



Contents

ISSUE 87 Sept 2007

Editor

Words Worth Writing

Assistant Editors

Stephen Ross

Graphic Design

Lindy Gratton

Web Design

Lindy Gratton

© Commonwealth of Australia 2007

SSN 1035-9338

Geoscience Australia

GPO Box 378

Canberra ACT 2601 Australia

cnr Jerrabomberra Avenue &

Hindmarsh Drive

Symonston ACT 2609 Australia

Internet: www.ga.gov.au

Chief Executive Officer

Dr Neil Williams

Subscriptions

Stephen Ross

p: +61 2 6249 9263

f: +61 2 6249 9926

[www.ga.gov.au/about/corporate/](http://www.ga.gov.au/about/corporate/ausgeo_news.jsp)

ausgeo_news.jsp

Sales Centre

p: +61 2 6249 9966

f: +61 2 6249 9960

e: sales@ga.gov.au

GPO Box 378

Canberra ACT 2601 Australia

Editorial enquiries

Len Hatch

p: +61 2 6249 9015

f: +61 2 6249 9926

e: len.hatch@ga.gov.au

CEO comment

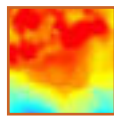
2



Promising results from Bight Basin survey

3

Samples show excellent source rock potential



In search of the next hotspot

6

Project to boost exploration for bountiful, renewable energy



Gippsland flooding revealed

11

Satellite data aids emergency relief



Crucial petroleum data saved

13

Old data support rapid increase in exploration



Energy Security Initiative updates

15

Accelerated industry access to data and progress report on several onshore surveys

In brief

UN duties continue for geoscientist

17

Product News

New map for nickel and platinum explorers

18

New geophysical datasets for Mount Isa area, Murchison region and Flinders Island

18

Estuary website expanded

20

New 1: 100 000 scale maps to help emergency management

20

GEODATA TOPO 250K Series broadens its appeal

21

Events

22



CEO comment



Neil Williams – CEO Geoscience Australia



This issue of *AusGeo News* reports on Geoscience Australia's programs to provide pre-competitive information to support industry's search for new offshore and onshore energy resources as well as contribute to the mitigation of the effects of natural hazards.

There is an article on the highly encouraging results from initial analysis of potential petroleum source rocks from geological sampling in the Bight Basin, an offshore frontier exploration area. Some samples have high organic carbon content and the potential to generate liquid petroleum, and represent the best source rock results reported from the Bight Basin.

Explorers interested in the 2007 Release of offshore petroleum exploration areas will also be assisted by Geoscience Australia's Acreage Release Data Room. The Data Room was opened by the Hon. Ian Macfarlane MP, Minister for Industry, Tourism and Resources on 17 July.

Borrowings of pre-competitive data from Geoscience Australia for the first half of this year are more than double that for the whole of calendar year 2006. There is a report on the completion of the Remastering Project which copied more than half a million older seismic survey and well data tapes held by Geoscience Australia onto modern high density media. This was done as part of the Australian Government's New Petroleum Program (Big New Oil initiative) between 2004 and 2007.

There is also an update on the Onshore Energy Security Program. I am happy to report that the gravity survey of parts of the Cooper Basin and the acquisition of aeromagnetic data covering parts of the Canning Basin have been completed, and the processing of deep seismic data from the Mt Isa region of Queensland is progressing. A major deep crustal seismic transect from Cloncurry to Georgetown to Charters Towers – conducted in partnership with the Geological Survey of Queensland – will be completed in early September. The Australia-wide airborne geophysical tie-line survey (AWAGS 2) is more than 50 per cent complete and is scheduled to be completed by December.

This issue also includes an article outlining the planned activities and outputs of Geoscience Australia's Geothermal Project, a new project under the Energy Security Program. The project will acquire new heat flow and thermal conductivity data and integrate this with other datasets to map the continent's heat flow and define the

geothermal potential in key regions across Australia.

There is also a report on Geoscience Australia's contribution to the emergency response following the severe flooding in Gippsland, Victoria in June this year. Geoscience Australia assisted by providing information on the extent of flooding derived from satellite imagery.

New products to assist mineral explorers include: a map that documents the nineteen major Proterozoic magmatic events and associated mineral deposits in the Northern Territory and South Australia, and geophysical datasets covering areas in Queensland (Mt Isa), Western Australia (Murchison) and Tasmania (Flinders Island). Scientists, natural resource managers, and the community now have access to the largest central source of coastal information and data in Australia through the OzEstuaries website.

We always appreciate your feedback and encourage you to use the online rating mechanism with each article.

Promising results from Bight Basin survey

Samples show excellent source rock potential

Jennifer Totterdell

Initial analysis of data from a new geological sampling survey by Geoscience Australia in the Great Australian Bight provides new evidence for the presence of potential petroleum source rocks in the Bight Basin.

Exploratory drilling in the Bight Basin has historically concentrated on the inboard margins of the basin. Apart from Woodside's Gnarlyknots 1A well, which was drilled in the Ceduna Sub-basin in 2003, only the more proximal parts of the Cretaceous depositional systems have been sampled.

Geoscience Australia's previous basin analysis study (1999–2004) identified a series of potential source rock intervals at different stratigraphic levels, including marine or marine-influenced sediments whose source rock character was predicted to improve further basinward.

A study of all available seismic data indicated that these rocks cropped out on the seafloor at the seaward edge of the Eyre Terrace where canyon formation, slumping and faulting have exposed the mid-Cretaceous section. This area was the prime dredging target for the survey conducted earlier this year.

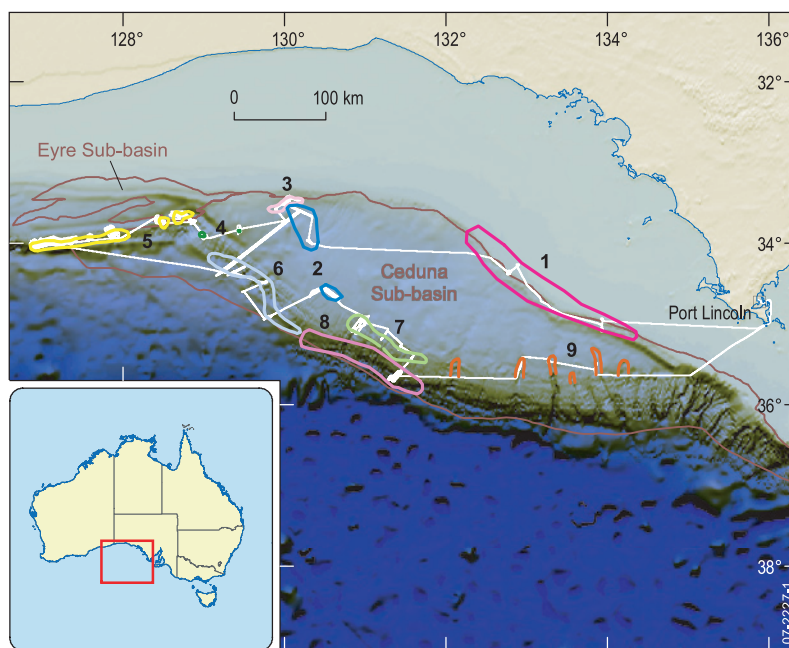


Figure 1. Voyage track across the nine survey areas during SS01/2007.

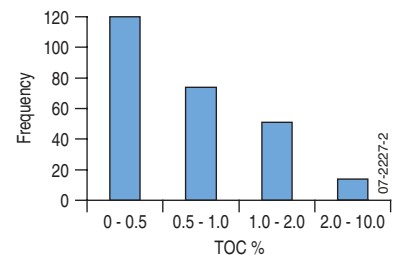
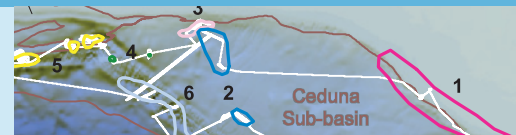


Figure 2. Total organic carbon (TOC) results for Bight Basin survey samples.

The seismic study also identified a range of sites where, if other geological conditions were met, seepage of hydrocarbons was most likely to occur. These included areas where recent reactivation of deep-seated faults was evident at the seafloor, basin margin areas where seal facies thin sufficiently to allow seal failure, and areas high-graded by the presence of slicks detected by synthetic aperture radar.

Conducted by the Marine National Facility vessel RV *Southern Surveyor* (survey SS01/2007), the survey gathered geological samples and geophysical data via deep sea dredging and gravity coring techniques.

Southern Surveyor departed Port Lincoln, South Australia on 22 February 2007 for a three-week survey, with a crew of 12 Geoscience Australia scientists and technicians, a scientist from the Geological Survey of Western

Australia, and two CSIRO technicians. Good sea and weather conditions enabled sampling to be completed in all nine target areas (figure 1). The survey resulted in the collection of thirty seven dredge samples, 69 gravity cores and 15 grab samples, as well as 4600 kilometres of swath data and 2400 kilometres of sub-bottom profile data.

