

Reference collection of mineral systems: Mount Isa Province

Geological Survey of Queensland
Celebrating 150
Exploring Queensland's Resources **Years**

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Mineral Geoscience



Outline

Reference collection of mineral systems

- Rationale
- Future state
- Approach
- How to make it happen - discussion

Rationale

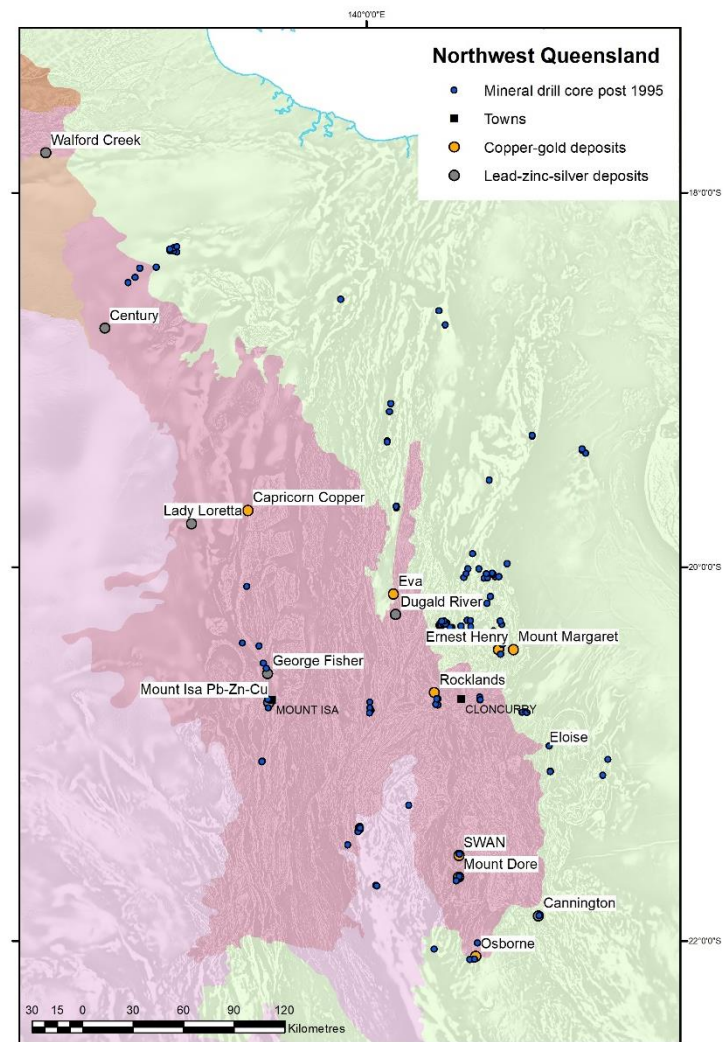
Systematic collection of geological information and representative samples characterising key mineral systems in the Mount Isa Province at all scales

Background

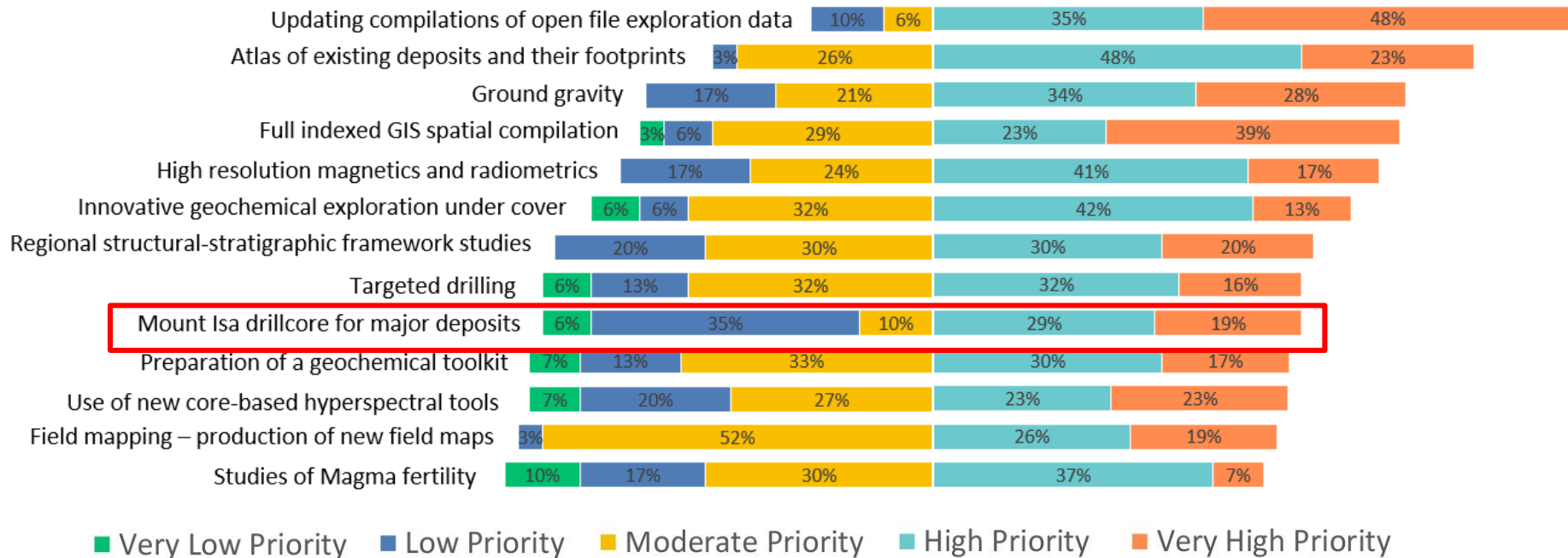
- GSQ are the custodians of geological data and knowledge for Queensland
- DNRME has the responsibility to maintain and grow existing drill core collection
 - Collections housed in both Brisbane and Mount Isa core facilities

