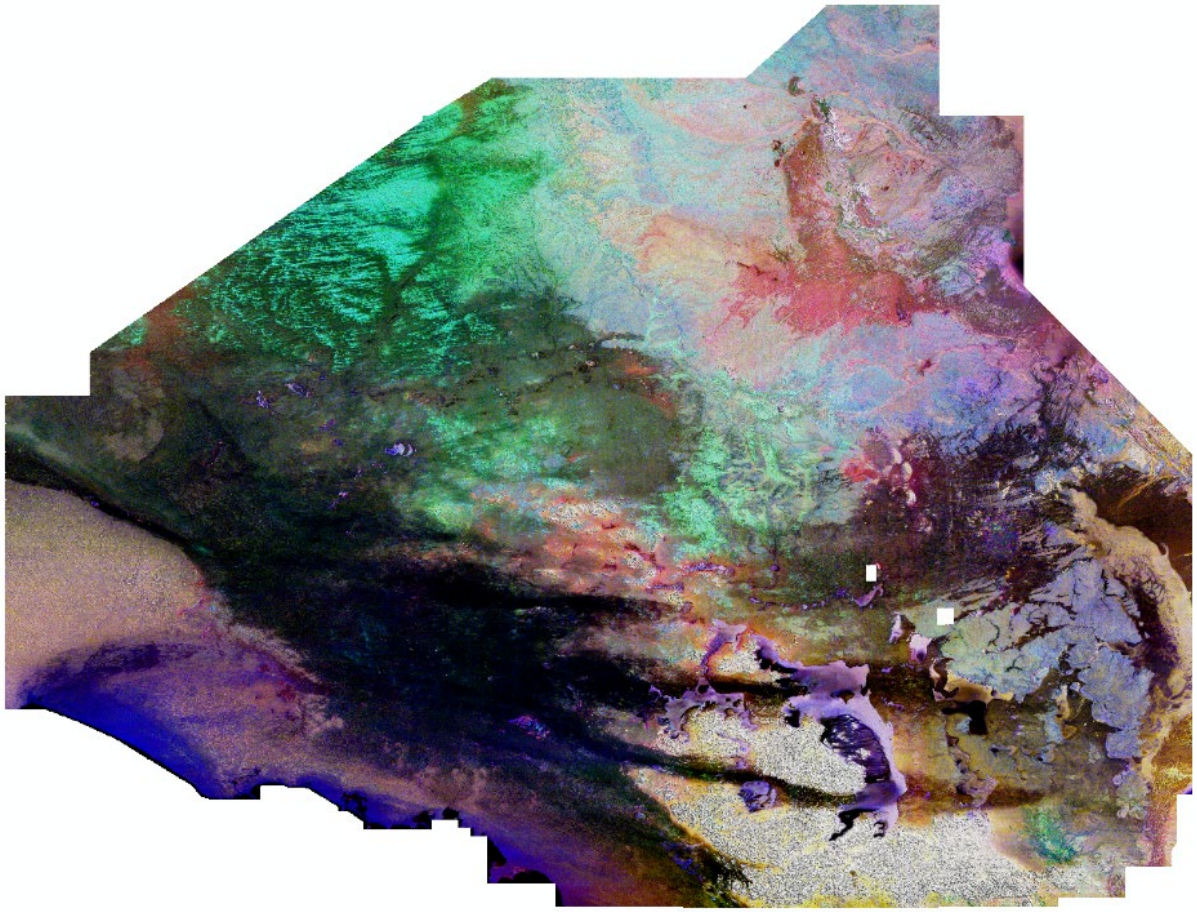
The Gawler Craton Airborne Survey

Radiometric Grids and Enhancements of the Merged Grids



Laszlo Katona, Gary Reed, Philip Heath, George Gouthas, Jonathan Irvine

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DATA PACKAGE: GDP00118_GCAS_MERGED_RADIOMETRICS_ERS

Department for Energy and Mining
Level 4, 11 Waymouth Street, Adelaide
GPO Box 320, Adelaide SA 5001
Phone +61 8 8463 3000
Email dem.minerals@sa.gov.au
dem.petroleum@sa.gov.au
www.energymining.sa.gov.au

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Abstract:

Gawler Craton Airborne Survey (GCAS) merged magnetic (TMI), radiometric and digital elevation model (DEM) grids.

The GCAS merged datasets are the result of re-gridding and merging the sixteen GCAS TMI, Radiometric and DEM surveys' located data, using a single consistent gridding algorithm and spatial origins for each data type. In the case of the radiometric data, the located data were reprocessed by Baigent Geosciences, to retain maximum signal and achieve the highest possible degree of internal consistency in relation to data calibration and processing across the broader GCAS survey region. Noise-adjusted singular value decomposition (NASVD) smoothing was incorporated into the processing stream, which is detailed in processing reports provided in a separate download package.

The gridding was performed in the GDA94 geodetic coordinate system (which is consistent with the data capture flight lines coordinate system) at 0.00036 decimal degrees (equivalent to 40m cells). The grid origin of each of the 16 GCAS regions were carefully calculated to ensure that the resulting grids were co-nodular within the survey overlap regions to eliminate or minimise the need for resampling during processing and merging.

The gridding method used for the TMI and DEM grids was minimum curvature, for the radiometrics it was minimum curvature with tension (0.2).

Noise-adjusted singular value decomposition (NASVD) processed radiometric grids are provided in the data package as ERS grids or tif images where shown, as follows:

Dose (GCAS_DOSE):

Dose rate is the total radiometric signal.

Uranium parts per million (GCAS_U_PPM):

Estimated uranium concentration in parts per million.

Thorium parts per million (GCAS_TH_PPM):

Estimated thorium concentration in parts per million.

Potassium percent (GCAS_K_PCT):

Estimated potassium concentration in percent.

Ternary Radiometrics (GCAS_K_TH_U_TIF.tif):

Potassium (Red), Thorium (Green) and Uranium (blue) are assigned to a three band tif image which presents the distribution of the three radio elements as combinations of the primary colours. Dose is used as a shaded relief to indicate landforms.

Piece-wise normalised ternary radiometrics (GCAS_PWN_K_TH_U_TIF.tif):

Piece-wise normalisation of radiometrics results in colours that better represent the relative abundances of the three radio-elements, at the expense of absolute values (Grujic, 2020).

Acknowledgements

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References:

Grujic M, 2020. Visualising regional radiometics data. Online (February 5, 2021): https://www.linkedin.com/pulse/visualising-regional-radiometics-data-mark-grujic/?trackingId=JskEZe%2F0nbPs9r1xSLe6UA%3D%3D