

New geophysical and remote sensed data in the Northern Territory: 2020

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In 2020, the NTGS Mount Peake–Crawford Airborne Magnetic, Radiometric and Elevation survey, centred 250 km north-northeast of Alice Springs (**Figure 1**), was completed and all data released (Dhu 2020). This survey was funded through the Northern Territory's *Resourcing the Territory* initiative and acquired in collaboration with Geoscience Australia (GA), who managed the project on Northern Territory Geological Survey's (NTGS) behalf. The survey acquired over 120 000 line km of airborne magnetic, radiometric and elevation data at 200 m line-spacing and 60 m ground clearance (**Figure 2**). Industry partners funded another 18 000 line km of data to infill areas of interest to 100 m line spacing.

Regional-scale ground gravity data was also acquired in the NT by GA under the Federal Government's *Exploring for the Future* initiative. Two surveys were completed, the East Tennant Gravity Survey, located ~80 km east of Tennant Creek; and the South West McArthur, Barkly Gravity Survey, located ~160 km north-northeast of Tennant Creek (**Figure 1**). NTGS contributed funding to the South West McArthur, Barkly Gravity Survey to increase the area covered by this survey to almost 18 000 km². NTGS is currently working to expand on these data through acquiring the NTGS Brunette Downs Ground Gravity Survey located between the East Tennant and South West McArthur, Barkly gravity surveys and extending east to the NT/QLD border (**Figure 1**). This survey will acquire ~10 000 new measurements over an area of around 57 000 km². Stations will be acquired at 2 km spacing, and industry is being provided with the opportunity to collaborate on the project to acquire higher resolution data over areas of interest.

Four co-funded geophysical surveys were completed under round 12 of the Geophysics and Drilling Collaborations (GDC) program (**Figure 3**). Two surveys, a sub-audio magnetic (SAM) survey and a high resolution ground gravity survey, were innovative in nature, while the other two surveys were of regional scale, an airborne gravity gradiometry survey and an airborne electromagnetic

(AEM) survey. These surveys were focused in the Tanami and Tennant Creek areas.

Emmerson Resources Limited completed a SAM survey over the Mauretania and Three Thirty prospects in the Tennant Creek mineral field (Walters 2019). These surveys were aimed at mapping ironstone structural architecture (Mauretania) and blind subsurface hematite-altered sediments (Three Thirty). A total of ~300 line km at 10 m line-spacing were acquired over two separate areas covering ~3 km².

Prodigy Gold NL completed a ground gravity survey over the Capstan and Suplejack prospects in the Tanami Region (Davis 2019). Both surveys aimed to resolve Tanami Group lithologies beneath cover units. The survey acquired ~2200 new measurements at 50 m station spacing along 250 m spaced lines, covering ~30 km² across two separate survey areas.

Asian Minerals Pty Ltd completed a regional-scale (4800 m line-spacing) AEM survey over the East Tanami project area, located northwest of Tennant Creek, to provide baseline geophysical data in an underexplored area (Eupene 2019). A higher resolution (1200 m line-spacing) infill survey was also acquired over a possible diatreme structure identified in the 2002 NTGS Buchanan airborne magnetic and radiometric survey. The AEM survey acquired ~1400 line km using the TEMPEST system covering ~4450 km².

Northern Star Resources Limited completed an airborne gravity gradiometry survey using the FALCON system over Browns Dome in the Tanami Region (Sinclair 2020). The survey aimed to assist in mapping the southern margin of the dome. Approximately 1400 line km at 400 m line-spacing was acquired over an area of ~530 km².

Since March 2020, NTGS has released over 20 HyLogger™ data packages (HDP), which provide a summary of interpretation of reflectance spectra measured on drill core using the HyLogger instrument (**Figure 3**). The HDPs have been produced primarily for drill core from previous GDC rounds (Smith 2020 a–u, Smith and Farias 2020). Work is currently underway to complete HDPs for each of the MinEx CRC National Drilling Initiative East Tennant drill cores.