Existing mineral drill core holdings

- ~1800 drill holes with core across State
- 761 drill holes with core in Mount Isa Province
- ~160 drill holes with core post 1995



Industry survey (Sept 17)



Project scope

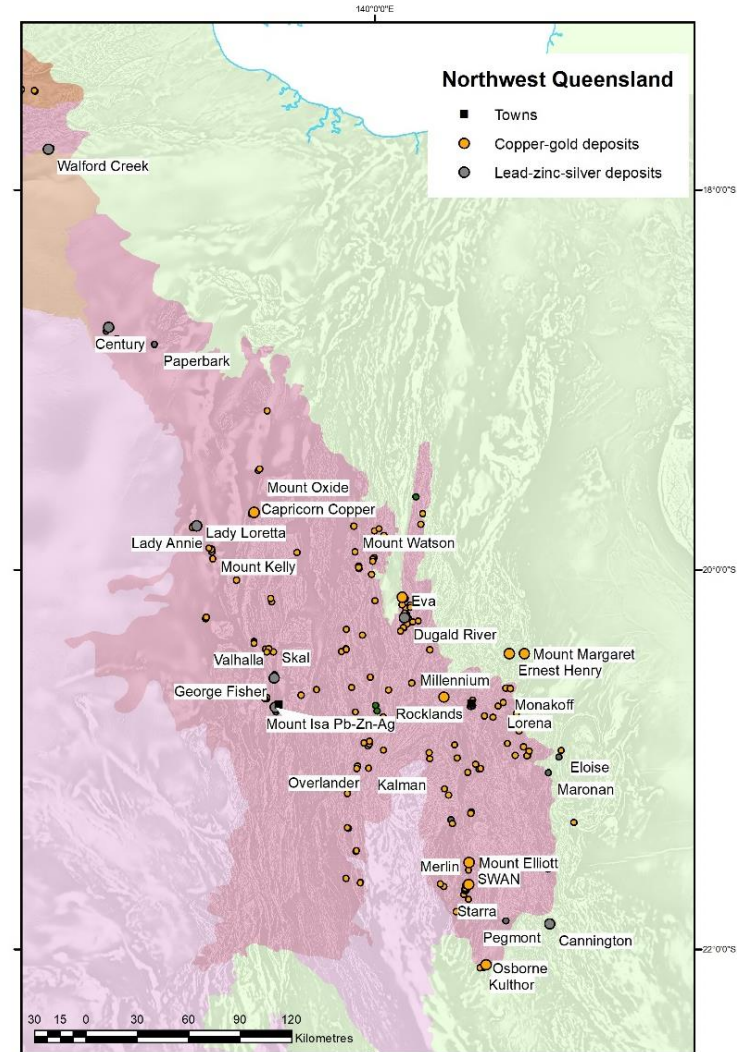
To create both a **physical** and **virtual** reference collection of deposits across the Mount Isa Province

- Funding under the New Discovery program of SREP (2018-2021)
- Plans to continue building up collection within NW Qld and across the State



