

New geophysical and remote sensed data in the Northern Territory: 2019

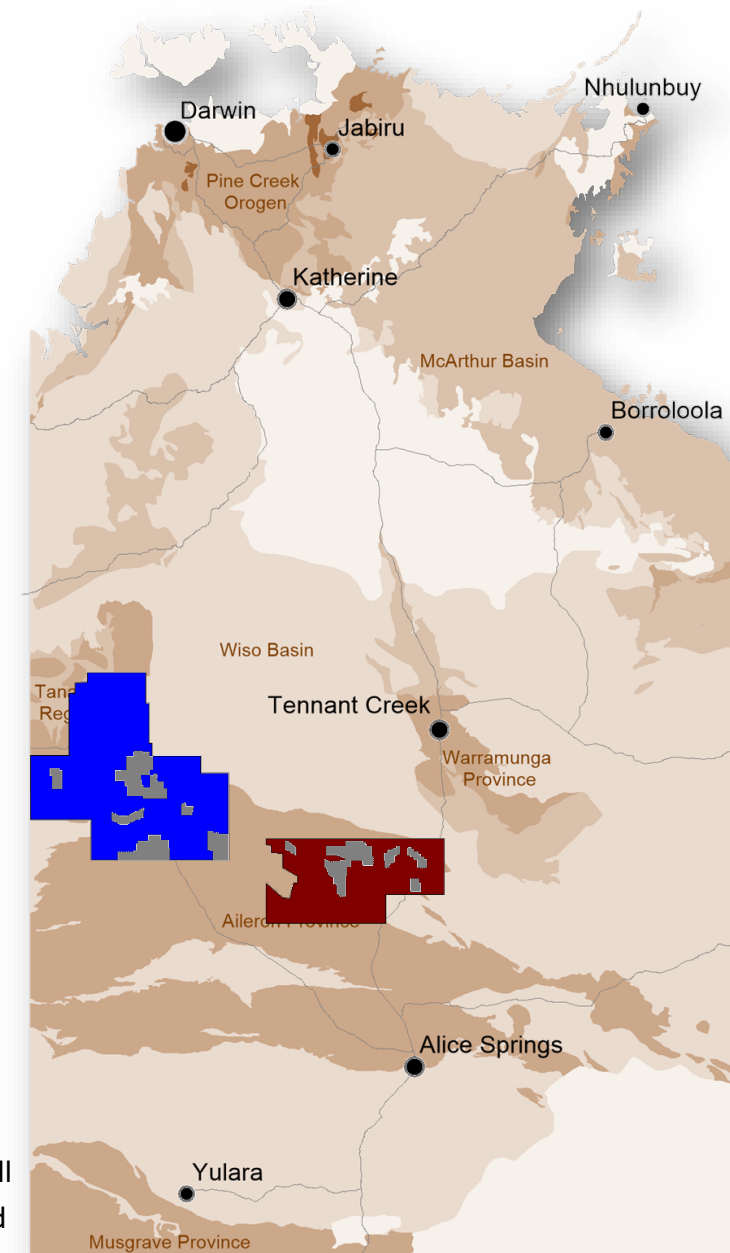


Tania Dhu

NTGS Regional Geophysical Projects

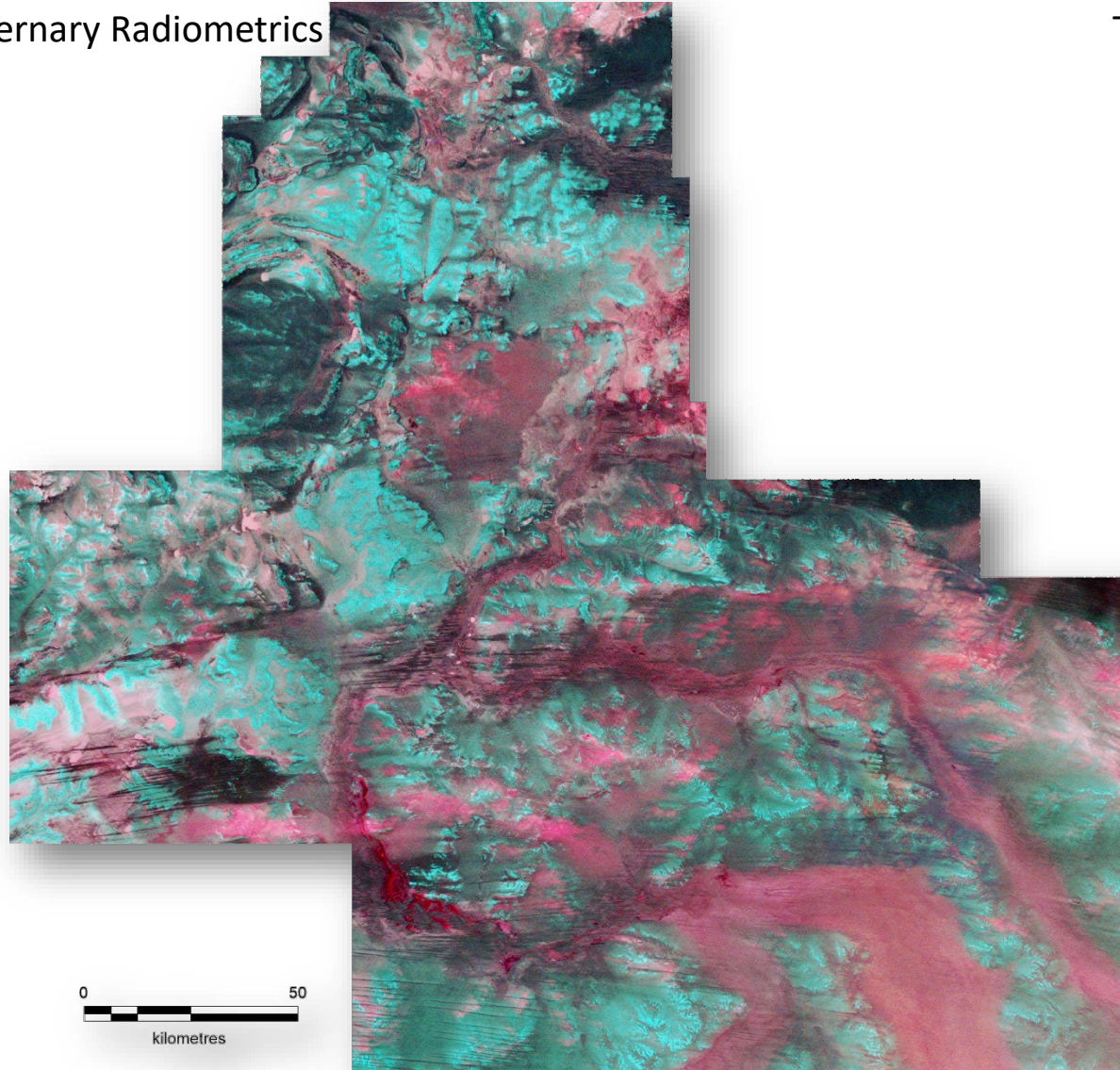
- NTGS Tanami Region Airborne Magnetic and Radiometric Survey: Final products released
- NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey: Final products released
- Surveys funded by NTGS through the Northern Territory Government's *Resourcing the Territory Initiatives*
- Managed by Geoscience Australia on behalf of NTGS

 NTGS Tanami Region Mag / Rad  Industry infill
 NTGS Mount Peake - Crawford Airborne Mag / Rad

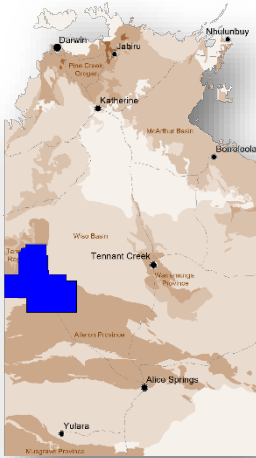
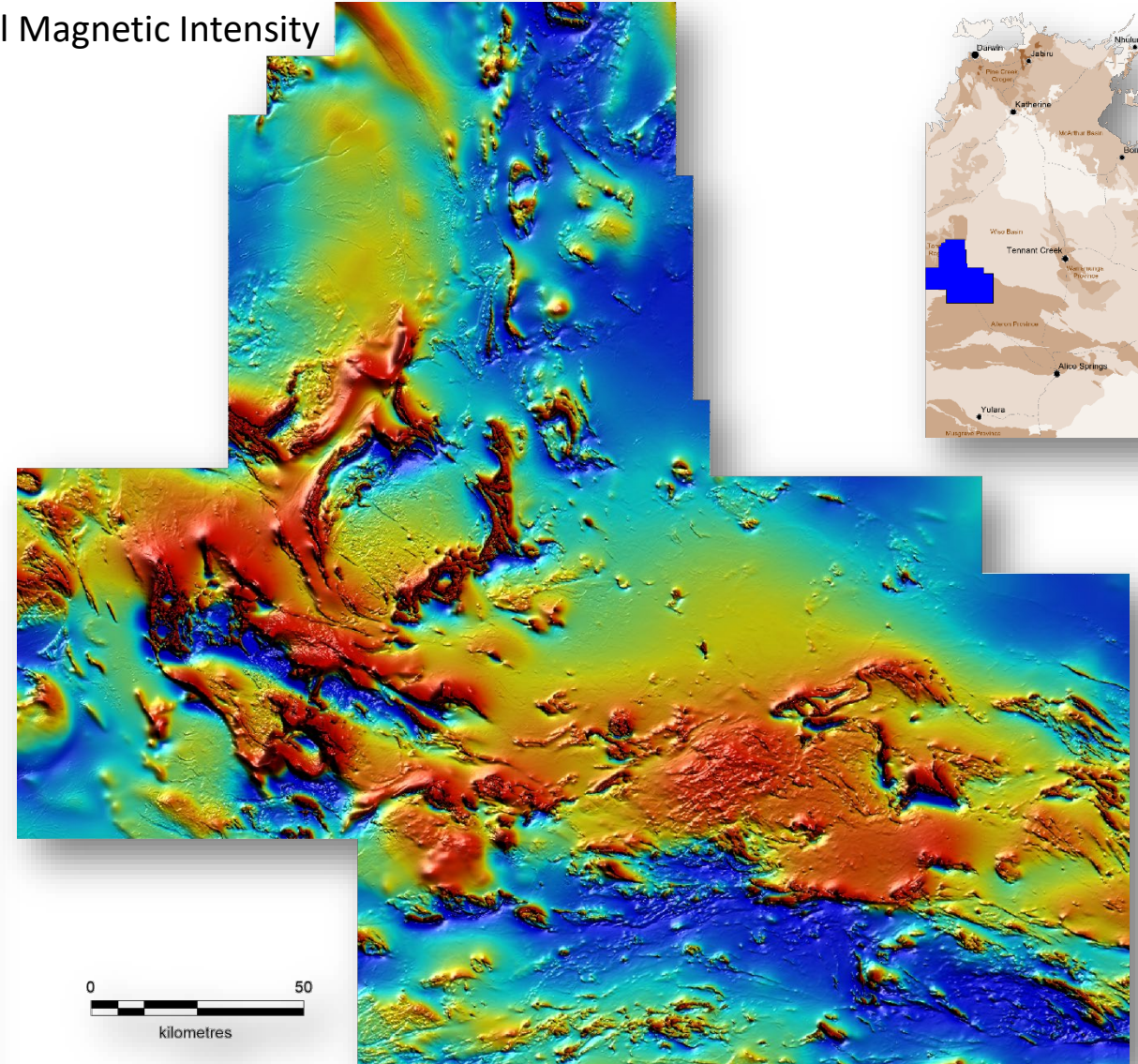


NTGS Tanami Region Airborne Magnetic and Radiometric Survey

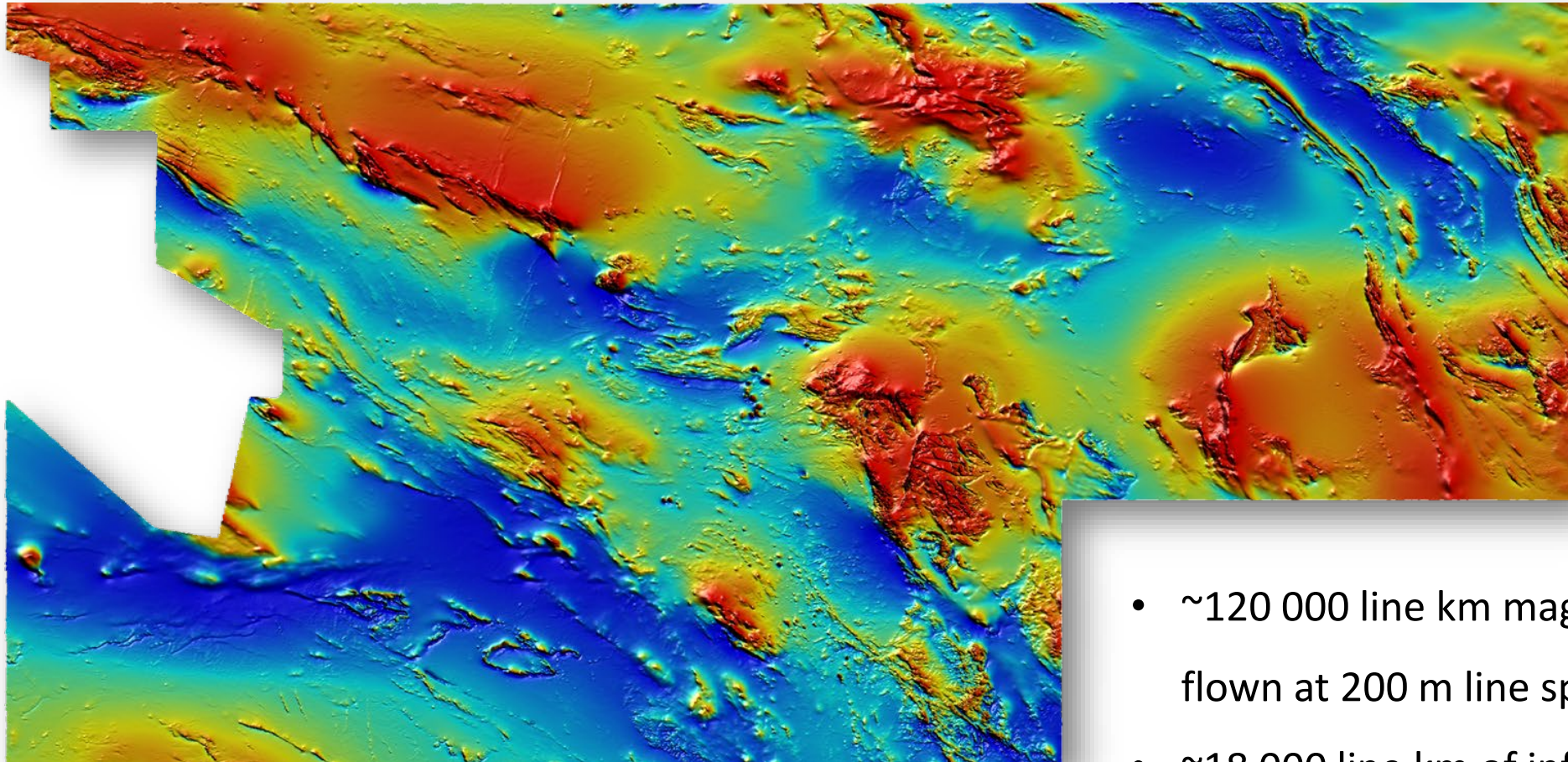
Ternary Radiometrics



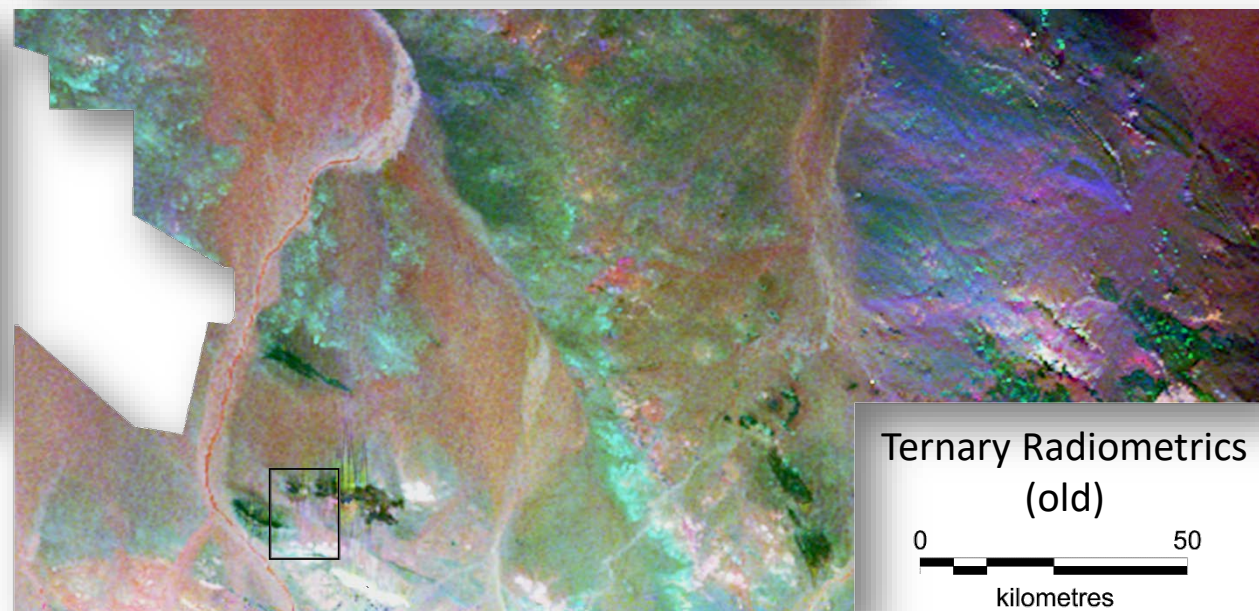
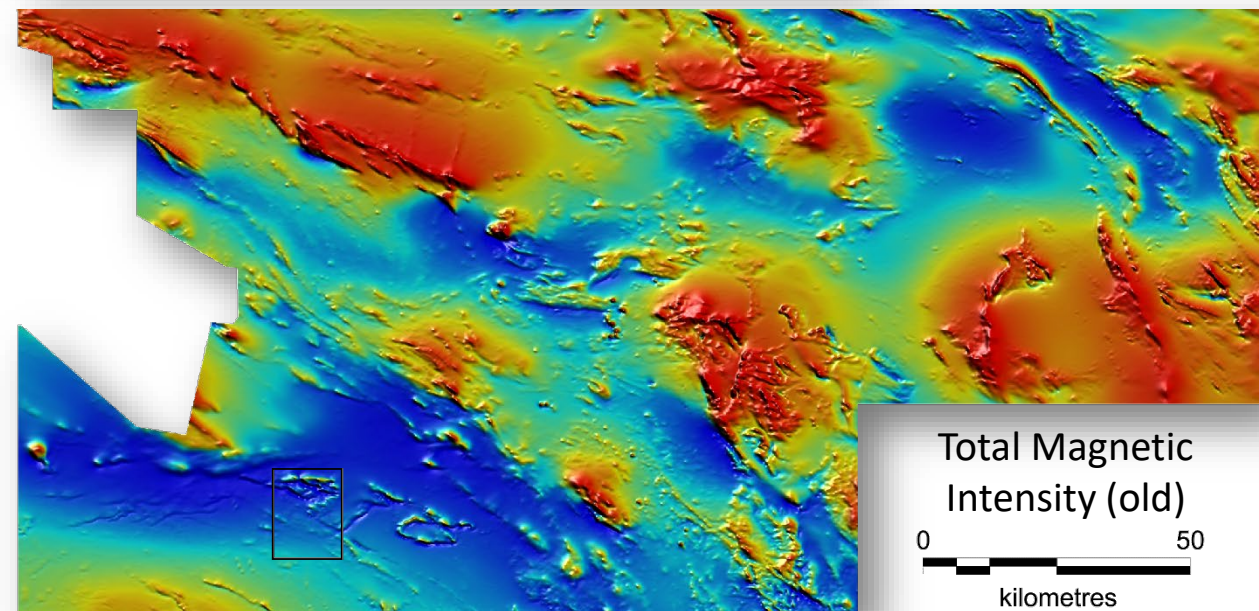
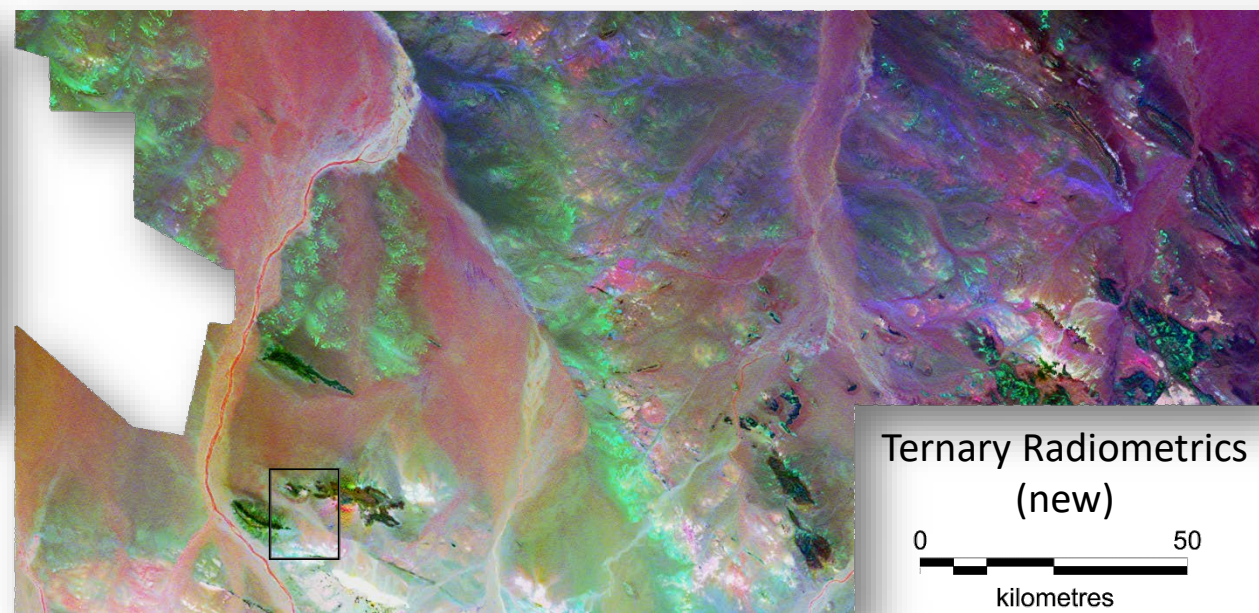
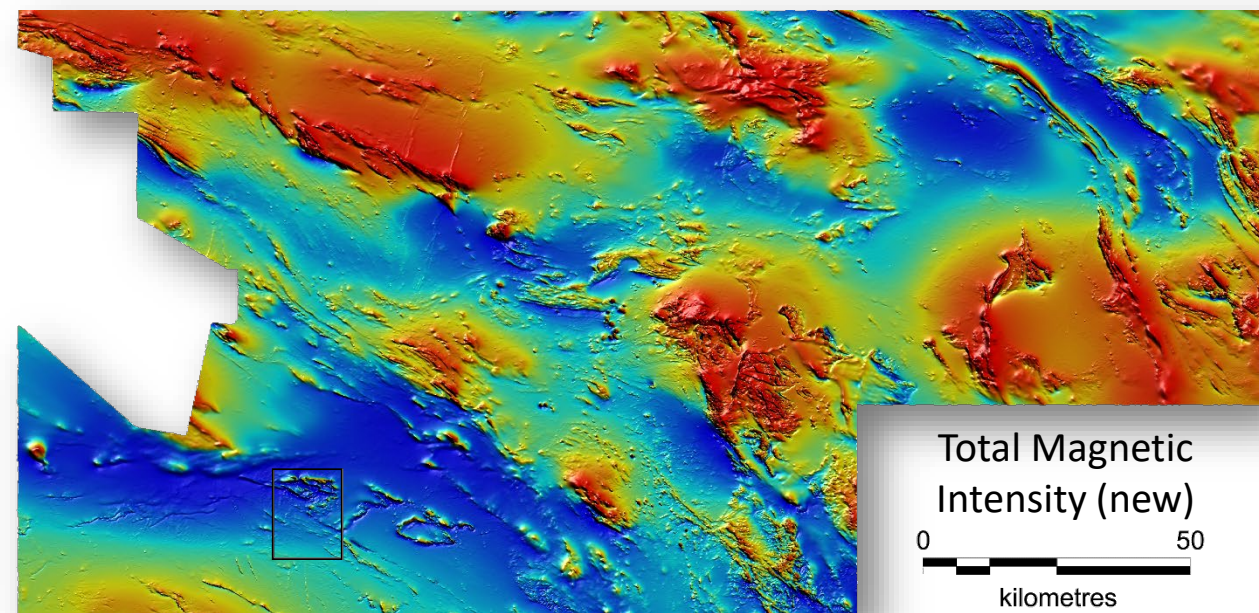
Total Magnetic Intensity