With the physical material now sorted, catalogued and subsampled, a detailed analysis program has been developed to incorporate sedimentological, geochemical and biostratigraphic analyses.

The organic geochemical analysis program is designed to assess the source rock characteristics of the dredge samples, and to investigate whether the gravity core samples reveal any indication of hydrocarbon seepage. While initial results from the gravity cores have proved disappointing, early results from the source rock characterisation study have been highly encouraging.

“Preliminary organic geochemical analysis has shown that some of the samples ... have excellent source rock potential, with high organic carbon contents and the potential to generate liquid hydrocarbons.”

Preliminary organic geochemical analysis has shown that some of the samples from Area 5 on the Eyre Terrace (figure 1) have excellent source rock potential, with high organic carbon contents and the potential to generate liquid hydrocarbons. These are the best source rock results reported from the Bight Basin, and indicate that careful targeting of appropriate depositional systems is vital for understanding hydrocarbon source potential.

The results can be summarised as follows:

- A total of 259 dredge samples were analysed for total organic carbon (TOC) and pyrolysis yields (Rock Eval).

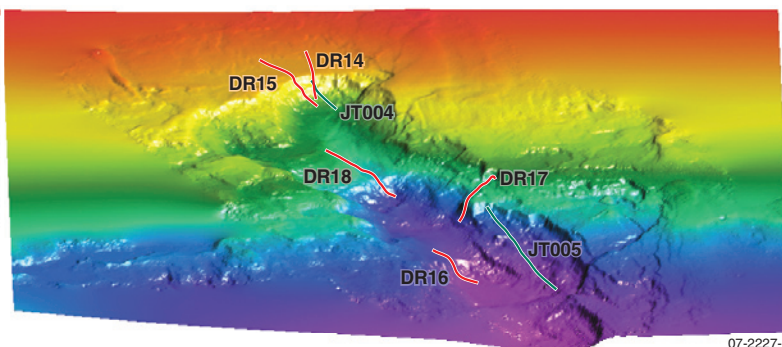


Figure 3. Dredge sample locations in a canyon on the Eyre Terrace (Area 5).

- Good to very good organic richness was found in 13 samples with TOC values between 2.1% and 6.2% (figure 2).
- Of these, seven show liquids potential with hydrogen indices (HIs) ranging between 274 and 479 milligrams hydrocarbons per gram TOC.
- The sample with the highest liquids potential (HI 479) also has the highest TOC. If further biostratigraphic and organic geochemical facies analyses prove that this rock is marine in origin, it can be classed as an oil shale (defined as TOC > 5%).
- No hydrocarbon potential was found in 120, or just under half, of the samples with TOC < 0.5%.
- HIs are below 150 for samples with TOCs between 0.5% and 2.0%, indicating only gas potential. However, our previous experience with the Bremer Sub basin dredge samples suggests that, if the isolated kerogens are re-analysed and the mineral matrix effect is eliminated, HI values can improve significantly.
- All samples with a TOC higher than 0.5% have low Tmax values (<440°C), indicating that the rocks are immature for hydrocarbon generation, as expected in this part of the basin.

More sophisticated geochemical analysis is now being

applied to a high-graded subset of these samples, most of which come from Area 5, the prime dredging target on the edge of the Eyre Terrace (figure 3).

If the seismic interpretation is correct, the best samples are likely to be from the upper White Pointer and/or Tiger supersequences, which

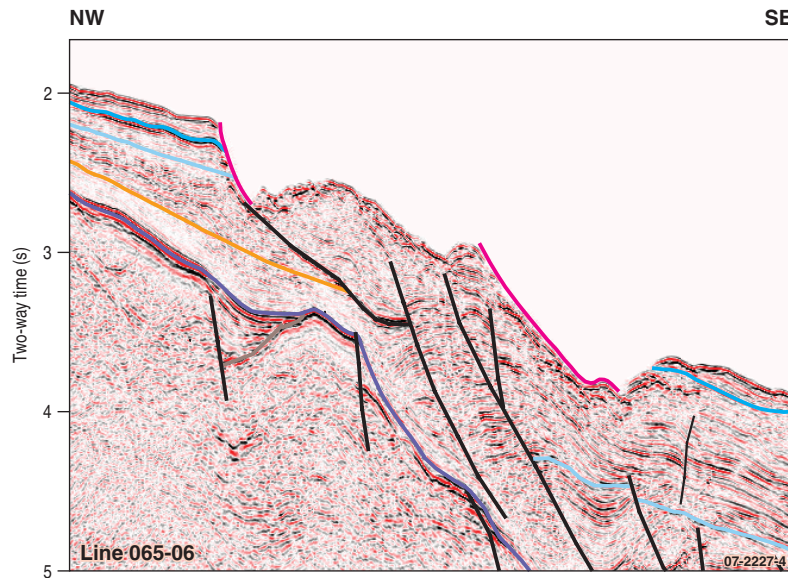


Figure 4. Portion of the seismic line crossing the canyon shown in figure 3. Indicative dredging sites shown by pink line.

have been preliminarily dated to be of Cenomanian–Turonian age (figure 4). Palynological analysis of the samples is now underway, with results from the first batch of samples expected by early November.

The results of the survey are being compiled as a Geoscience Australia record, which is expected to be available in mid 2008.

For more information

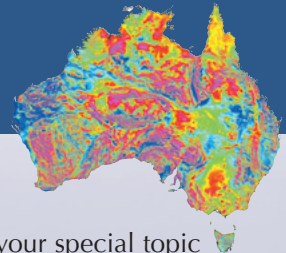
phone Jennifer Totterdell on
+61 2 6249 9407
email jennifer.totterdell
@ga.gov.au

Related websites

Fieldnotes (Geological Survey of Western Australia): The search for petroleum sources and seeps
<http://geodocs.doir.wa.gov.au/>

AusGeoRef

Australian Geoscience References



Find

Information about:

- Australian geoscience
- Papers from Australian geoscience conferences and journals
- The latest research in your particular field
- An Australian geographic location or a geological feature

Annual subscription costs start from \$US95.00.

Try the 30 day free trial (www.ausgeoref.org)

For more information phone + 61 2 6249 9567
or email Geoscience Australia's Library.
(Reference.Library@ga.gov.au)

Create

- A search on your special topic
- A customised bibliography
- An Alert profile for your particular field
- A document request



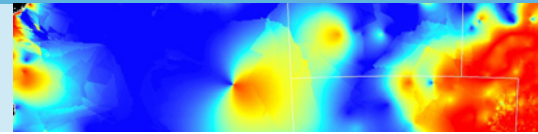
Australian Government
Geoscience Australia

in
collaboration
with



In search of the next hotspot

Project to boost exploration for bountiful, renewable energy



Anthony Budd, Fiona Holgate, Edward Gerner and Bridget Ayling

Geoscience Australia's Geothermal Energy Project is part of the Energy Security Initiative announced by the Prime Minister in August 2006.

Geoscience Australia received \$58.9 million over five years to implement the Onshore Energy Security Program by acquiring new data to attract investment in exploration for onshore petroleum, geothermal, uranium and thorium energy sources.

The program will acquire national-scale geophysical and geochemical data, including seismic, gravity, heat flow, radiometric, magneto-telluric and airborne electromagnetic data in collaboration with the state and Northern Territory governments under the National Geoscience Agreement.

“The key geological ingredients of the ‘hot rock’ geothermal model are high heat-producing granites overlain by thick accumulations of low thermal-conductivity sediments.”

Formulating the Geothermal Energy Project

The key geological ingredients of the ‘hot rock’ geothermal model are high heat-producing granites overlain by thick accumulations of low thermal-conductivity sediments. The decay of radioactive elements (mostly uranium, thorium and potassium) over millions of years produces heat in the granite. This heat may be trapped at depth within the crust by a sedimentary cover that lies above the granite like a blanket.

Where temperatures are high, water circulating through the hot rocks can be used to generate electricity. At lower temperatures, the heat can be used for direct-use applications, such as space and water heating.

By raising awareness of Australia's geothermal potential among decision-makers and the general public, Geoscience Australia aims to provide background information to support policy formulation regarding a potential new geothermal industry.

Extensive consultation with state and Northern Territory geological surveys and geothermal exploration companies has identified a list of key impediments faced by geothermal explorers. The project aims to reduce those impediments through geoscience input.

The greatest identified geoscience need is for a better understanding of the distribution of temperature in the continent's upper crust. Two existing datasets—the Austherm05 map of temperature at five kilometres depth, and a database of heat flow measurements—suffer from having too few data points, compounded by poor distribution. Geoscience Australia aims to provide additional information for both datasets.

