

Mineral systems of north-east Queensland

Vladimir Lisitsin

Geological Survey of Queensland

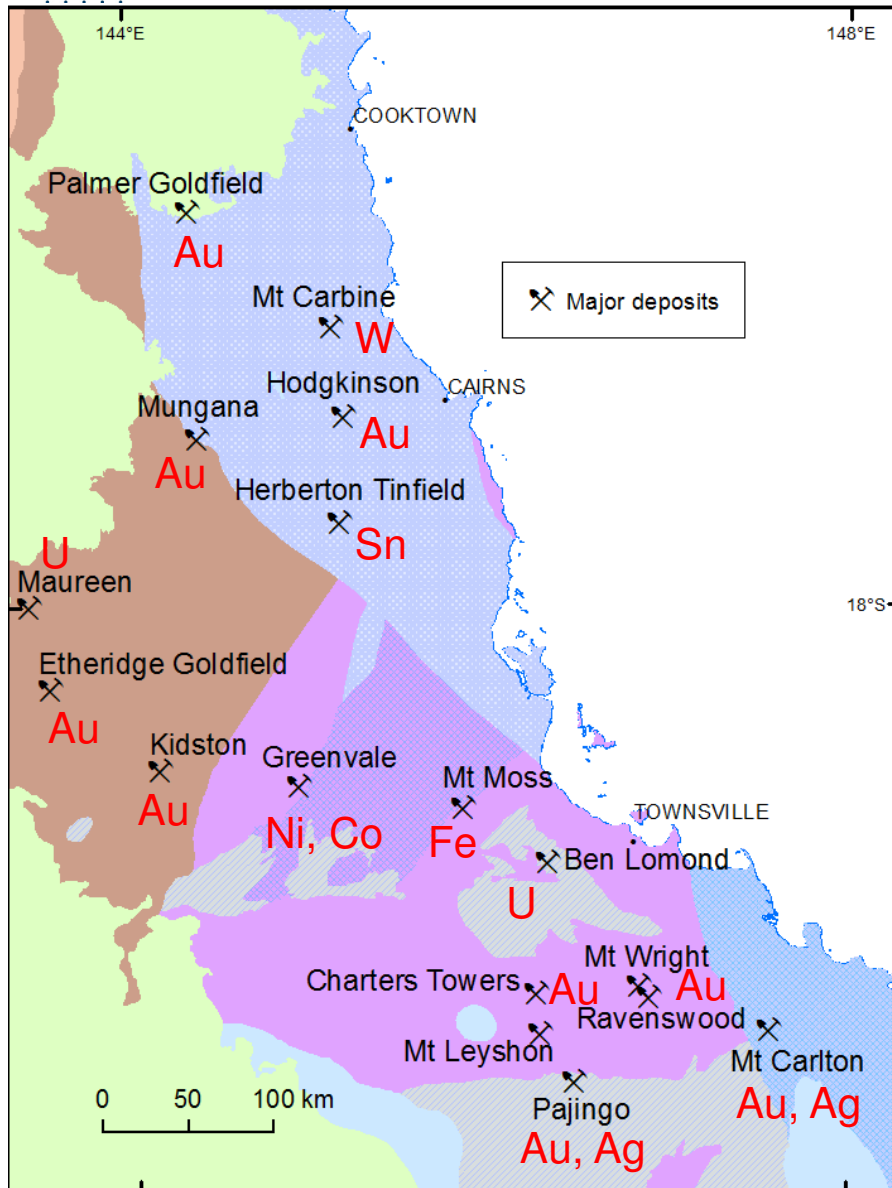
UNCOVER Summit 2014



Outline

- Major Palaeozoic mineral systems of north-east Queensland
- Intrusion-related mineral systems of the Kennedy Igneous Association
- Upcoming 3-year project to better characterise the intrusion-related mineral systems and facilitate exploration targeting in the region

