



Contents

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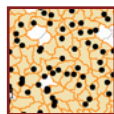
2



Offshore energy program underway

3

New programs to improve resource estimate



Onshore Energy Security Program update

6

ambitious five-year program gathers data



New opportunities for offshore petroleum exploration

10

2008 Acreage Release focuses on North West Shelf



Assessing natural disaster risk in the Asia-Pacific region

16

Supporting international development through natural hazard research

In brief

Australia's marine jurisdiction extended

22

SHRIMP joins hunt for exploration targets

23

Life under the ice

23

Product News

New Charters Towers region gravity datasets

24

Proterozoic mineralising events maps

24

New publication on the Lake Violet 100 000 sheet area

25

Events

26



CEO *comment*



Neil Williams – CEO Geoscience Australia



The United Nations Commission on the Limits of the Continental Shelf has confirmed the location of the outer limit of Australia's continental shelf in nine distinct marine regions, which entitles Australia to an additional 2.5 million square kilometres of continental shelf beyond the 200 nautical miles limit. For Geoscience Australia's Law of the Sea and Maritime Boundaries Advice project this confirmation is the culmination of 15 years of cutting edge work and I would like to recognise the dedication and ongoing commitment shown by the project team.

This issue includes an outline of our forward program of offshore frontier basin research to identify a new oil province. The Offshore Energy Security Program will focus on the Remote Eastern Frontiers, including the Capel and Faust basins (see *AusGeo News* 89), the Southwest Margin, including the Mentelle Basin and sub-basins of the North Perth Basin and southern Carnarvon Basin, and the Southern Margin including the Bass and Sorell Basins and the Bight Basin. The other major research effort will be the development of petroleum systems models for the 'Producing regions' of the North West Shelf.

The update on the Onshore Energy Security Program reports on the deep crustal seismic reflection survey in the Darling Basin conducted in conjunction with the New South Wales Department of Primary Industries. The article also reports on scheduled surveys in South Australia and the Northern Territory and progress of the National Geochemical Survey of Australia.

This years' release of Offshore Acreage for petroleum exploration includes areas which cover a wide range in size, water depth and exploration maturity. The article on the 2008 Release includes details of the release areas which provide investment opportunities suited to both large and small investors. Geoscience Australia has provided a number of data packages to assist explorers in reviewing potential acreage as well as the Acreage Release Data Room at our Symonston ACT headquarters.

With increasing recognition that disasters erode hard-won development gains, international policymakers have focussed on disaster risk reduction. The article on Geoscience Australia's contributions to Australia's international aid program outline the

natural hazard risk assessments used to identify areas and countries in the Asia-Pacific region at high risk from one or more natural hazards.

There is also a report on the launch of Geoscience Australia's sensitive **high resolution ion microprobe (SHRIMP)** by the Minister for Resources, Energy and Tourism, the Hon. Martin Ferguson AM MP on 1 April. This in-house facility will significantly increase the amount of high-quality data about the age of Australian rocks for resources exploration companies, government geoscience agencies and researchers.

New products reported on include: new gravity data covering the Charters Towers region in Queensland and a report on the geology of the Lake Violet sheet area in the northern part of Western Australia's Yilgarn Craton produced in association with the Geological Survey of Western Australia.

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



Offshore energy program underway

New programs to improve resource estimate



Peter Southgate

Geoscience Australia's Offshore Energy Security Program, which commenced in 2006 and extends to 2011, will provide high-quality pre-competitive data and information to help stimulate petroleum exploration in Australia. The forward program, developed in consultation with industry will focus on three offshore frontier regions:

- Remote eastern frontiers, offshore eastern Australia
- Southwest margin
- Southern margin.

Petroleum systems modelling in the current producing regions will form part of Geoscience Australia's ongoing core petroleum program. These studies are aimed at improving resource estimates and stimulating further exploration. Negotiations are currently underway with a number of organisations to partner with Geoscience Australia to deliver these models.

“Geoscience Australia's Offshore Energy Security Program, will provide high-quality pre-competitive data and information to help stimulate petroleum exploration in Australia.”