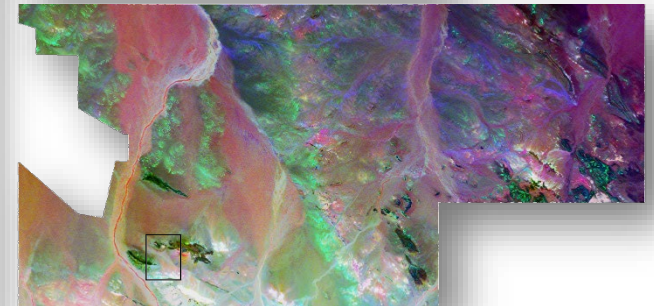
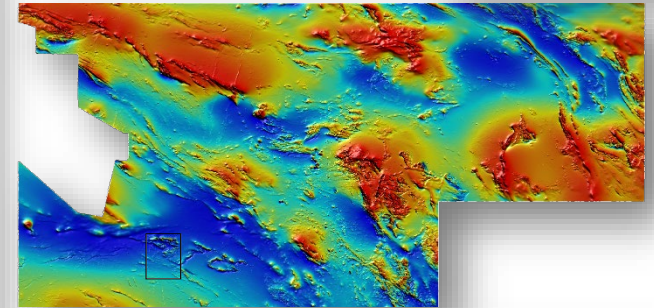
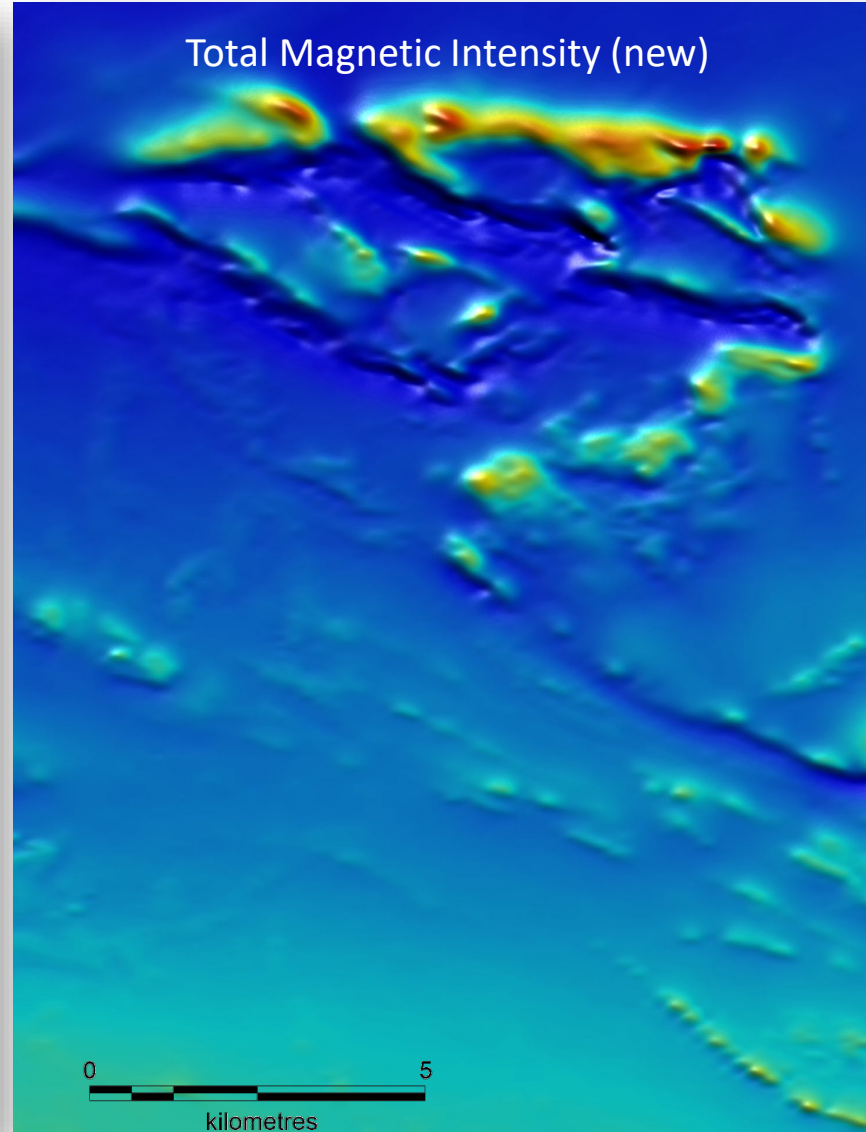
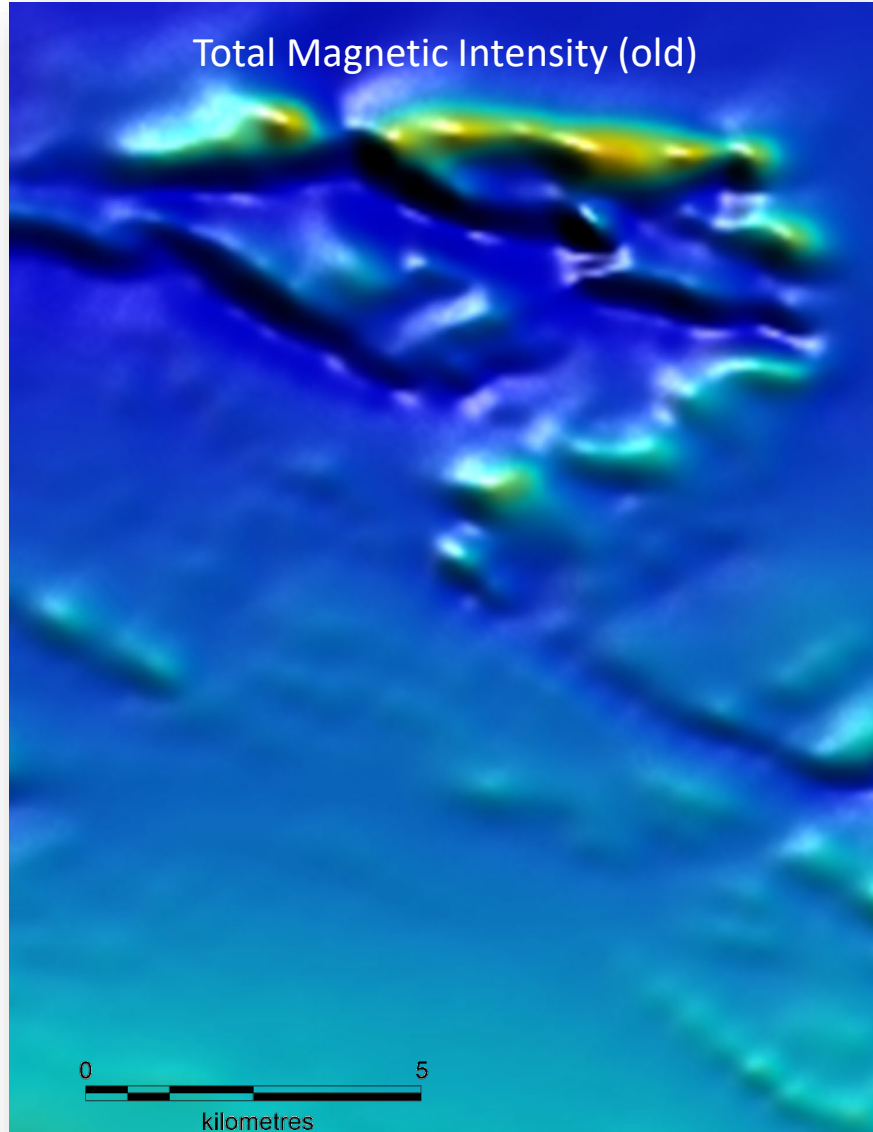
NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey



- ~120 000 line km magnetic / radiometric data flown at 200 m line spacing 60 m clearance
- ~18 000 line km of infill data flown at 100 m line spacing



NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey

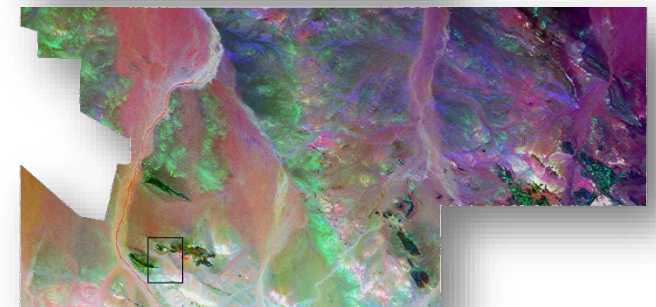
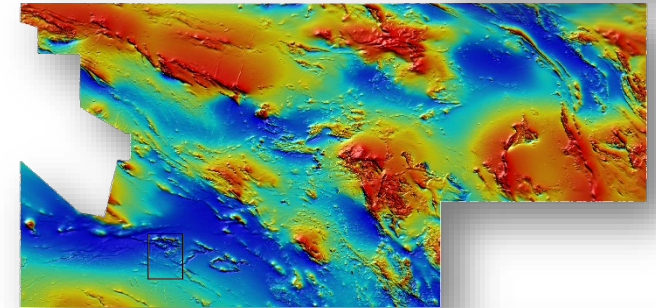


NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey

Ternary Radiometrics (old)



Ternary Radiometrics (new)



Geophysics and Drilling Collaborations (GDC) Round 11

- Six geophysical and six drilling programs were completed under Round 11 of NTGS GDC co-funding program
- Over 74,000 line km of magnetic and radiometric data, 2500 line km of airborne gravity gradiometry (AGG) data, 1500 line km of airborne electromagnetic (AEM) data, and 5000 m of drill core were produced by these projects

CR2018-0345	CR2019-0220
CR2018-0532	CR2019-0033
CR2018-0642	CR2019-0034



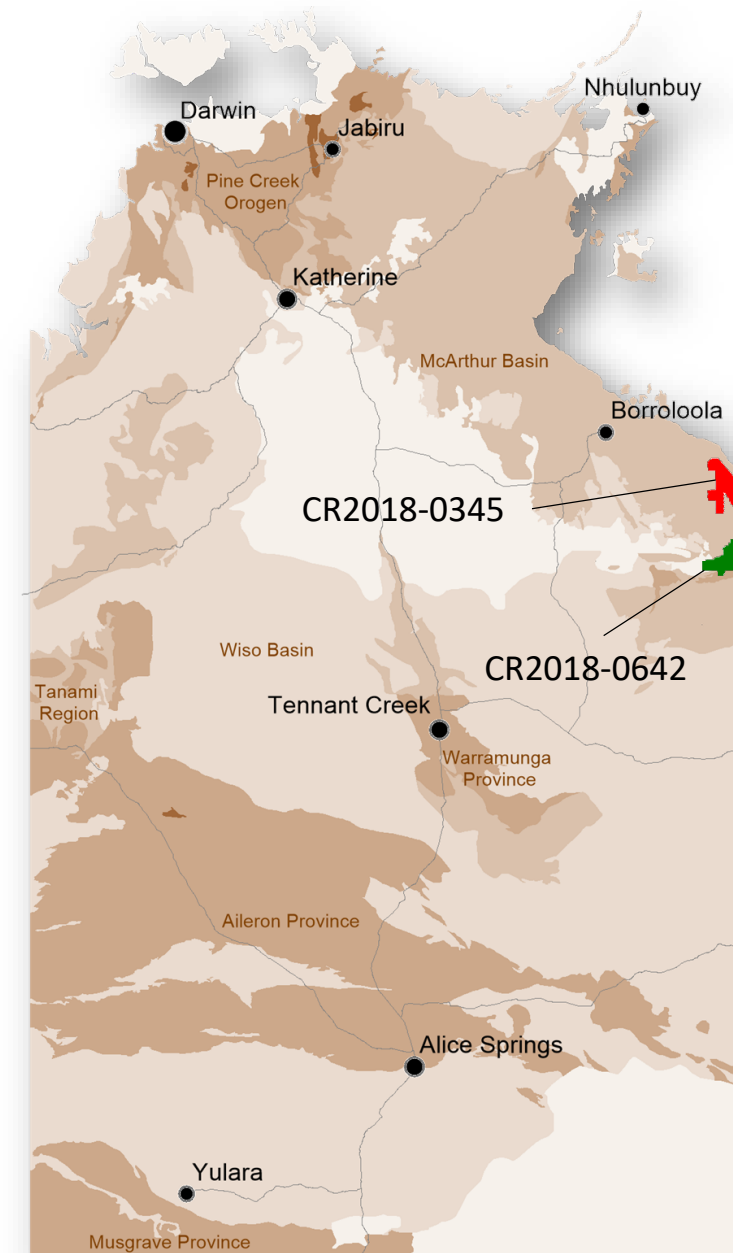
GDC Round 11 HyLogging

- Ten drillholes from six programs have been scanned using the HyLogger instrument:
 - CR2018-0616 Marindi Metals: CPDH006 (HDP0079)
 - CR2018-0643 MMG Exploration Ltd: NB18DD050 (HDP0075)
 - CR2018-0670 Todd River Resources Ltd: MCDD0003 and MCDD0005 (HDP0078)
 - CR2019-0019 Prodigy Gold NL: BLDD001 (HDP0080) and BLDD002
 - CR2019-0023 Vista Gold Australia Pty Ltd: WD018-001 and WD018-002 (HDP0081)
 - CR2019-0034 Todd River Resources: RVDD0001 and RVDD0002: currently being scanned



GDC Round 11 Geophysics

- McArthur Basin – 2 projects
 - CR2018-0345 Woologorang project, Northern Cobalt Ltd – airborne magnetic and radiometric survey (red)
 - CR2018-0642 Murphy project, Lagoon Creek Resources Pty Ltd – Falcon airborne gravity gradiometry survey (green)



Woollogorang CR2018-0345

- Northern Cobalt Ltd exploring for Stanton style cobalt and Redbank type copper deposits hosted in the Gold Creek Volcanics
- 25 000 line km helicopter-borne magnetic / radiometric data acquired
- Flown at 75 m line spacing and 30 m clearance



Woollogorang CR2018-0345

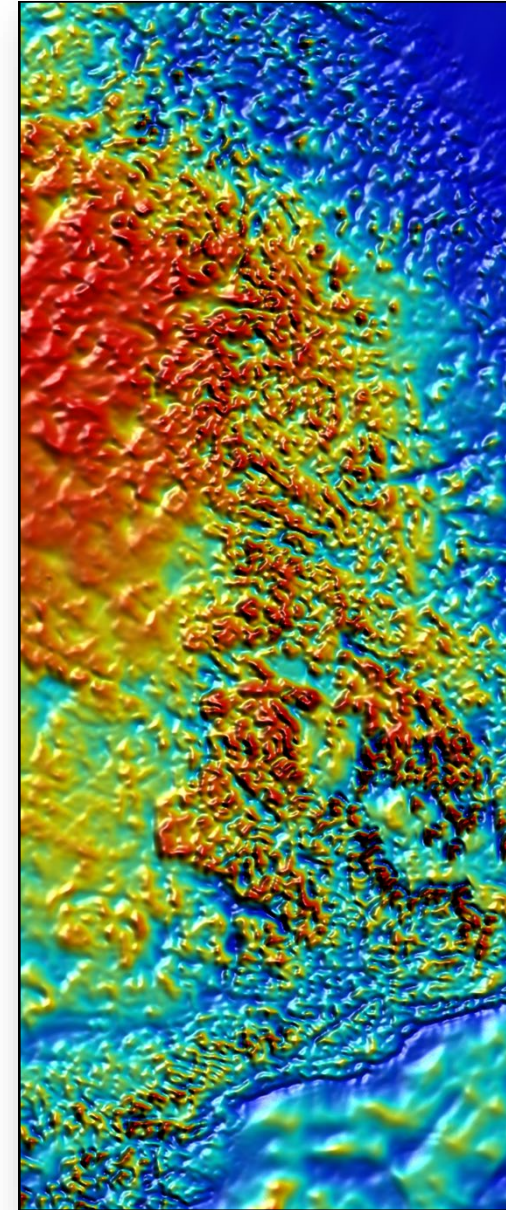
- Gold Creek Volcanics are under cover through much of the survey area
- Gold Creek Volcanics produce a stippled texture in the TMI



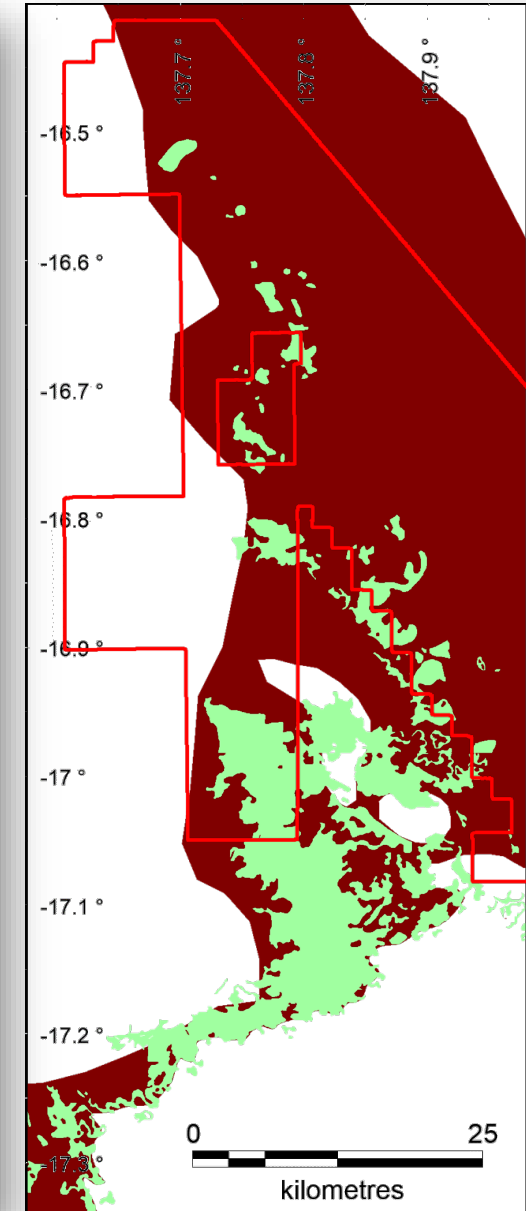
-  Gold Creek Volcanics outcrop
 - Ahmad M and Wygralak AS, 1989. *Calvert Hills (First Edition). 1:250 000 geological map series, SE53-08.* Northern Territory Geological Survey, Darwin.
 - Rawlings DJ, 2002. *Robinson River (Second Edition). 1:250 000 geological map series, SE53-04.* Northern Territory Geological Survey, Darwin.
-  Gold Creek Volcanics interpreted extent
 - Blaikie TN, in press. Southern McArthur Basin geophysical interpretations. *Northern Territory Geological Survey, Digital Information Package DIP 0xx.*