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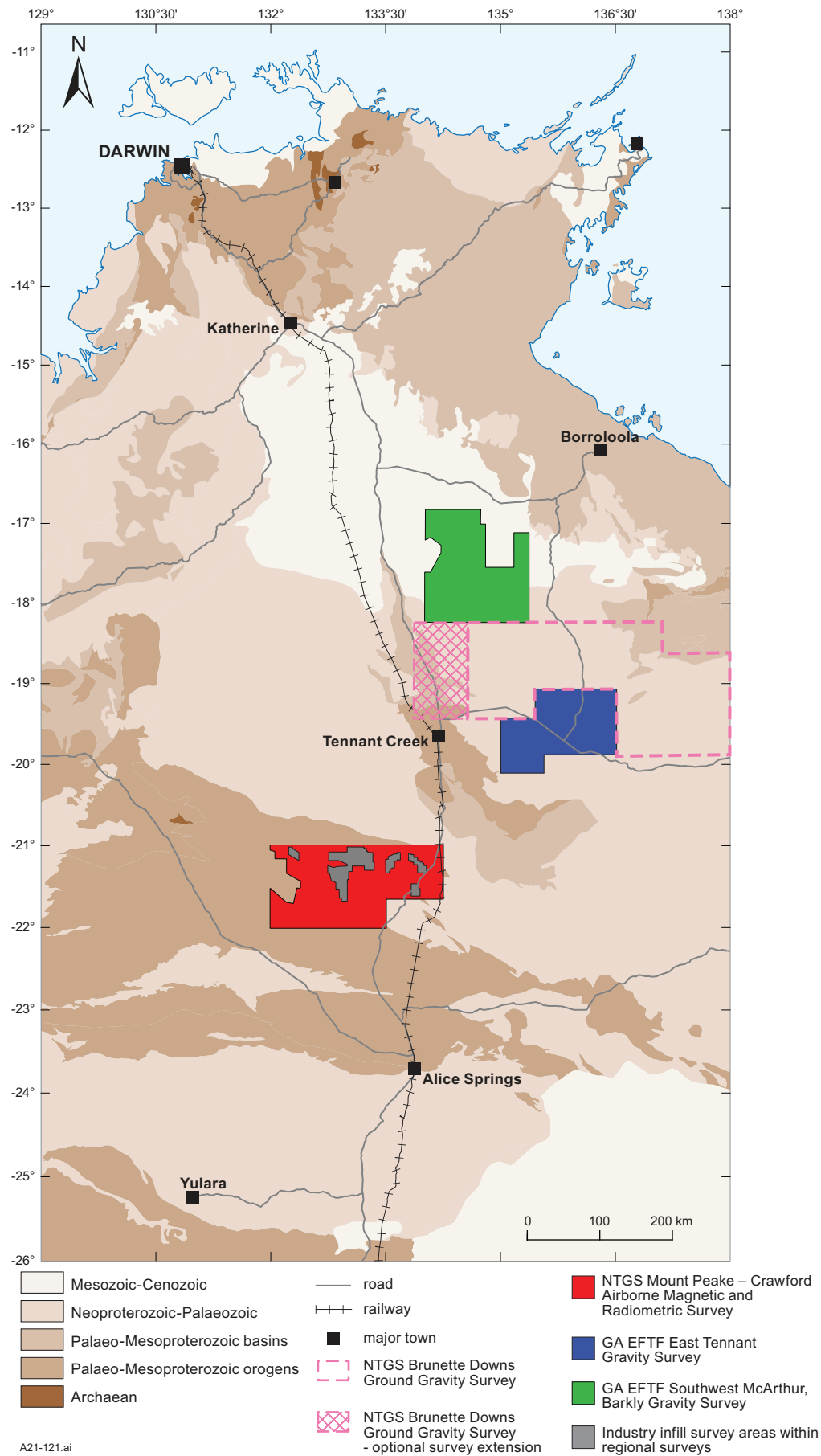


Figure 1. Location of recent and upcoming regional geophysical surveys: NTGS Mount Peake–Crawford Airborne Magnetic and Radiometric Survey (red polygon); GA EFTF East Tennant Gravity Survey (green polygon); GA EFTF South West McArthur, Barkly Gravity Survey (blue polygon); planned Brunette Downs Ground Gravity Survey (pink outline). Industry infill survey areas within regional surveys are shown in grey polygons.