Remote eastern frontiers

New geophysical and geological datasets have been acquired from the Capel and Faust basins some 800 kilometres east of Brisbane in water depths between 1300 and 2500 metres (figure 1). Between December 2006 and January 2007, Geoscience Australia acquired about 6000 kilometres of industry standard 2D seismic data using an eight kilometre solid streamer.

The survey identified numerous depocentres (or areas of maximum deposition), some up to 150 kilometres long and 40 kilometres wide with up to seven kilometres of sediment fill. Initial interpretation has identified a potential pre-rift succession, three syn-rift phases

(clastic/volcanic), and two post-rift carbonate packages. Episodes of post-rift igneous activity are apparent, and possible correlations with the Capricorn, Great South and/or deepwater Taranaki basins are suggested.

In late 2007, the research vessel *Tangaroa* completed a marine reconnaissance survey of the Capel and Faust basins. Geophysical datasets acquired on that survey included gravity, magnetics, multibeam sonar and sub-bottom profiler data. An accompanying seafloor sampling program acquired geological and biological samples from potential seepage sites and representative areas of the sea floor.

The dual aim was to search for indications of active petroleum systems and document marine biodiversity and habitats. These datasets are designed to better define the region's petroleum prospectivity and inform marine and environmental planning decisions.

The multibeam sonar revealed seafloor features that appear to reflect the underlying basin structure, such as fault-related slumps. The gravity and magnetic coverages are expected to significantly improve the delineation of