A third way to predict heat distribution is to use geological modelling of high heat-producing granite locations and overlying low thermal-conductivity sediments.

Other geoscience inputs to be developed to improve discovery rates and reduce risk for explorers include:

- a comprehensive and accessible geothermal geoscience information system
- an improved understanding of the stress state of the Australian crust
- increased access to seismic monitors during reservoir stimulation
- a reserve and resource definition scheme.

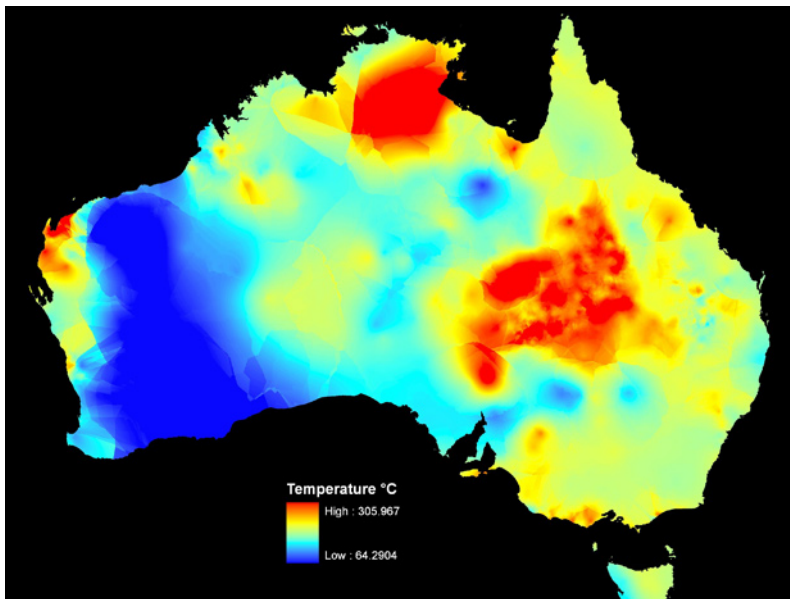


Figure 1. Modelled crustal temperature at five kilometres depth, using Austherm07 data, OZ SEEBASE™ depth to basement and basement temperature gradient defined by heat flow provinces. Temperature data in this image have been derived from proprietary information owned by Earth Energy Pty Ltd (ABN 078 964 735).

“The greatest identified geoscience need is for a better understanding of the distribution of temperature in the continent’s upper crust.”

Mapping heat in the crust

Temperature increases with depth in the crust, but current drilling technologies limit economic development of geothermal systems to about five kilometres maximum depth. Temperatures greater than 200°C are required at such depths for commercial electricity generation; however, 200°C at five kilometres is anomalous in Australia. It is necessary to find ‘hot spots’—areas with above average crustal temperature.

Three methodologies will be applied, and the datasets will be integrated to map the continent’s heat flow provinces and define geothermal potential in each province.

Temperature at five kilometres depth

Temperature measurements are often taken at intervals in boreholes. This is particularly true for petroleum, as temperature provides important information for understanding the maturity and therefore the type of hydrocarbon that may be expected. Temperature measurements, combined with other information such as thermal gradient, allow the temperature expected at five kilometres depth to be extrapolated vertically. This extrapolated temperature can be interpolated horizontally between drillholes, and contoured to produce a continuous map of temperature at five kilometres depth across the entire continent.

This technique was pioneered by Somerville et al (1994: Geotherm94 database) at the former Bureau of Mineral Resources (now Geoscience Australia) and the Energy Research and Development Corporation. Additions and refinements were subsequently made to the database by Chopra and Holgate (2005: Austherm05 database).

Geoscience Australia has since purchased the Austherm07 database and has started making further improvements. These

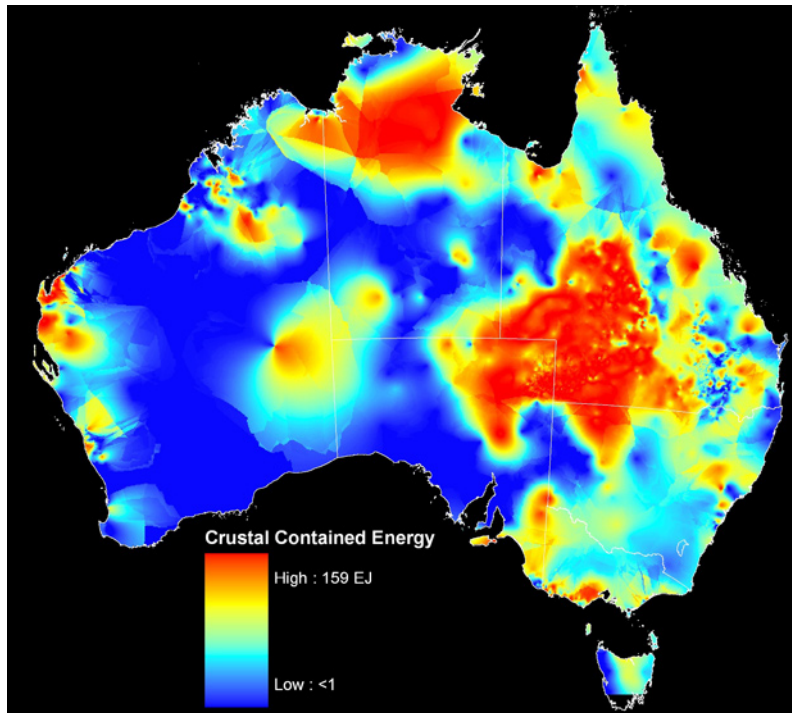


Figure 2. Distribution of contained crustal energy (see text for calculation method). The total resource is 1.9×10^{25} J, equivalent to 2.6 million times the gross energy consumption in Australia during 2004–05. Temperature data used in this image have been derived from proprietary information owned by Earth Energy Pty Ltd (ABN 078 964 735).

include utilising the OZ SEEBASE™ (FrogTech 2006) sediment thickness data to better constrain the depth at which geothermal gradients change from those typical of sedimentary basins to lower gradients typical of crystalline basement rocks, and mapping the continent's temperature gradients based on recognised heat flow provinces (figure 1).

The Austherm07 database has also been used in a new way to estimate the geothermal energy contained within the Australian crust. Two grids with 5 kilometre x 5 kilometre cells were made: a lower grid of temperature at five kilometre depth; and an upper grid produced by interrogating the database to predict the depth at which 150°C would be reached. This temperature is the minimum temperature required for these developments. The average temperature, volume and estimated contained heat were calculated for each cell (figure 2).

This provides an estimate of 1.9×10^{25} joules of energy contained in the upper five kilometres of Australia's crust, equivalent to about 2.6 million years total energy supply at the 2004–05 consumption level of 7258.1 petajoules per year (ABARE 2006). Obviously, not all of this energy will be accessible for extraction, but just one per cent could provide 25 000 years of energy supply. Future drilling and extraction technologies will undoubtedly allow extraction of heat at depths greater than five kilometres, increasing this potential resource.

Heat flow measurements

Heat flow is the preferred method of quantifying the amount of thermal energy available at a geographic location. It is the product of thermal gradient and thermal conductivity, and may be measured in the crust via drillholes. Approximately 200 heat flow measurements are available for Australia—far too sparse a coverage to provide a meaningful map of heat flow on a continental scale.

Geoscience Australia is purchasing a thermal conductivity meter and downhole logging equipment to acquire new heat flow measurements and improve the definition of heat flow provinces throughout the continent. Geoscience Australia and the collaborating agencies will measure temperature gradient in selected holes across the continent and take new thermal conductivity measurements of samples from state and territory core libraries.

Granite and sediment map

By mapping out deeply buried granites and with knowledge of their chemistry and the thermal conductivity of the overlying sediment, it will be possible to make predictions about crustal temperature.