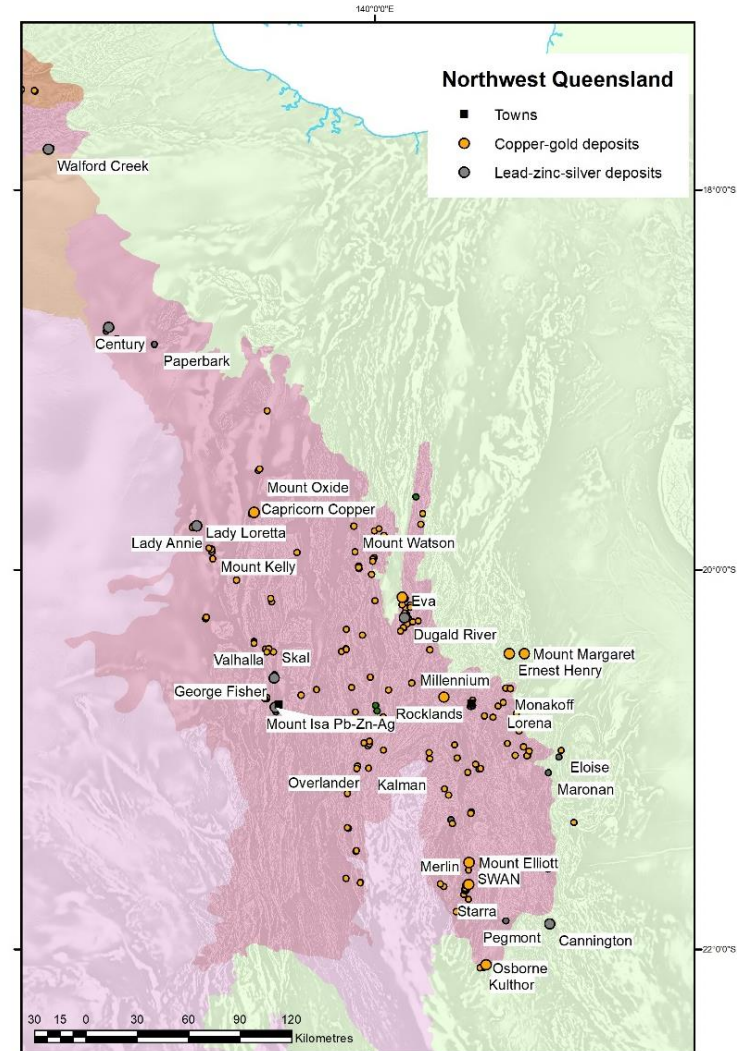
Project scope

- Acquire drill core and associated data from major deposits and current active projects
- Collection will be stored at the Mount Isa core facility, with a representative set of samples housed in Brisbane



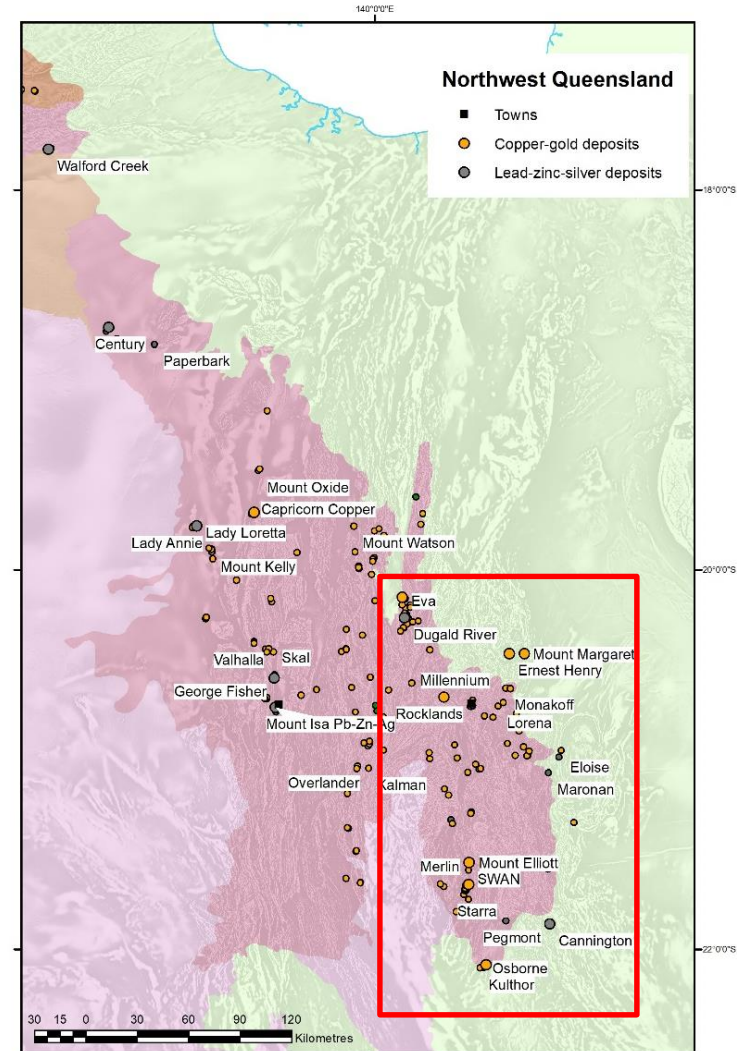
Project scope

- Collect geochemical, mineralogical, petrophysical and geochronological data on these drill core to form a 'baseline' of key mineral systems
- Data collection is a much wider process and will complement datasets acquired on samples in the collection