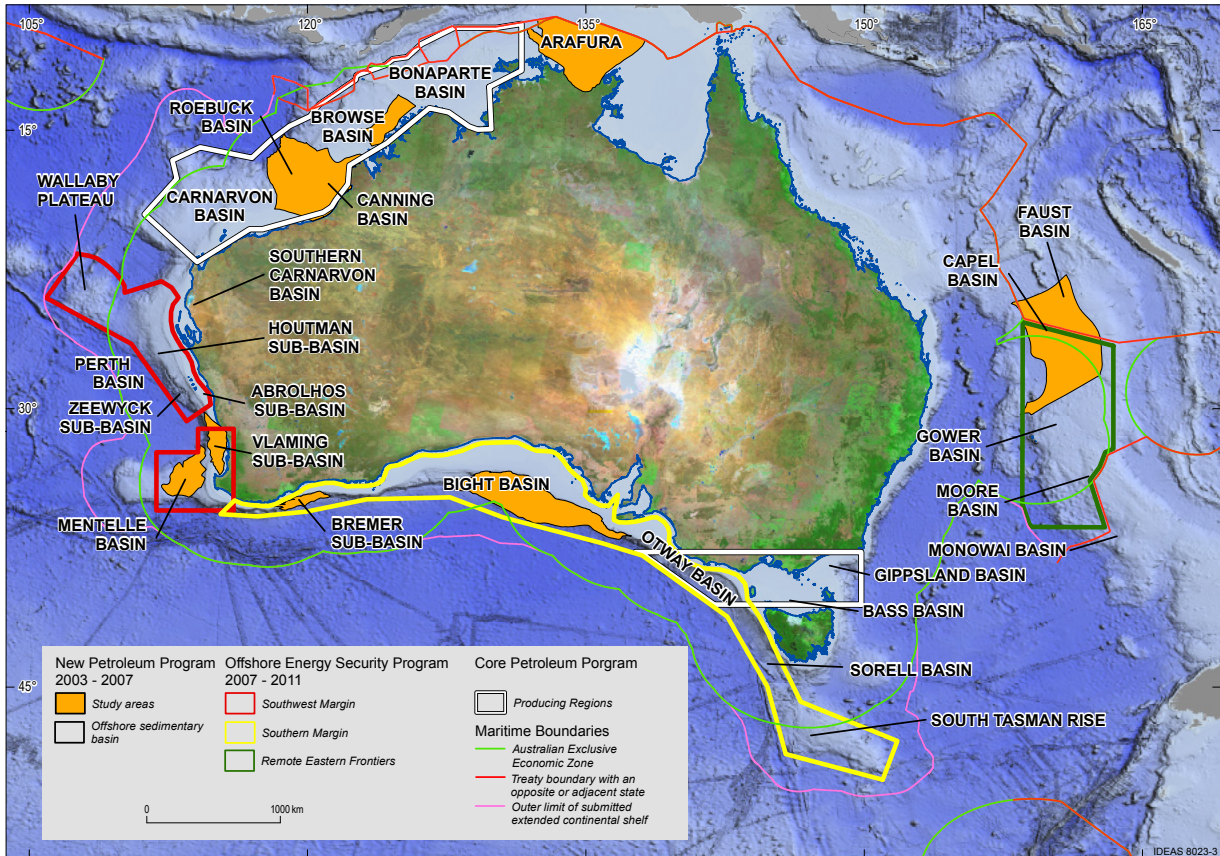


Figure 1. Frontier basins targeted for geophysical and geological datasets acquisition under the Offshore Energy Security Program. Studies in the producing regions of the North West Shelf and Bass Strait region will involve synthesis studies.

deponent boundaries. Seafloor sampling and camera footage provided information on the substrate composition and potential fluid escape sites. Current work involves the initial interpretation of these datasets and their integration to define the rift basin architecture and tectonostratigraphic history to better understand the region's petroleum prospectivity.

Southwest margin

During the New Petroleum Program (2003 to 2007), Geoscience Australia collected 2D seismic data in the Bremer, Perth and Mentelle basins off southwestern Australia. Acreage in the Bremer Basin was released to industry in 2005, and a 50-kilometre seismic grid has been interpreted for the Mentelle Basin.

Between November 2008 and March 2009, Geoscience Australia will undertake two major surveys to investigate the Mentelle Basin and the Abrolhos, Houtman and Zeewyck sub-basins of the North Perth Basin and the southern Carnarvon Basin (figure 1).

Seismic acquisition in the Mentelle Basin will infill the current 50-kilometre grid to provide a dataset with a line spacing of 20 to 30 kilometres. The improved seismic grid will provide critical data on basin shape and sediment architecture, permitting petroleum systems

models to be developed at the regional scale. The schedule for seismic acquisition, processing and interpretation suggests a 2010 date for release of acreage in the Mentelle Basin.

The deep water Houtman and Zeewyck sub-basins and the north Perth and south Carnarvon basins will be the focus for new acquisition of 2D seismic data and the reprocessing of open-file industry seismic data. Open-file seismic data from the shallow water Abrolhos Sub-basin will be used to constrain the deeper water stratigraphies of the Houtman and Zeewyck sub-basins where petroleum exploration well information is limited.



A marine reconnaissance survey to this region will assist in the resolution of basin depocentres and provide the opportunity to dredge outcropping strata in submarine canyons so that ages, lithologies and source potential can be determined and the seismic data constrained.

The Wallaby Plateau is a poorly understood fragment of continental crust in the southern parts of the Carnarvon Basin. It has been suggested that a reconnaissance seismic acquisition grid and geological sampling program would provide insights into the location of potential depocentres and, secondly, into whether or not gas-producing stratigraphies of the Exmouth Plateau may extend to the southwest.

Southern margin

Over the past 10 years, Geoscience Australia, in partnership with the Victorian, Tasmanian, South Australian and Western Australian geological surveys, has undertaken studies in the Bass, Otway, Sorell, Duntroon, Bight and Bremer basins that define the continent's southern margin (figure 1). The southern margin synthesis study aims to integrate the results of this earlier work to better understand the break-up history between Australia and Antarctica, resolve outstanding stratigraphic correlation problems and permit improved resource prediction.

A cooperative National Geoscience Agreement project between Geoscience Australia and the Tasmanian Geological Survey is funding the acquisition of about 104 000 line-kilometres of airborne magnetics data at a line spacing of 800 metres in the Bass and Sorell basins off Tasmania. Acquisition was completed in March and, at the time of writing, was scheduled for release in late May.

The new data will allow improved resolution of offshore structure and the distribution of volcanic rocks and intrusive bodies. The program also includes acquisition of 2D seismic data from the Sorell Basin and possibly over the South Tasman Rise in subsequent years.

