

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

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In 2019, the Northern Territory Geological Survey (NTGS) collaborated on several regional geophysical acquisition projects funded through the Northern Territory Government's *Resourcing the Territory* initiative. The NTGS Tanami Region Airborne Magnetic and Radiometric Survey (Dhu 2019) was released (**Figure 1**; **Figure 2**) and the NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey was commenced (**Figure 1**). Both these surveys were funded by NTGS and managed by Geoscience Australia (GA); they also included infill projects funded by industry. NTGS also contributed funding to increase the volume of data acquired by GA in the TISA - Southwest McArthur Ground Gravity Survey and the Barkly Seismic Survey (**Figure 1**). These two surveys were primarily funded by GA through the Federal Government's *Exploring for the Future* initiative.

The NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey is centred 250 km north-northeast of Alice Springs (**Figure 1**). Over 120 000 line km of data has been acquired along 200 m spaced north-south lines at 60 m ground clearance. This data upgrades existing 1980–1990 vintage 500 m line-spaced data. Industry partners funded another 18 000 line km of data to infill areas of interest to 100 m line spacing. This data was released on 02 March 2020.

A ground gravity survey is in planning stage for the Tanami region. The survey will cover an area of almost 30 000 km<sup>2</sup> (**Figure 1**), complementing the recent NTGS Tanami Region Airborne Magnetic and Radiometric Survey. The proposed survey will acquire over 4000 ground gravity stations infilling existing data to 2 km spacing. Industry will be able to participate in the survey to infill areas of interest; industry submissions are currently being sought. It is anticipated that acquisition will commence in June 2020.

Six co-funded geophysical surveys were completed under round 11 of the Geophysics and Drilling Collaborations (GDC) program (**Figure 3**). The Andrew Young Igneous Complex Airborne Electromagnetic (AEM) Survey (CR2019-0033: Winzar and Whitford 2019) and the Airborne Magnetic and Radiometric Survey Raptor Project (CR2019-0034: Winzar and Fitzpatrick 2019) were both flown in the Aileron Province by IGO Limited. Gempart (NT) Pty Ltd conducted two airborne magnetic and radiometric surveys in the Musgraves Province: the Giles Creek Magnetic and Radiometric Survey (CR2018-0532: Bubner and Mackie 2018) and the Claude Hills North Helicopter-borne Magnetism and Radiometrics Survey (CR2019-0220: Bubner and Mackie 2019). In the McArthur Basin, Northern Cobalt Ltd flew the Wollogorang Project Heli-Mag/Rad Survey (CR2018-0345: Northern Cobalt Ltd 2018), and Lagoon Creek Resources Pty Ltd flew the Falcon Airborne Gravity Gradiometry (AGG) Survey Westmoreland

(CR2018-0642: Lagoon Creek Resources Pty Ltd 2018). In total, almost 74 000 line km of airborne magnetic and radiometric data covering over 6400 km<sup>2</sup> were acquired in addition to ~1500 line km of AEM data and 2500 line km of AGG data.

Ten diamond drillholes from six drilling programs were also completed under round 11 of the GDC program (**Figure 3**) delivering over 5000 m of drill core to NTGS core facilities. All of this drill core has been scanned using the HyLogger™ instrument, which produces high-resolution imagery and measures the reflectance spectra of minerals in the drill core. These data have been processed using The Spectral Geologist (TSG) software to identify the dominant mineralogy. Key findings from representative drillholes from five of the six drilling programs have been published in HyLogger Data Packages (HDP). A HDP is currently in preparation for the final drilling program.