CR2018-0345

TMI RTP: regional data



Gold Creek Volcanics



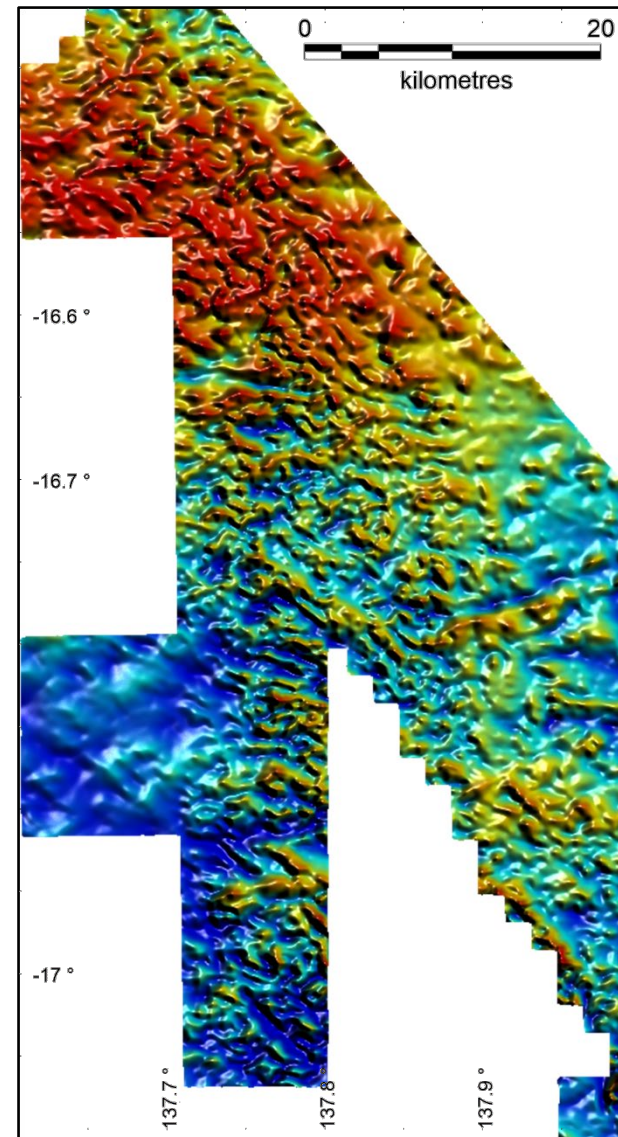
Woollogorang CR2018-0345

- Many deposits associated with magnetic lows (blue)
- Left figure 500 m line spacing regional data from mid-1990's
- Right figure new data acquired at 75 m line spacing

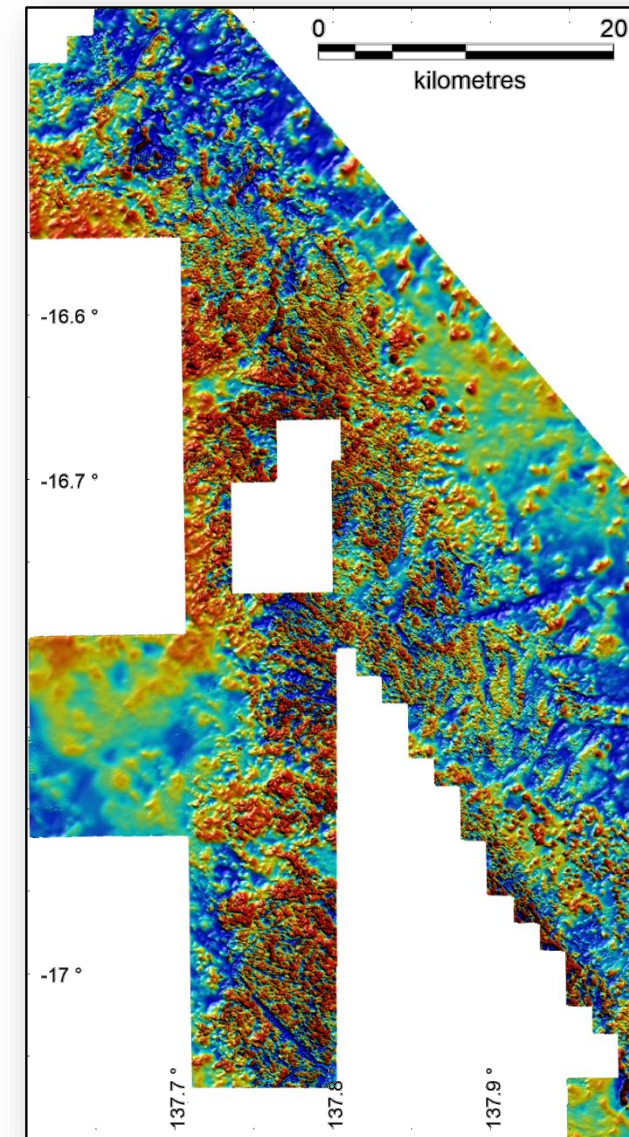


CR2018-0345

TMI RTP
Regional data



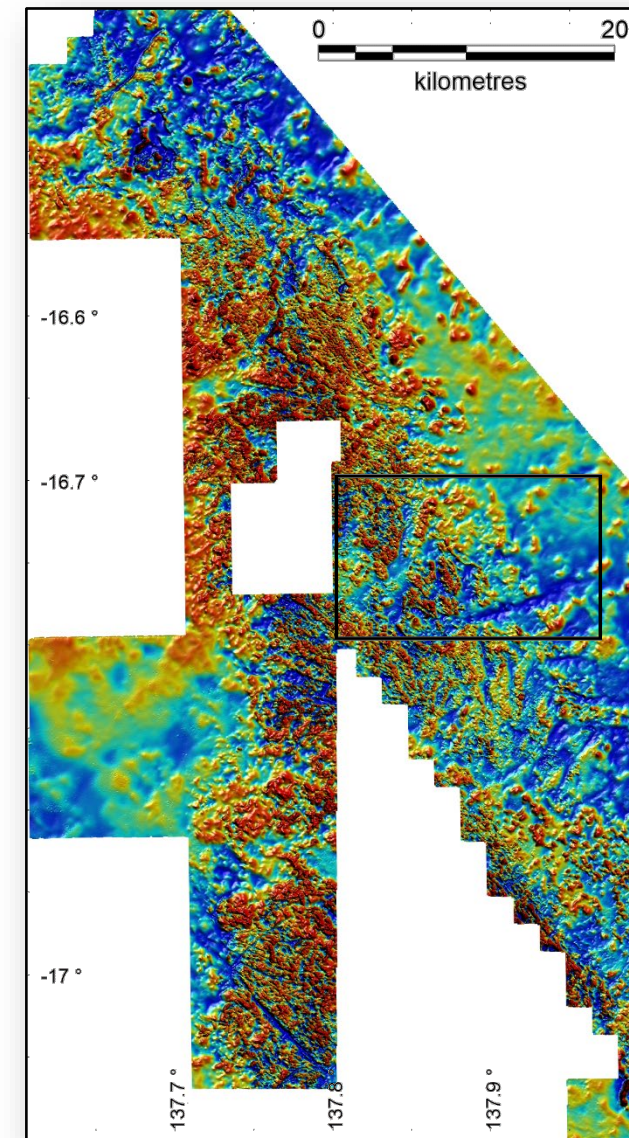
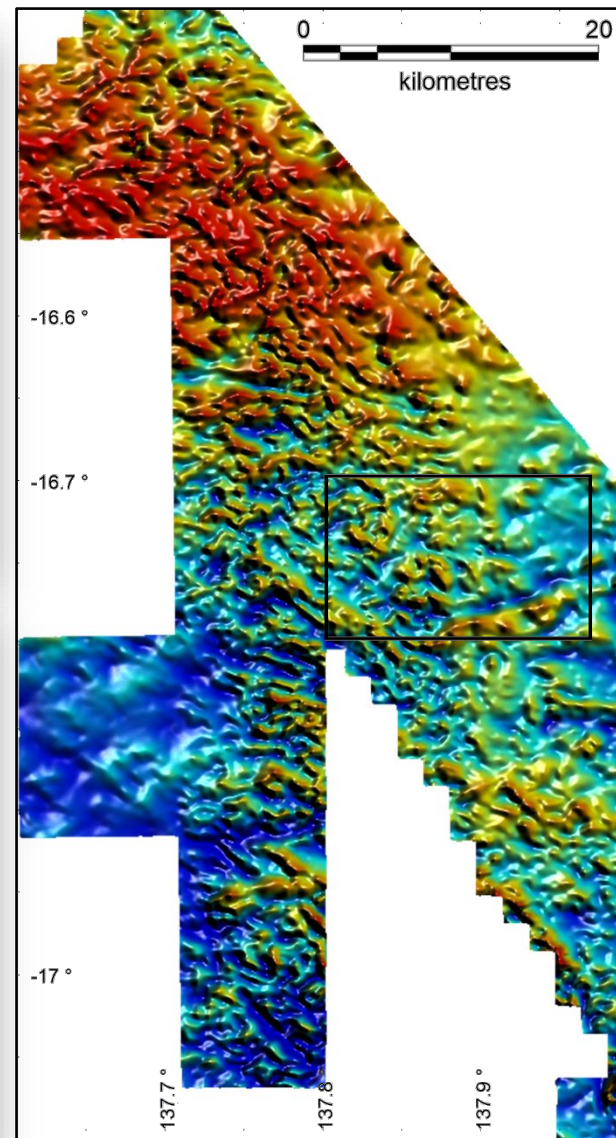
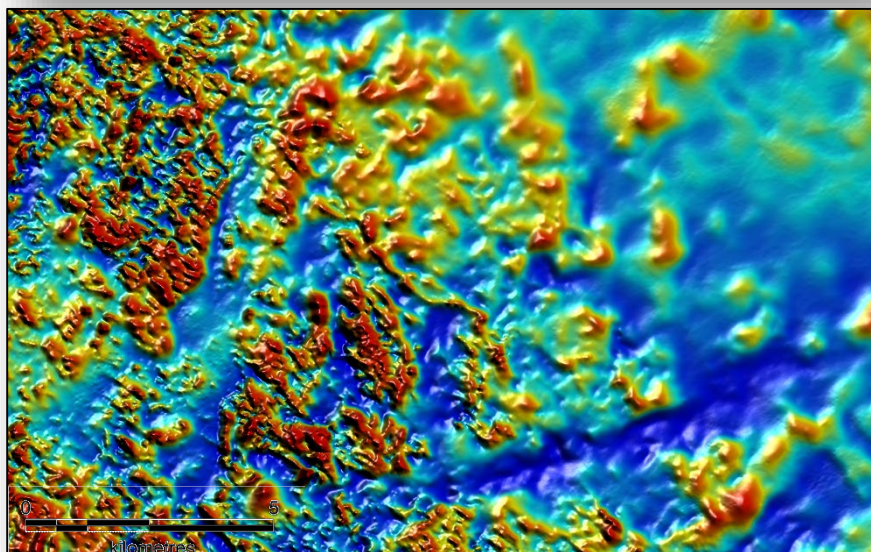
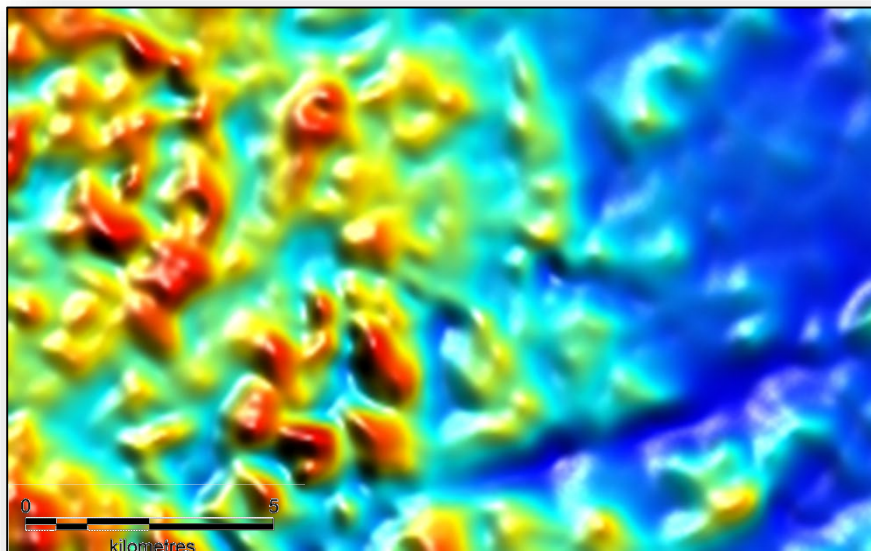
TMI RTP
New data



Woollogorang CR2018-0345

TMI RTP
Regional data

TMI RTP
New data

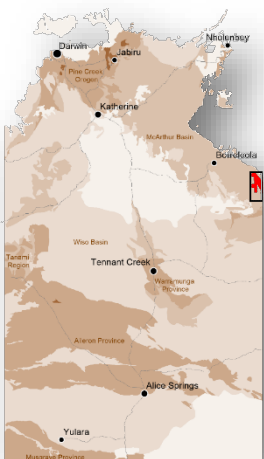
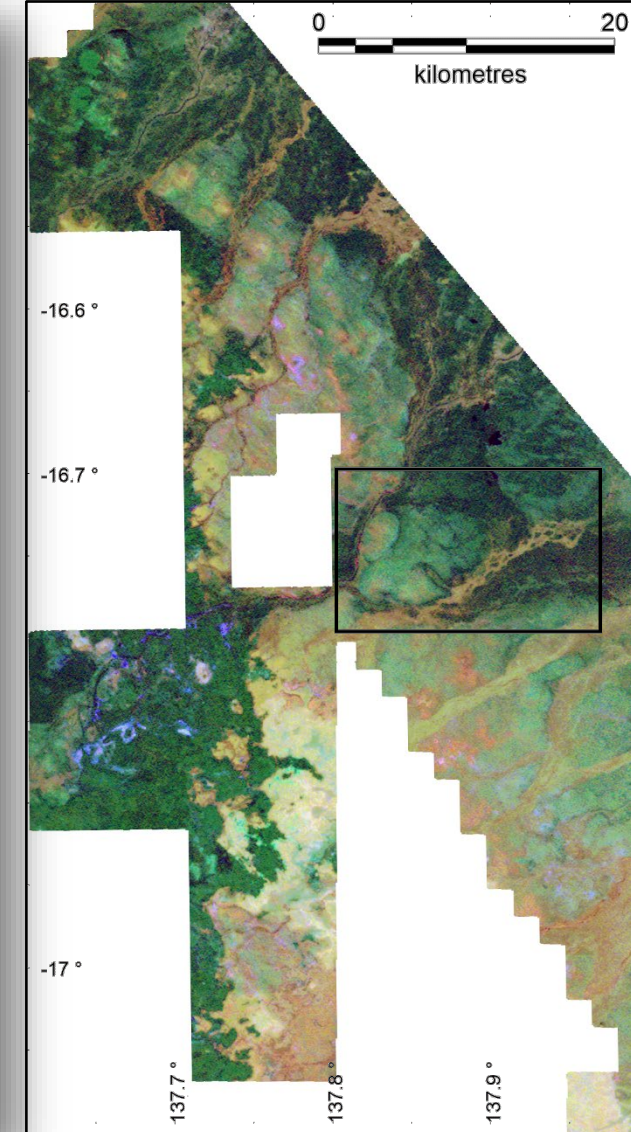
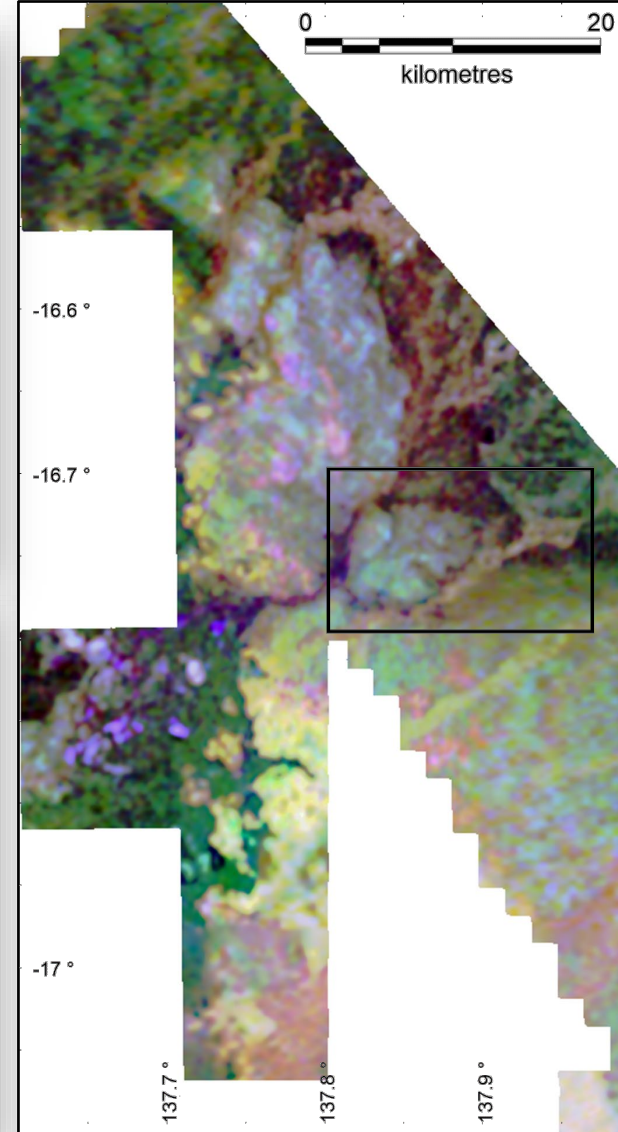
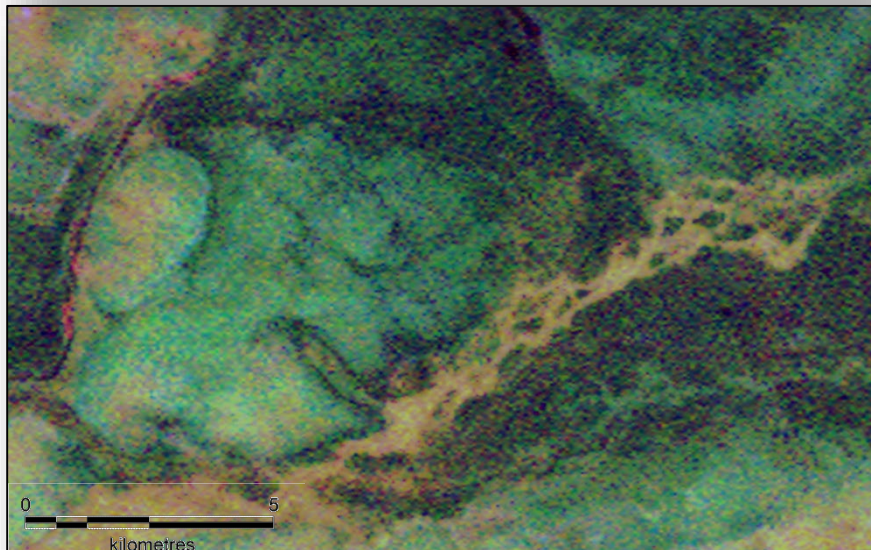
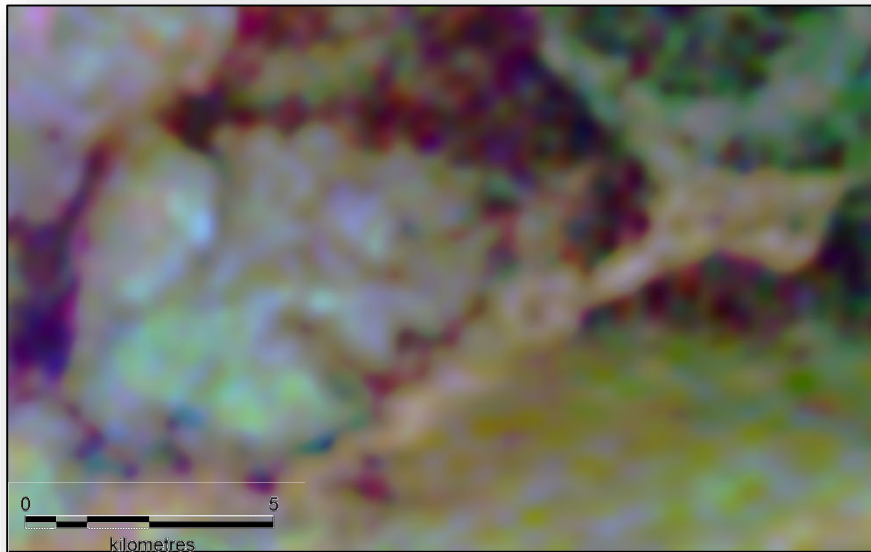