In February–March 2007, a prospectivity validation survey to the Bight Basin recovered source rocks of Cenomanian–Turonian age, with total organic carbon (TOC) values between 2% and 6.2% and hydrogen indices (HI) values between 274 and 479.

These data clearly demonstrate the existence of a good-quality source rock in the Bight Basin, and studies are underway to establish whether correlations exist between these rocks and the asphaltite strandings common on the southern margin. There are also 2D petroleum systems modelling studies underway for the Bight Basin to further support upcoming acreage releases in 2009 and 2010.

Producing regions

Most of the exploration areas offered to market via the acreage release program are in producing regions of the North West Shelf, Otway and Gippsland basins (areas shown within the white polygons in figure 1). As those areas continue to mature and areas are returned to market

after industry relinquishment, it is essential that new information be provided to support their re-release.

Future work by Geoscience Australia in these areas will be at the regional, basin and sub-basin scales, with stratigraphic and structural syntheses leading to the development of petroleum systems models. The success of this program will depend on the development of partnerships between Geoscience Australia and external organisations able to provide access to 3D seismic datasets, petroleum systems modelling skills, basin analysis skills, and analytical skills to constrain elements of the petroleum systems.

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Related websites/articles

AusGeo News 89: Survey of remote eastern frontier basins completed

www.ga.gov.au/ausgeonews/ausgeonews200803/survey.jsp

AusGeo News 87: Promising results from the Bight Basin survey

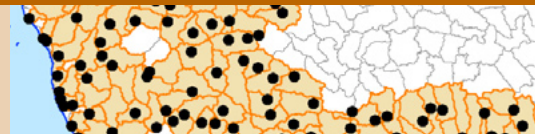
www.ga.gov.au/ausgeonews/ausgeonews200709/bight.jsp

AusGeo News 86: Promising results from Capel and Faust basins seismic survey

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

Onshore Energy Security Program update

Ambitious five-year program gathers data



James Johnson and Ned Stolz

Geoscience Australia's Onshore Energy Security Program (OESP) is applying the latest geophysical imaging and mapping technology to boost investment in exploration for onshore energy resources such as petroleum, uranium, thorium and geothermal energy.

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

Deep reflection seismic data

In conjunction with the New South Wales Department of Primary Industries, Geoscience Australia has completed a deep crustal seismic reflection survey in the Rankins Springs trough and Yathong trough of the Darling Basin. The survey area is interpreted as an extensive sediment-filled structural low, a large part of which attains basement depths in excess of 3500 metres. Previous seismic coverage of these troughs was virtually non-existent, and this survey will therefore provide a step change in information on the basin architecture across the region.

Two traverse lines totalling 234 kilometres of high-resolution reflection seismic data were acquired by Terrex Seismic (figure 1) in March 2008. The energy source was three truck-mounted Hemi50 vibrators, and data were recorded for 22 seconds, giving a depth penetration of more than 60 kilometres. Preliminary analysis of field stacks of line RS2 (figure 2) has interpreted sediments of the Darling Basin and a possible underlying older basin. Data from both lines are

