

# Under cover and deep geology from QUEST electromagnetic and gravity data

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MDRU Open Day  
December 1, 2022



**BARRICK**



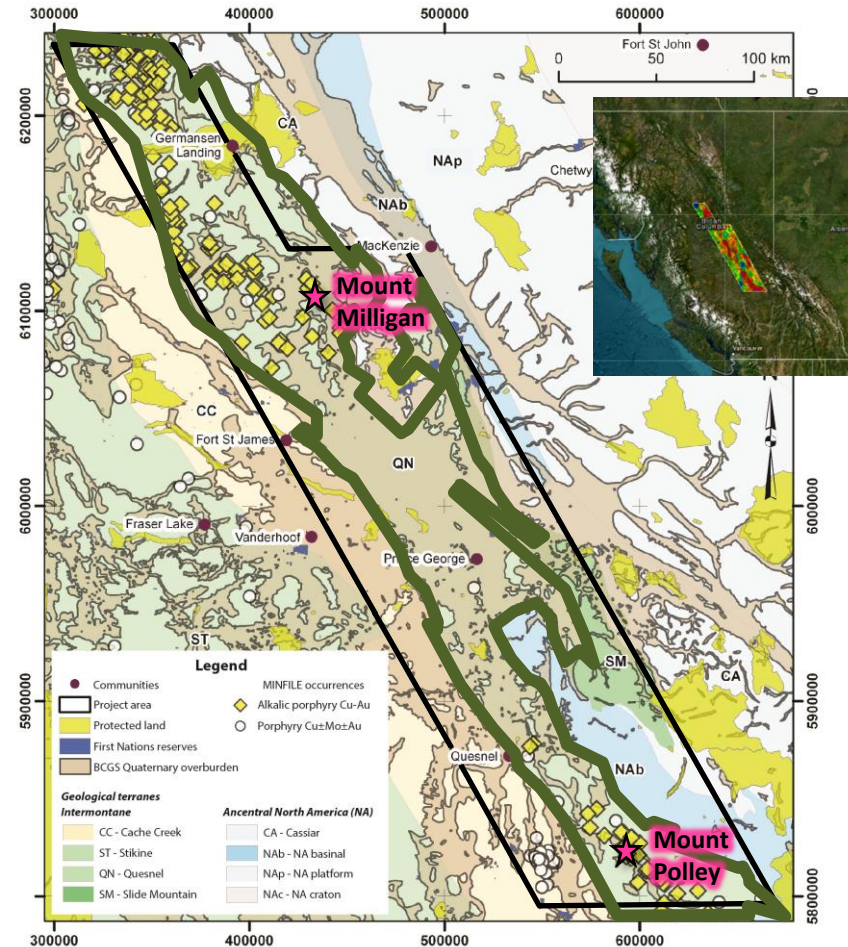
**Newmont**<sup>TM</sup>



**Teck**

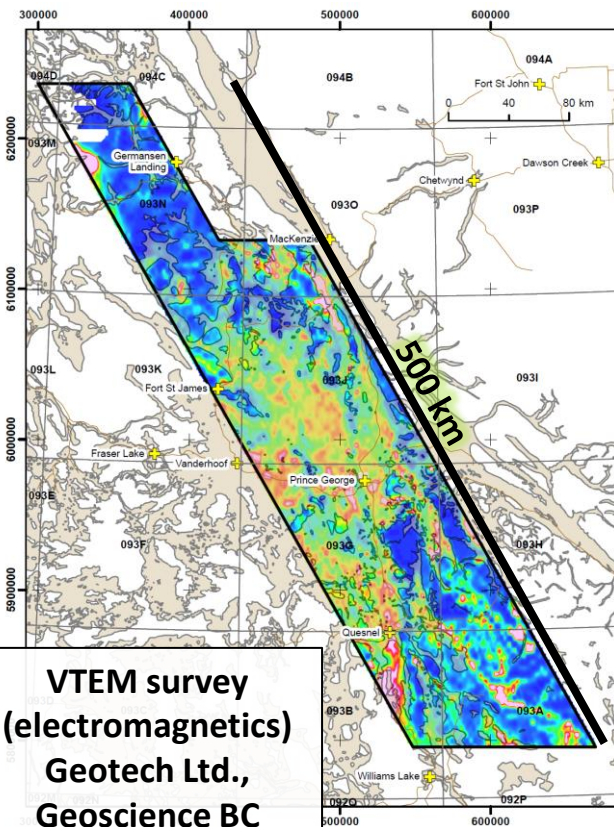
# Still more to learn from QUEST!