Unfortunately, most of the available granite chemistry comes from surface samples. However, it is possible to identify buried granites using remote sensing methods, such as gravity and

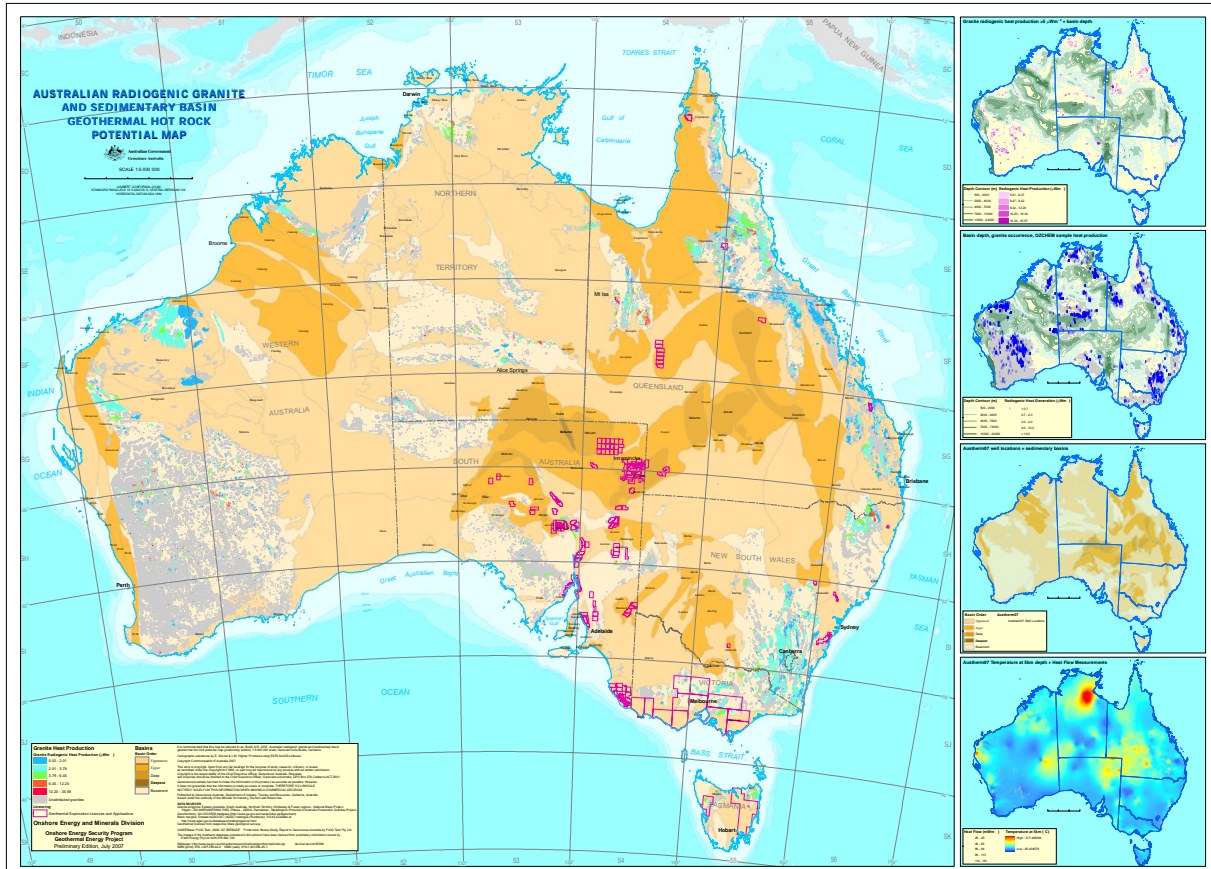


Figure 3. Distribution of granites and their radiogenic heat production, combined with location and depth of sedimentary basins (main panel). Right-hand panels include information on distribution of geochemical samples and their uranium–thorium–potassium contents, distribution of downhole temperature measurements, depth of sedimentary basins, and temperature at five kilometres depth.

magnetics. By mapping granite outcrops, it is also possible to predict the composition of buried granites as they trend from outcrop areas to beneath sediments. In this way, the heat production beneath sedimentary basins may be estimated.

Local temperature profiles of the crust may be estimated using information about the thickness and thermal conductivity of overlying sedimentary strata, heat production by buried granites, and estimates of heat flow upwards from the mantle.

The initial stage of this work was the compilation of information about outcropping granites and their chemistry. The heat production of the granites has been calculated and combined in a GIS with maps of basin thickness (figure 3). This provides a first-pass map of prospective areas, but also highlights areas where more granite geochemical data are needed.

Other activities

Direct-use applications of geothermal energy

Most current geothermal exploration activity in Australia is focused on electricity production, but most existing applications use low-temperature geothermal resources directly, such as for spas or space heating. Direct-use applications of geothermal energy are generally very efficient and require only low-temperature

geothermal resources, which are more widespread than the high-grade resources necessary for electricity generation. Geoscience Australia will compile detailed information on possible geothermal resources near major energy markets, with the aim of targeting new drilling for infill heat flow measurements.

Geothermal database

Geoscience Australia has developed an information management plan for the capture, storage, manipulation and delivery of geothermal-related geoscience data. The first stage is to develop a heat flow database. This will be populated with new data and legacy data from an extensive literature search, including contributions from geothermal companies, state and Northern Territory geological surveys, and universities.

As well as complete heat flow measurements, the geothermal database will store temperature-only and thermal conductivity-only records. Other data layers to be captured (in either a relational database system or a GIS) include:

- a grid of extrapolated and interpolated temperature at five kilometre depth
- geochemistry
- drillhole locations and attributes
- Bouguer gravity (and stations), magnetics, and radiometrics coverages
- topographic information (population centres, infrastructure)
- gamma logs
- geology layers (outcrop, solid, faults etc)
- seismic lines
- digital elevation model
- mean average surface temperature
- thermal IR
- hydrogeology.

For more information

phone Anthony Budd on
+61 2 6249 9574

email anthony.budd@ga.gov.au

References

ABARE (Australian Bureau of Agricultural and Resource Economics). 2006. Energy in Australia, ABARE.

Chopra P & Holgate F. 2005. A GIS analysis of temperature in the Australian crust. Proceedings, World Geothermal Congress 2005, Antalya, Turkey, 24–29 April 2005.

FrogTech. 2006. OZ SEEBASE™ Proterozoic Basins Study. Report to Geoscience Australia by FrogTech Pty Ltd.

Somerville M, Wyborn D, Chopra P, Rahman S, Estrella D & Van der Meulen T. 1994. Hot Dry Rocks Feasibility Study. Report 243, Energy Research and Development Corporation.

Related websites

Onshore Energy Security Program
www.ga.gov.au/minerals/research/oesp/work_program_03.jsp

Geothermal Energy Project, including map showing distribution of granites and their radiogenic heat production.

www.ga.gov.au/minerals/research/national/geothermal/index.jsp

Gippsland flooding revealed

Satellite data aids emergency relief

Medhavy Thankappan

During June 2007, the Gippsland region in southeastern Victoria experienced heavy rainfall and widespread flooding. Geoscience Australia staff used Landsat 5 satellite images of the area around Bairnsdale and Sale, acquired two weeks before the heavy rains and then around the flood peak, to determine the extent of flooding. Clouds obscured some flooded areas, but assessments of the flooding based on satellite images were still possible for most areas.

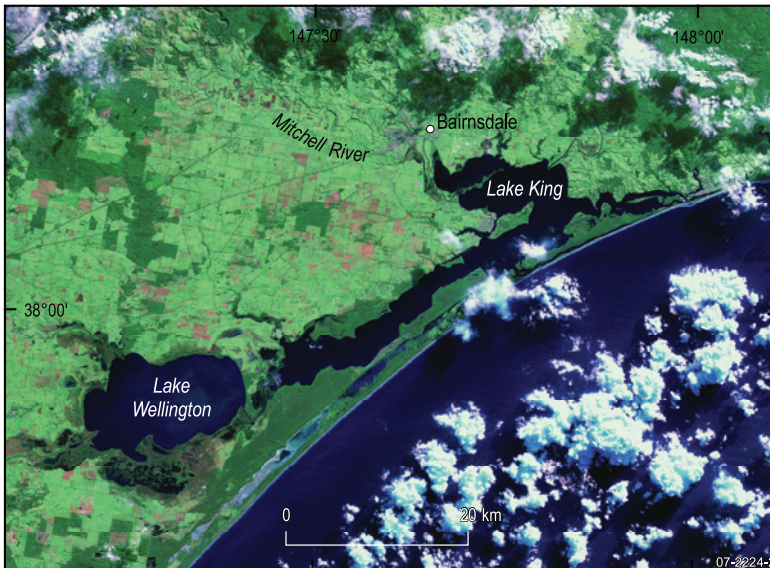


Figure 1. Landsat Thematic Mapper image acquired on 13 June 2007 before the flood.

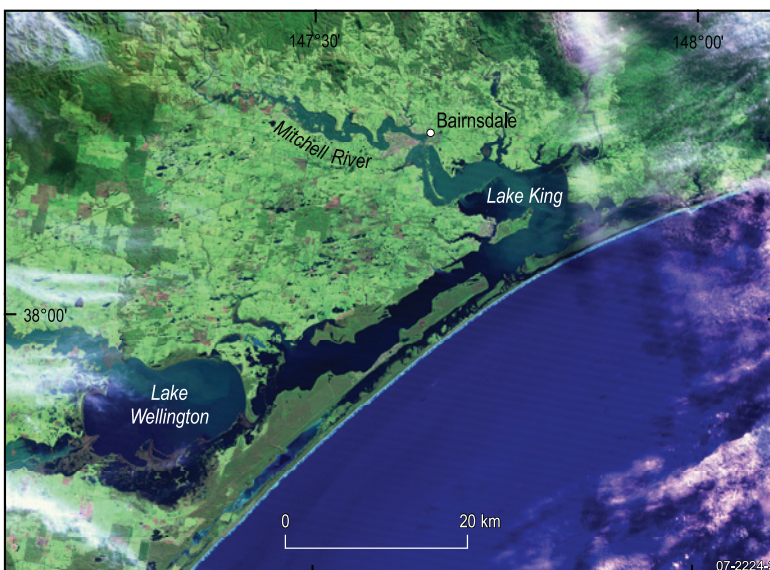


Figure 2. Landsat Thematic Mapper image acquired on 29 June 2007 during the flood.