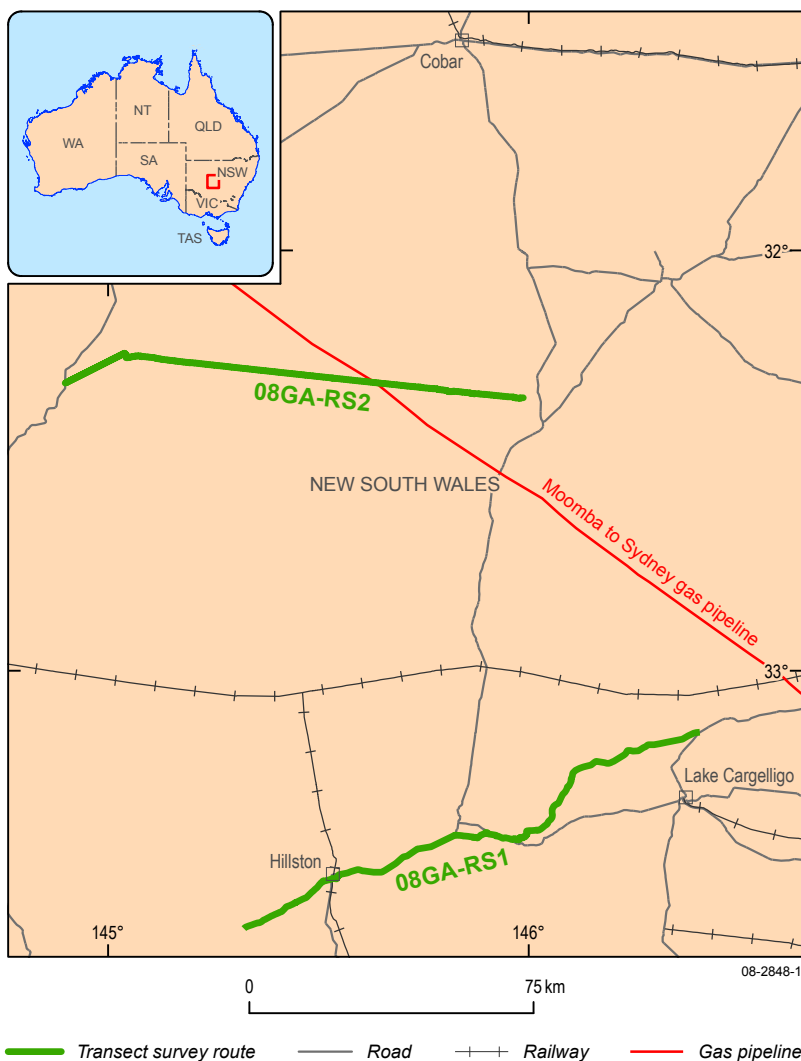


Figure 1. Rankins Springs seismic survey traverse line location map.

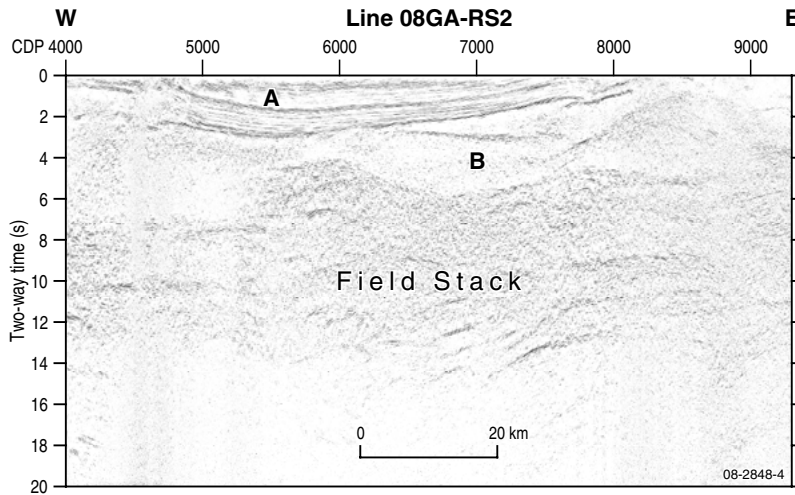


Figure 2. Field stack of line 08GA-RS2 showing interpreted sediments of the Darling Basin (A), and a possible underlying older basin (B).

now being processed in-house by Geoscience Australia's geophysicists, and the results will be released to industry later this year.

The next seismic survey acquisition program under the OESP is scheduled to commence in June in South Australia. That survey consists of three traverse lines (figure 3)—one line in each of the Gawler and Curnamona provinces and the Arrowie Basin. The data will be used for the assessment of uranium, geothermal and hydrocarbon resource potential in these important mineral and energy provinces of South Australia.