- Significant porphyry potential in the Quesnel terrane of BC, but large parts of it are under glacial till
- **Porphyry-prospective terrane:** lots of porphyry mineralization; operating mines to the north and south - infrastructure is there to support new mines
- **Goal:** analysis and interpretation of underused QUEST project gravity and electromagnetic data to improve geological knowledge under cover, and to attempt to identify stratigraphic correlations with northern and southern Quesnel geology
- **Preliminary ideas:** intriguing correlations between gravity and EM models suggest these data can distinguish between more massive versus sedimentary stratigraphy, and identify structures and intrusive bodies

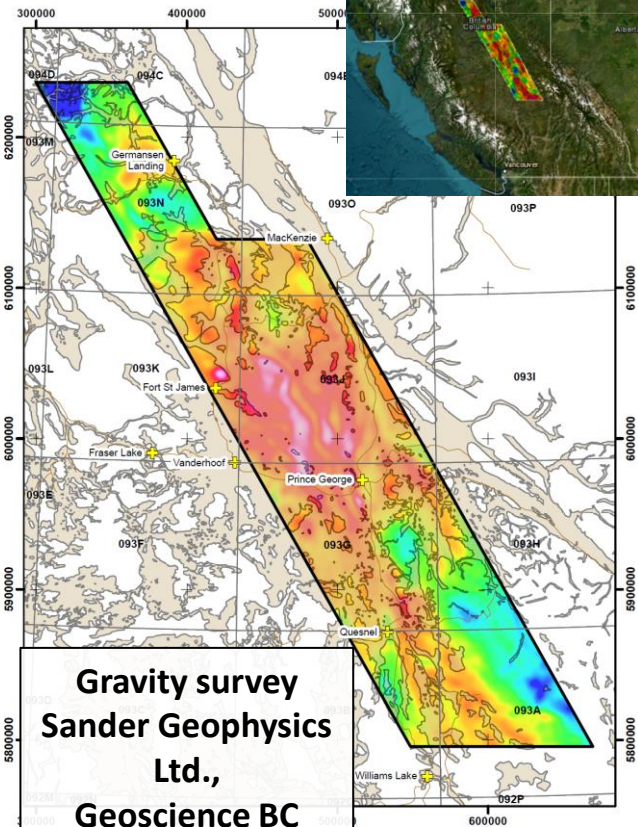


# Geoscience BC QUEST geophysical surveys

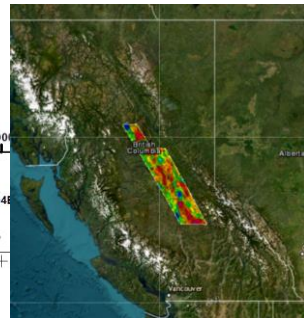
- Geoscience BC, supported by industry, funded 2 large scale geophysical surveys as part of their QUEST project initiated in 2007