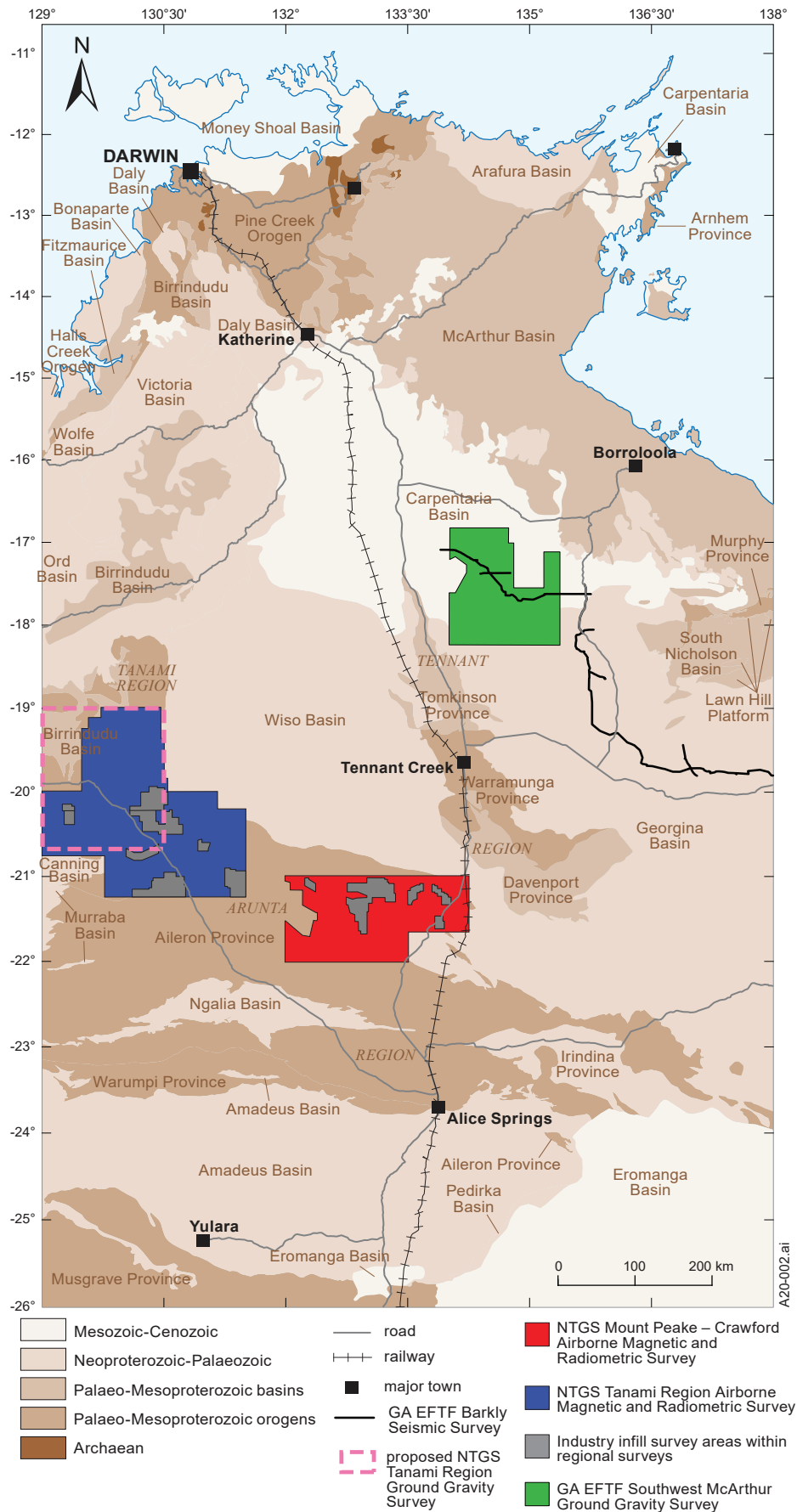
Three of the drilling programs were completed in the McArthur Basin. MMG Exploration Ltd drilled NB18DD050 at Cow Lagoon (Spelbrink and Assan 2019), Todd River Resources Ltd drilled MCDD0003 and MCDD0005 (Todd River Resources Ltd 2019), and Marindi Metals drilled CPDH006 at the Caranbirini project (Moulang 2019). HyLogger results from NB18DD050, MCDD0005 and CPDH006 are summarised in HDP0075, 0078 and 0079 respectively (Smith 2019a, b, c).

Prodigy Gold NL drilled two holes (BLDD001 and BLDD002) at the Capstan prospect in the Tanami Region (Davis *et al* 2018). The HyLogger results from BLDD001 are summarised in HDP0080 (Smith 2019d). HDP0081 (Smith 2019e) summarises results from WD018-002, one of two drillholes (WD018-001 and WD018-002) completed by Vista Gold Australia Pty Ltd in the Pine Creek Orogen (Harris 2019). Todd River Resources also completed RVD0001 and RVDD002 in the Rover area southwest of the Tennant Creek mineral field (Wetherley and Elliston 2019). These holes have recently been HyLogged and results will be published mid-year.

