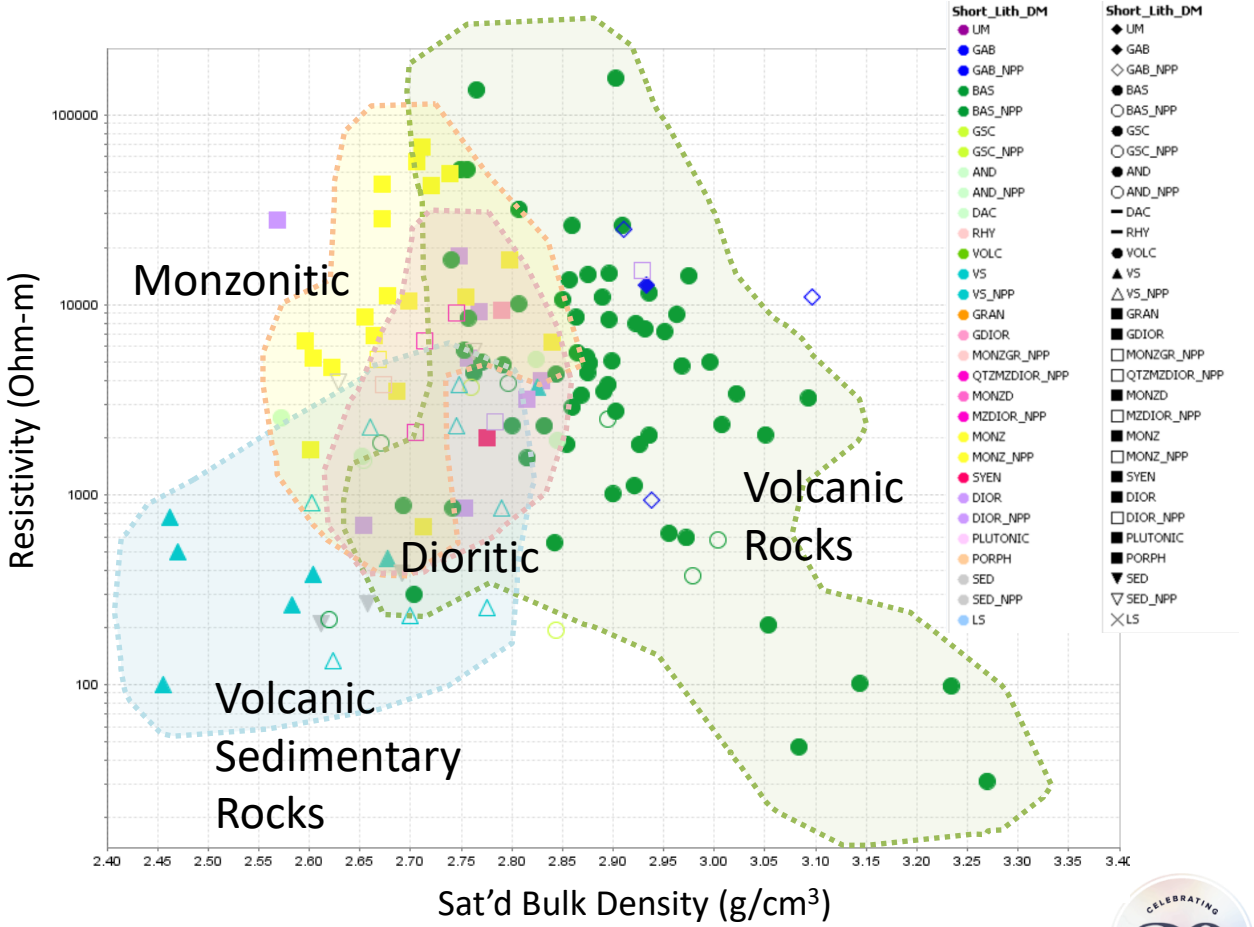
New QUEST VTEM Inversion

Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Next steps

- Establish full geophysical/ petrophysical character of identified targets
- Rule out magnetic mafic and ultramafic rocks, and focus in on intrusive targets that are ‘intermediate’ in nature
- Prioritize geophysical targets