Visual comparison of the Landsat Thematic Mapper (TM) image acquired on 13 June, before the flood, with a 29 June image showed the inundated areas clearly. In the earlier image, the Mitchell River is a thin, meandering black line flowing into Lake King (figure 1), while the later image shows the inundation of areas around Bairnsdale, as well as the Mitchell River breaching its banks (figure 2).

The two Landsat TM images were processed digitally to extract information on the extent of flooding. Data from six spectral bands of Landsat TM covering the visible and near infrared sections of the electromagnetic spectrum were used in the analysis. The two satellite images were subjected to a segmentation process, followed by digital classification to identify different feature categories. The water categories were then combined to produce a map showing the extent of all water bodies in each image.

Geoscience Australia provided to State Emergency Services, Victoria, for assessment, the map of surface water extent derived from the satellite images (figure 3). Feedback indicated that the satellite-derived information complemented local information available to emergency managers during the emergency.

The accuracy of surface water extents is determined by the spatial and spectral characteristics of the satellite data from which it is derived. Landsat TM has a spatial resolution of 30 metres, and areas of surface water smaller than that might not be identified. The amount of cloud

cover can also affect the quality of the final map, especially when flooded areas are obscured by cloud and cloud shadow.

Information on flood extents is invaluable for emergency authorities involved in flood recovery and damage assessment. Prompt delivery of such information to emergency managers could help them prioritise their response activities.

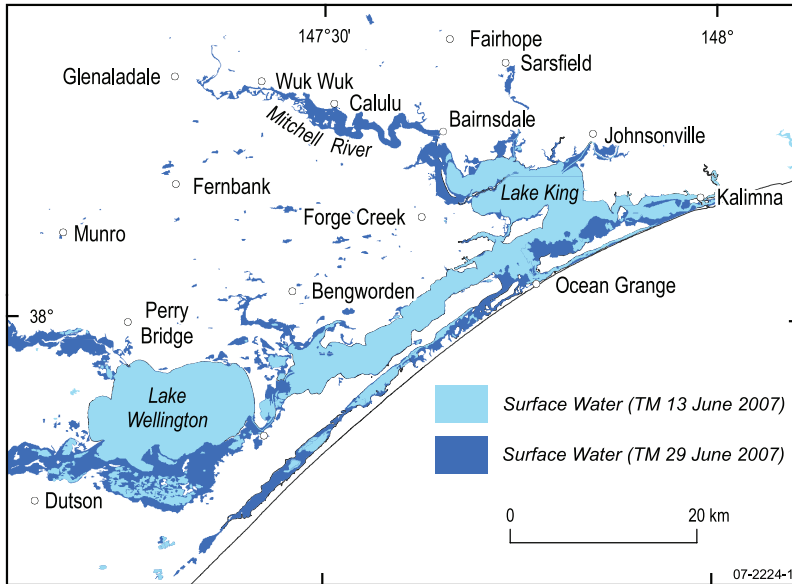


Figure 3. Map showing extent of surface water derived from Landsat images acquired before and during the flood.

For more information

phone Medhavy Thankappan
on +61 2 6249 9310
email medhavy.thankappan
@ga.gov.au

KALGOORLIE 2007

Kalgoorlie, 25 to 27 September

Interested in the highlights of two decades of research in the mineral-rich Yilgarn Province?

Geoscience Australia is making a major contribution to the upcoming Kalgoorlie 2007 Conference with a pre-conference field trip, a Keynote presentation, and four invited presentations.

Presentations during the conference include:

- Putting it all together; anatomy of a giant hydrothermal system (Keynote)
- Tectonic framework of the Eastern Goldfields Superterrane
- An overview of the Yilgarn Craton and its evolution
- How does the 3D architecture of the Yilgarn control hydrothermal fluid focussing?
- Tertiary palaeochannels: geology and metallogenic significance

The pre-conference field trip will be the first public release of the results of a structural study from the AMIRA P763-Y1 project. Participants will view ten gold mines including Leinster, Leonora, Menzies and Laverton to illustrate the different structural controls of gold mineralisation in a range of rocktypes, structural settings and events.

There will also be poster sessions during the conference. For more information visit www.kalgoorlie07.org/.

OLD GROUND NEW KNOWLEDGE

Crucial petroleum data saved

Old data support rapid increase in exploration



Access to exploration data at the ‘cost of transfer’ is a valuable link in most petroleum companies’ exploration programs. Large companies now carry out work programs in Australia because Geoscience Australia provides data that can be used both for interpretation and for reprocessing.

Geoscience Australia’s repository

The Geoscience Australia Data Repository is Australia’s biggest collection of petroleum geoscientific data, and one of the world’s largest. It includes over 750 terabytes of seismic exploration data, as well as a vast collection of cores, cuttings and reports, and provides valuable information to the petroleum industry and research organisations (figure 1).

“In an average month, Geoscience Australia’s national repository provides exploration data to 15 to 20 petroleum companies.”

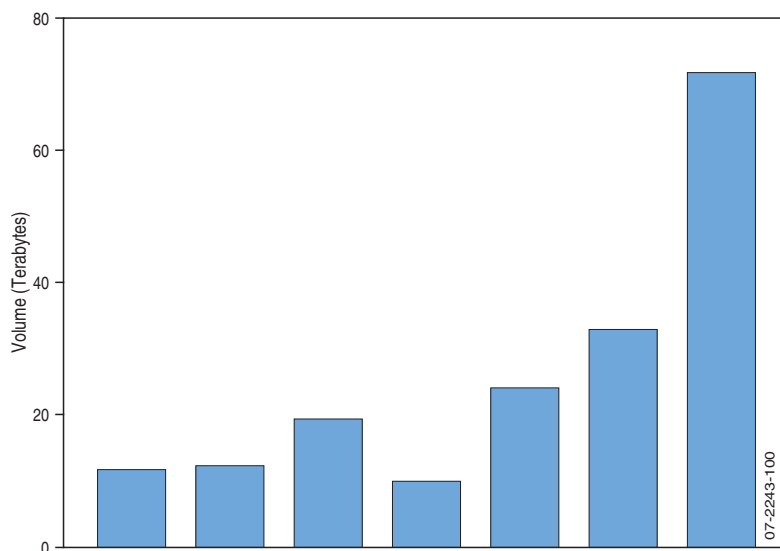


Figure 1. Borrowings of precompetitive data from Geoscience Australia since 2001. Note that the figure for 2007 covers only the six months to June 2007.

By far the major part was lodged to meet the requirements of the *Petroleum Search Subsidy Act 1959* or the later *Petroleum (Submerged Lands) Act 1967*. These Acts require only the submission of offshore data, as all onshore data are handled by state or territory agencies. The state resources departments carry out the day-to-day administration of the Petroleum (Submerged Lands) Act, and all submissions and requests for data must be made through them.

All the data collected by petroleum companies during their offshore exploration and drilling phases must be submitted. This includes:

- exploration seismic data—raw field data, navigation, final processed data, and various acquisition, processing and interpretive reports
- well data—cores and cuttings, fluids and gases (where present), and well completion reports.

The basic data can normally be accessed by other companies after two years; interpretive data can normally be accessed after five years. In an average month, Geoscience Australia’s national repository provides exploration data to 15 to 20 petroleum companies.

Remastering project

As part of the Australian Government's New Petroleum Program (part of the Big New Oil initiative) the 2003 federal Budget provided funding of \$10 million over four years for the transcription to high density media (3590B cartridges) of older seismic survey and well data on 9 and 21 track tapes and 3480 cartridges (figure 2). Hardcopy support data was also digitised.

The successful tenderers for the work were Spectrum Data and Guardian Data Seismic (transcription) and GeoCom (quality control).

The original target was to transcribe more than 500 000 tapes and as many 3480 cartridges as possible. The number actually transcribed has reached 645 000. This includes:

- 9 track tapes (355 000)—12% were classified as in 'bad' condition and 30% as 'marginal', but 99% of these data were recovered
- 21 track tapes (30 000)—only a few of which posed problems
- 3480 cartridges (260 000)—which rarely posed problems.



Figure 2. Some of the field tapes stored at Geoscience Australia's national repository of seismic data, before remastering.

All original tape media were disposed of after quality control processes to determine that the transcription was correct and complete. Two copies were made of each remastered dataset.