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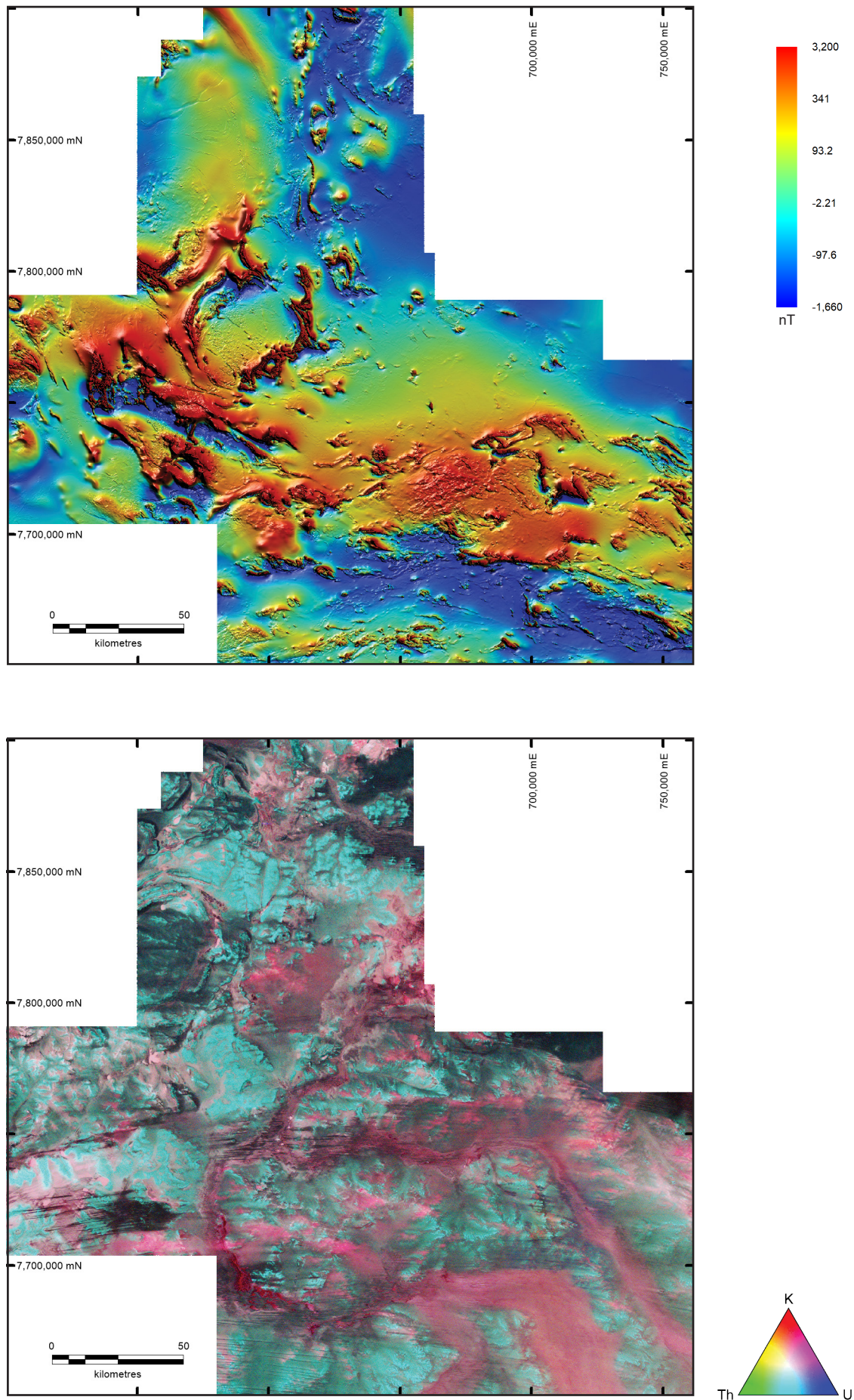
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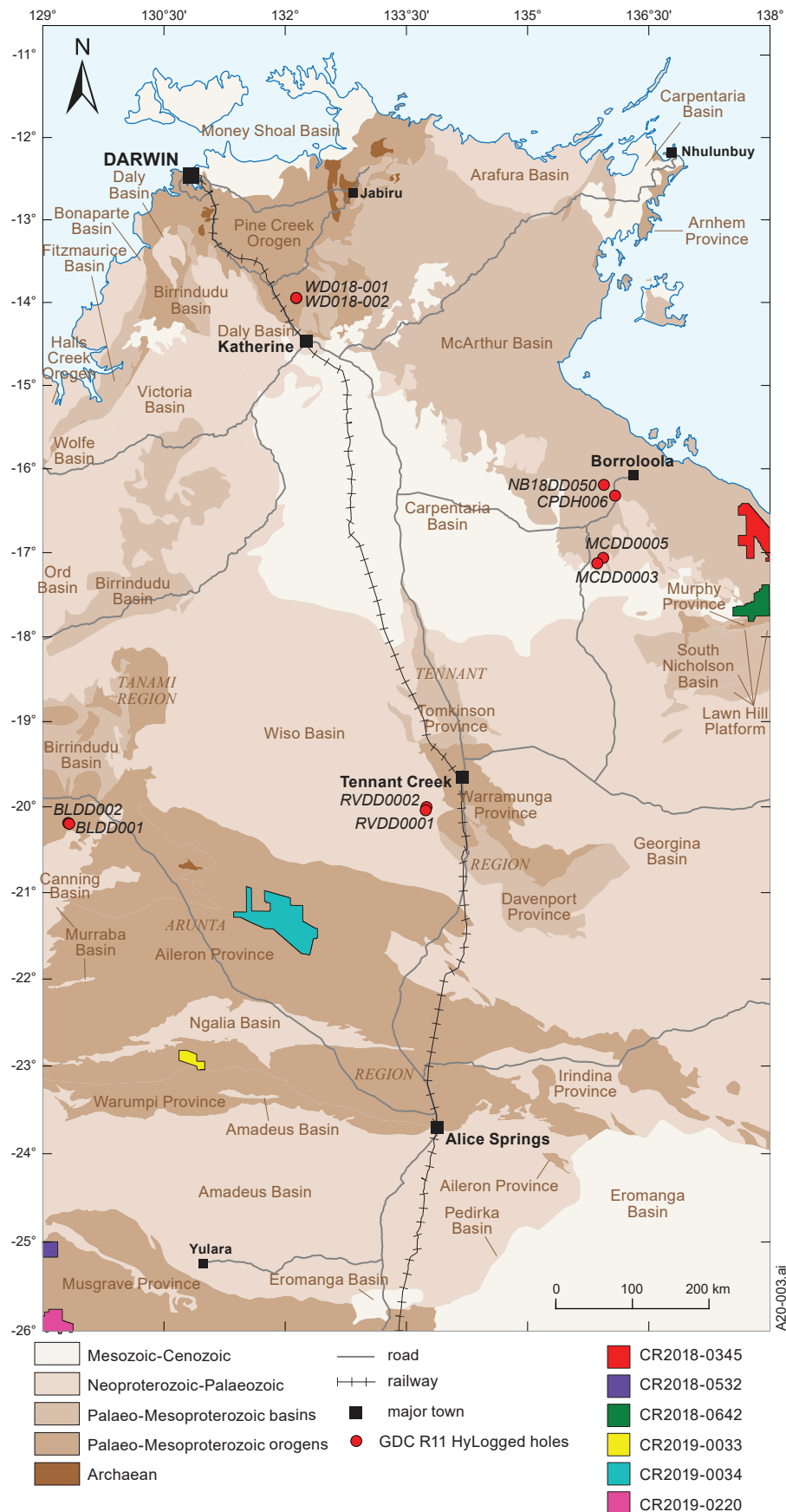