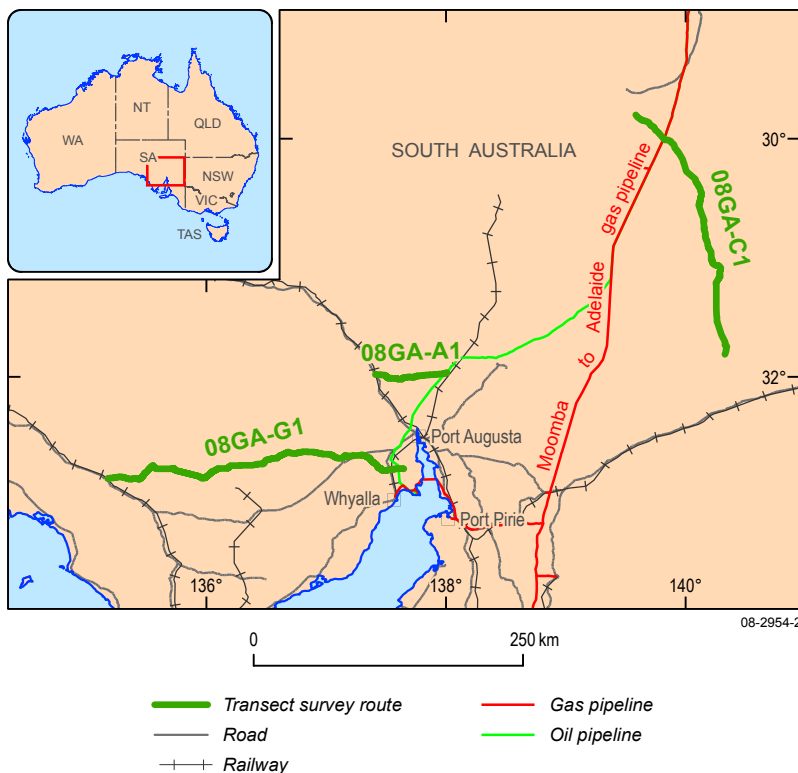


Figure 3. Gawler-Curnamona-Arrowie seismic survey proposed traverse line location map.

Australia-wide airborne geophysical tie-line survey

Data from the recently completed Australia-wide airborne geophysical tie-line survey (AWAGS2) survey were supplied to Geoscience Australia in March for quality assurance / quality control testing and initial processing. Results from the survey are scheduled to be released during the last quarter of 2008.

This survey, which was flown across the entire Australian mainland and Tasmania, acquired more than 156 700 kilometres of radiometric and magnetic data on north-south flight lines spaced 75 kilometres apart, with a nominal flying height of 80 metres above ground level.

The processed radiometric data from AWAGS2 will form the Australian Radioelement Datum and be used to adjust data in the National Radiometric Database (all Commonwealth and state public-domain data) to the new datum. The survey will also be the datum for airborne radiometric data acquired in the future.

The processed magnetic data will increase the resolution of the Australian Magnetic Anomaly Map and will be incorporated into continental-scale datasets. This will fill the gap between wavelengths of about 100 kilometres from standard airborne surveys and wavelengths exceeding 400 kilometres from satellites.

Airborne electromagnetic surveys

The Paterson airborne electromagnetic (AEM) survey is the first AEM survey to be conducted under the OESP. The contractor ceased flying in November 2007 to avoid the hot summer months which cause unstable flying conditions and recommenced in May 2008. This survey is scheduled to be completed by mid-2008; results are to be released towards the end of 2008.

The Pine Creek AEM survey (figure 4) is the next AEM survey to be conducted under the OESP, and is expected to commence flying in the second half of 2008. Data will be collected on 5 km, 2 km and 1.66 km spaced lines over a large region around Pine Creek and to the east of Kakadu National Park. A number of companies exploring in the area have also expressed interest in sponsoring additional infill lines over their tenement areas.

The results will be used to assess the region's potential for uranium resources by mapping the relevant unconformity and structures, as areas adjacent to Kakadu are considered to be highly prospective for uranium. The Ranger uranium mine, which started operating in 1980, is close to the region of the new survey. The AEM data will also assist the mapping of subsurface water resources within the survey area.