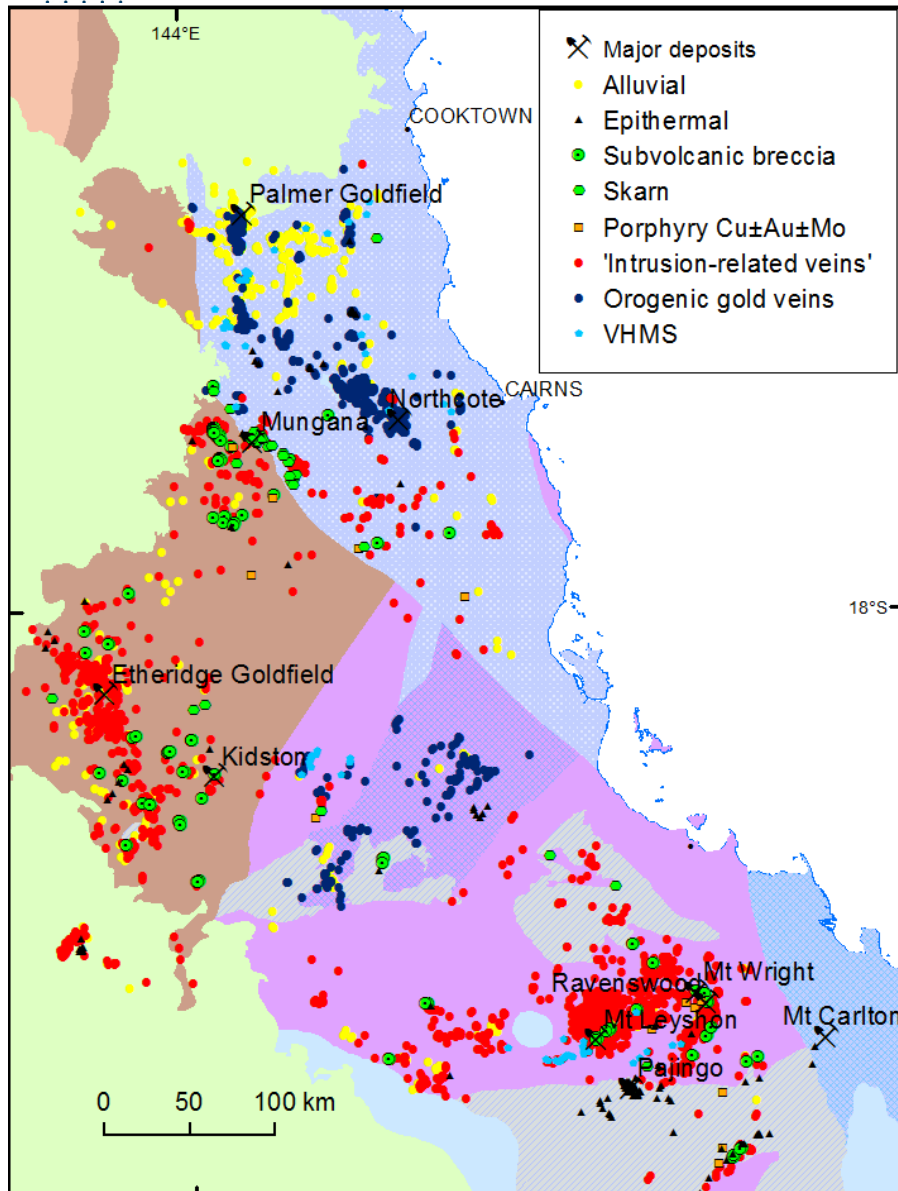
North-east Queensland – significant mining history



Significant historic production and remaining resources of various commodities:

- Gold-silver – Charters Towers (6.5 Moz), Kidston (5 Moz), Pajingo (5 Moz), Ravenswood (4 Moz), Mt Leyshon (3 Moz), Mt Carlton (>2.2 Moz), Palmer (1.5 Moz), Mt Wright (1 Moz)
- Tin-tungsten – Herberton, Mt Carbine
- Uranium – Ben Lomond, Maureen
- Nickel – Greenvale