**VTEM survey  
(electromagnetics)  
Geotech Ltd.,  
Geoscience BC  
Report 2008-04**



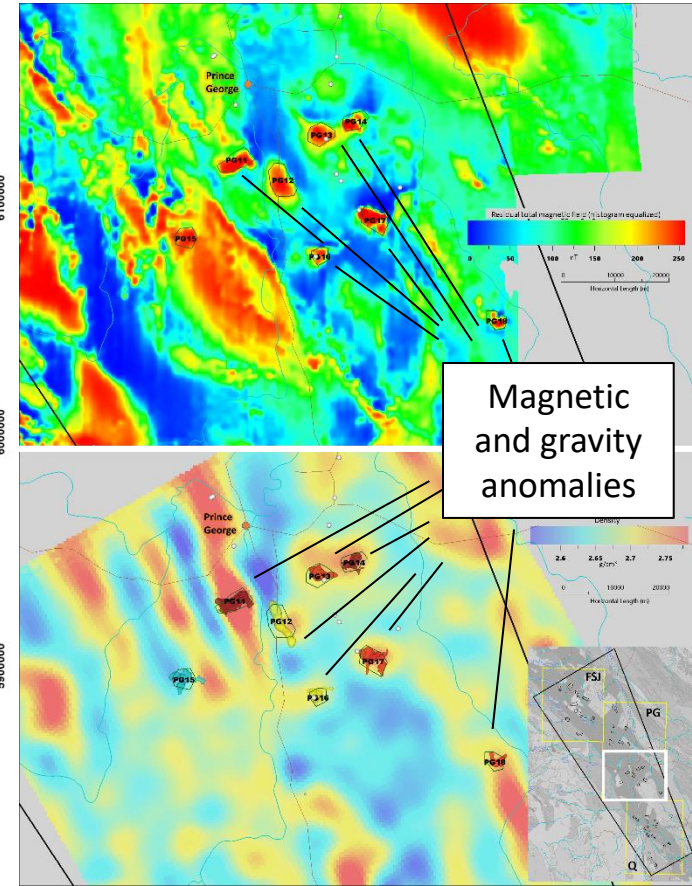
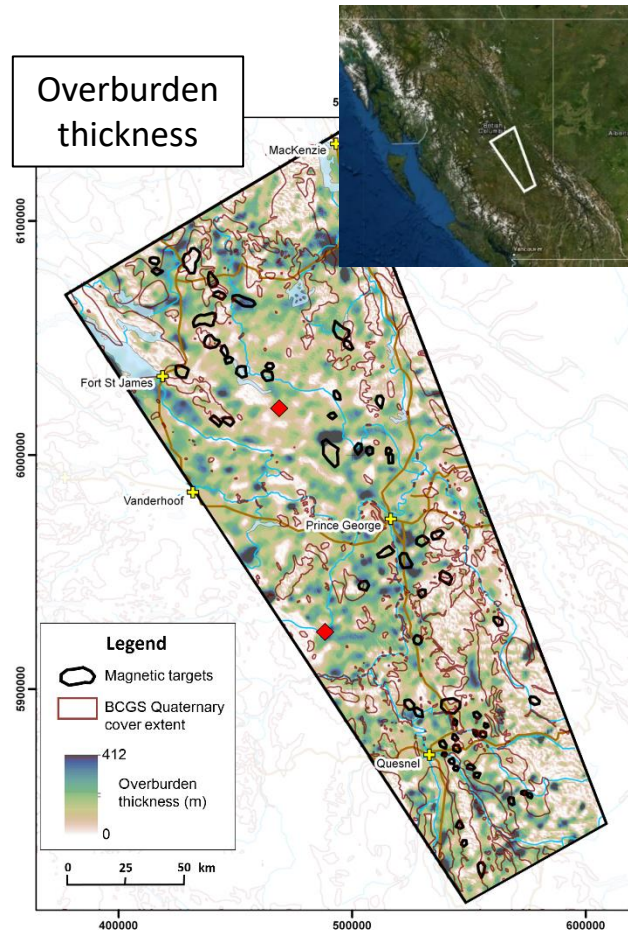
**Gravity survey  
Sander Geophysics  
Ltd.,  
Geoscience BC  
Report 2008-08**