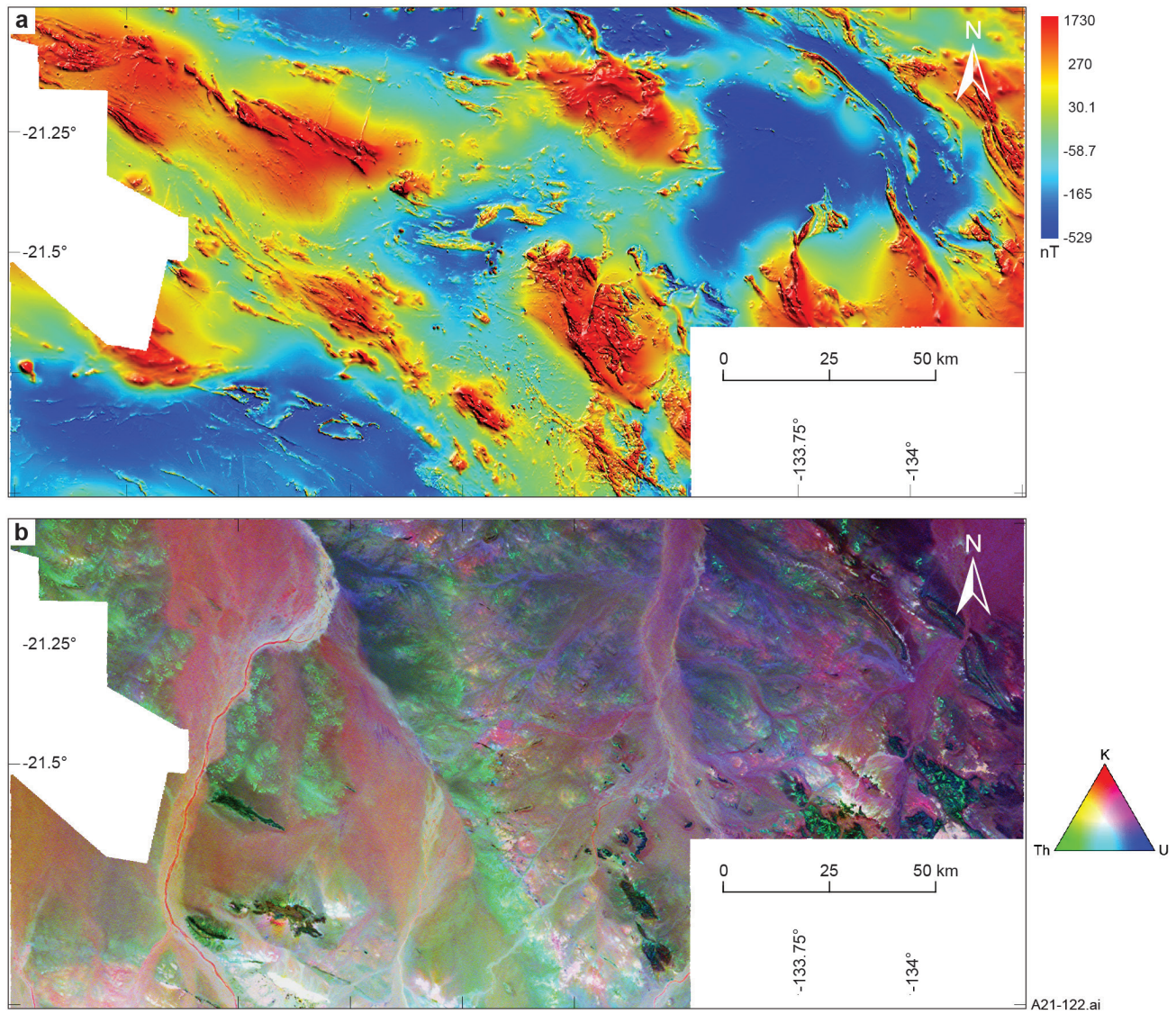


Figure 2. NTGS Mount Peake–Crawford Airborne Magnetic and Radiometric Survey: top image shows total magnetic intensity reduced to pole; bottom image shows ternary radiometrics.