Collaborative projects

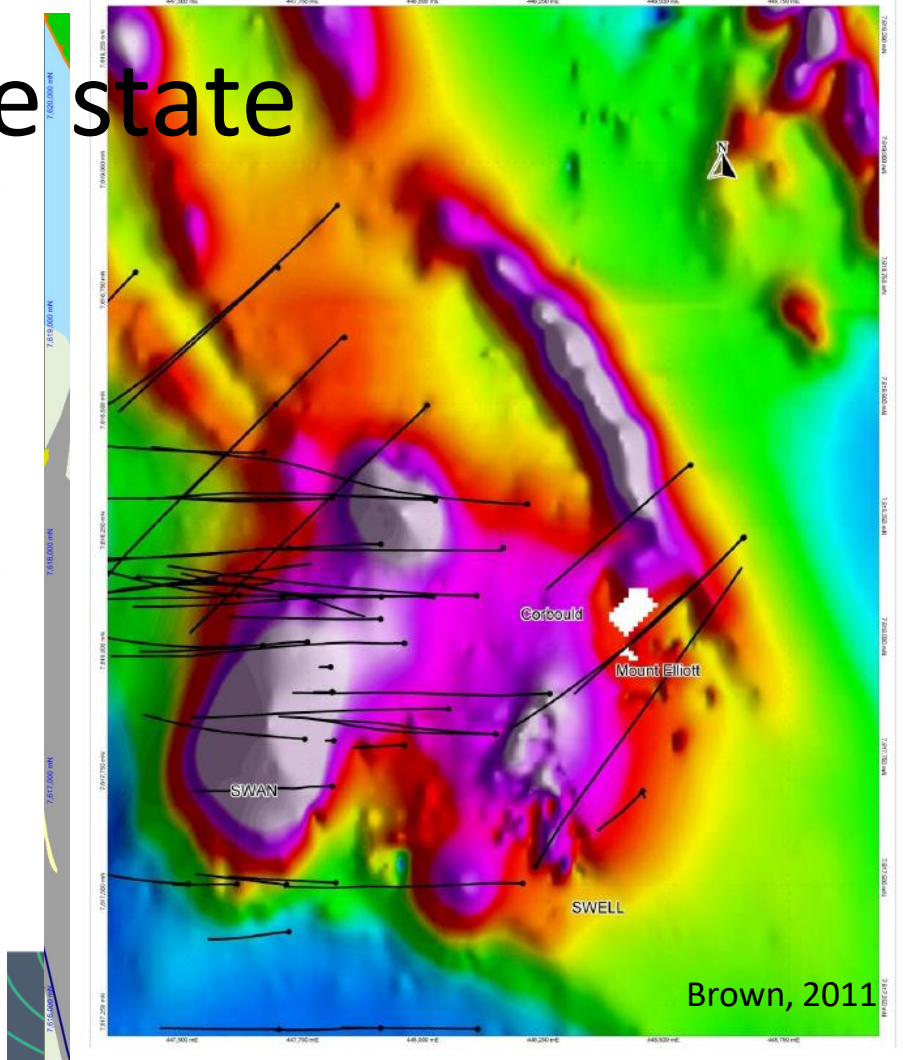
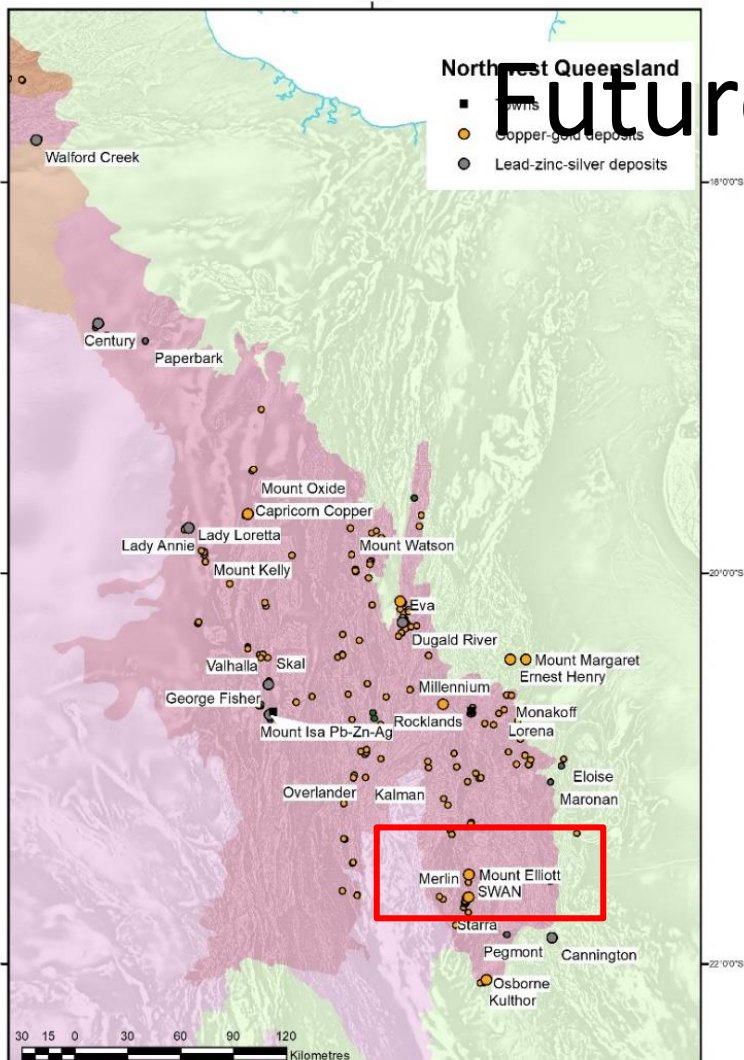
- Supports or supported by current research projects under the New Discovery Program
 - Distal footprints of mineral systems (CODES/Uni of Tasmania)
 - Cloncurry mineral systems (CSIRO)
 - Deposit atlas (BRC/UQ)