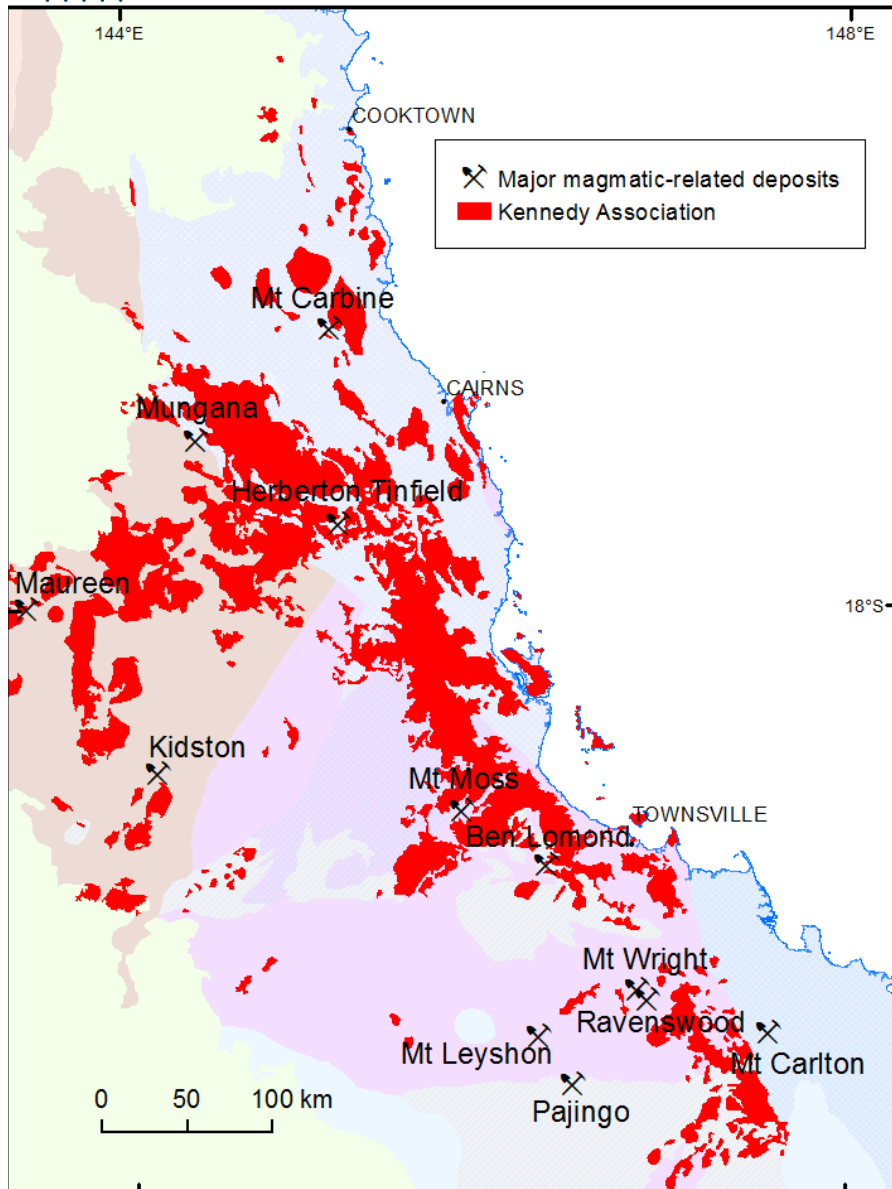
North-east Queensland – gold mineralisation of various styles



Gold-bearing occurrences represent multiple deposit types and styles:

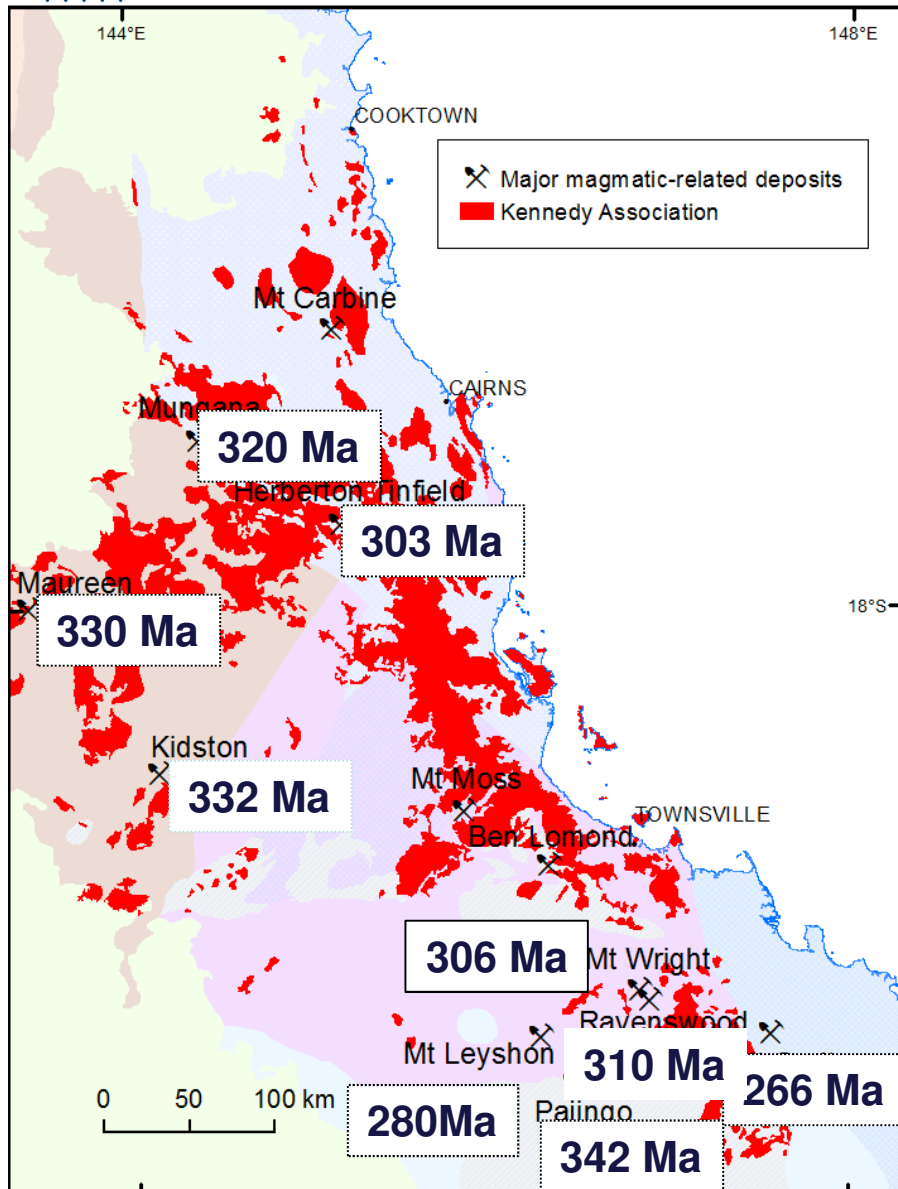
- Cainozoic alluvial
- Ordovician VHMS
- Early Devonian 'intrusion-related veins'
- Carboniferous to Permian orogenic gold veins
- Carboniferous to Permian epithermal, porphyry, skarn, subvolcanic breccia and 'intrusion-related veins'