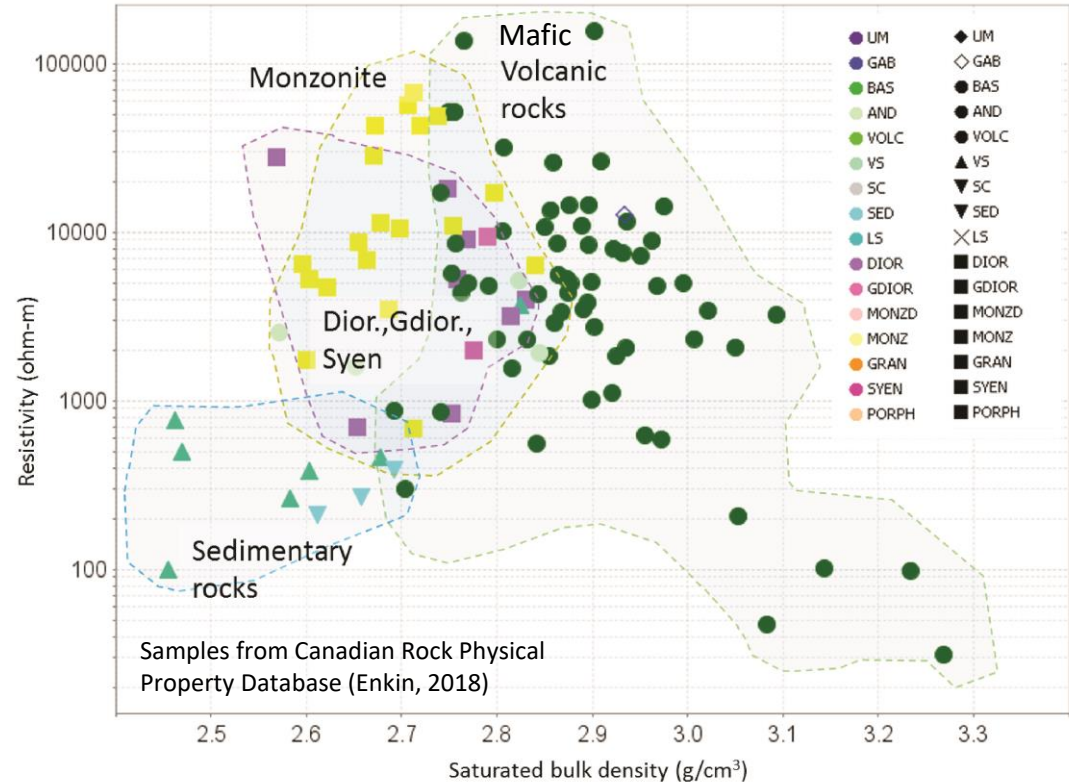
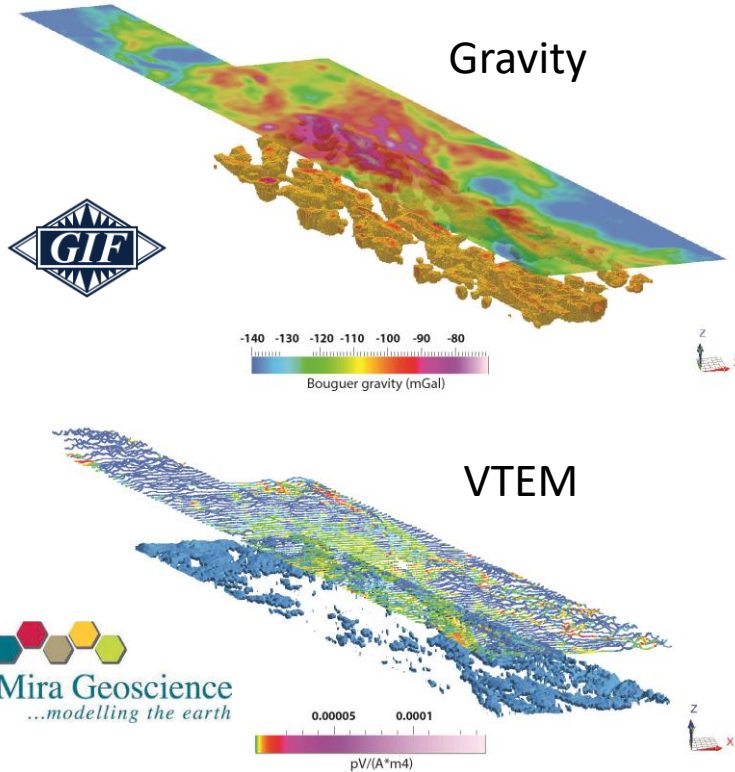


# Recent project

- Geoscience BC Report 2022-07
- Identification of New Porphyry Potential Undercover in Central British Columbia (part of Geoscience BC's *Central Interior Copper-Gold Research Project*)
- **EM** – modelling cover thickness
- **magnetics and gravity** – modelling potential porphyry host intrusions