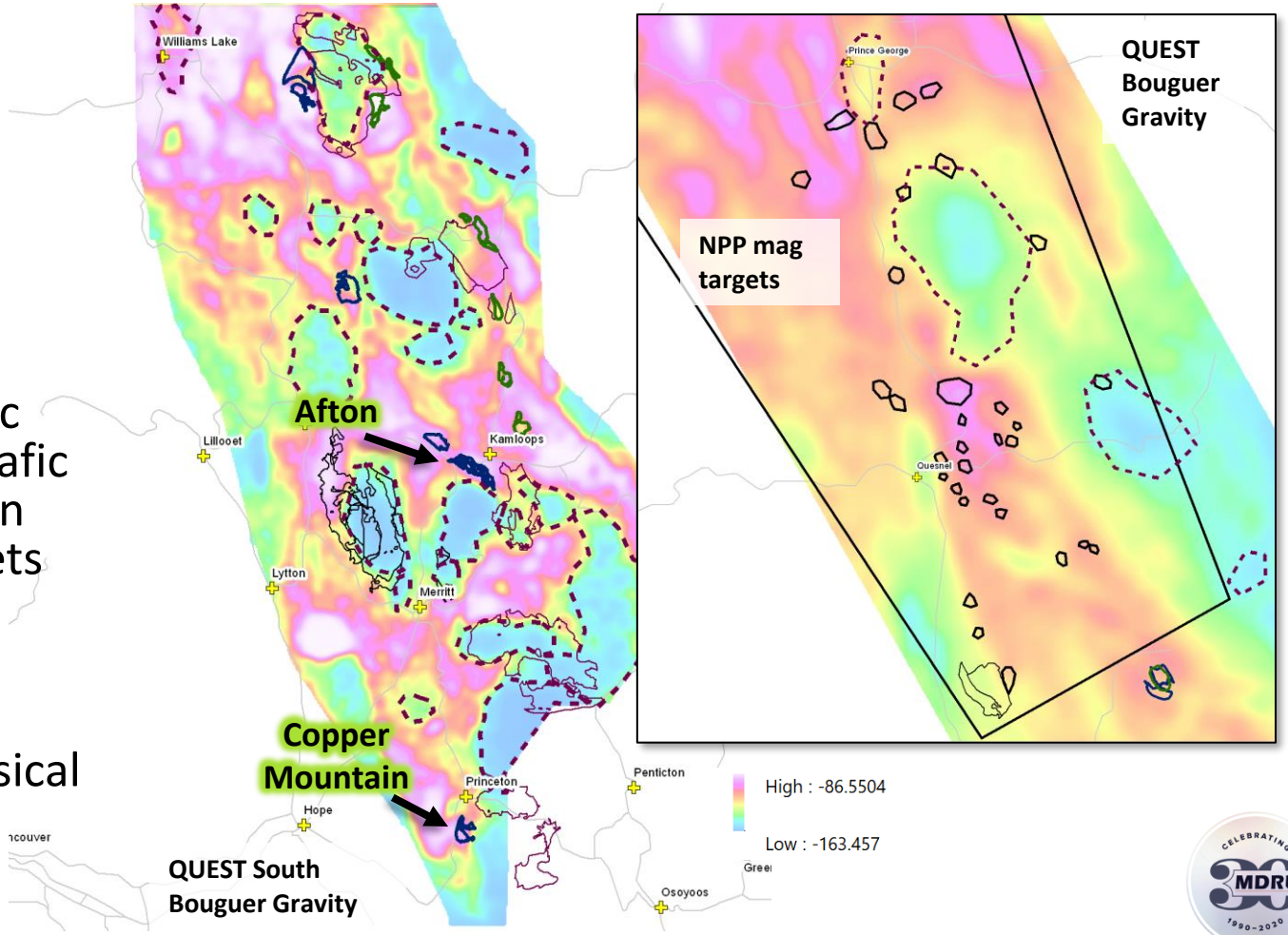
Quesnel Terrane physical property data from the Canadian Rock Property Database (Enkin, 2018), including NPP project samples.

Geoscience BC

CELEBRATING 30 MDRU 1990–2020

Next steps

- Establish full geophysical/ petrophysical character of identified targets
- Rule out magnetic mafic and ultramafic rocks, and focus in on intrusive targets that are ‘intermediate’ in nature
- Prioritize geophysical targets



Geoscience BC

Acknowledgements

- Geoscience BC
- Dominique Fournier, Craig Hart
- MDRU researchers, staff, and technicians (Rob Lee, Farhad Bouzari, Bahram Najafian,)
- UBC-GIF (Doug Oldenburg, Thibaut Astic, Devin Cowan)
- Randy Enkin, GSC
- Peter Kowalczyk, Ocean Floor Geophysics

THANK YOU!

Geoscience BC

CELEBRATING 30 MDRU 1990–2020