Australian Government
Geoscience Australia

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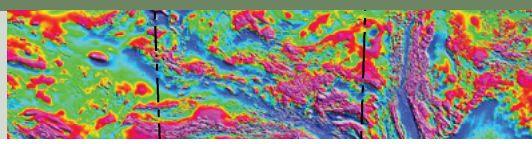
New magnetic datasets to identify energy, geothermal and mineral resources

New compilation of Magnetic Anomaly Map of Australia released



Peter Milligan

Geoscience Australia has just released a new fifth edition full-colour Magnetic Anomaly Map of Australia at a scale of 1:5 million. It is estimated that 27 million line-kilometres of survey data were acquired to produce this new edition which is eight million line-kilometres more than were acquired for the previous edition released in 2004.

Information in the new magnetic anomaly map and associated grid database provides insights into the distribution of magnetically susceptible minerals within the Earth's crust. Such insights are of great value to energy and mineral exploration companies and for research into the solid earth and the environment. Magnetic minerals in small amounts are widespread in the crust, and become concentrated in zones which highlight the structure of the crust. This is particularly important for areas which have a significant thickness of surface cover (regolith and sedimentary basins) which can mask the underlying crystalline basement rocks. The magnetic signatures of the basement are measured through the cover and provide important information to help determine the nature and depth of the basement.

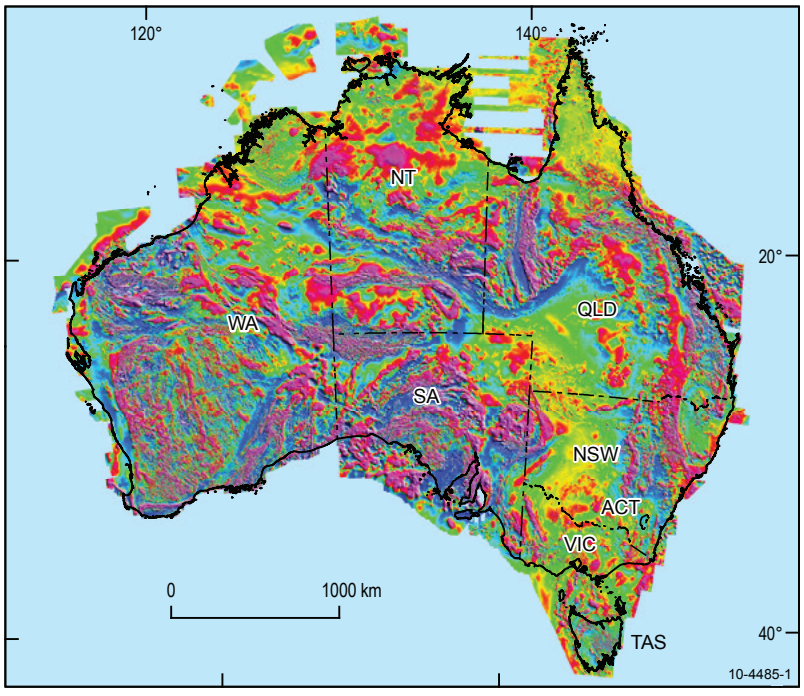


Figure 1. The main Total Magnetic Intensity colour image of Australia.

New independent airborne total-field magnetic data acquired in 2007 during the Australia-wide Airborne Geophysical Survey (AWAGS) have been used to increase the accuracy of intermediate wavelengths of the continental-scale merge of the grids. The very long flight lines of the AWAGS survey give an accurate coverage of the intermediate wavelengths (150 kilometres to 400 kilometres) of the Earth's crustal magnetic anomaly field. This provided an important control when merging nearly 800 separate airborne magnetic survey grids together to produce the new national dataset. The AWAGS survey was part of Geoscience Australia's Onshore Energy Security Program which is designed to reduce risk in exploration and support development of Australia's onshore energy resources.

"This edition includes an additional 155 individual survey grids acquired since publication of the previous edition."

For the composite grid used to produce this edition, 795 individual survey grids have been matched and merged, with the resolution of each grid optimal for the specifications of the original survey flight-line data. This edition includes an additional 155 individual survey grids acquired since publication of the previous edition. As well as the new composite digital grid of the total magnetic intensity (TMI) of Australia at a resolution of 80 metres (figure 1), a range of new digital derivative magnetic products at the same resolution will be released shortly. These will include variable reduction-to-the-pole of the TMI, the first vertical derivative of the TMI and various others.

Most of the new survey data have been acquired by the state and Northern Territory geological surveys.

The gridded datasets will be available free-of-charge in ERMapper format from the Australian governments' Geophysical Archive Data Delivery System (GADDS). Because the new full-resolution grid datasets are up to 10 gigabytes in size an alternative is for Geoscience Australia to copy the data to a portable hard-drive disk supplied by the client. The Geoscience Australia contact is Murray Richardson (contact details below). Printed copies of the map are also available from the Geoscience Australia Sales Centre.

For more information

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Geophysical datasets

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Geophysical Archive Data Delivery System (GADDS)
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Onshore Energy Security Program website
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AusGeo News 92: New Radiometric Map of Australia
www.ga.gov.au/ausgeonews/ausgeonews200812/radiometrics.jsp