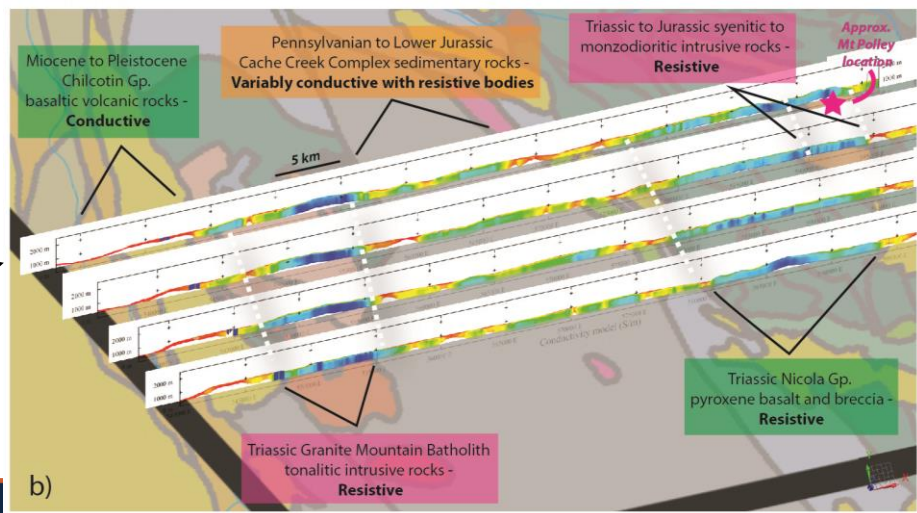
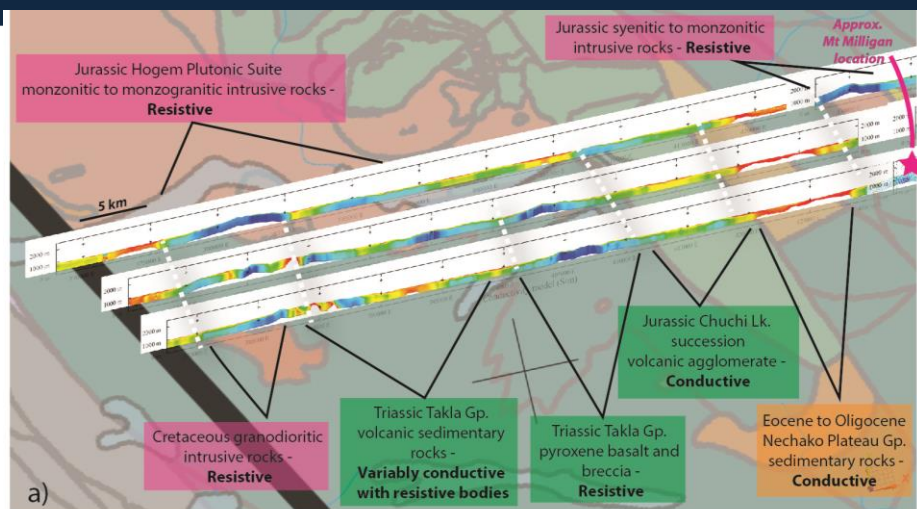
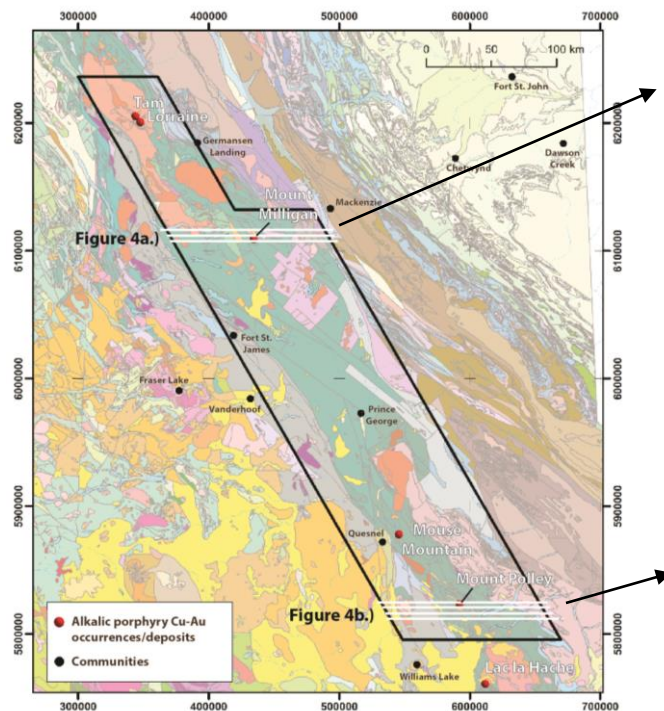