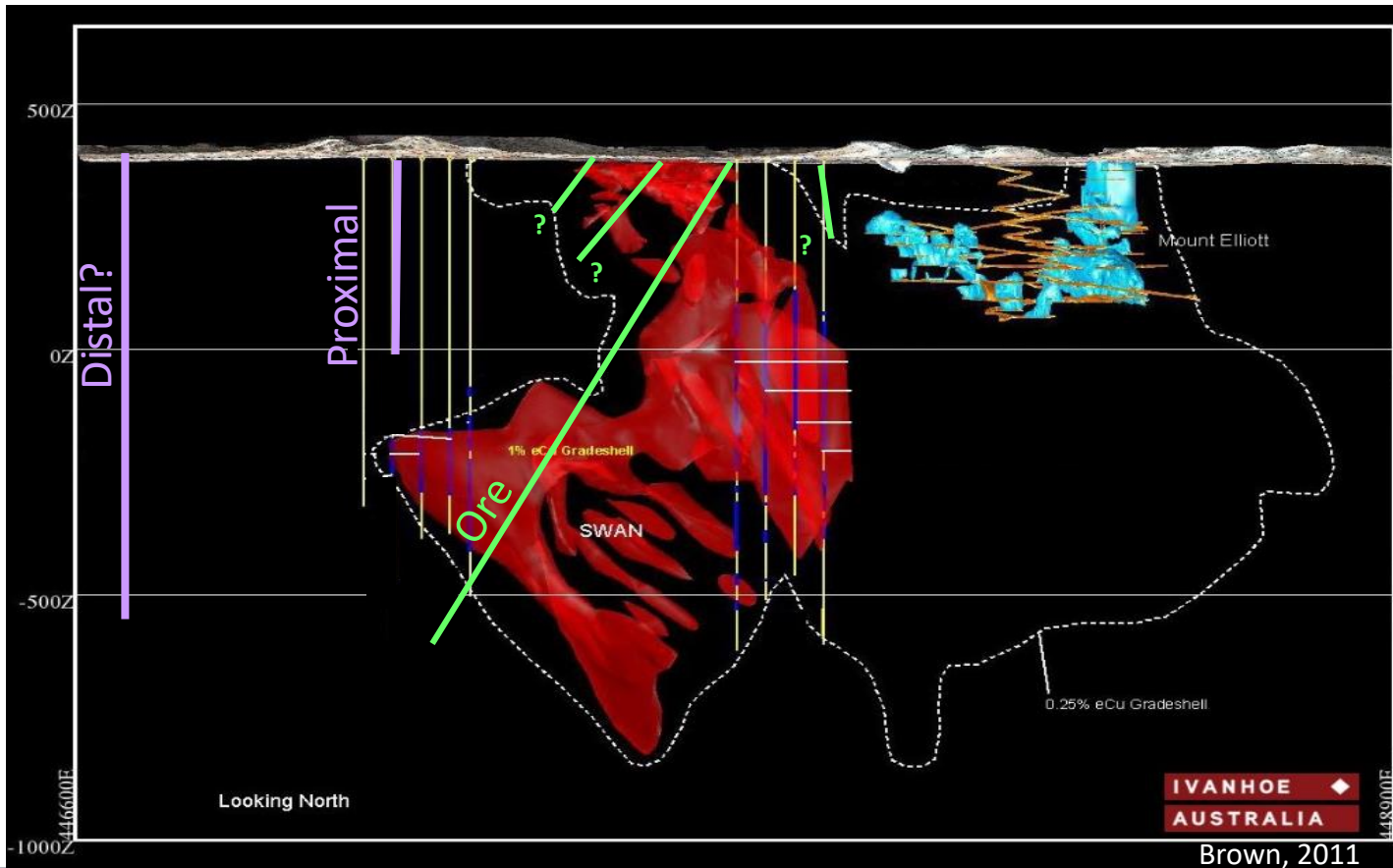
North West Queensland

- Towns
- Copper-gold deposits
- Lead-zinc-silver deposits

Future state



Brown, 2011

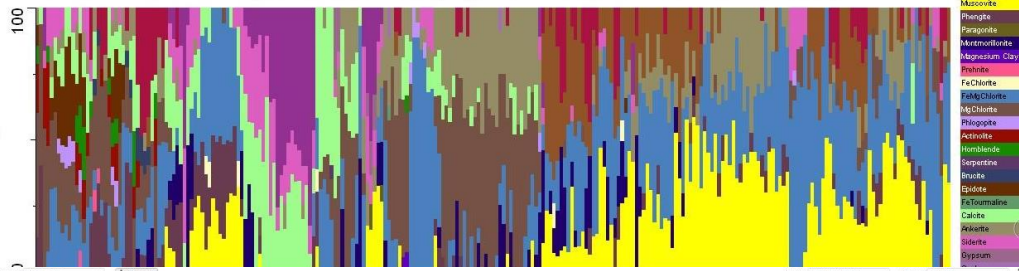


Spatial Summary (Bin=1 MinBin=5% sTSA 6.3)

