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NEW YILGARN SYNTHESIS

A recently released Geoscience Australia Record uncovers one of Australia's key mineral provinces, the eastern Yilgarn Craton in Western Australia. The Yilgarn produces two-thirds of the gold and more than half the nickel mined in Australia.

The Record reports on research conducted at Geoscience Australia as part of the predictive mineral discovery Cooperative Research Centre's Y2 Project. The principal goal of the project was to determine the 3D architecture of the eastern Yilgarn Craton (EYC) and its evolution through time "to enable prediction of where within the terrane the location of major gold deposits is likely to occur". It is envisaged that the new datasets and new understanding developed by the Y2 project not only benefit explorers in the Yilgarn, but those in other terranes as well.

The main achievement of the Y2 project was the building of comprehensive 3D maps of Kalgoorlie-Kambalda and the Norseman-Wiluna region. The maps were built on a foundation of 2D solid geology maps from government agencies, universities and industry. These data were integrated with various geophysical data sets (seismic reflection, refraction, broadband recording, receiver function, gravity and magnetic data, plus various derivatives such as "worms"), geochemical data sets

(e.g., from AMIRA P624), and geochronological data sets (from AMIRA P624 and earlier projects as well as published data). The result of this integration is a more holistic understanding of the Eastern Yilgarn Craton.

- Record 2006/05 is structured around the six key outputs delivered by the project:
 An integrated geological and geophysical 3D map (model) for three specific regions within the EYC. These regions were the Kalgoorlie-Ora Banda region, the Leonora-Laverton region, and the Norseman-Wiluna region, the first two being nested within the later model
- Interpreted seismic sections for the 2001 seismic data recorded in the Leonora-Laverton region
- Tomographic model of the Kalgoorlie-Ora Banda region which links the region's velocity structure from the surface, through the base of the crust to the base of lithosphere with the integrated geological and geophysical 3D geological models
- Map of chalcophile elements across selected portions of the EYC
- Assessment of the utility of the new 3D data versus the 2D data at a regional scale



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• Prospectivity analysis of the derived 3D models.

Extensive appendices follow each chapter, including all pertinent publications and deliverables. Acknowledgements as well as an outline of all data sources and intellectual property, and references complete the report.

The Y2 project was a predictive mineral discovery Cooperative Research Centre (*pmd**CRC) collaborative project between Geoscience Australia, the Geological Survey of Western Australia and the University of Western Australia. It also involved significant collaboration with the Australian National University's Research School of Earth Sciences, AngloGold Ashanti, Goldfields St Ives, and the former companies WMC Resources, and Placer Dome Asia Pacific.

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Related articles *AusGeo News 82* The Eastern Yilgarn in 3D

Improved access to petroleum exploration well data

Originally launched in 2003 the National Petroleum Wells Database has become an extremely useful tool, giving petroleum explorers access to scientific and well header data for Australian petroleum exploration wells.

The web page provides users with access to a number of comprehensive databases, representing about 100 person-years of data entry completed by geologists, geochemists, biostratigraphers and technical staff.

Database information includes well header data, biostratigraphic picks, reservoir and facies data (porosities, permeabilities, hydrocarbon shows and depositional environments), organic geochemistry data (Rock-Eval pyrolysis, molecular and isotopic analyses), and organic petrological data (vitrinite reflectance, maceral analyses).

A major revision of the web page was released at the Australian Petroleum Production & Exploration Association (APPEA) conference in May. The updated web page includes many new and improved features to meet current government and industry needs including:

- easy retrieval of Acreage Release data
- an improved map for spatial searching and display of data
- ability to retrieve age restricted and isopach data for many data types in the database

- query and produce multiple summary reports (including graphs) for wells
- generation of multiple oil and gas reports for wells
- links to scanned documentation
- improved graphical displays of data.