# What else can gravity and electromagnetic data 'see'?



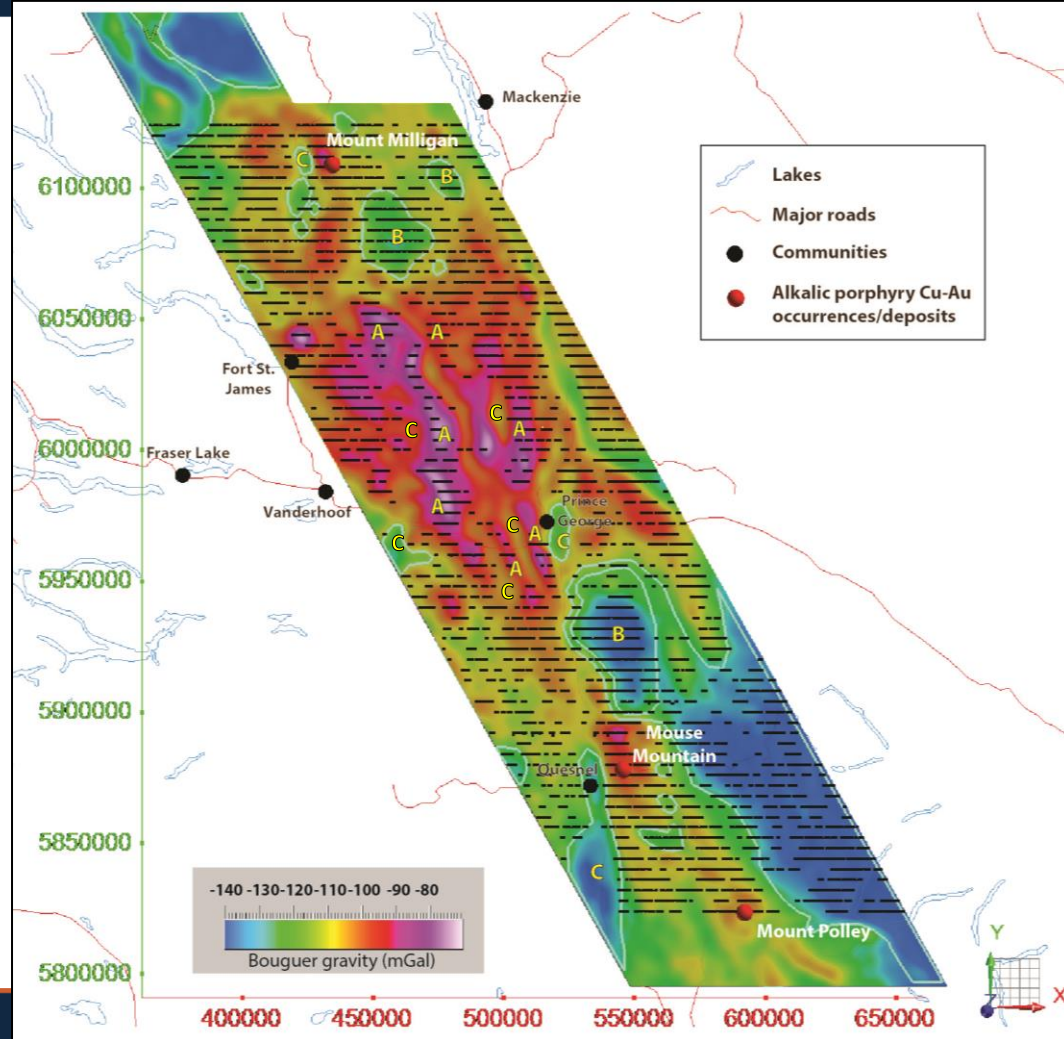
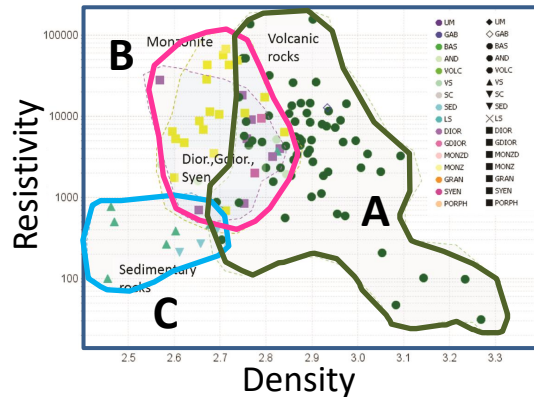