Permo-Carboniferous intrusion-related mineral systems



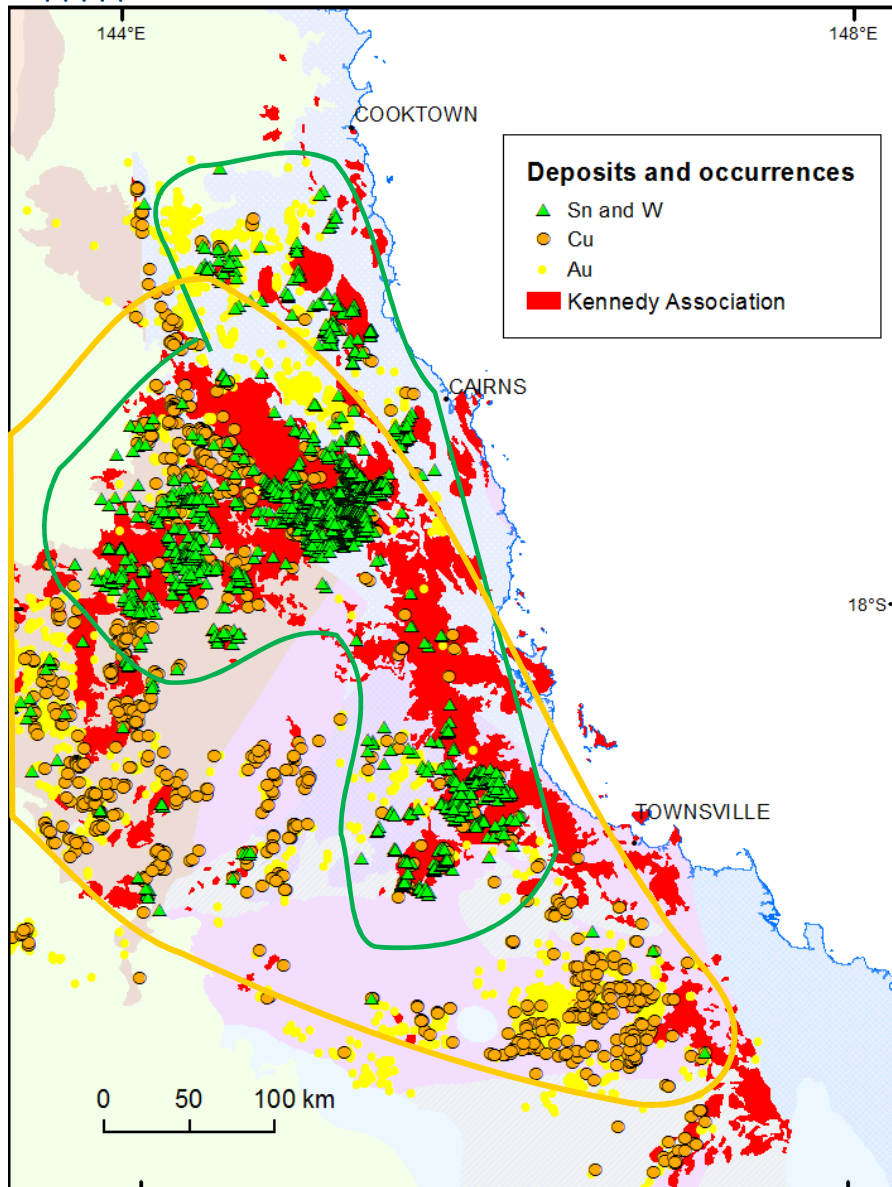
- Diverse deposits throughout the region show close genetic relationships with Permo-Carboniferous magmatism
- Magmatic rocks of the Kennedy Igneous Association are particularly widespread

Permo-Carboniferous intrusion-related mineral systems



- A handful of geochronology results from major deposits – no data for the bulk of Permo-Carboniferous(?) mineralisation
- Clear indications of multiple metallogenic events – several distinct mineral systems?
- Do they have different controls – and different prospectivity?

Permo-Carboniferous intrusion-related mineral systems



- An extensive 'family' of related hydrothermal mineral systems, such as:
 - Sn-W
 - Intrusion-related Au
 - Epithermal Au-Ag
 - Porphyry Mo-Cu

Permo-Carboniferous intrusion-related mineral systems

- A collaborative 3-year project between GSQ, JCU and industry will commence shortly under the Industry Priorities initiative of Queensland Government
 - Geochronology and geochemistry of metallogenic and magmatic events
 - Distinguish and map distinct mineral systems
 - Geophysical and geochemical signatures
 - Regional mineral prospectivity models