At the start of the remastering project, the older media held 20 per cent of the total collection. Additional funding has since been provided to concatenate the digital data from 3590B (10 gigabyte) to 3592 (500 gigabyte) tapes. This will further reduce access time and the cost of using the data.

Data use

More data became available to petroleum explorers as the collection was sorted and recatalogued during remastering. Data from more than 150 remastered surveys has since been accessed, with field data from one pre 1980 survey having been accessed five times.

Borrowings of precompetitive data by explorers trebled between 2004 and 2006, and borrowings in the first half of 2007 are more than double those of 2006 (figure 1).

For more information

phone Paula Cronin on
+61 2 6249 9181

email paula.cronin@ga.gov.au

New Data Room accelerates industry access

A new Data Room to enable Australian and international petroleum exploration companies to scrutinise geological and geophysical datasets supporting the annual release of offshore acreage was opened by The Hon Ian Macfarlane, MP on 17 July 2007.

The Data Room at Geoscience Australia's headquarters was created as part of the Australian Government's \$75 million Offshore Energy Security Program.

With Australia's use of petroleum increasing and further domestic sources needed, the Program provides exploration companies with new pre-competitive information and improved access to acreage release data.

The Minister said that the long term aim of the Energy Security Initiative is to secure Australia's domestic oil supply for the future. Mr Macfarlane pointed out that 'Unless new discoveries are made, current projections for Australia anticipate a self-sufficiency rate of about 33 per cent by 2015, leaving us two-thirds dependent on foreign supply'.

'The global oil exploration community is showing significantly increased interest in Australia following initiatives by Geoscience Australia to accelerate access to offshore petroleum exploration datasets', Mr Macfarlane said.



Figure 1. Minister for Industry, Tourism and Resources, the Hon. Ian Macfarlane, MP viewing some of the acreage release data now available in the new Data Room following the opening.

For more information

phone Marita Bradshaw on +61 2 6249 9452

email marita.bradshaw@ga.gov.au

Onshore Energy Security Program

An outline of the five-year Onshore Energy Security Program (OESP) was reported on in *AusGeo News 86*. Regular updates are now available through Geoscience Australia's website, which contains information on the Program, summaries of current and planned surveys, and recent presentations. Web pages for individual OESP projects are being developed with the Geothermal Energy Project being the first to be posted. The Program's Five-Year Plan (2006-2011), which is included on the site provides further information on the Program's objectives, outputs and planned activities for the national and regional projects. All new data releases for the OESP will be announced through Geoscience Australia's monthly *Minerals Alert*.

Background and more detailed information, including area maps, on the following geophysical surveys are included in *AusGeo News 86* and on the Geoscience Australia website.

Completed Geophysical surveys

The gravity survey over parts of the Cooper Basin in southwest Queensland was completed in late May 2007. The data acquired will assist the assessment of hydrocarbon potential of the region as well as identification of granites with

possible geothermal energy potential in areas beneath the basin.

Acquisition of infill aeromagnetic data in areas of the Canning Basin, including the Kidson Sub-basin of northern Western Australia, has also been completed. This data will contribute to understanding of the structure of the basin and its hydrocarbon potential and facilitate planning of a future seismic survey.

Geophysical surveys in progress

Processing of deep seismic data from the Mt Isa region of Queensland is progressing, with interpreted results scheduled for release in early 2008. The seismic lines imaged crustal structure in parts of the Eastern Succession, a region rich in copper, gold, silver, and lead which is also emerging as an important uranium province.

The first of three deep crustal seismic lines between the Cloncurry area and the Croydon-Georgetown area was completed in June 2007 (figure 2).

The Australia-wide airborne geophysical tie-line survey (AWAGS2), which began in March 2007, continues to acquire radiometric and magnetic tie-line data to develop a new datum for re-levelling of previous airborne radiometric and magnetic surveys. The survey is progressing to schedule and is more than 50 per cent complete (figure 3).



Figure 2. Seismic vibrator trucks operating between Croydon and Georgetown, northwest Queensland.

For more information

phone Bill McKay on
+61 2 6249 9003
email bill.mckay@ga.gov.au

Related websites/articles

AusGeo News 86: Onshore Energy Security Program takes off

www.ga.gov.au/ausgeonews/ausgeonews200706/onshore.jsp

Onshore Energy Security Program

www.ga.gov.au/minerals/research/oesp/

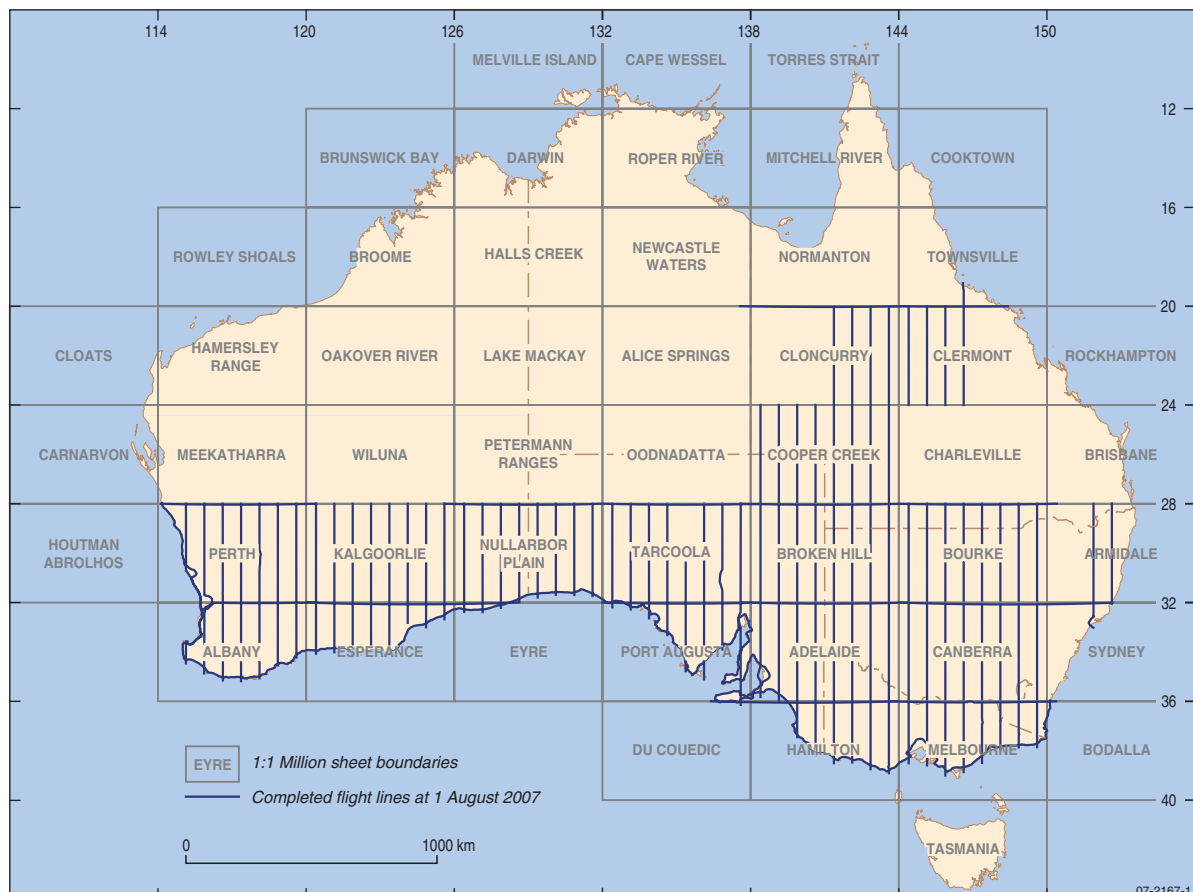


Figure 3. Flight-line pattern for the AWAGS2 magnetic and radiometrics survey showing progress to 1 August 2007.

UN duties continue for geoscientist

The senior advisor on Science and Law of the Sea with Geoscience Australia, Phil Symonds, has been elected to serve another five years as a member of the United Nations Commission on the Limits of the Continental Shelf. He has been a member of the Commission since April 2002 and his re-election came during voting in New York by the 153 countries which are party to the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

The 21-member Commission is a scientific and technical organisation which facilitates the establishment of the outer limit of a country's extended continental shelf by considering data and other materials submitted by countries.

The extended continental shelf is determined by UNCLOS formulae requiring information on water depth, the shape of the sea-floor and the thickness of sediment which is obtained from geological and geophysical surveys over the continental margin.

“The Commission’s recommendations on the submission ... could result in Australia gaining almost three million square kilometres of seabed and subsoil over which it will have environmental and resource management responsibilities.”