# Trends in EM data



# Correlations between gravity and EM

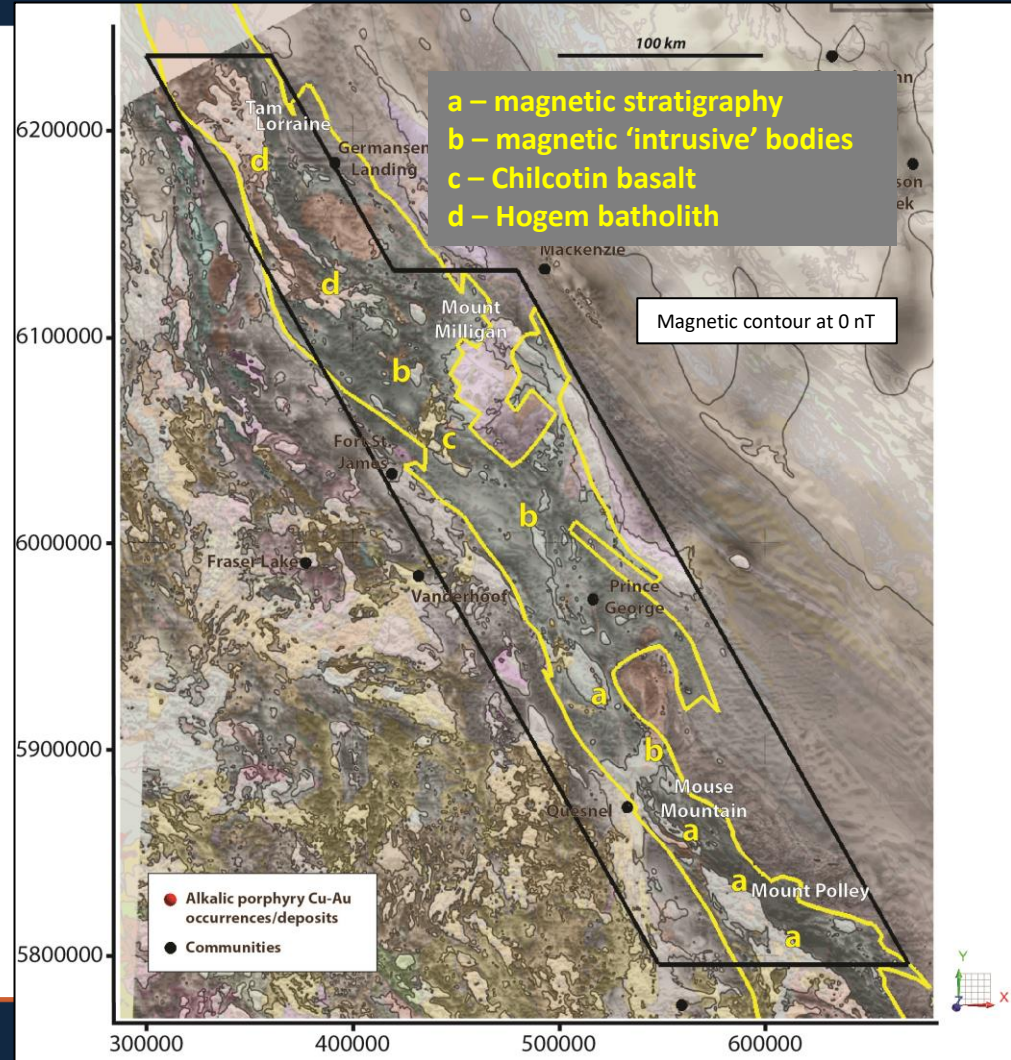
- “A” – high resistivity and gravity high (high density)
- “B” – high resistivity and gravity low (low density)
- “C” - low resistivity and gravity low (low density)





# Magnetic data

- Not a major focus of this project
  - investigated in detail by Sánchez et al. (2015)
- Points of note
  - Central Quesnel does not have significant magnetic stratigraphy
  - Magnetic anomalies are mainly intrusive rocks containing magnetite, or Chilcotin basalt
- Will continue to link back into interpretations from gravity and EM...





## Next steps and deliverables

- Continued geological interpretation of QUEST VTEM and gravity data and models
- Investigation of ML/clustering to split out geophysical/geological domains
- Incorporation of new interpretations (geological domains, structures) into 2D sections/maps + report
- Geoscience BC Summary of Activities January, 2023
- Final report, summer, 2023

## Acknowledgements

- Geoscience BC
- Jim Logan
- Peter Kowalczyk

Thank  
You!