CR2018-0345

Woollogorang CR2018-0345

Ternary Radiometrics
Regional data

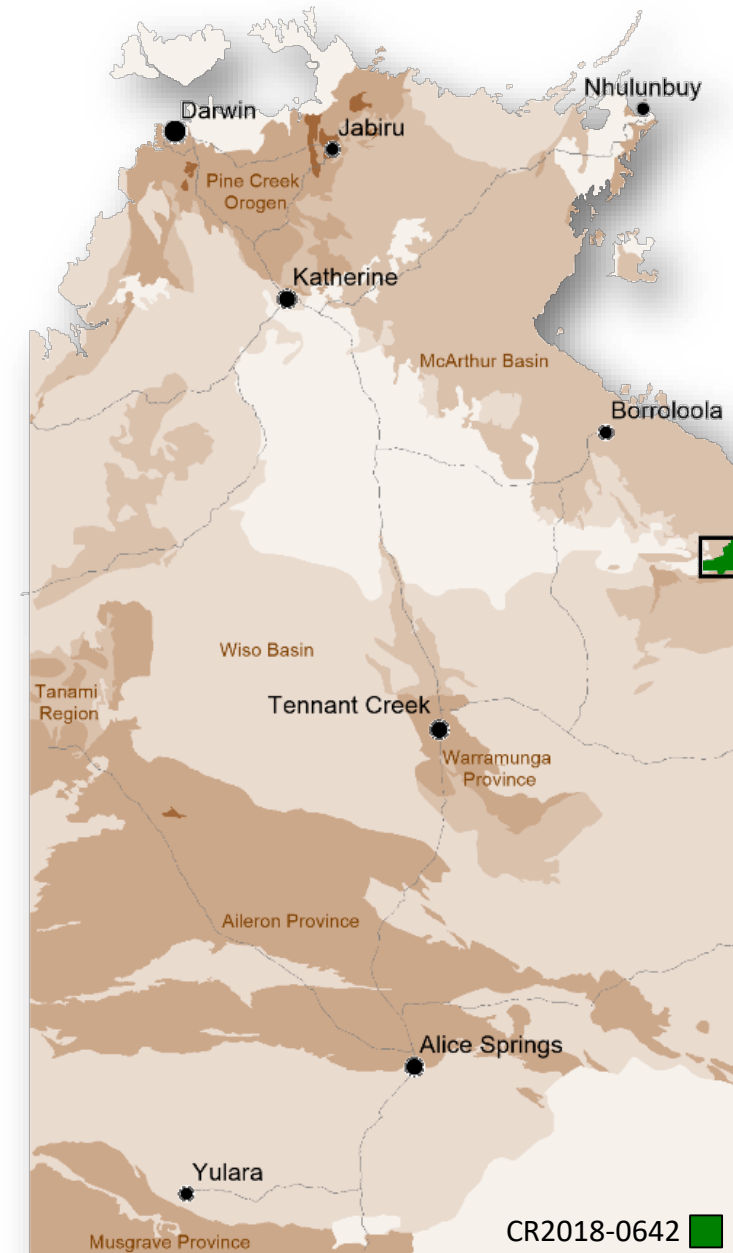
Ternary Radiometrics
New data



CR2018-0345

Murphy CR2018-0642

- Lagoon Creek Resources Pty Ltd exploring for Westmoreland-style, unconformity related uranium
- 2585 line km Airborne Gravity Gradiometry (AGG) and magnetic data acquired using the FALCON system
- Flown at 800 m line spacing and 80 m clearance



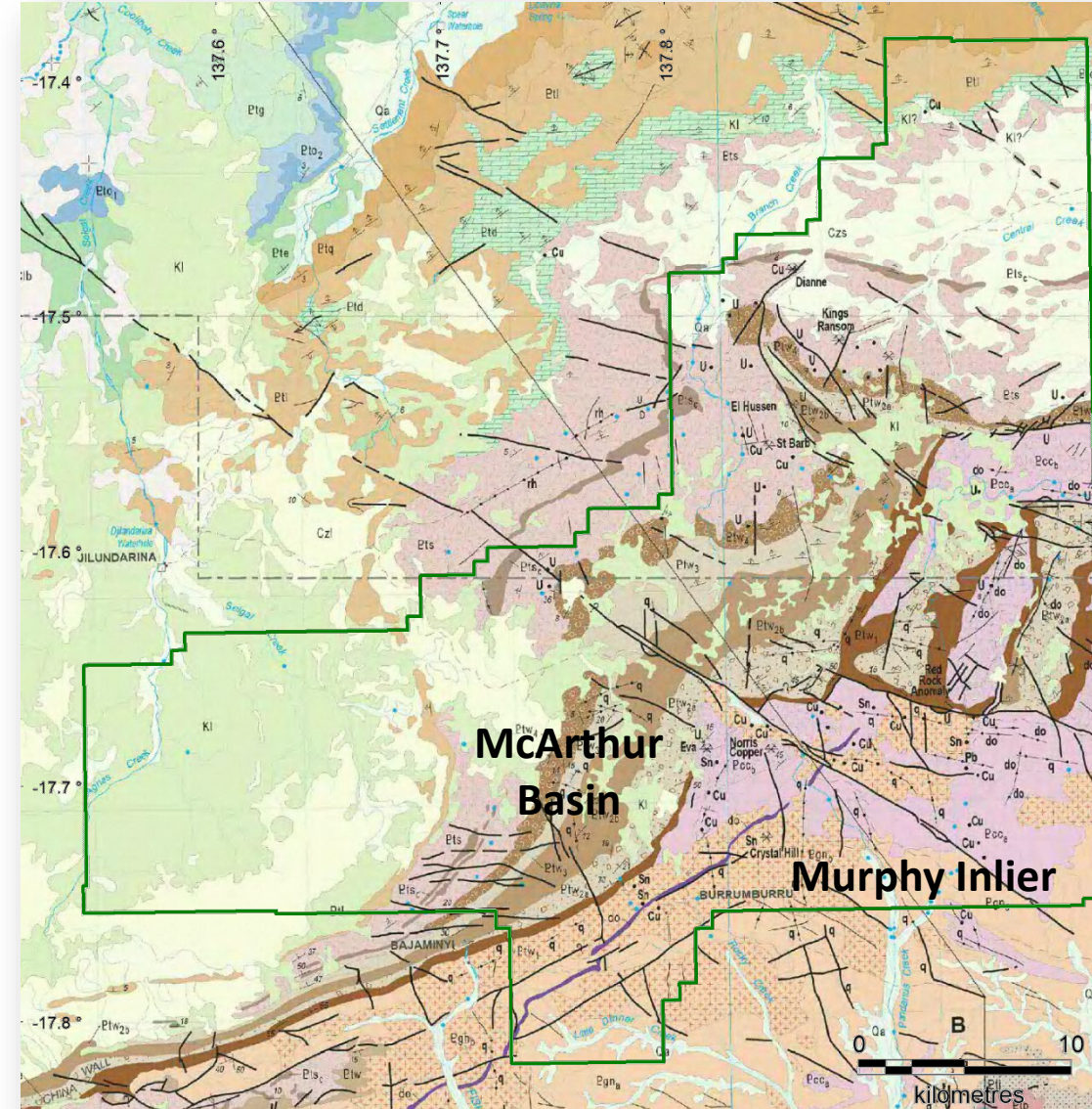
Murphy CR2018-0642

- The survey covers the boundary between the outcropping Murphy Inlier and sediments of the McArthur Basin
- The data will assist with identifying and mapping basement structures that may have acted as fluid pathways

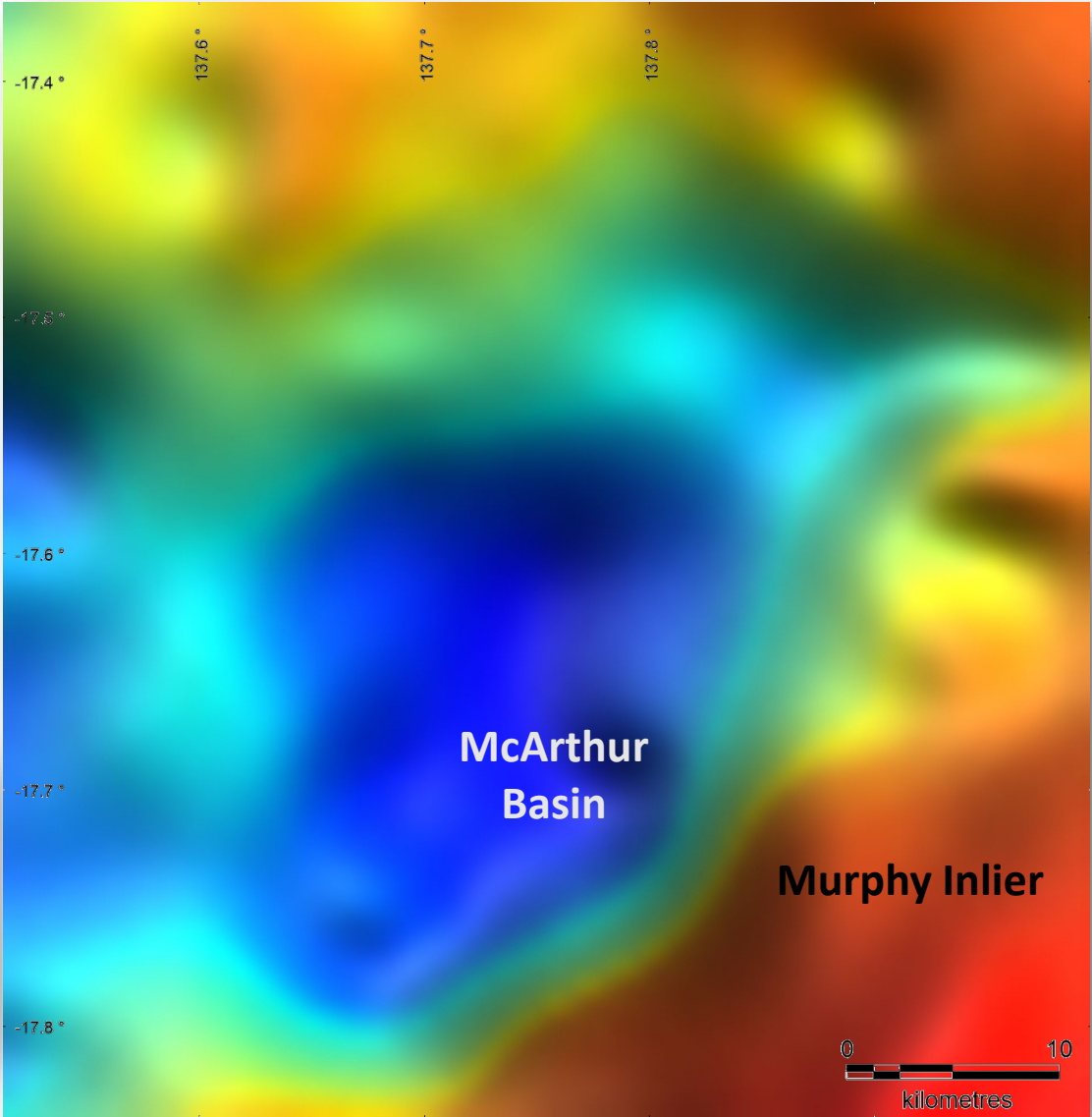


CR2018-0642

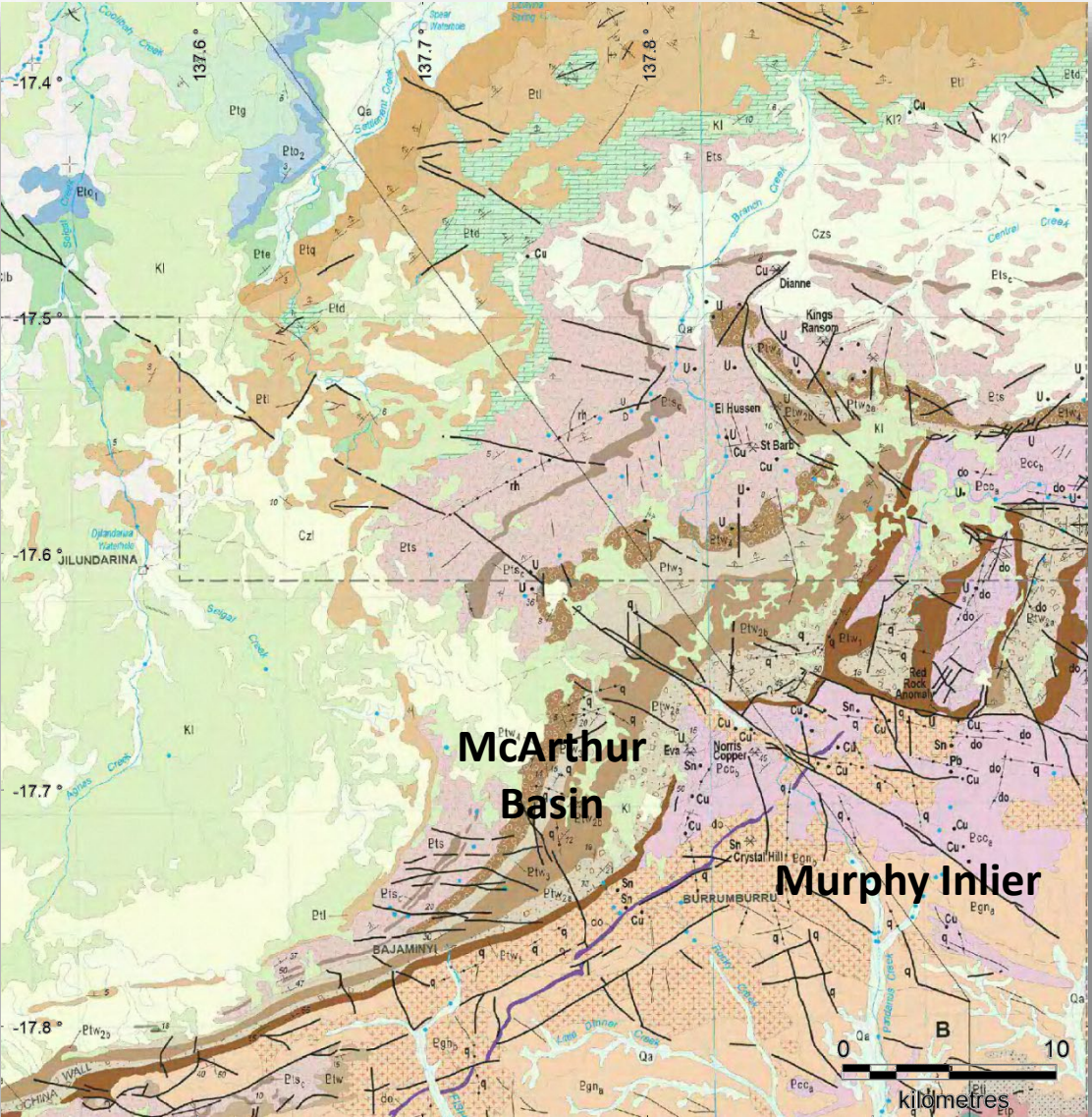
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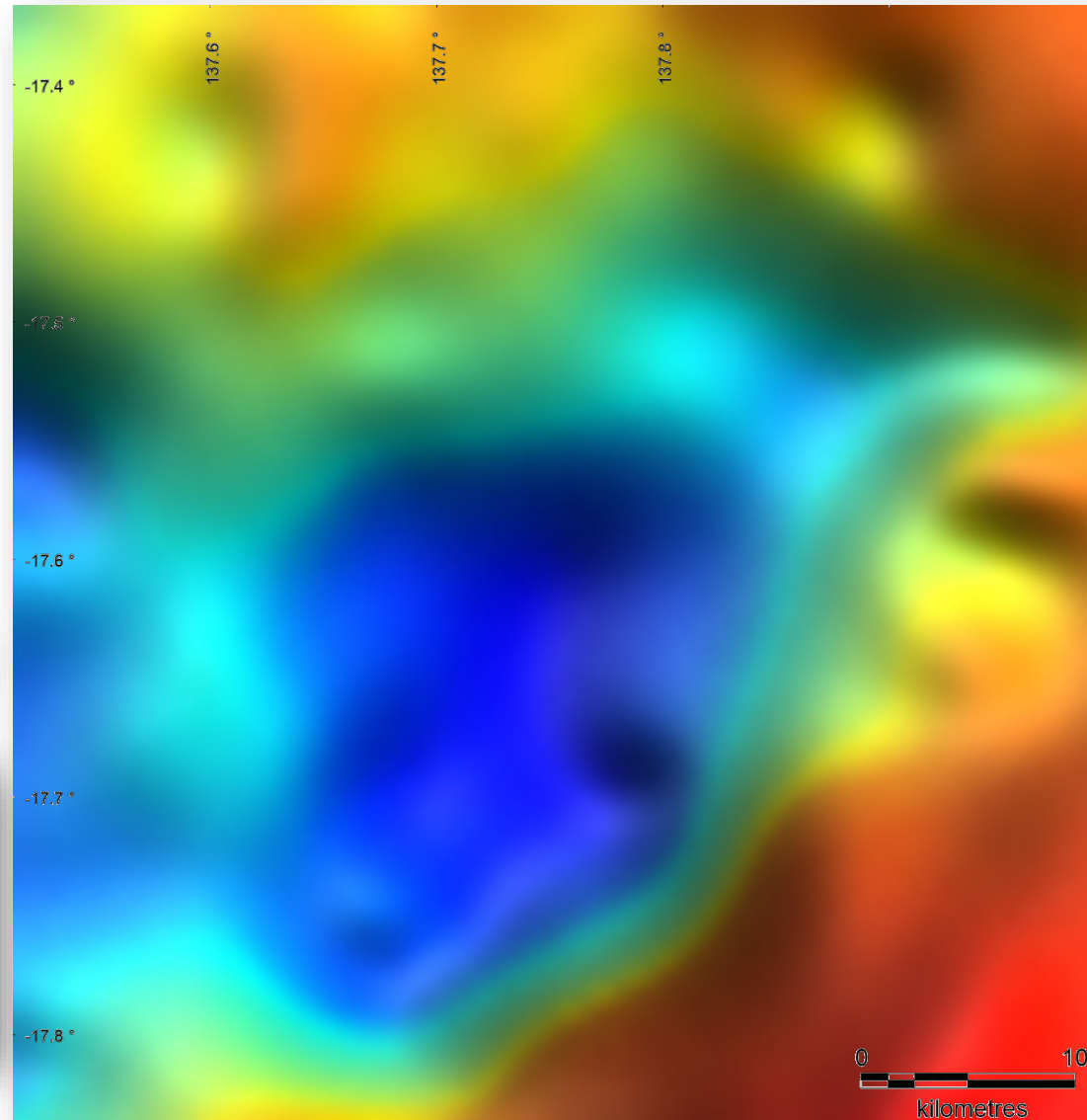
Bouguer Anomaly: Regional data (ground gravity)



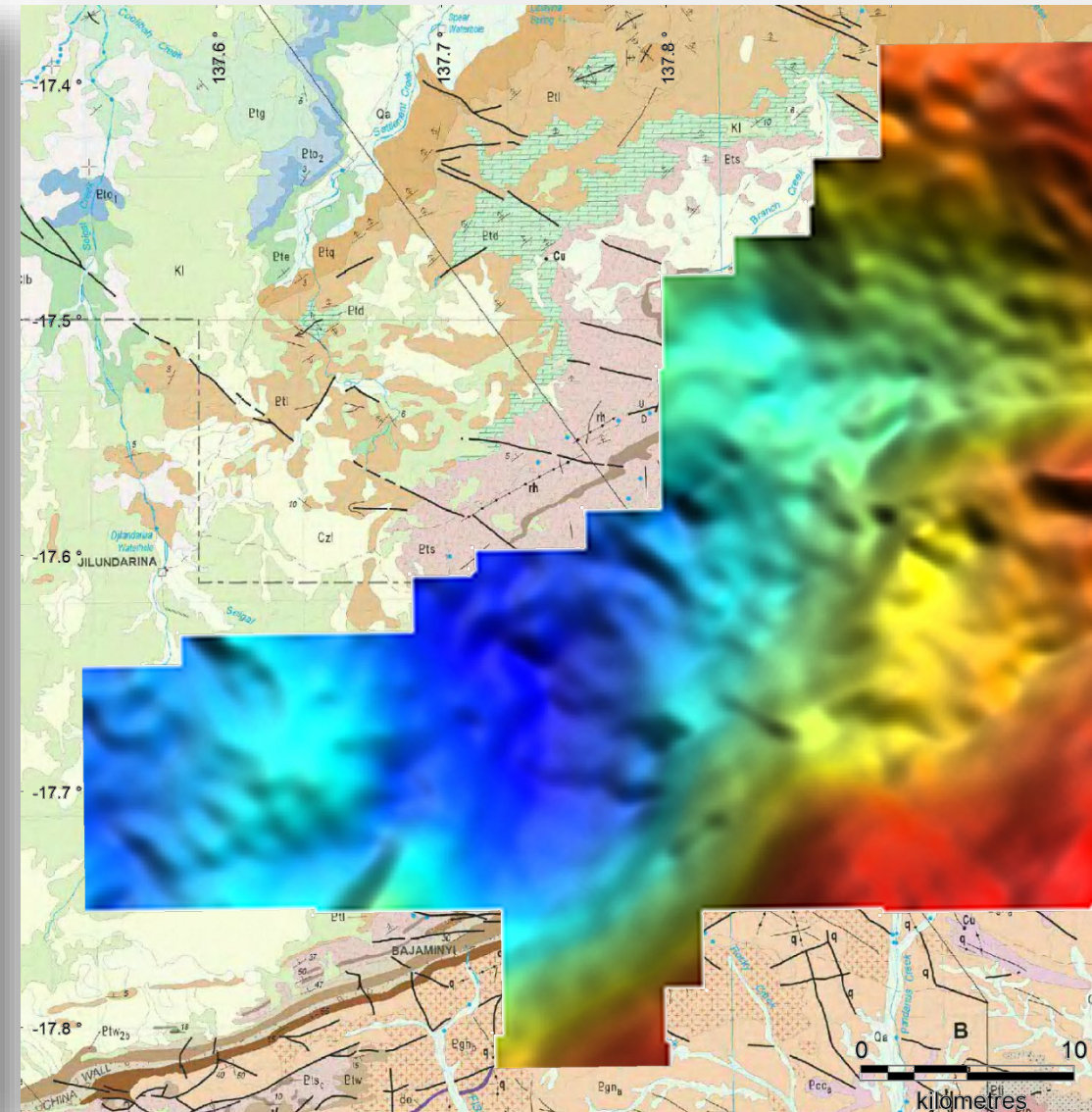
Ahmad M and Wygralak AS, 1989. *Calvert Hills (First Edition). 1:250 000 geological map series, SE53-08.* Northern Territory Geological Survey, Darwin