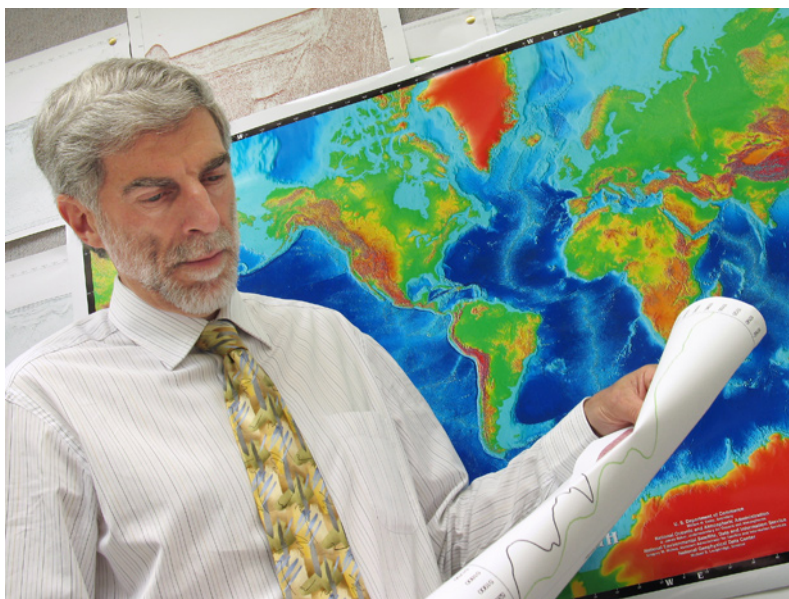


Figure 1. Phil Symonds.

Mr Symonds, who has extensive experience in the collection and analysis of continental margin data, has been closely involved in technical aspects of the United Nations Convention on the Law of the Sea since the late 1970s, and has worked in Geoscience Australia's Law of the Sea project since its inception in 1994. He is also involved in providing ongoing assistance to small-island and developing countries to help them meet the May 2009 deadline for lodging their submissions with the Commission.

Mr Symonds led the scientific team which prepared Australia's November 2004 submission to the Commission seeking extension of the country's jurisdiction beyond the 200 nautical mile exclusive economic zone to the outer limit of the extended continental shelf. The Commission's recommendations on the submission, which are expected later this year, could result in Australia gaining almost three million square kilometres of seabed and subsoil over which it will have environmental and resource management responsibilities.

Related websites

United Nations Convention on the Law of the Sea (UNCLOS)

www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm

New map for nickel and platinum explorers

On 16 May 2007 the price of nickel metal rose to an all-time record of US\$54 200 per tonne, surpassing the previous highest price of \$US23 900 per tonne achieved in 1988. The nickel price has been surging in response to strong demands, constrained supplies and low metal stockpiles, all reflecting robust worldwide economic growth, particularly China's increasing need for raw materials. Similar pressures are also affecting the prices of platinum-group elements (PGEs) such as platinum and rhodium.

Economic quantities of these metals are concentrated in mafic-ultramafic igneous rocks. These rocks are a major focus for minerals exploration in Australia, and past exploration booms have witnessed significant nickel discoveries. To assist mineral explorers, Geoscience Australia has released a new poster-size 1:4 000 000 scale colour map *A Synthesis of Australian Proterozoic Mafic-Ultramafic Magmatic Events. Part 2: Northern Territory and South Australia*.

This map includes details of nineteen major Proterozoic magmatic events and associated mineral deposits throughout the Northern Territory and South Australia. Inset maps show the locations of mineral deposits (figure 1) and the distributions of Large Igneous Provinces (LIPS: large volumes of coeval mafic magmatism). A Time-Space-Event chart summarises the geological ages that underpin the rock correlations on the map and relates mineralised events in Australia to major Ni-Cu-PGE deposits overseas.

This map is the second of a series showing, for the first time, the continental extent and age relationships of Proterozoic mafic and ultramafic rocks. It will be of interest to companies actively exploring for nickel, platinum-group elements, chromium, titanium, and vanadium, as well as to those interested in the geological evolution of the Australian continent. Along with Part 1 (Western Australia) which was released in October 2006, it can be downloaded free online in pdf and jpeg formats from Geoscience Australia's website.

For more information

phone Dean Hoatson on +61 2 6249 9593

email dean.hoatson@ga.gov.au

Related websites/articles

A Synthesis of Australian Proterozoic Mafic-Ultramafic Magmatic Events. Part 2: Northern Territory and South Australia

www.ga.gov.au/image_cache/GA10251.pdf

www.ga.gov.au/image_cache/GA10252.jpg

A Synthesis of Australian Proterozoic Mafic-Ultramafic Magmatic Events. Part 1: Western Australia

www.ga.gov.au/image_cache/GA8798.pdf

www.ga.gov.au/image_cache/GA8797.jpg

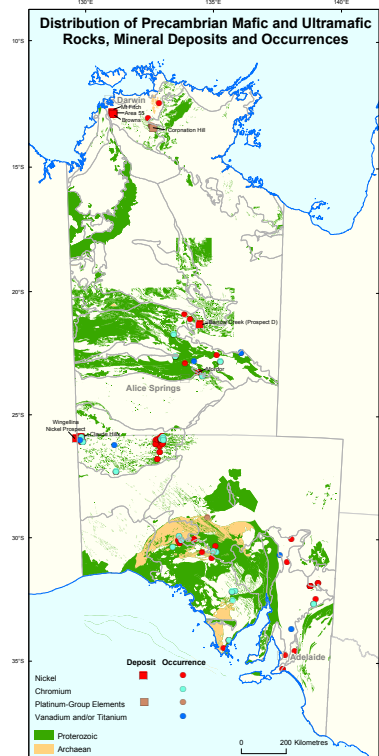


Figure 1. Section featured on the new map.

AusGeo News 84: New map for nickel explorers

www.ga.gov.au/ausgeonews/ausgeonews200612/productnews.jsp#product2

New geophysical datasets for Mount Isa area, Murchison region and Flinders Island

Datasets from five new geophysical surveys, released since April 2007, will be a valuable tool in assessing the mineral potential of the respective survey areas.

The new gravity surveys include three in the Mount Isa area in Queensland and one in the Murchison region of Western Australia as well as a new airborne magnetic and radiometric survey of Flinders Island in Tasmania.

Table 1. Details of the gravity surveys.

Survey	Survey Type	Date of Acquisition	1:250 000 Map Sheets	Station Spacing / orientation	Stations	Contractor
Mount Isa Area C (Qld)	Gravity	Oct 2006 – Feb 2007	Duchess, Urandangi, Glenormiston, Mt Whelan	2.0 x 2.0 km east – west on Duchess and Urandangi (eastern half); 4.0 x 4.0 km east – west elsewhere	9 236	Fugro Ground Geophysics
Mount Isa Area D (Qld)	Gravity	Feb – May 2007	Bedourie, Machattie, Connemara (western part), Birdsville, Betoota	4.0 x 4.0 km east – west traverses	4 903	Daishsat Geodetic Surveyors
Mount Isa Area E (Qld)	Gravity	Feb – May 2007	Richmond, McKinlay, Manuka, Mackunda, Winton (western part), Brighton Downs, Maneroo (north-west corner)	4.0 x 4.0 km east – west traverses	6 233	Daishsat Geodetic Surveyors
Murchison (WA)	Gravity	Feb – June 2007	Belele, Glengarry, Cue, Sandstone	2.5 x 2.5 km east – west traverses	3 555	Fugro Ground Geophysics

Table 2. Details of the airborne surveys.

Survey	Survey Type	Date of Acquisition	1:250 000 Map Sheets	Line Spacing/ terrain clearance/ orientation	Line km	Contractor
Flinders Island (Tas)	Magnetic, Radiometric, Elevation	Jan – Mar 2007	NE Tasmania	200 m 90 m east – west	17 900	UTS Geophysics

The data for all surveys were acquired in surveys conducted in 2006/07 which were managed by Geoscience Australia on behalf of the Geological Surveys of Queensland, Western Australia and Tasmania.

The data have been incorporated into the national geophysical databases. The point-located and gridded data for the four surveys can be obtained free online using the GADDS download facility.

Related websites

Geological Survey of WA
www.doir.wa.gov.au

Geological Survey of Qld
www.nrw.qld.gov.au/science/geoscience/

Geological Survey of Tasmania
www.mrt.tas.gov.au

For more information

phone Murray Richardson on +61 2 6249 9229

email murray.richardson@ga.gov.au

Estuary website expanded

Scientists, natural resource managers, policy makers and the community now have access to the largest central source of coastal information and data in Australia through the OzCoast and OzEstuaries website. Previously called OzEstuaries, it is used in more than 180 countries, territories, colonies and dependencies.

The latest version of the website includes a new Geology and Geomorphology (the study of landforms) module with 3D models and shallow water benthic habitat mapping case studies, an Environmental Management module and new information sheets on coastal issues related to climate change as well as the science underpinning commonly used estuary and coastal indicators.