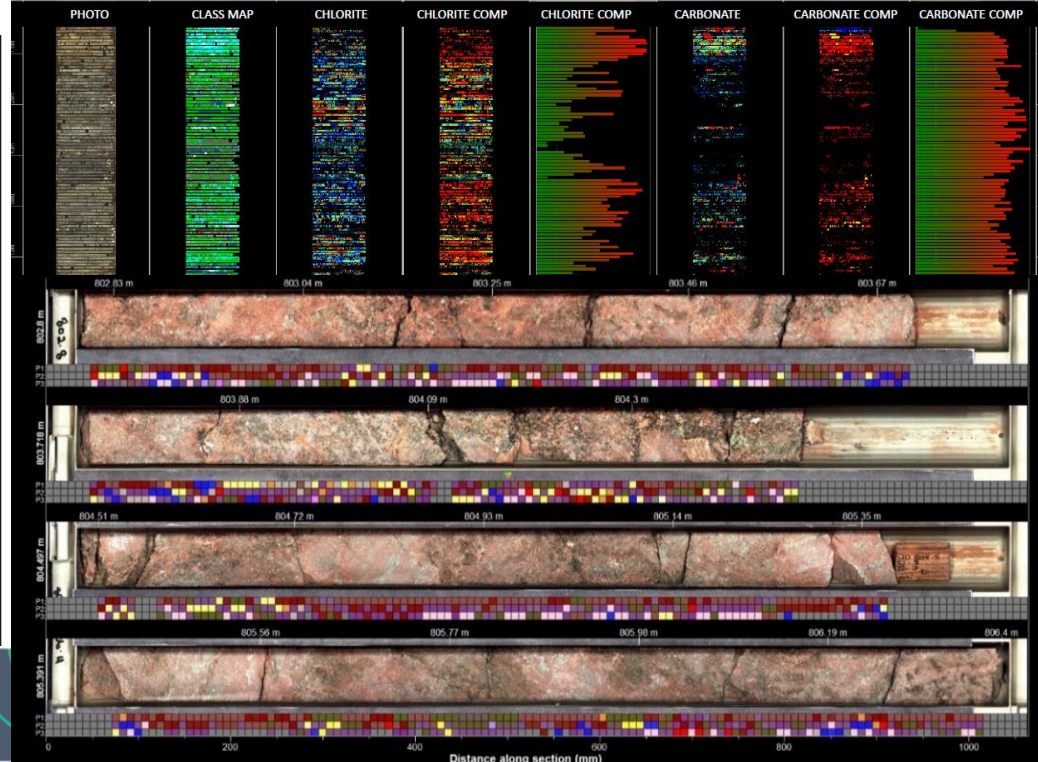
- Mineral**
- Muscovite
 - Phengite
 - Paragonite
 - Actinolite
 - Magnesian Chlorite
 - Pyrite
 - FeChlorite
 - MgChlorite
 - Pyrophan
 - Actinolite
 - Hornblende
 - Serpentine
 - Brucite
 - Epidote
 - Pyrophanine
 - Calcite
 - Albite
 - Silicite
 - Baryum

Sample	Depth	Assay			Lithology	Alteration			Minerals									
		Cu (%)	Au (g/t)	Mo (%)		Zone	Min1	Min2	Chalcoite %	Chalcopyrite %	NativeCu %	Molybdenite %						
MED00291		0.90	0.25			W	M	G	1	2	1	2	1	2	1			
MED00277		0.15	0.07															
MED004018		0.94	0.30						1.50									
MED004020		0.76	0.78						3.00									
MED004236		0.34	0.15															
MED004237		0.41	0.83															
MED004239	810	0.41	0.15		BND	AL	AB	CB										
MED004240		0.56	0.29															
MED004241		0.30	0.42															
MED004242		0.36	0.72										1.50					
MED004243		0.36	0.34															
MED004245		0.34	0.79															
MED004246		0.34	0.35															
MED004247		0.34	0.73															
MED004248		0.34	0.85															
MED004249		0.34	1.68															
MED004251	830	0.34	1.22															
MED005030		0.44	0.47															
MED005040		0.09	0.08															
MED005041		0.02	0.01															
MED005042		0.07	0.02															
MED005043		0.03	0.03															
MED005044		0.05	0.01															
MED005045		0.08	0.07		BNP	AL	AB	CB										
MED005046		0.03	0.01															
MED005047		0.02	0.04															
MED005048		0.09	0.09															
MED005049		0.01	0.02															
MED005051		0.03	0.01															
MED005052		0.02	0.01															
MED005053		0.01	0.01															
MED005054		0.04	0.02															
MED005055		0.03	0.02															
MED005056		0.43	0.19															
MED005057		0.24	0.22		AL	AB	CH											
MED005059		0.15	0.13															
MED005060		0.32	0.26															
MED005062		0.26	0.20															
MED005064		0.11	0.06															