Bouguer Anomaly: Regional data (ground gravity)

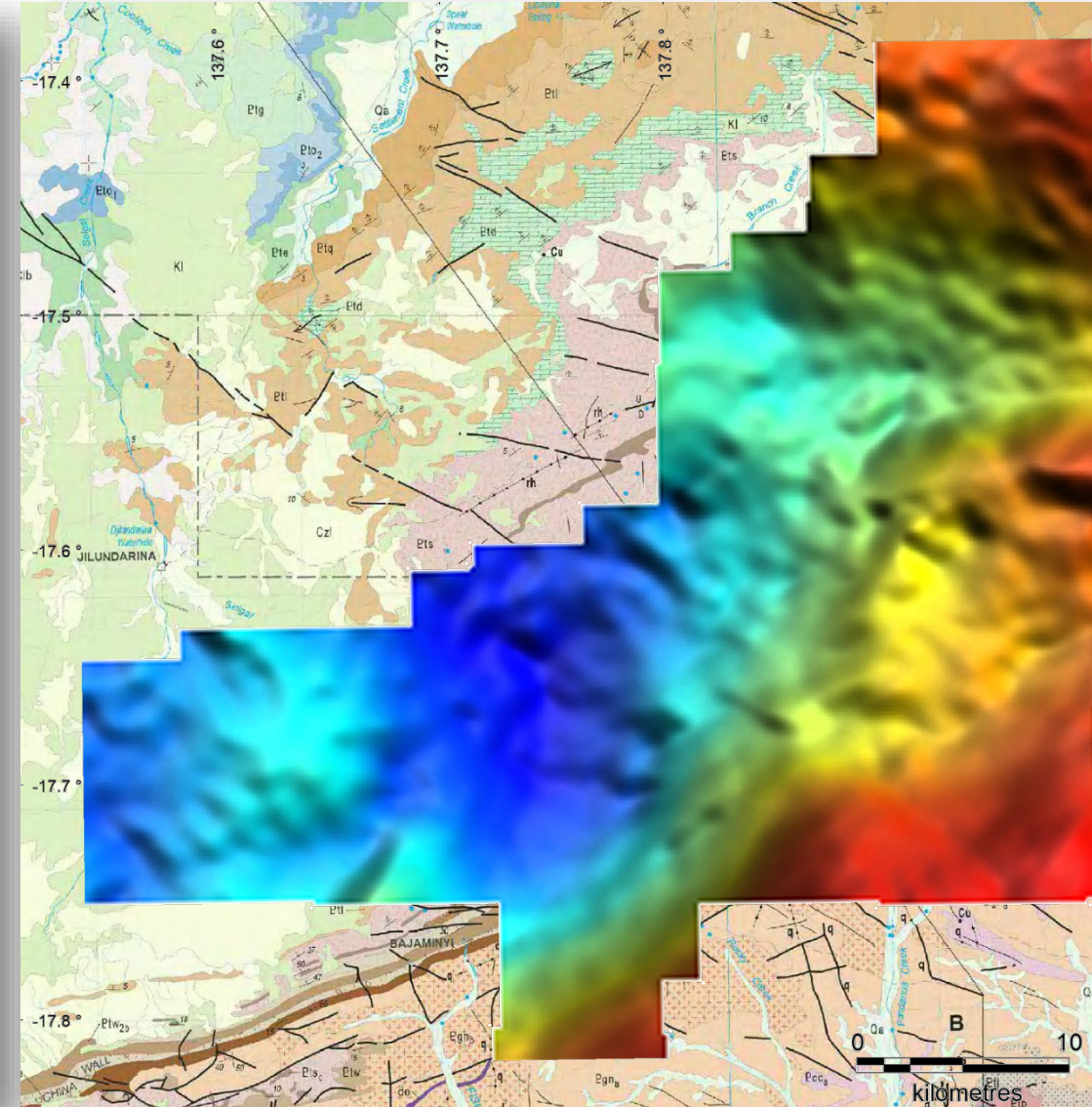
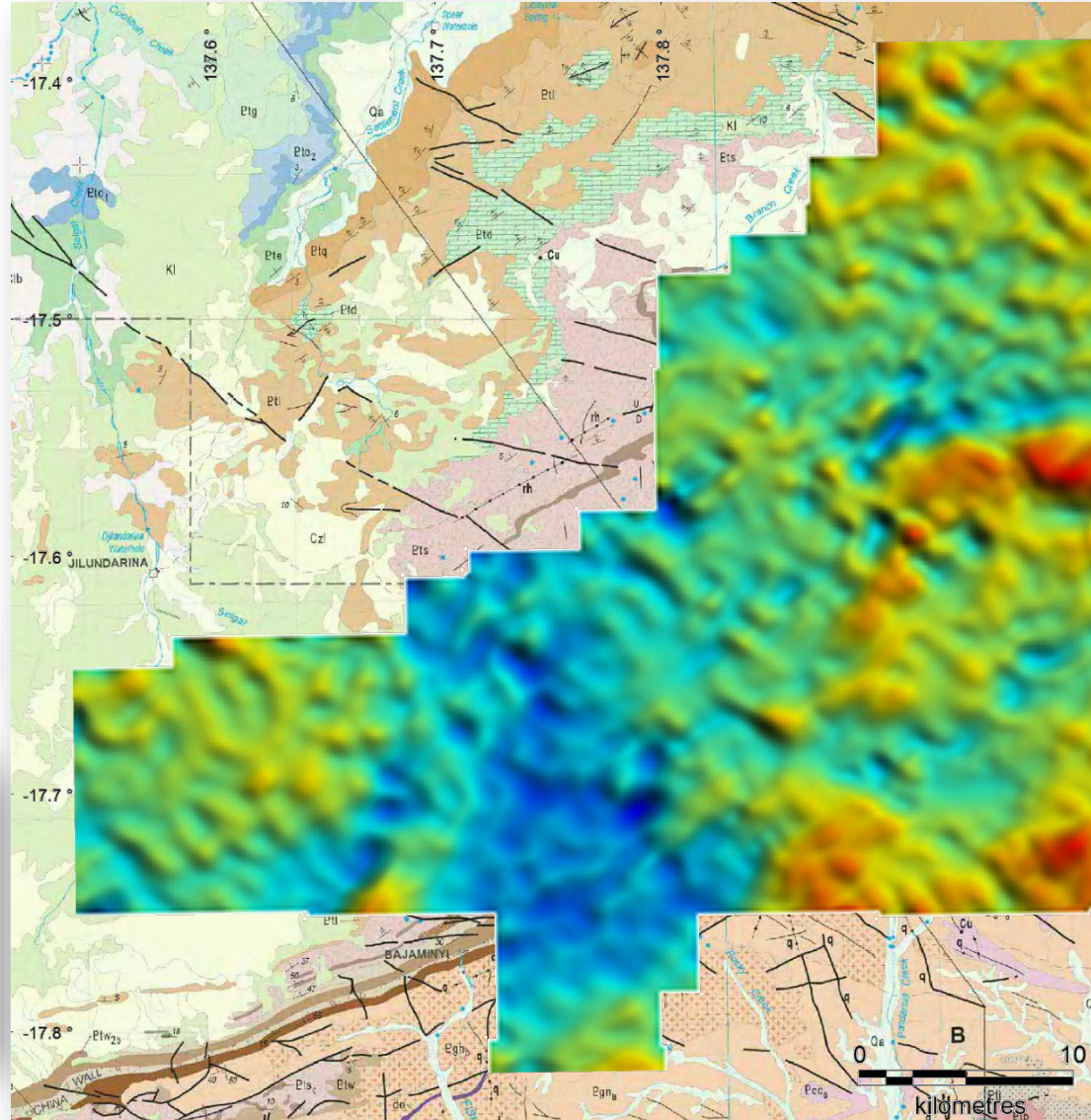


Fourier derived enhanced vertical gravity (terrain correction density 2.6 g/cm^3) conformed to ground



Fourier derived enhanced vertical gravity gradient (terrain correction density 2.6 g/cm³) conformed to ground

Fourier derived enhanced vertical gravity (terrain correction density 2.6 g/cm³) conformed to ground



CR2018-0642

GDC Round 11 Geophysics

- Musgrave Province – 2 projects
 - CR2018-0532 Giles Creek project, Gempart (NT) Pty Ltd – airborne magnetic and radiometric survey (purple)
 - CR2019-0220 Claude Hills North project, Gempart (NT) Pty Ltd – airborne magnetic/radiometric survey (pink)

CR2018-0532

CR2019-0220



Giles Creek CR2018-0532

- Gempart (NT) Pty Ltd exploring for gold, base metals, PGE's and REE's
- 2700 line km of airborne magnetic / radiometric data acquired
- Flown at 150 m line spacing and 50 m clearance

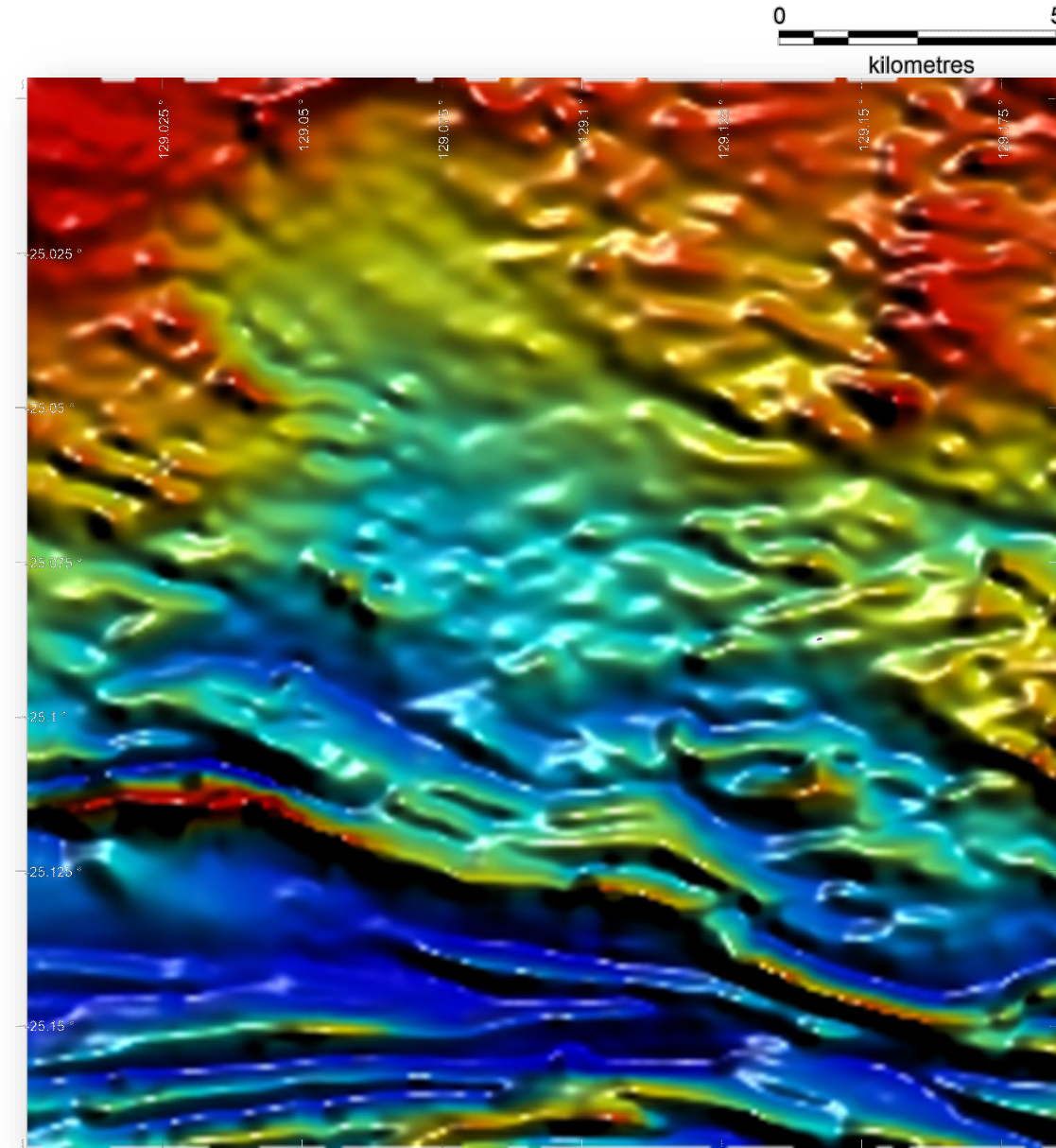


Giles Creek CR2018-0532

- Pre-existing magnetic / radiometric data was acquired in the mid-80's at 500 m line spacing