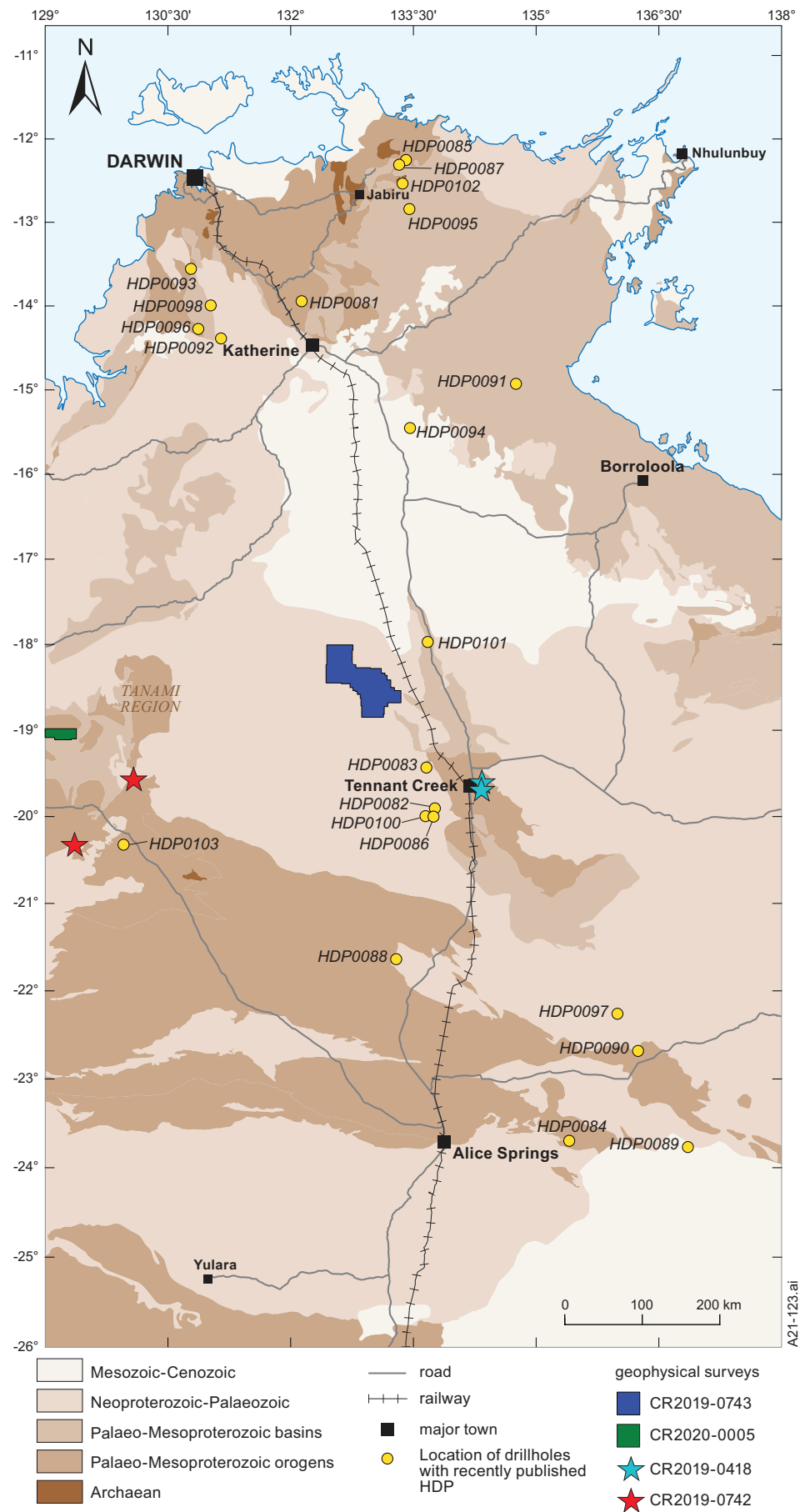


Figure 3. Location of Geophysics and Drilling Collaborations program round 12 geophysical projects and recently published HyLogger Data Packages. Location of drillholes with recently published HDPs are represented by yellow dots; the extent of regional-scale geophysical surveys are represented by polygons; stars indicate the location of smaller-scale geophysical surveys.

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