The Environmental Management module, derived from the OzCoast database compiled by the Cooperative Research Centre for Coastal Zone, Estuary & Waterway Management (Coastal CRC), shows how data, planning and participation processes can be used in developing, implementing and reviewing catchment and coastal plans.

The data and information can be used to improve natural resource management and the conservation of Australia's coastal zone, estuaries and near-shore environments. Users can download maps, images, reports and data as well as build their own conceptual model depicting pressures and stressors on different coastal environments and utilise search tools to find information on stakeholders, regional plans and strategies and other coastal topics.

The website was designed with input from well over 100 scientists from 40 agencies including government, universities, private industry and the National Estuaries Network. The former Coastal CRC and the National Land and Water Resources Audit (NLWRA) were instrumental in coordinating communication between these agencies.

The name OzCoast and OzEstuaries is transitional and the site will assume the name OzCoasts in July 2008.



For more information

phone Lynda Radke on
+61 2 6249 9237

email lynda.radke@ga.gov.au

Related websites

OzCoast and OzEstuaries website
www.ozcoasts.org.au/

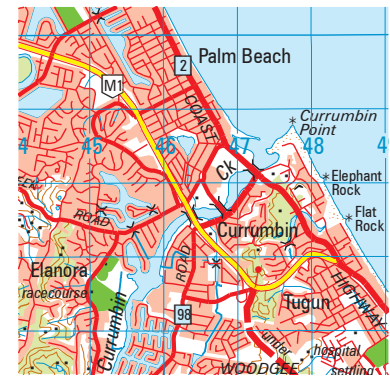


Figure 1. Section of Beenleigh map showing street pattern.

New 1:100 000 scale maps to help emergency management

Geoscience Australia has recently released three new 1:100 000 scale topographic maps covering the Brisbane – Gold Coast area (Beenleigh and Murwillumbah Special) and the area west from Beaudesert to Mt Lindesay (Mount Lindesay).

These maps have been produced using data captured at 1:25 000 scale as part of the collaborative arrangement between Geoscience Australia and the Queensland Government Departments of Emergency Services (DESQ) and Natural Resources and Mines (NRM) supplemented with data supplied by the New South Wales Department of Lands which is held at scale by Geoscience Australia.

Production of these maps is part of a pilot program of mapping for emergency management in which Geoscience Australia played a significant role through the coordination and purchase of satellite imagery required for the map revision.

The maps are an example of the 'map once, use many' approach where data captured as part of the pilot project is merged with data at different scales to provide sufficient information to enable maps at various scales to be produced. During production various cartographic enhancements are incorporated into the final maps. The extended detail of streets within built up areas is a feature of the new maps and this information closely represents the data at 1:25 000 scale.

Geoscience Australia is currently using data sourced as part of the pilot mapping initiative to produce five 1:100 000 scale maps covering the Mackay – Proserpine area and seven maps covering the Bundaberg area. Areas still to be mapped include Cairns, the Condamine area west of Toowoomba and Warwick in Queensland as well as the West MacDonnell Ranges in the Northern Territory. Collaborative mapping of the pilot areas in the other states is also well advanced.

For more information

phone Geoscience Australia Sales Centre on Freecall 1800 800 173
(in Australia) or +61 2 6249 9966

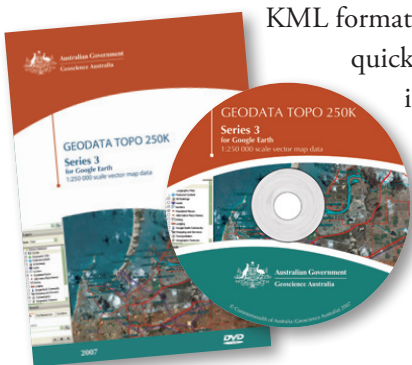
email sales@ga.gov.au

GEODATA TOPO 250K Series 3 broadens its appeal

Geoscience Australia's popular *GEODATA TOPO 250K Series 3* topographic vector data is now available for general use without the need for expensive or sophisticated Geographic Information Systems (GIS).

GEODATA TOPO 250K Series 3 for Google Earth is based on 1:250 000 scale vector data and utilises the popular Google Earth™ Mapping Service platform (Google Earth™) to overlay the topographic data on the existing satellite imagery using Google Earth's own viewer. Google Earth™ Mapping Service is an online interactive browser for geospatial data which requires data in

KML format. The data is cut into tiles to facilitate quick and efficient display and is arranged in nine main themes: elevation, framework, habitation, hydrography, infrastructure, terrain, transport, utility and vegetation.



Viewers can switch data layers on or off and delete or add them. While the satellite imagery shows detail at moderate to high resolution and with a high spatial accuracy, the data complements this by confirming which features are present and describing them with a range of attribution.

Because no background in mapping or GIS is required to use Google Earth™, presenting GEODATA TOPO 250K data through the Google Earth™ Mapping Service with a satellite image backdrop marks an exciting development that has great potential to broaden the use and appeal of this data, making it even more accessible to users.

GEODATA TOPO 250K Series 3 for Google Earth is available on DVD ROM from the Geoscience Australia Sales Centre and select map retailers.

For more information

phone Geoscience Australia Sales Centre on Freecall 1800 800 173
(in Australia) or +61 2 6249 9966

email sales@ga.gov.au

Related websites

GEODATA TOPO 250K Series 3
www.ga.gov.au/ausgeonews/ausgeonews200609/productnews.jsp#product1



Kalgoorlie '07—Old Ground, New Knowledge

25 to 27 September

The School of Mines, Kalgoorlie
Contact: Ms Jocelyn Thomson, Secretariat Geoconferences (WA) Inc
PO Box 4052, Victoria Park WA 6979
email jaytee@iinet.net.au
www.kalgoorlie07.org/

Mining 2007

31 October to 2 November

Hilton Brisbane
Contact: Vertical Events, PO Box 1153, Subiaco WA 6904
phone +61 8 9388 2222
fax +61 8 9381 9222
email info@verticalevents.com.au
www.verticalevents.com.au/mining2007/

IMTA (Asia Pacific) Conference & Trade Show

2 & 3 November

International Map Trade Association
Gold Coast International Hotel, Surfers Paradise
Contact: Noleen Zander, Asia Pacific Region Office, PO Box 1112, Unley SA 5061
phone +61 8 8357 1777
email imtaaspac@chariot.net.au
www.maptrade.org/events/

China Mining Congress

13 to 15 November

Beijing International Convention Center, Beijing
Contact: Doug Bowie, Vertical Events, PO Box 1153, Subiaco WA 6904
phone +61 8 9388 2222
fax +61 8 9381 9222
email info@verticalevents.com.au
www.china-mining.com/

NewGenGold

15 & 16 November

Paydirt Media Ltd & Keith Yates and Associates Ltd
Sheraton Perth Hotel, Perth
Contact: Kay Matheson, Paydirt Media Pty Ltd, PO Box 1589, West Perth, WA 6872
phone +61 8 9321 0355
fax +61 8 9321 0426
email kay@paydirt.com.au
www.newgengold.com/

19th International Geophysical Conference & Exhibition

18 to 22 November

Australian Society of Exploration Geophysicists

Perth Convention & Exhibition Centre

Contact: Promaco Conventions Pty Ltd, PO Box 890, Canning Bridge, WA 6153

phone +61 8 9332 2900

fax +61 8 9332 2911

email promaco@promaco.com.au

www.promaco.com.au/2007/aseg/

NAPE Expo 2008

7 & 8 February

American Association of Professional Landmen

Houston, Texas, USA

Contact: NAPE, 4100 Fossil Creek Boulevard, Fort Worth, Texas 76137 USA

phone +1 817 847 7700

fax +1 817 847 7703

email info@napeexpo.com

www.napeonline.com

KALGOORLIE 2007

Kalgoorlie, 25 to 27 September

Interested in the highlights of two decades of research in the mineral-rich Yilgarn Province?

Geoscience Australia is making a major contribution to the upcoming Kalgoorlie 2007 Conference with a pre-conference field trip, a Keynote presentation, and four invited presentations.

Presentations during the conference include:

- Putting it all together; anatomy of a giant hydrothermal system (Keynote)
- Tectonic framework of the Eastern Goldfields Superterrane
- An overview of the Yilgarn Craton and its evolution
- How does the 3D architecture of the Yilgarn control hydrothermal fluid focussing?
- Tertiary palaeochannels: geology and metallogenic significance

The pre-conference field trip will be the first public release of the results of a structural study from the AMIRA P763-Y1 project. Participants will view ten gold mines including Leinster, Leonora, Menzies and Laverton to illustrate the different structural controls of gold mineralisation in a range of rocktypes, structural settings and events.

There will also be poster sessions during the conference. For more information visit www.kalgoorlie07.org/.

OLD GROUND NEW KNOWLEDGE