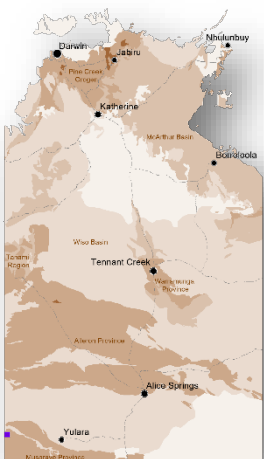


CR2018-0532

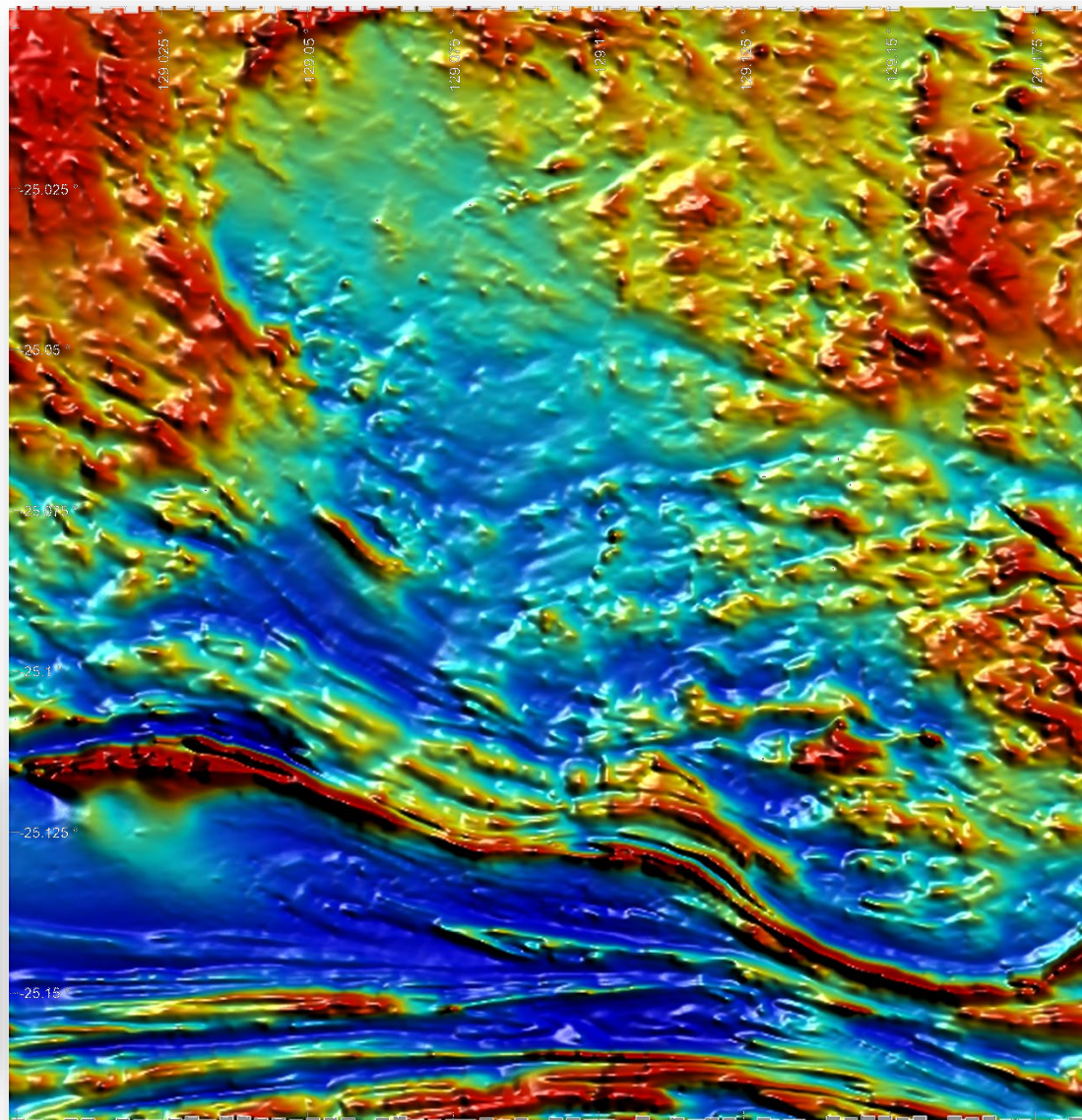


Giles Creek CR2018-0532

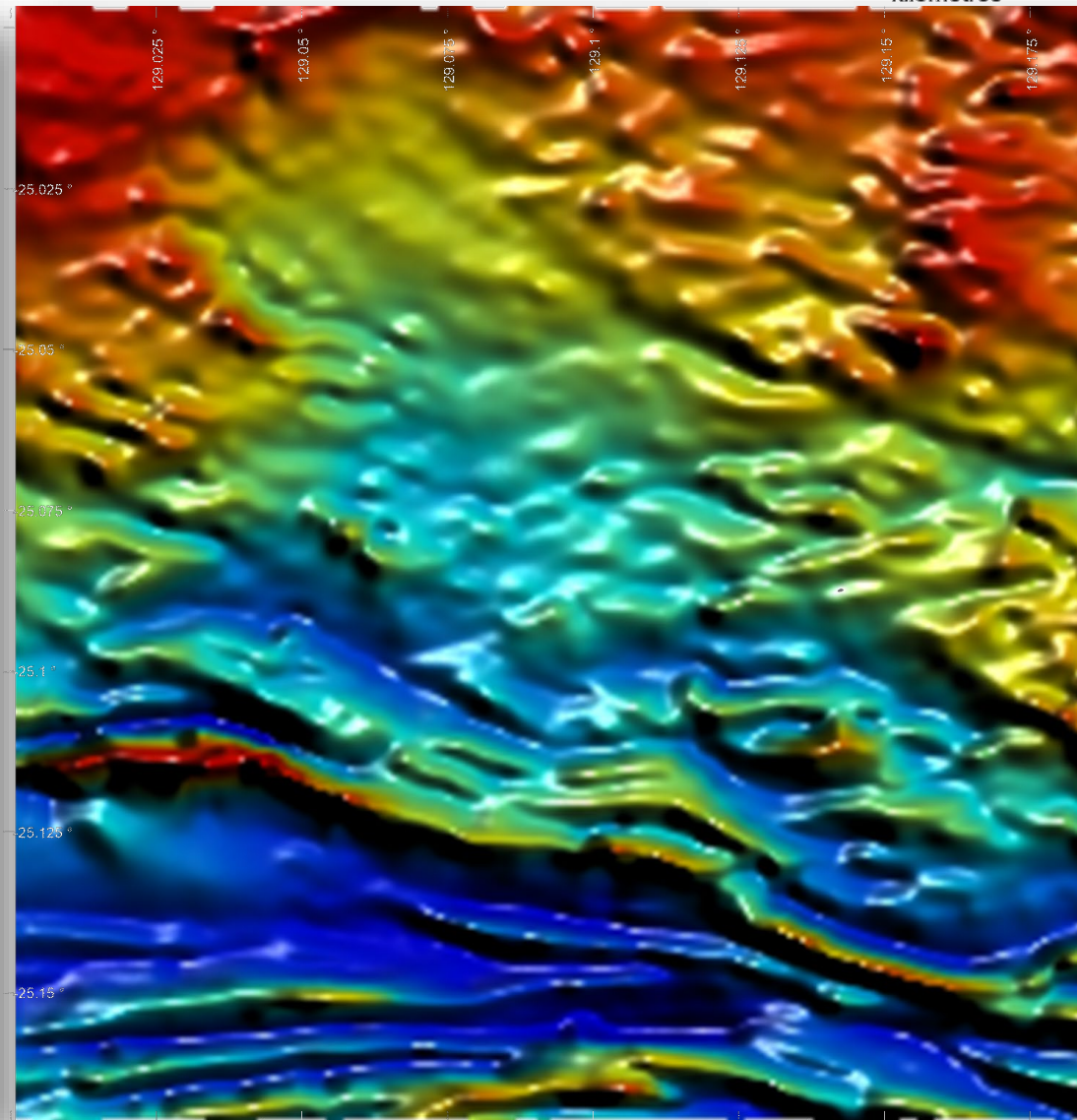
TMI RTP
New data



CR2018-0532



TMI RTP
Regional data

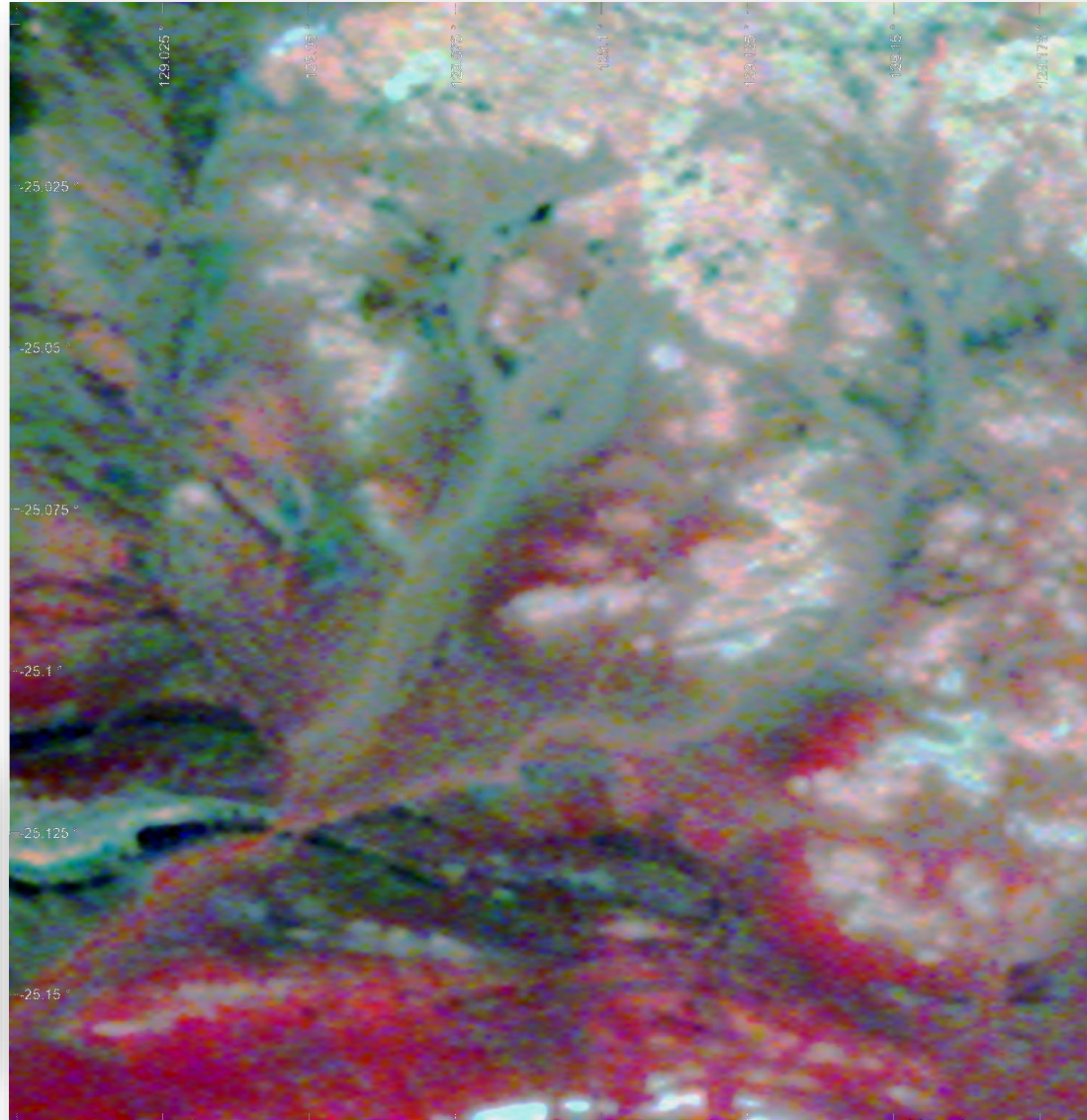


Giles Creek CR2018-0532

Ternary Radiometrics
Regional data



Ternary
Radiometrics
New data



CR2018-0532

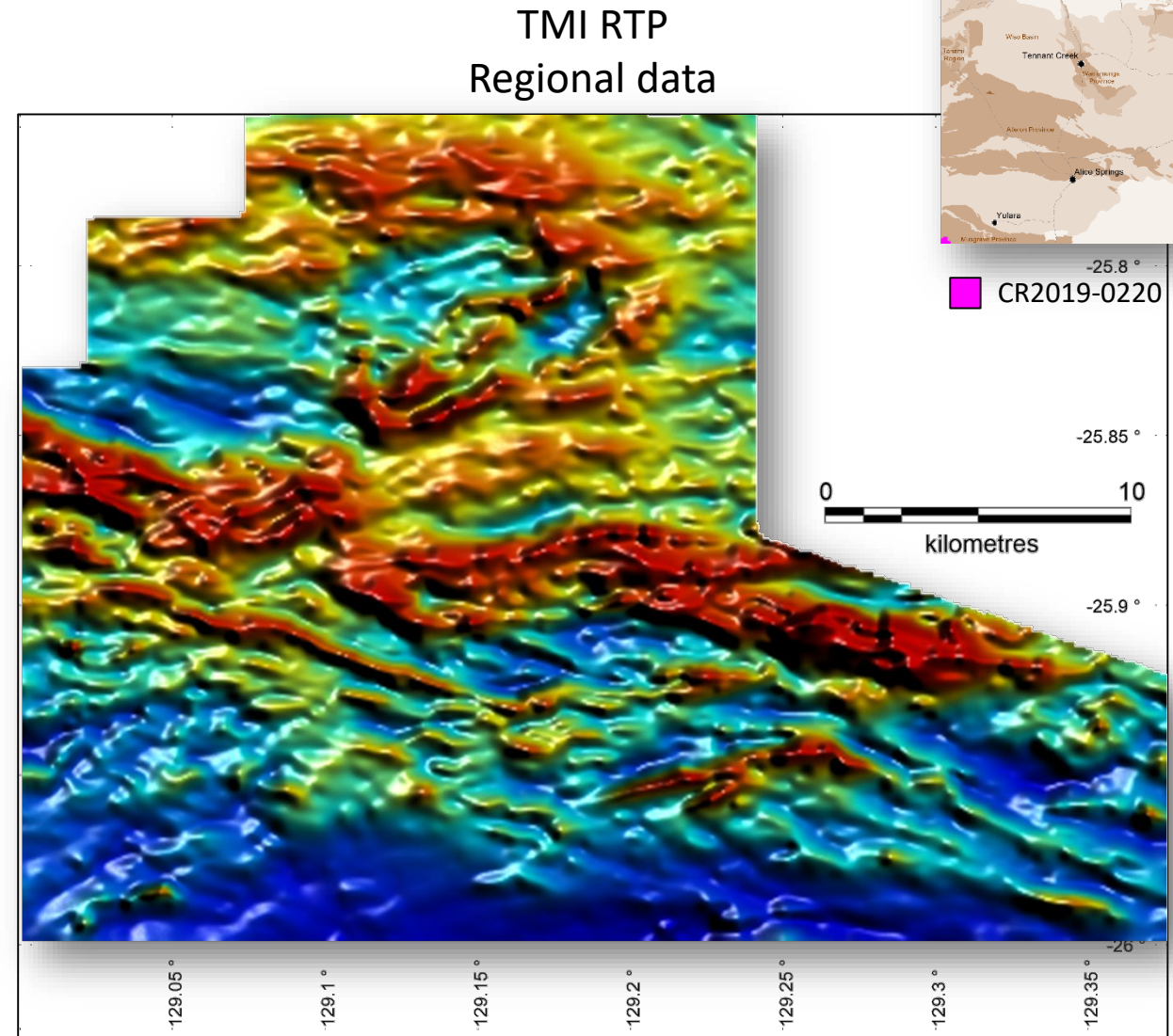
Claude Hills North CR2019-0220

- Gempart (NT) Pty Ltd exploring for gold, nickel, PGE's and REE's
- 4700 line km of airborne magnetic / radiometric data acquired
- Flown at 200 m line spacing and 60 m clearance



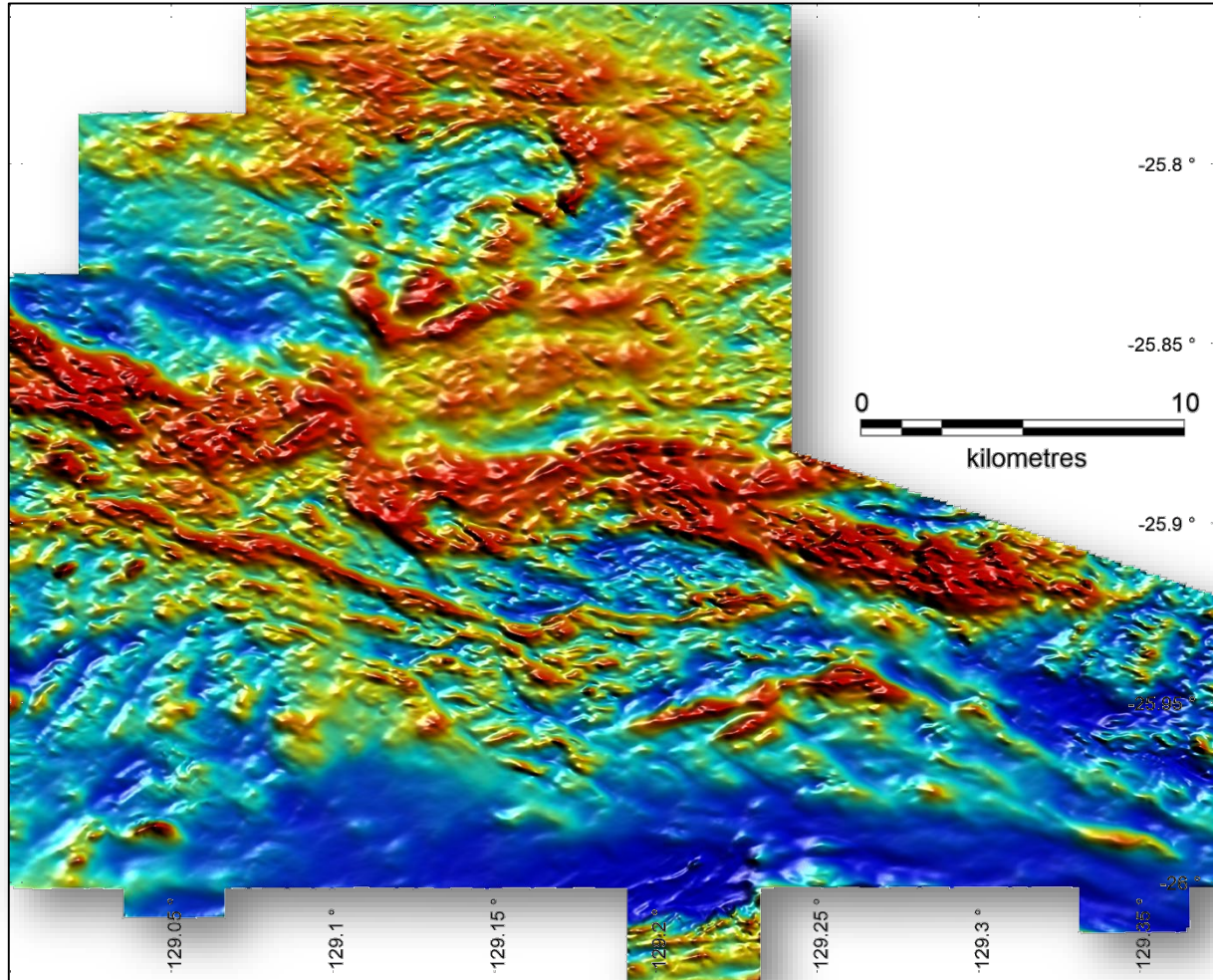
Claude Hills North CR2019-0220

- Pre-existing magnetic / radiometric data was acquired in the mid-80's at 500 m line spacing

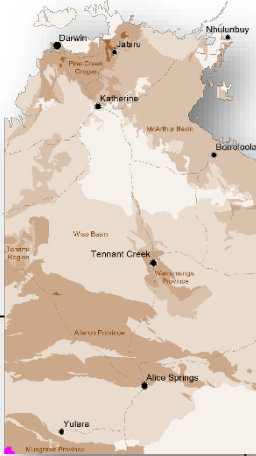
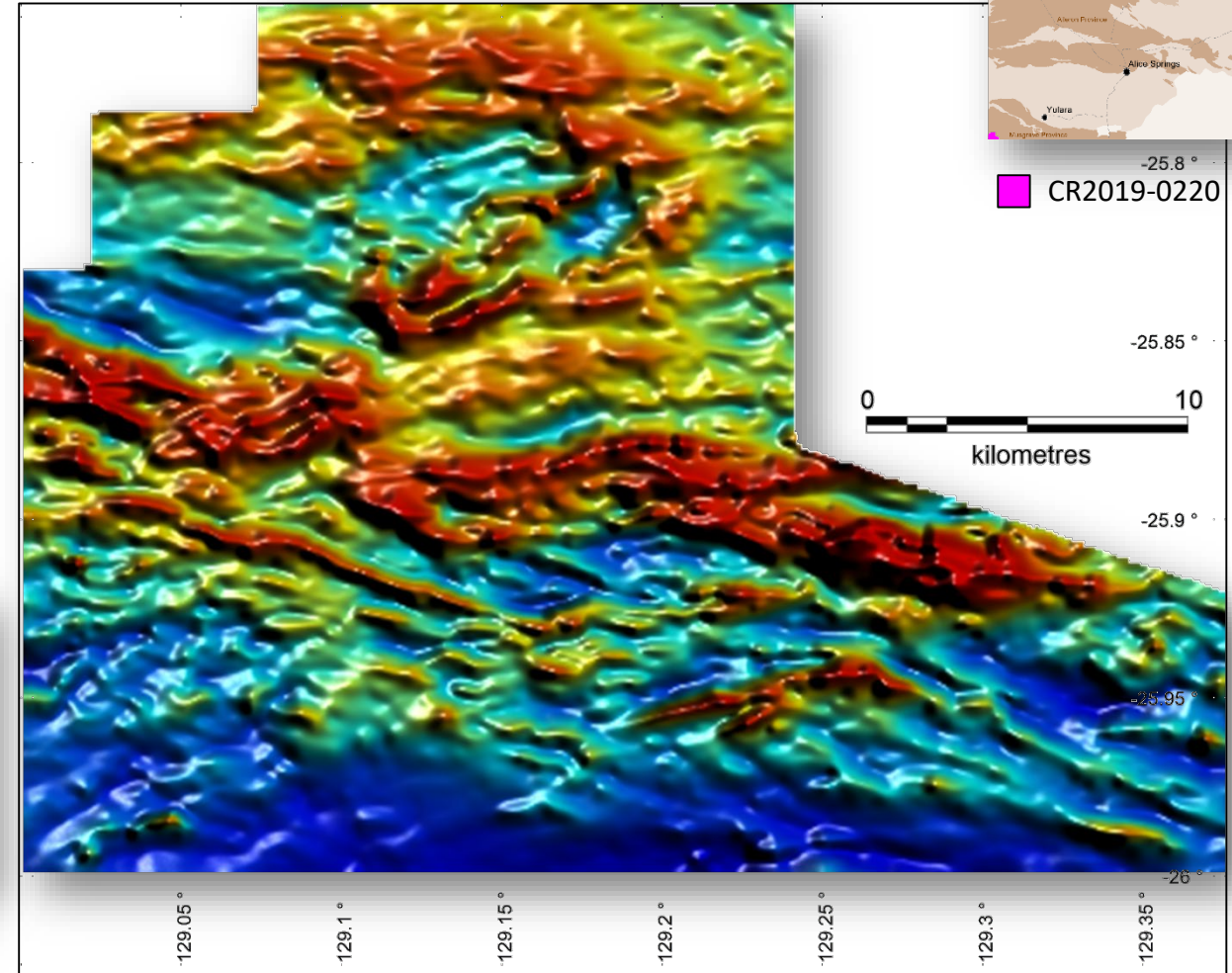