**Figure 1.** Location of recent and proposed regional geophysical surveys: NTGS Tanami Region Airborne Magnetic and Radiometric Survey (blue polygon); NTGS Mount Peake – Crawford Airborne Magnetic and Radiometric Survey (red polygon); GA EFTF Southwest McArthur Ground Gravity Survey (green polygon); GA EFTF Barkly Seismic Survey (black line) and proposed NTGS Tanami Region Ground Gravity Survey (pink dashed rectangle). Industry infill survey areas within regional surveys are shown in grey polygons.





**Figure 2.** NTGS Tanami Region Airborne Magnetic and Radiometric Survey: top image shows total magnetic intensity (TMI) and bottom image shows ternary radiometrics.



**Figure 3.** Location of Geophysics and Drilling Collaborations program round 11 projects. Drillholes are shown as red dots, geophysical surveys in polygons: CR2018-0345 Wollongorang Project Heli-Mag/Rad Survey (red polygon); CR2018-0532 Giles Creek Magnetic and Radiometric Survey (purple polygon); CR2018-0642 Falcon Airborne Gravity Gradiometry Survey Westmoreland (green polygon); CR2019-0033 Andrew Young Igneous Complex Electromagnetic Survey (yellow polygon); CR2019-0034 Airborne Magnetic and Radiometric Survey Raptor Project (aqua polygon) and CR2019-0220 Claude Hills North Helicopter-borne Magnetics and Radiometrics Survey (pink polygon).

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