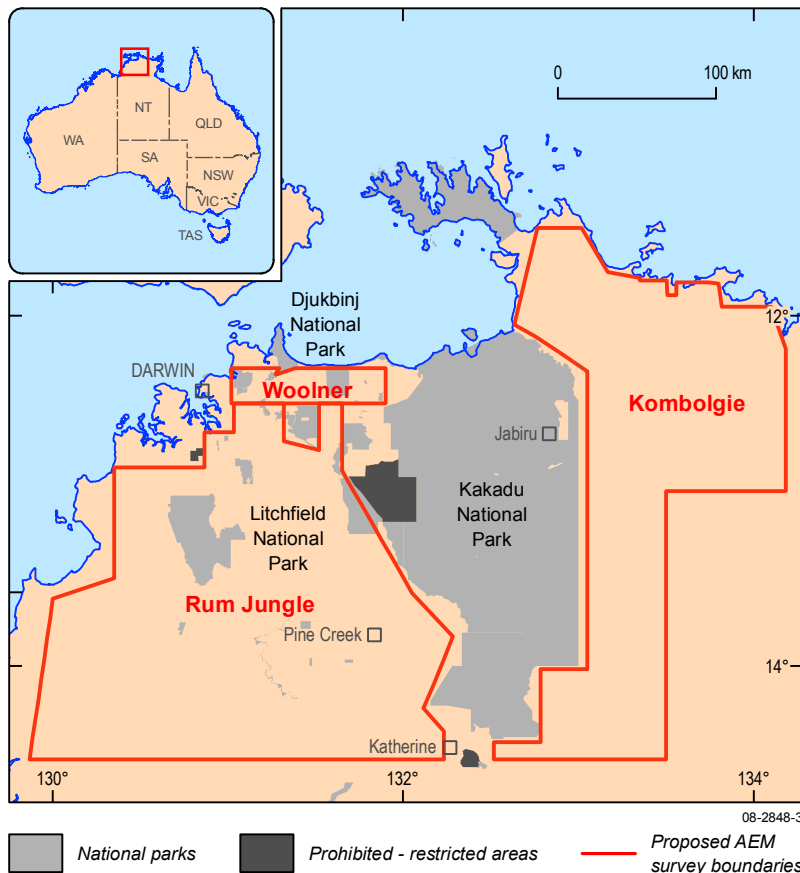


Figure 4. Proposed airborne electromagnetic survey area, Pine Creek Region, Northern Territory.

National Geochemical Survey of Australia

The National Geochemical Survey was initiated to complement the results of the AWAGS2 Australia-wide airborne radiometric survey and improve the existing knowledge of concentrations and distributions of energy-related elements such as uranium and thorium at the national scale. It will also provide complete uniform geochemical coverage across Australia.

Sampling of surface and subsurface transported regolith at the outlets of large catchments for the project is now underway in all states and in the Northern Territory (figure 5). Of about 1500 sites selected to cover all of Australia, 50 percent had been received at Geoscience Australia by 31 May. Sample preparation (drying, sieving, milling, etc.) has started, and preliminary testing of analytical instruments and methods has commenced. The field work component of the survey is due to be completed by 31 December 2008.

Regular updates on the OESP are available through the program's website, which contains information on the program, summaries of current and planned surveys, and recent presentations. The program's five-year plan, which is included on the site, provides further information on 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*.