Claude Hills North CR2019-0220

TMI RTP
New data

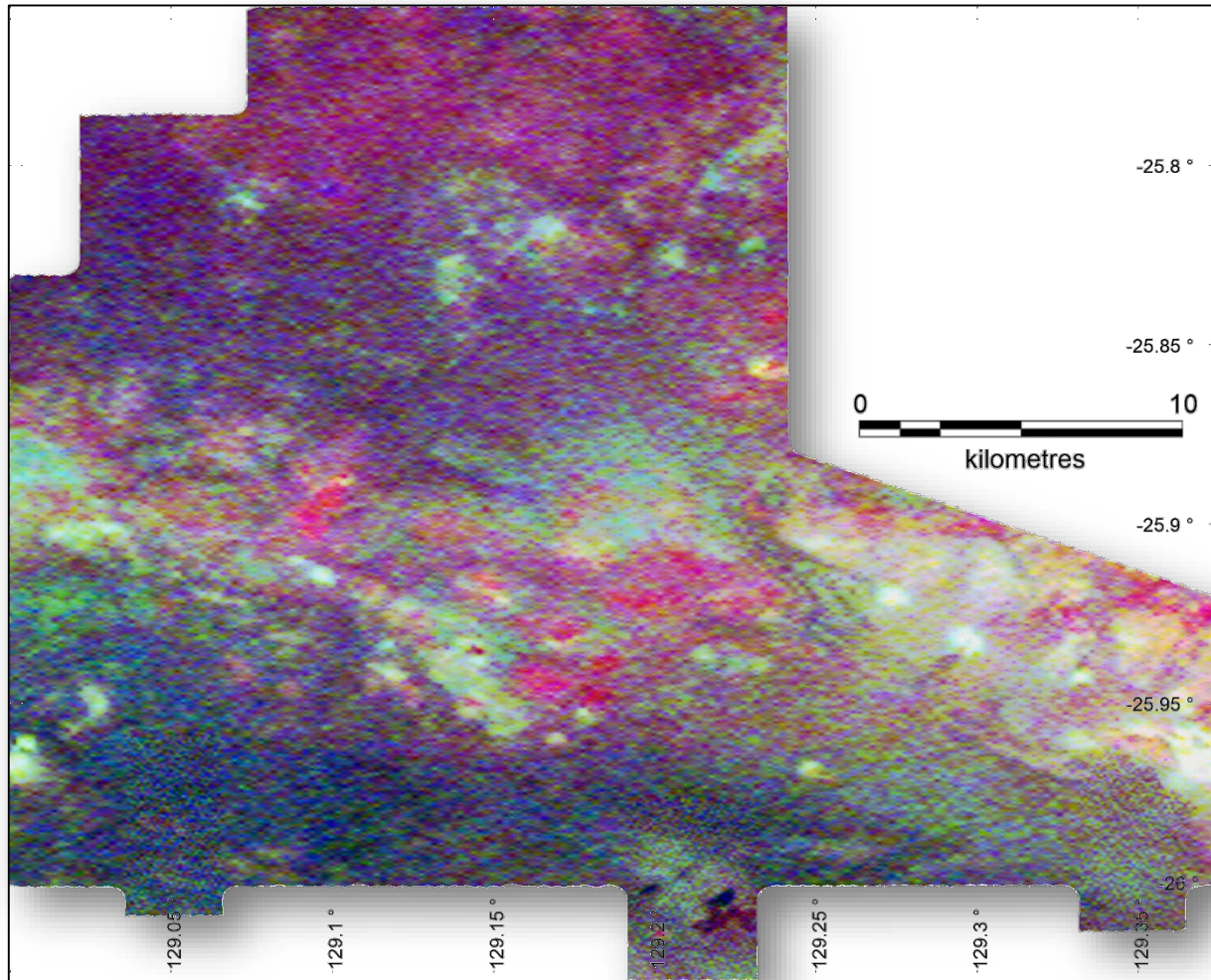


TMI RTP
Regional data

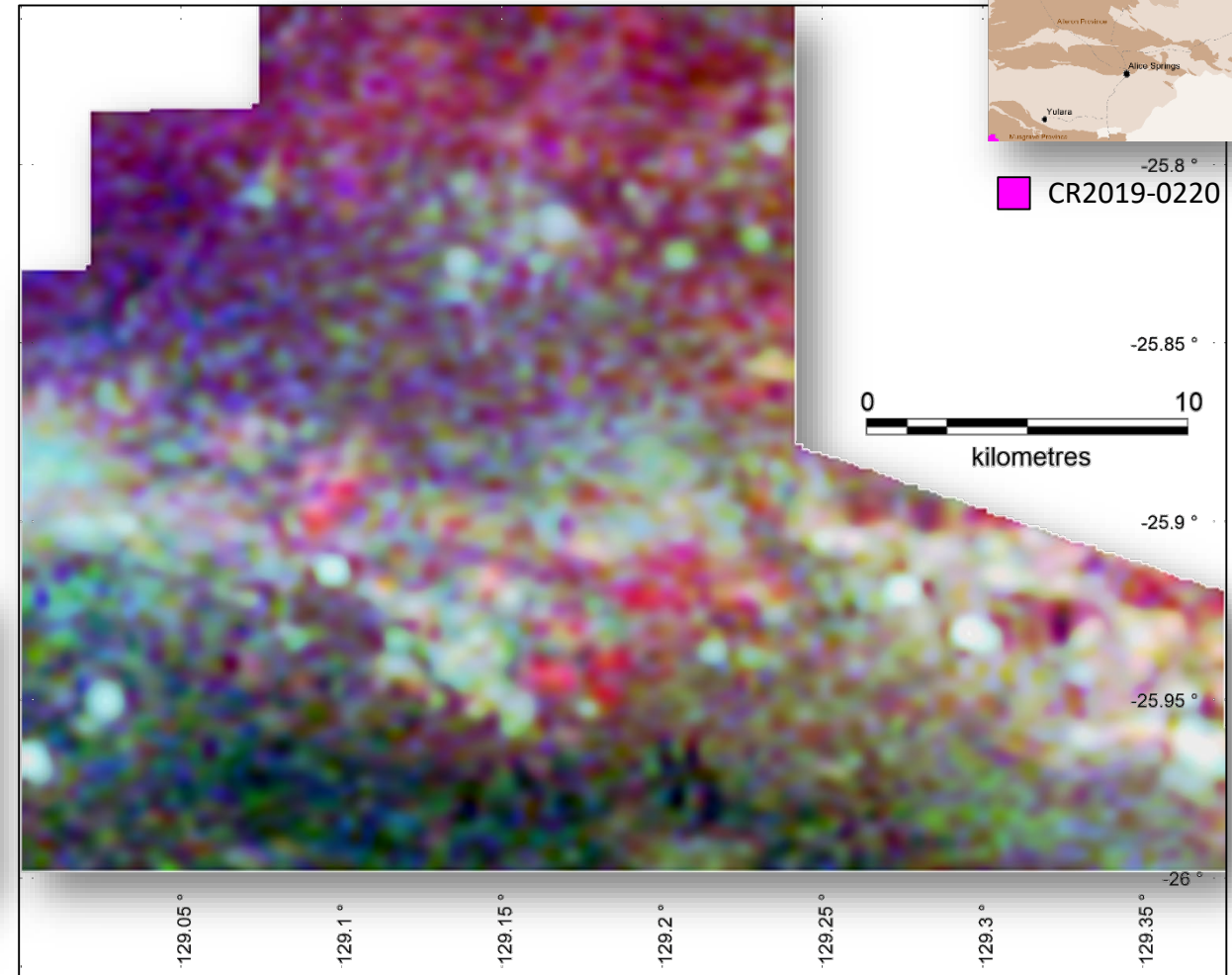


Claude Hills North CR2019-0220

Ternary Radiometrics
New data

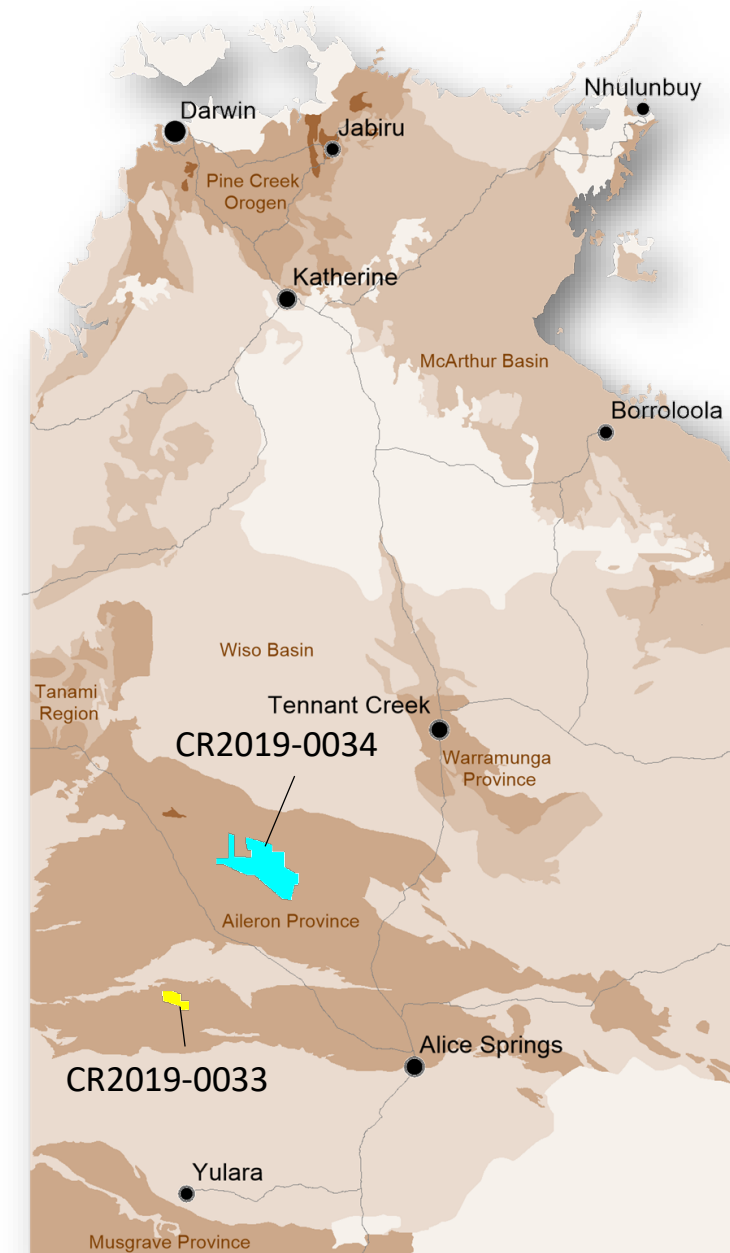


Ternary Radiometrics
Regional data



GDC Round 11 Geophysics

- Aileron Province – 2 projects
 - CR2019-0033 Lake Mackay project, Independence Group NL – Spectrem airborne electromagnetic survey (yellow)
 - CR2019-0034 Raptor project, Independence Group NL – airborne magnetic and radiometric survey (aqua)



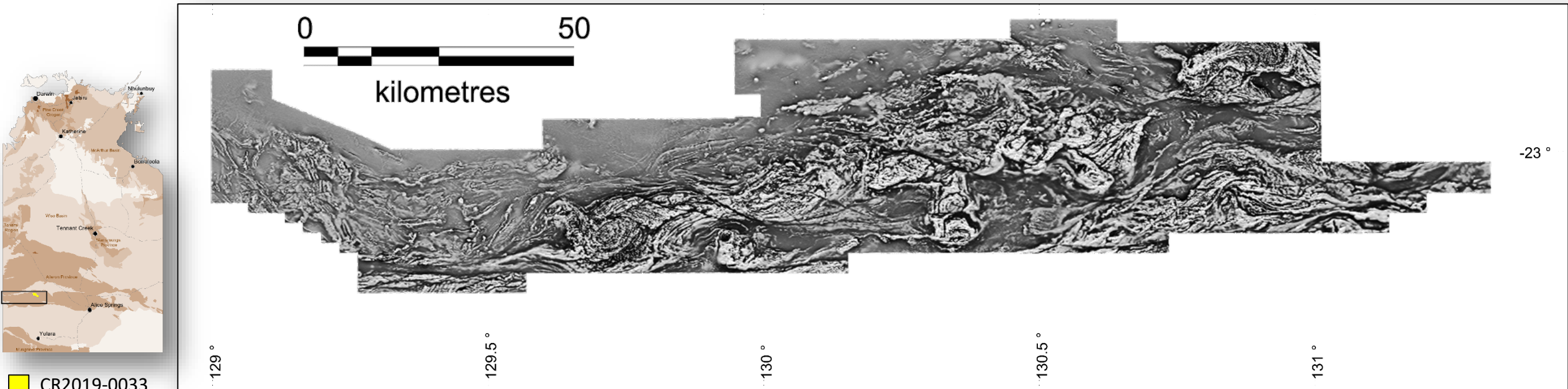
Lake Mackay CR2019-0033

- Independence Group NL exploring for “Grapple Style” pyrrhotite breccia sulphide mineralisation
- 1500 line km of airborne electromagnetic (AEM) data acquired using the SPECTREM system
- Flown at 300 m line spacing and 51.2 m clearance



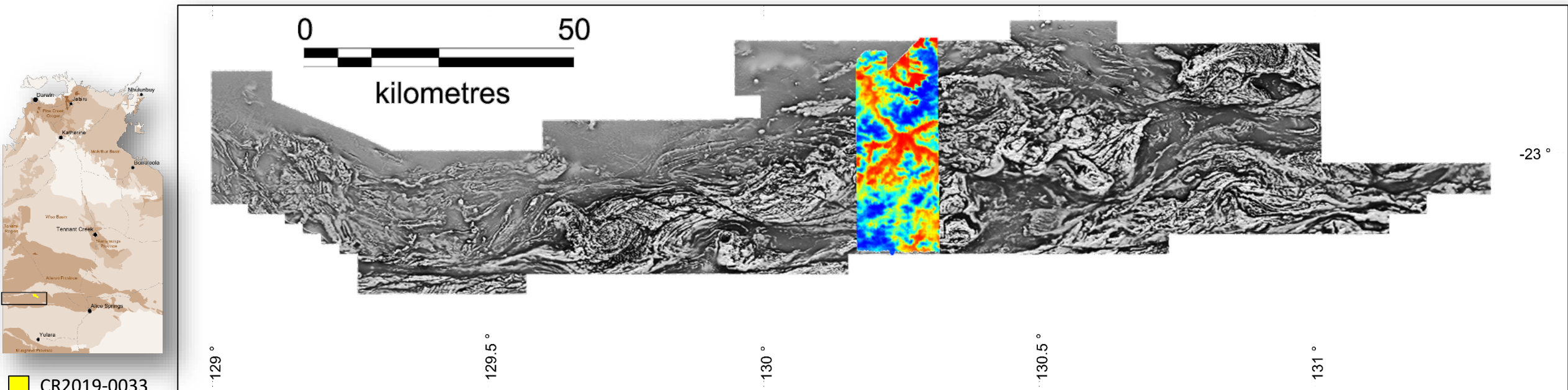
Lake Mackay CR2019-0033

- Four GDC funded geophysics program awarded to this project:
 - GDC Round 9 CR2016-0615 airborne magnetic and radiometric survey (200 m line-spacing flown N-S)



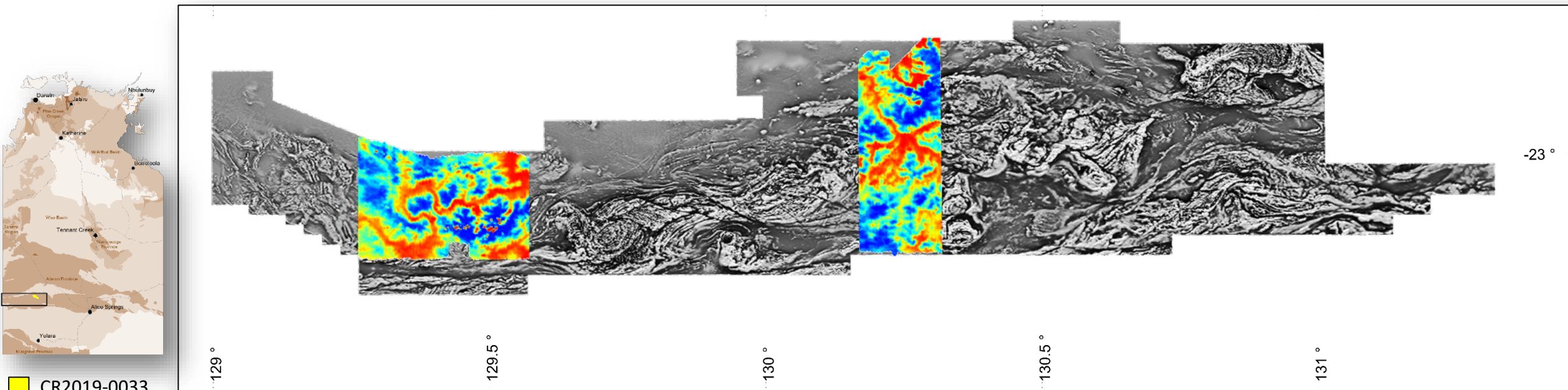
Lake Mackay CR2019-0033

- Four GDC funded geophysics program awarded to this project:
 - GDC Round 10 CR2018-0250 SPECTREM AEM survey (300 m line-spacing flown N-S)



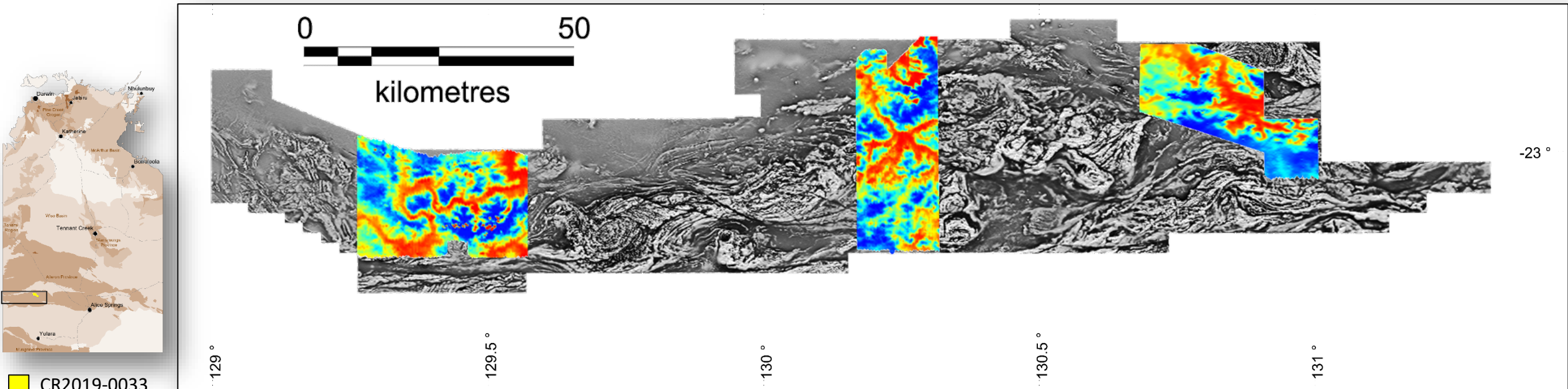
Lake Mackay CR2019-0033

- Four GDC funded geophysics program awarded to this project:
 - GDC Round 10 CR2018-0251 SPECTREM AEM survey (300 m line-spacing flown N-S)



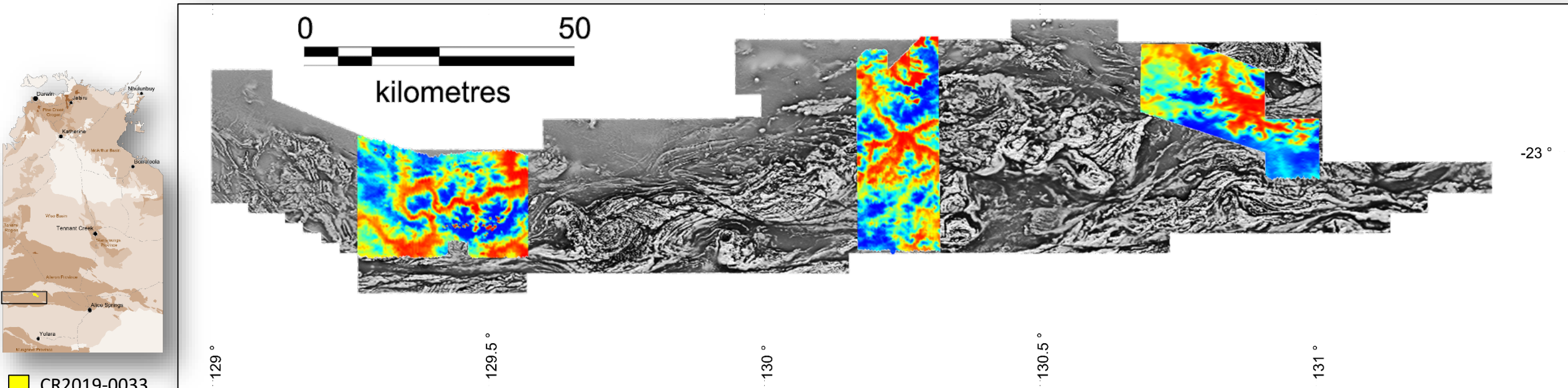
Lake Mackay CR2019-0033

- Four GDC funded geophysics program awarded to this project:
 - GDC Round 11 CR2019-0033 SPECTREM AEM survey (300 m line-spacing flown N-S)



Lake Mackay CR2019-0033

- “Grapple Style” pyrrhotite breccia sulphide mineralisation is conductive and therefore may be detectable in AEM data
- Shown here are late time-constant (Tau) images reflecting deep and more conductive sources (hot colours)



Lake Mackay CR2019-0033

- Independence Group NL exploring for mafic intrusions that may host magmatic Ni-Cu-Co mineralisation
- 41 500 line km of airborne magnetic / radiometric data acquired
- Flown at 100 m line spacing and 35 m clearance



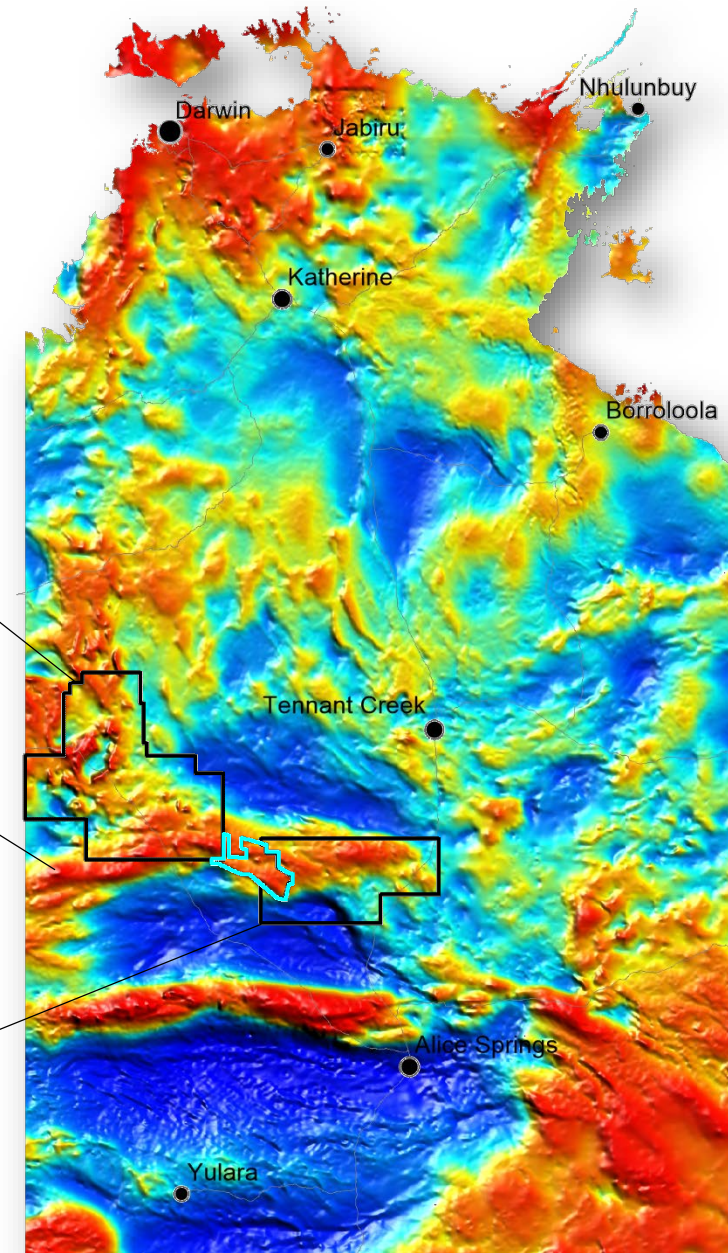
Lake Mackay CR2019-0033

- The survey is focussed on the Willowra Gravity Ridge linking the NTGS Tanami Region and NTGS Mount Peake – Crawford airborne magnetic and radiometric surveys

NTGS Tanami Region
Airborne Magnetic and
Radiometric Survey

Willowra Gravity Ridge

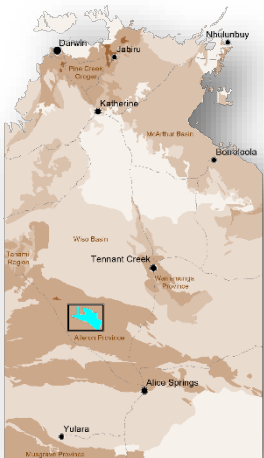
NTGS Mount Peake –
Crawford Airborne
Magnetic and
Radiometric Survey