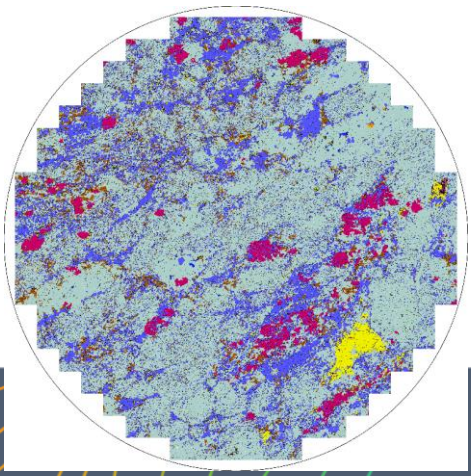
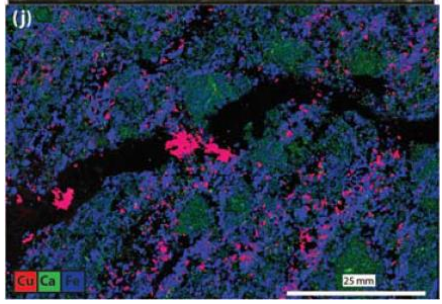
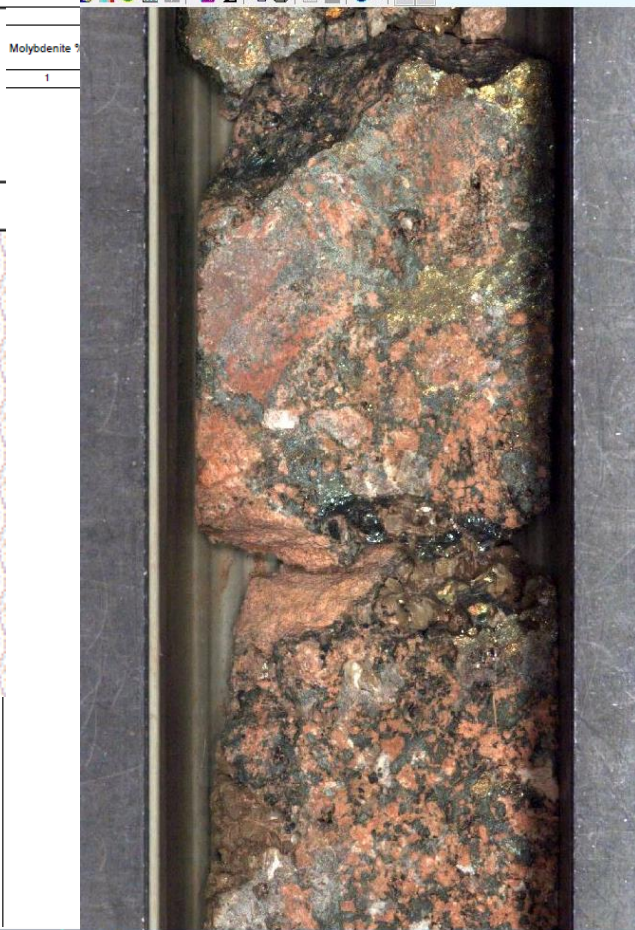
Bin % Sample Count



Category: Mineral Logs Layer: Stacked by section Color: EM734



Sample	Depth	Assay					
		Cu (%)		Au (g/t)		Mo (%)	
		1	2	1	2	1	2
ME005037		0.50		0.25			
ME004017		0.15		0.07			
ME004018		0.84		0.30			
ME004020		2.10		0.78			
ME004236		0.34		0.15			
ME004237		1.19		0.83			
ME004239	810	0.41		0.15			
ME004240		0.58		0.29			



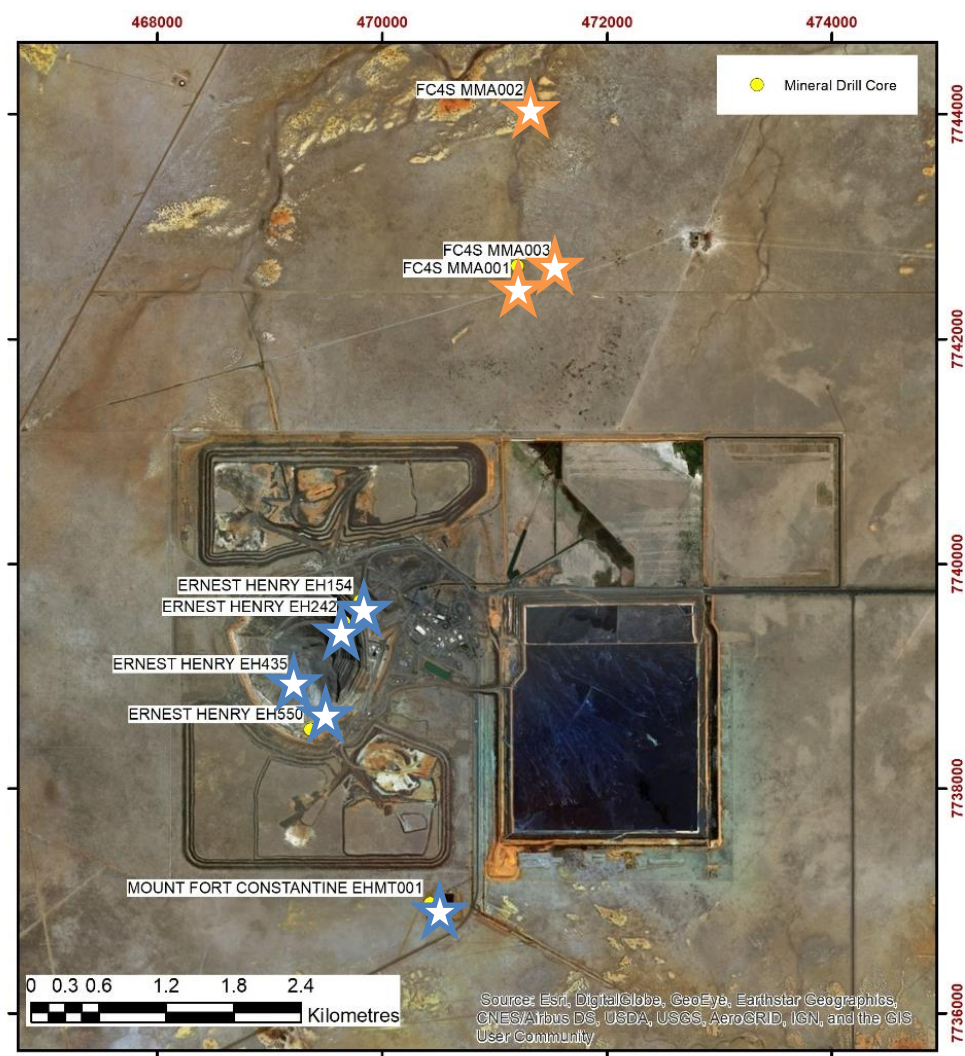
Sample	Depth	Cu (%)	Au (g/t)	Mo (%)	AL	AB	CH
ME005051		0.03	0.01				
ME005052		0.02	0.01				
ME005053		0.01	0.01				
ME005054		0.04	0.02				
ME005055	860	0.03	0.02				
ME005056		0.43	0.19				
ME005057		0.24	0.22		AL	AB	CH
ME005058		0.15	0.13				
ME005059		0.32	0.26				
ME005060	870	0.25	0.20				
ME005061		0.11	0.06				