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Related articles/websites AusGeo News 82 Sourcing WA's offshore natural gases National Petroleum Wells database dbforms.ga.gov.au/www/npm.well.search

Product News



Australia's maritime boundaries updated

Geoscience Australia has recently released an updated version of Australia's maritime boundaries (AMB) in digital format. The boundaries include the outer limits of the coastal waters, territorial sea, contiguous zone, exclusive economic zone (EEZ) and continental shelf. They were determined in accordance with the provisions of the United Nations Convention on the Law of the Sea (UNCLOS) and a variety of domestic legislation, in particular, the *Seas and Submerged Lands Act 1973*. The delineation of these boundaries has strategic, economic and environmental implications for Australia.

Extensive work has been carried out to validate and where necessary to update the territorial sea baseline from which the outer limits are derived. As well, the straight baseline components of the territorial sea baseline have been amended with the new locations re-defined by proclamation under the *Seas and Submerged Lands Act 1973* dated 15 February 2006. For the first time, the data also includes boundaries adjacent to the Australian Antarctic Territory and areas of continental shelf beyond 200 nautical miles from the baseline. These continental shelf boundaries were submitted by Australia to the United Nations Commission on the Limits of the Continental Shelf in November 2004. Also included are Australia's territorial sea baseline, relevant basepoints and relevant maritime treaties.

All the AMB data are clearly attributed, providing information about the source material used to determine the baseline and linking the baseline with the various limits. The data are available in geographical coordinates related to the WGS84 datum which is used on maritime charts and by mariners generally.

Maritime boundary data continues to be used by a range of agencies and for a variety of uses which include: coastal surveillance, the management of fisheries and fishing permits, the management of petroleum leases and distribution of royalties, management of the marine environment, and the enforcement of various legislation.

Geoscience Australia has updated the determination of these maritime boundaries for Australia in cooperation with the relevant Commonwealth and State government agencies. This information is made available as digital data suitable for a geographic information system (GIS) and is known as Australia's Maritime Boundaries (AMB Version 2.0). This data replaces the Australian Maritime Boundaries Information System (AMBIS) 2001 Version 1.1 data which was previously released in October 2001.

The AMB data are available in the following common industry formats:

- ESRI ArcInfo export format (.e00 files)
- ESRI Shape Files (.shp, .shx, .dbf files)
- Map Info tables (.mid, .mif files). The data can be downloaded

free of charge from Geoscience Australia's web site (www.ga.gov.au) or purchased on CD ROM from the Geoscience Australia Sales Centre.

To order the CD ROM phone Freecall 1800 800 173 (in Australia) or +61 2 6249 9966 (email sales@ga.gov.au) ⊾

New Riverine Flood Hazard & Risk Studies Database available

Geoscience Australia has developed a Database of Australian Riverine Flood Hazard and Risk Studies (www.ga.gov.au/oracle/flood) which is now available online. The database offers information on over a thousand national flood studies. It contains comprehensive information on flood studies undertaken between

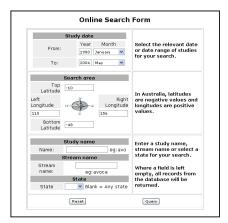
1980 and 2004. This database will be beneficial to independent consultants, all levels of government and anyone interested in floodplain management.

The database can be searched by study date, name, stream name, state, and longitude or latitude. Studies can also be viewed by category, including damage assessment, hydrology or hydraulic scenarios, hazard or inundation mapsets, terrain or floor level survey, historical floods, post flood information and related studies.

This new resource provides the foundation for users to identify and prioritise areas for future flood studies. It also gives users access to previous studies of a particular area as well as information on the techniques and data used as well as the current custodian. This means that agencies wanting to commission a flood study (particularly small local government bodies) can learn from flood risk assessments undertaken in other areas.

The database is a useful tool at both the national and regional level helping to determine areas of high flood hazard and risk, and assisting in comparisons of relative risk between urban centres. The information can also be used to identify areas where further research is needed and where studies should have an increased focus on risk assessment.

The development of this database was made possible by funding provided by the Department of Transport and Regional Services and is the culmination of two years work. The cooperation of the many agencies who contributed data, is greatly appreciated.



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Related website Database of Australian Riverine Flood Hazard and Risk Studies www.ga.gov.au/oracle/flood