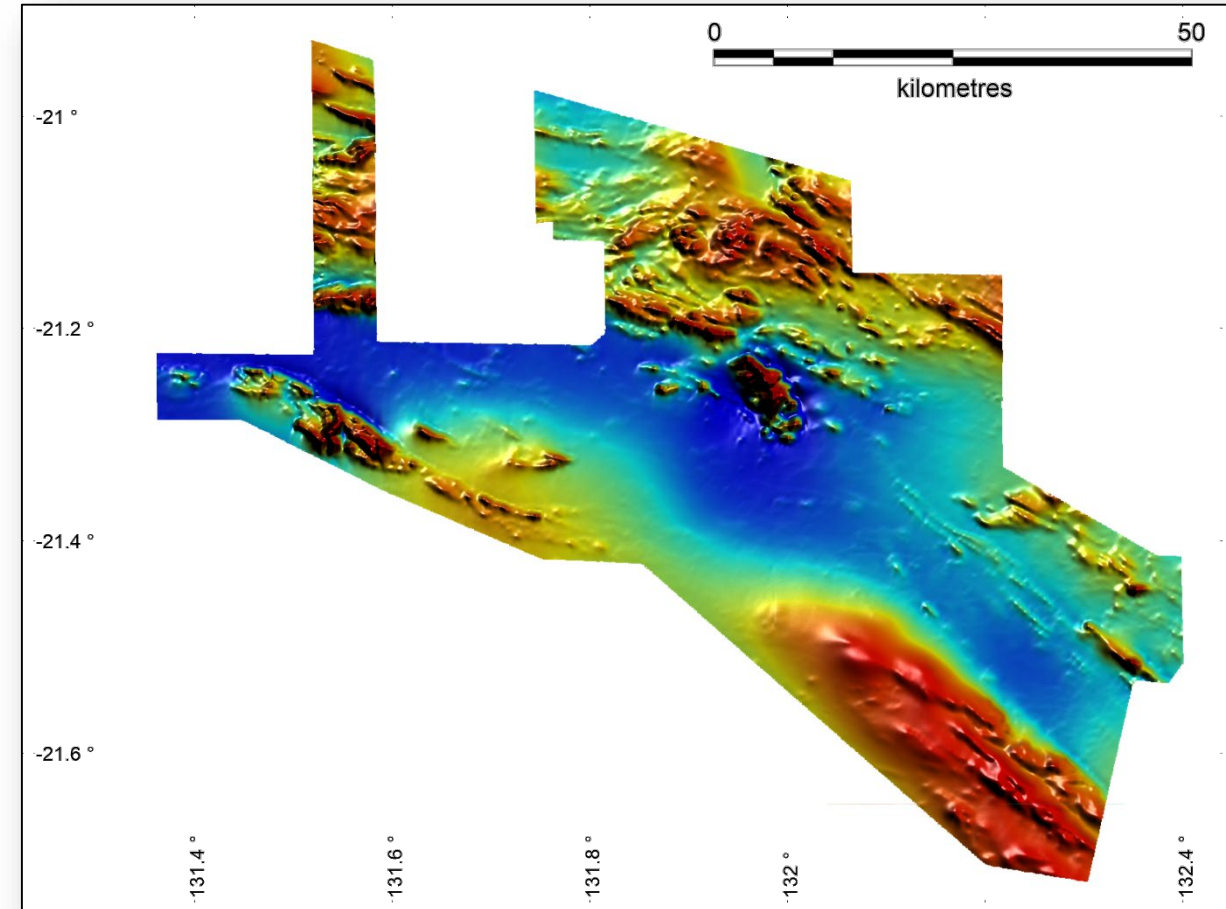
NT-wide Bouguer Anomaly

Lake Mackay CR2019-0034

- Pre-existing magnetic / radiometric data was from the mid-90's at 500 m line spacing

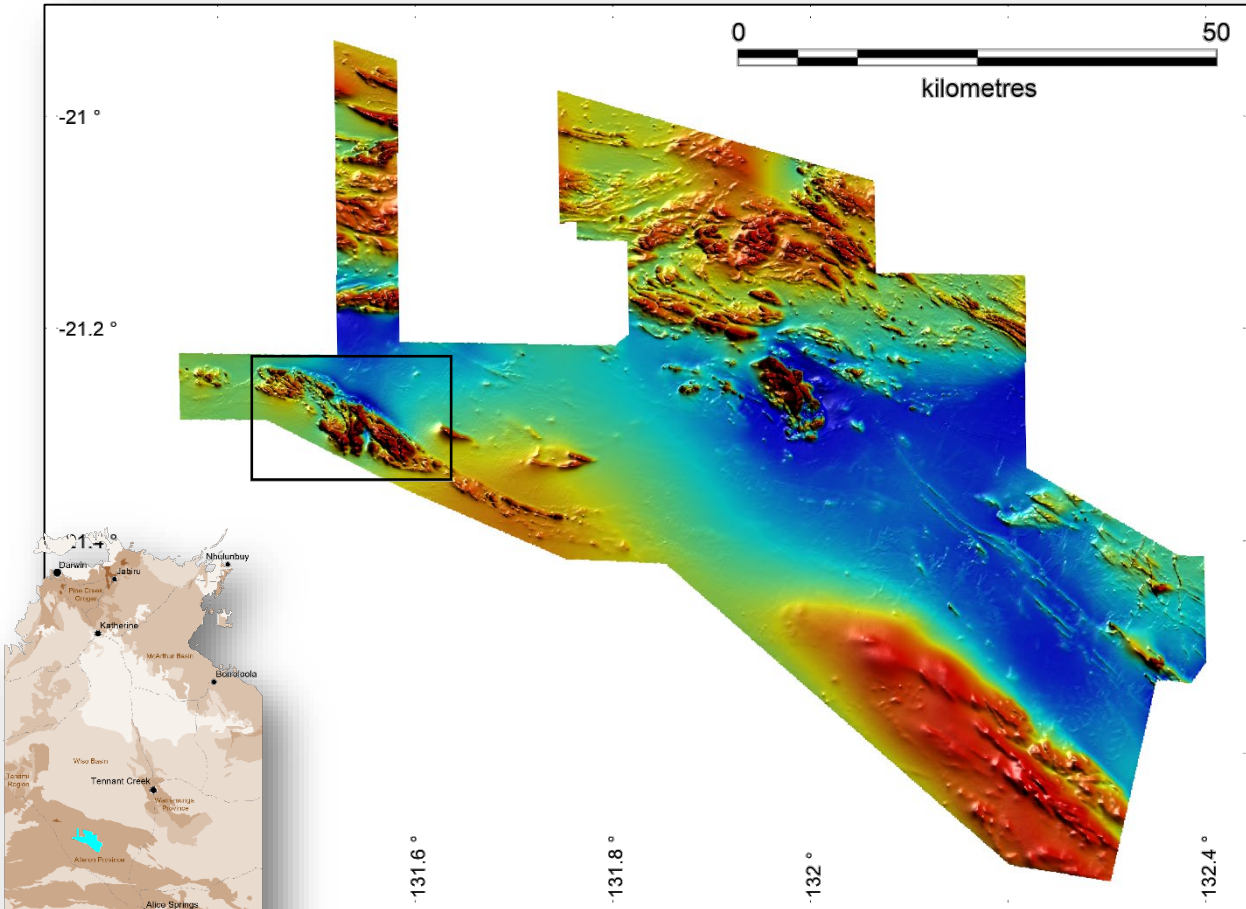


 CR2019-0034

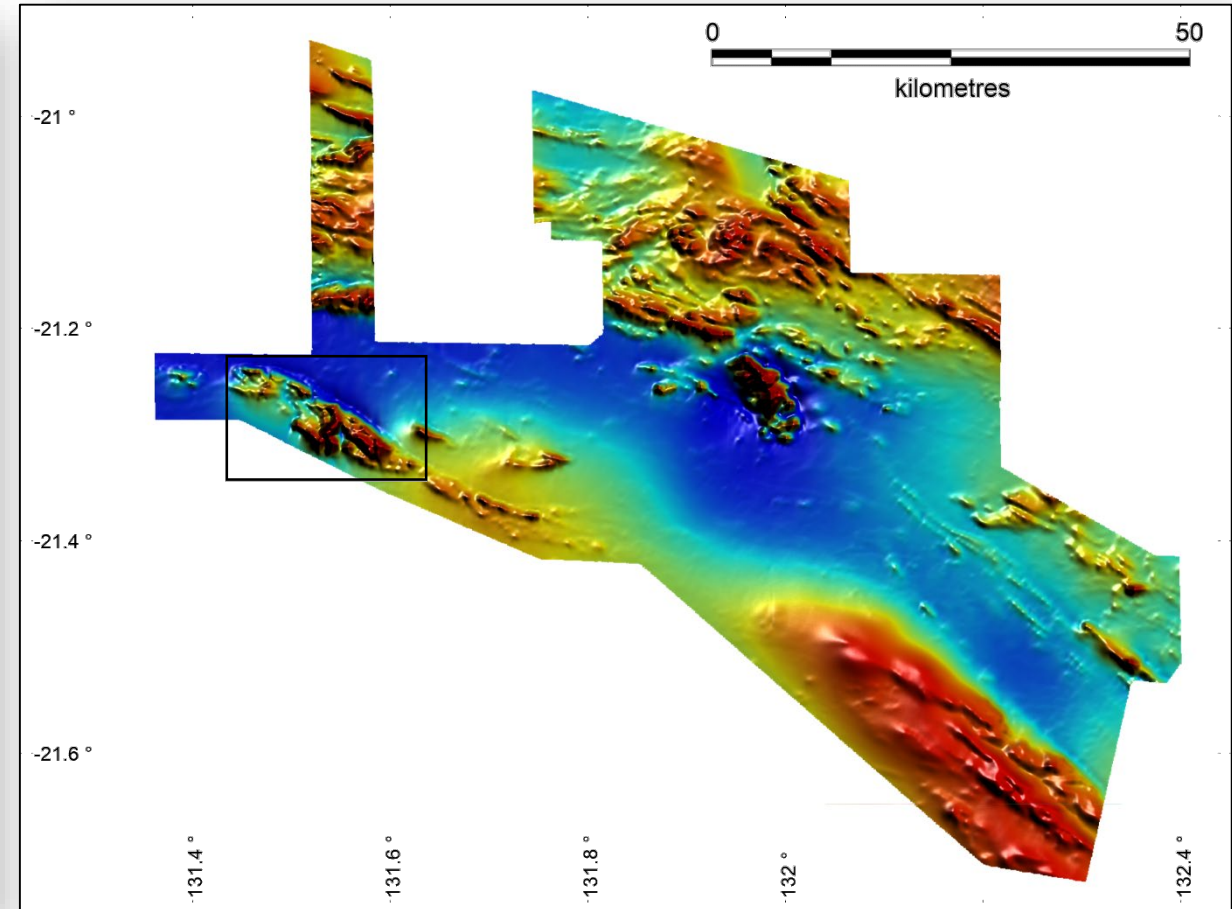


TMI RTP
Regional data

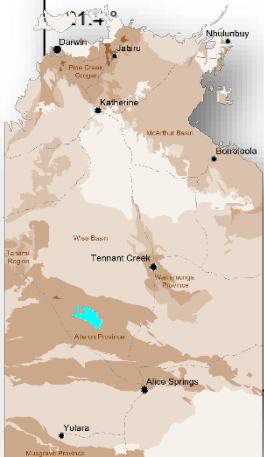
Lake Mackay CR2019-0034



TMI RTP
New data

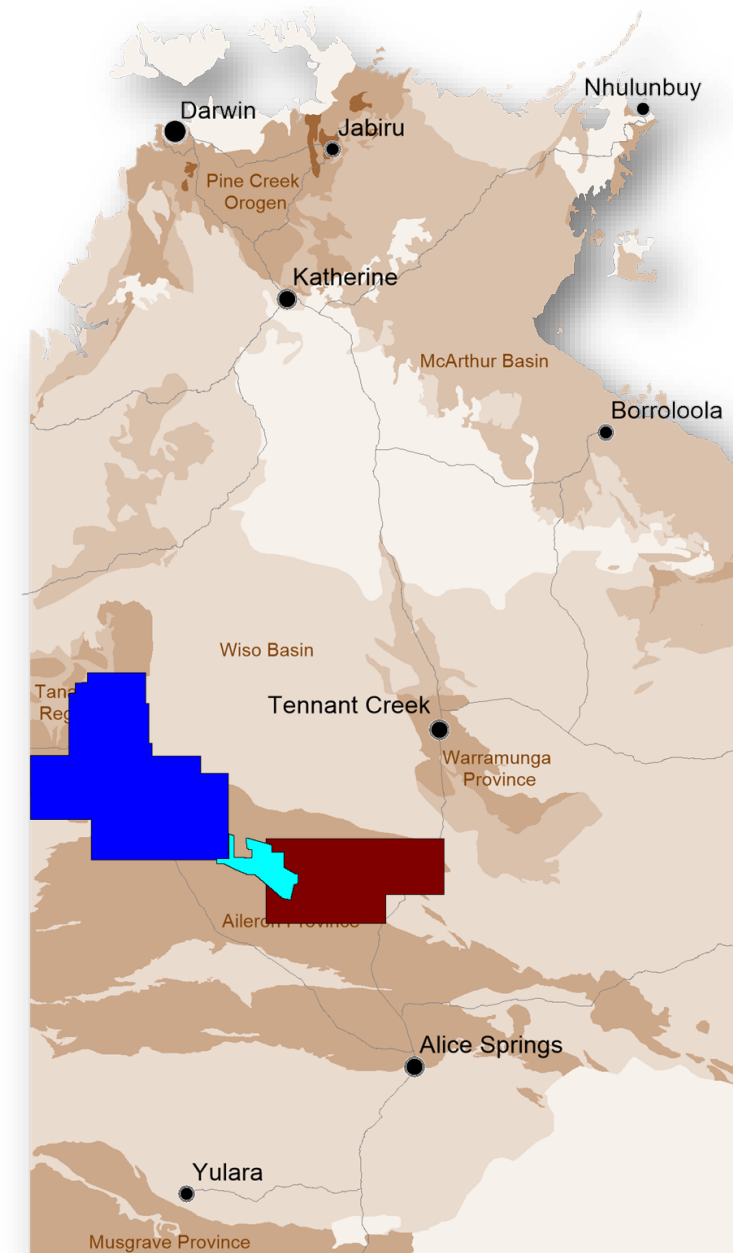
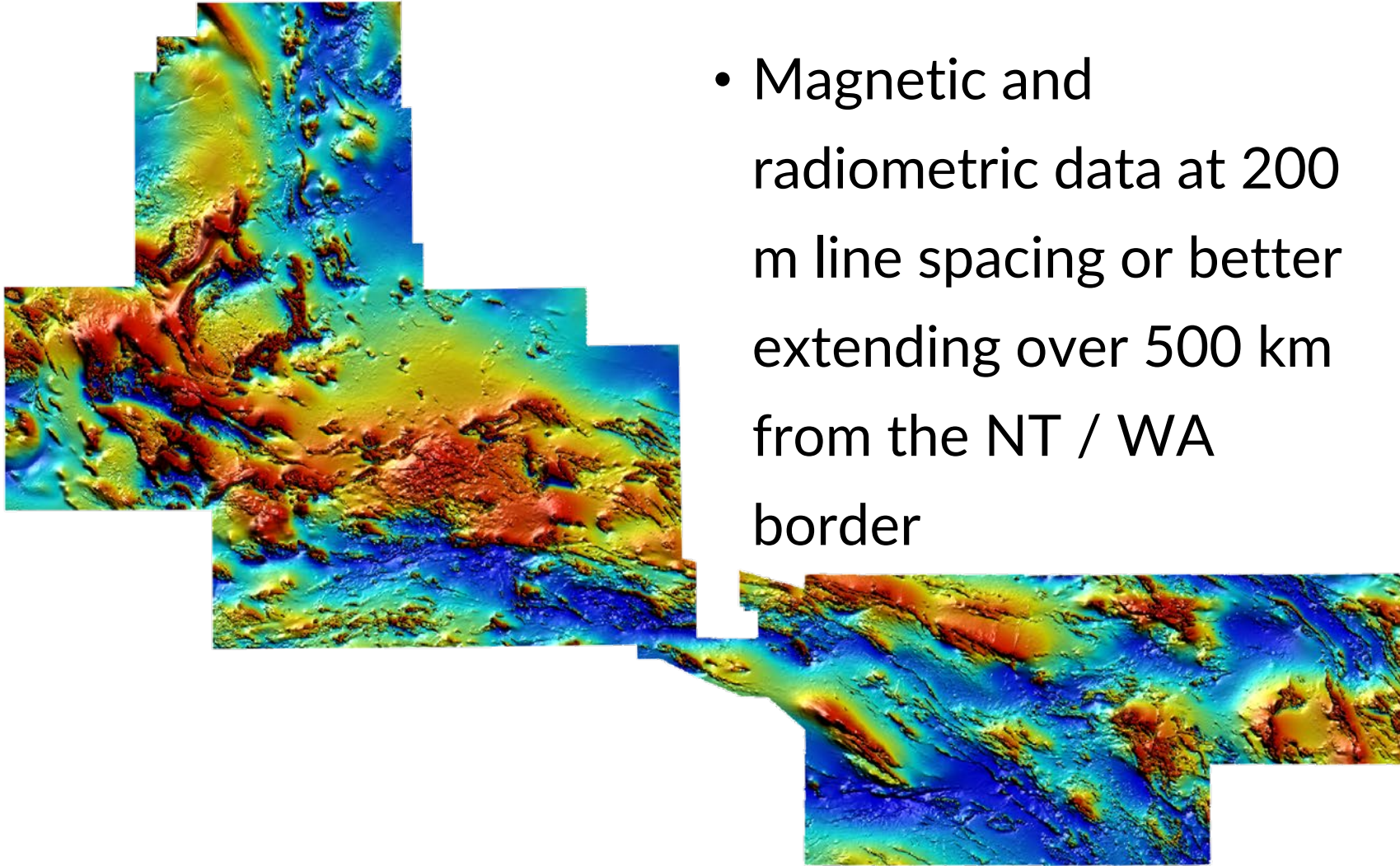


TMI RTP
Regional data

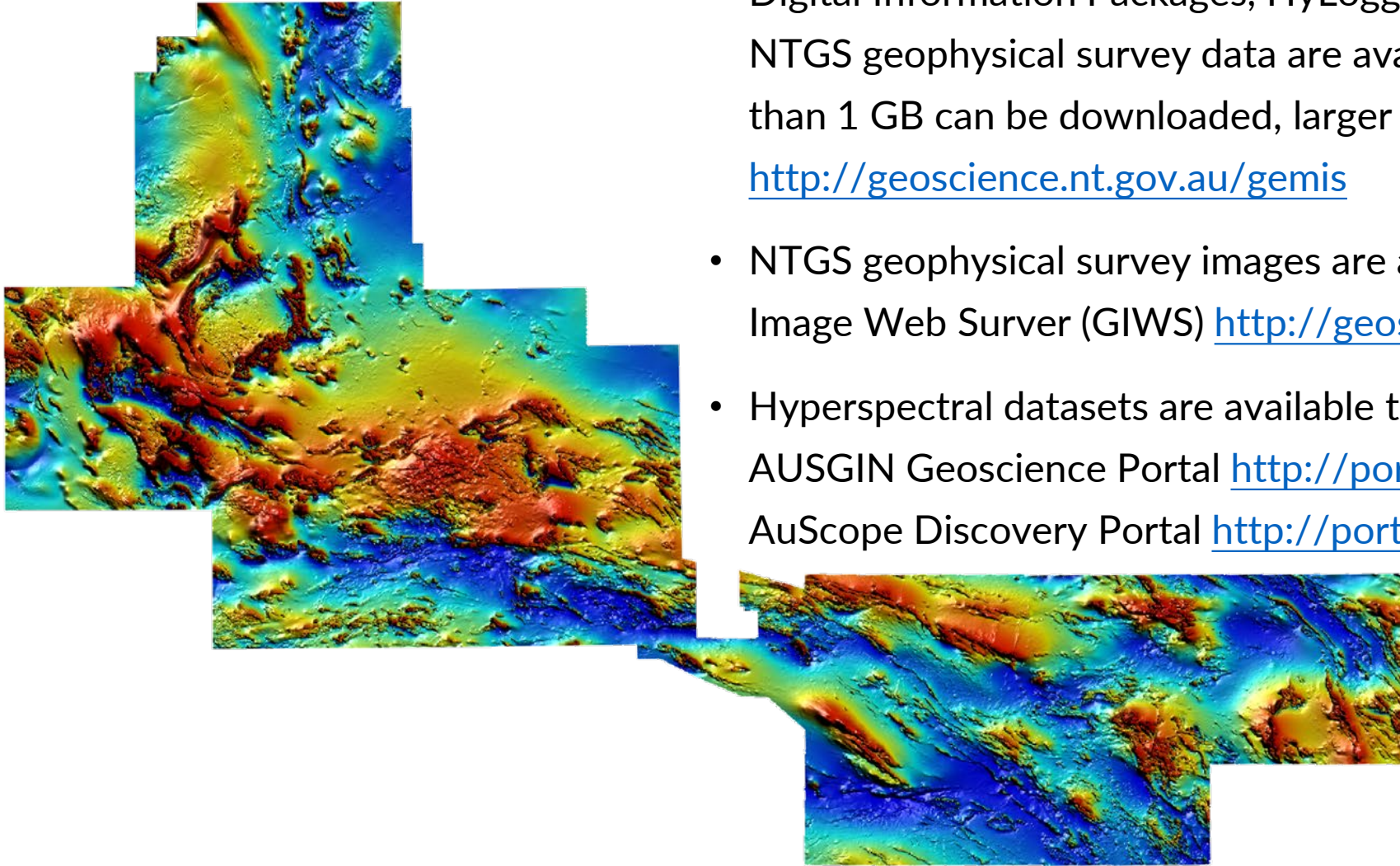


CR2019-0034

Tanami Region / Aileron Province



Thank You



- Industry and NTGS geophysical survey data can be located on STRIKE <http://strike.nt.gov.au>
- Digital Information Packages, HyLogger Data Packages and industry and NTGS geophysical survey data are available through GEMIS (datasets less than 1 GB can be downloaded, larger datasets are available on request) <http://geoscience.nt.gov.au/gemis>
- NTGS geophysical survey images are available from the Geophysical Image Web Surver (GIWS) <http://geoscience.nt.gov.au/giws>
- Hyperspectral datasets are available to view and download through AUSGIN Geoscience Portal <http://portal.geoscience.gov.au/> and the AuScope Discovery Portal <http://portal.auscope.org/>