Approach

- **Representative** sample collection from key deposits
- Orebody-proximal-distal-background

Ernest Henry Cu-Au deposit

- Representative drill holes
 - two through orebody
 - two within the inner halo
 - one deep drill hole (1.7km)
 - three drill holes from FC4WS target



- Initially focusing on major Cu-Au and Pb-Zn-Ag deposits
- Characterising mineral systems not deposits
 - looking to sample from Cu-Co, Au-As-Bi, Mo-Re deposits/prospects

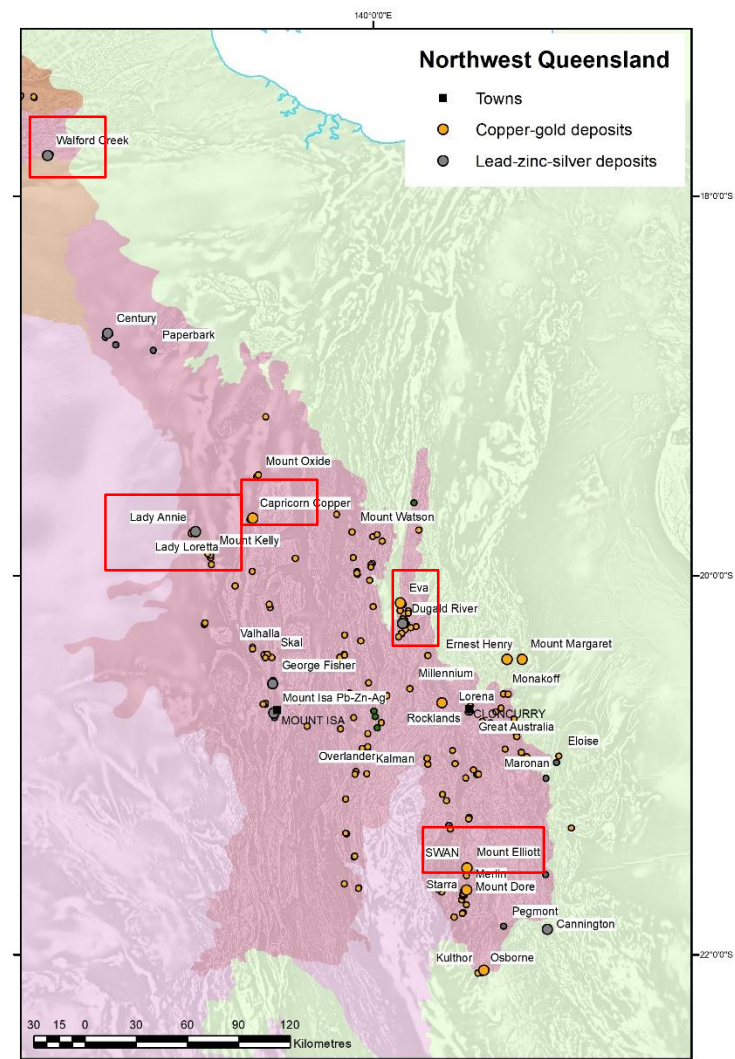
Current work

- Assessment of historical drill core within both MI and EDC core facilities underway
- A selection of this drill core will be transported down to Brisbane for hyperspectral scanning (Hylogger)



Areas of focus over next 12 months

- Mount Elliott/SWAN
- Mount Kelly
- Mammoth/Esperanza
- Eva/Dugald River
- Walford Creek



Way forward

- Priority will be given to previously mentioned areas but we are building a collection of minerals systems and seeking input from the entire region
- Drill core acquired in the next 6-12 months will shape the focus of GSQ project work
 - Data available immediately for parent companies
- Local transportation costs covered by GSQ from site to our Mount Isa core facility



Summary

- Physical and virtual reference sample collection
- Baseline of minerals systems within the Mount Isa Province
- Support external SREP projects and drive future GSQ work



Discussion

- Problems/limitations
- What data do you want collected and what do you view as the most important?
- Are there other areas/deposits which should be prioritised?

