GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

MAGNETIC ANOMALY MAP OF WESTERN AUSTRALIA

SECOND EDITION 2005

SCALE 1:2 500 000

0 100 200 300 400

KILOMETRES

ALBERS EQUAL AREA PROJECTION WITH CENTRAL MERIDIAN 121° 00'E AND STANDARD PARALLELS 17° 30' S AND 31° 30' S
HORIZONTAL DATUM: GEODETIC DATUM OF AUSTRALIA (GDA 94)

GDA GDA94 positions are compatible within one metre of the datum WGS84 positions.

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NGA

PRODUCT OF THE NATIONAL GEOSCIENCE AGREEMENT

EXPLANATORY NOTES

This image was compiled from total magnetic intensity survey data (including offshore marine survey data) held in the National Airborne Geophysical database by Geoscience Australia (GA). Most surveys were flown by GA (formerly the Australian Geological Survey Organisation, AGSO), using its own aircraft, as part of the airborne geophysical reconnaissance of Australia, which commenced in 1951. Some surveys were carried out by airborne geophysical companies operating under contracts to GA and the Geological Survey of Western Australia (GSWA) in either separate or joint projects. A number of other surveys, carried out for the private sector, have been acquired by GA and GSWA. The data from these surveys were acquired at a range of line spacings (see source diagram), flying heights, and measurement accuracy (Richardson, 2004). Marine survey data has been used in offshore areas except where indicated on the airborne survey source diagram.

Pre-1990 GA surveys were flown mainly with a line spacing of 1500 m or 3200 m, with lines oriented either north–south or east–west, and at an altitude of 150 m above ground. Since 1990, the surveys have been acquired mainly with line spacings of 400 m or less and at altitudes of 80 m or less. Some early surveys were acquired with line spacing greater than 3200 m — data from these surveys have poor location accuracy.

For each survey the International Geomagnetic Reference Field, for the relevant epoch, was removed, and a grid created with a cell size of approximately one fifth of the survey line spacing using the minimum curvature method of Briggs (1974). All grids were subjected to micro-levelling (Minty, 1991). The gridded data from all the surveys were joined together in a two-stage method, based on the data differences in the overlap regions between adjacent surveys. Initially, a base-shift was applied to each survey to minimise the global set of differences between adjacent surveys. An iterative process was then applied, removing a plane surface from each survey to minimise the differences between it and its neighbours. Remaining high-frequency differences between the grids were smoothed out using a convolution operator. The final grid was created by interpolating all of the data into one grid with a cell size of 7.2 seconds of arc, which was then reprojected to the Albers Equal Area projection with a cell size of 250 m.

The image was generated from a colour palette (white high, blue low) using histogram equalisation. To emphasize the expression of high-frequency anomalies, an artificial illumination was applied from the northeast. The output of this sun-angle image was used to modulate the colour intensity and saturation of the initial colour image in the Hue, Saturation, Value colour space (Milligan et al., 1992).

REFERENCES

Briggs, I. C., 1974, Machine contouring using minimum curvature: Geophysics, v. 39, p. 39 –48.

Milligan, P. R., Morse, M. P., and Rajagopalan, S., 1992, Pixel map preparation using the HSV colour model: Exploration Geophysics, v. 23, p. 219 –224.

Minty, B. R. S., 1991, Simple micro -levelling for aeromagnetic data: Exploration Geophysics, v. 22, p. 591 –592.

Richardson, L. M., 2004, Index of airborne geophysical surveys (eighth edition). Geoscience Australia, Record 2004/08

Published by the Geological Survey of Western Australia. Copies are available from the Information Centre, Department of Industry and Resources, 100 Plain Street, East Perth, WA 6004. Telephone (08) 9222 3459, Fax (08) 9222 3444, www.doir.wa.gov.au

The recommended reference for this map is:
Geological Survey of Western Australia, 2005, Magnetic Anomaly Map of Western Australia, 2nd edition (1:2 500 000 scale): Western Australia Geological Survey

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Image processing	J. H. Watt
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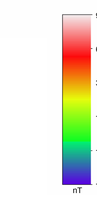
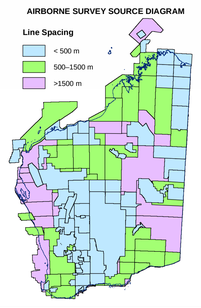
These data are available in digital form from Geoscience Australia Airborne Geophysics Data Sales, GPO Box 378, Canberra, ACT 2601. Telephone (02) 6249 9519, Fax (02) 6249 9982.

Digital data are also available for download from Geoscience Australia, www.ga.gov.au/gadds



99% of the data falls within the range given above.
The true dynamic range of the data is -7000 to 18 700 nT

AIRBORNE SURVEY SOURCE DIAGRAM



WARNING: Inks are water soluble and will fade with prolonged exposure to light