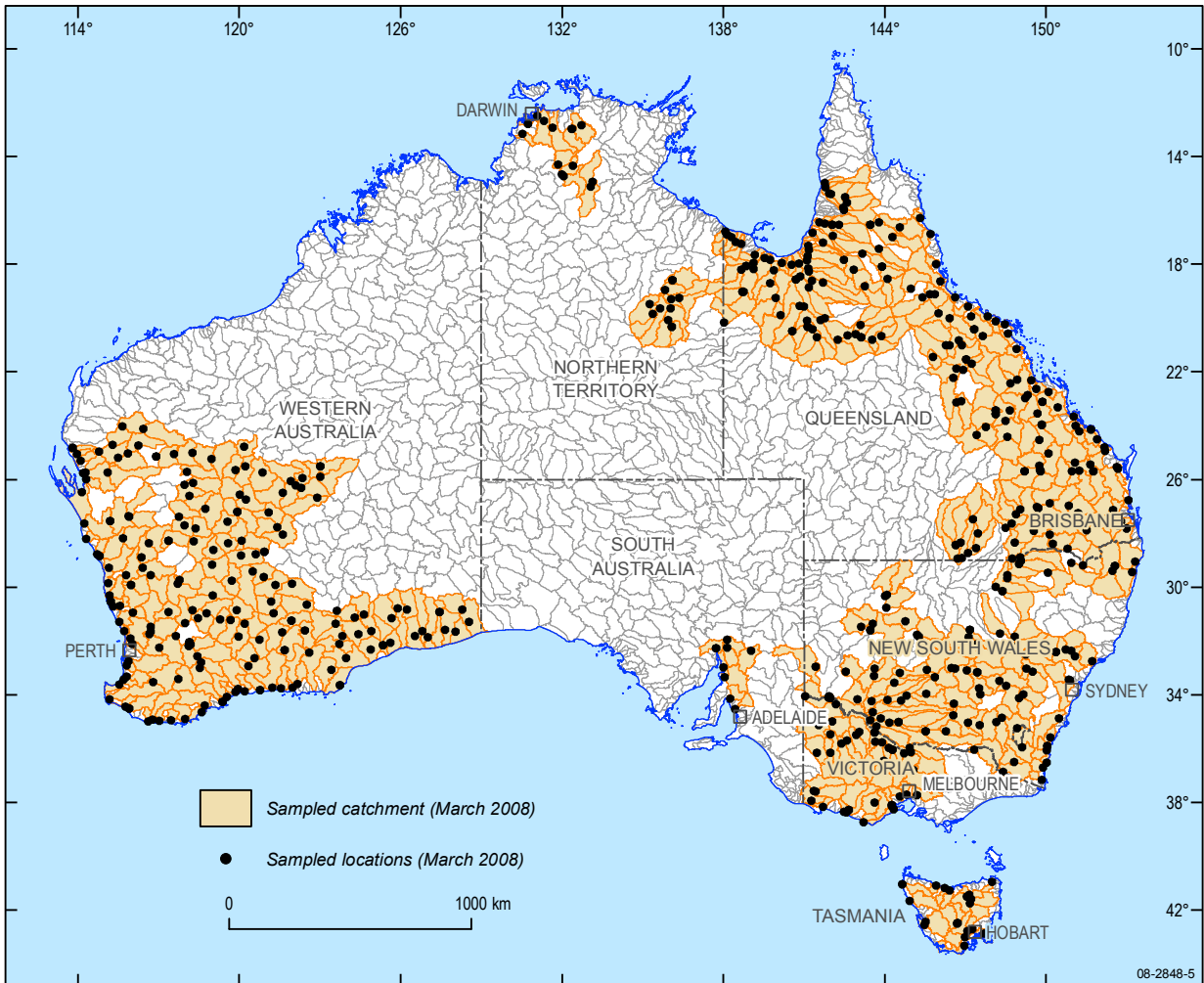


Figure 5. Sampling of surface and subsurface transported regolith for the National Geochemical Survey to 31 March 2008.

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Related websites/articles

Onshore Energy Security Program

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

AusGeo News 86: Onshore Energy Security Program takes off

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

AusGeo News 88: Flight to find new energy resources

www.ga.gov.au/ausgeonews/ausgeonews200712/onshore.jsp



New opportunities for offshore petroleum exploration

2008 acreage release focuses on North West Shelf

Marita Bradshaw

Each year the Australian Government releases new offshore opportunities for petroleum exploration. The 2008 release of offshore petroleum exploration areas was announced on 7 April by the Hon. Martin Ferguson AM MP, Minister for Resources and Energy, at the annual Australian Petroleum Production and Exploration Association conference held in Perth.

“They cover a wide range of sizes, water depths and exploration maturity, providing opportunities to a diversity of petroleum exploration companies.”

Thirty-five new exploration areas in five offshore sedimentary basins are offered in the 2008 release. All areas are available through a work program bidding system, with closing dates for bids at six and twelve months from the date of release. Acreage in the first round closes on 9 October 2008 and includes the more explored areas. The second closing round on 9 April 2009 comprises acreage located in less well explored and frontier regions.

The 2008 acreage release areas are in Commonwealth waters offshore of Western Australia and the Northern Territory, and in the Territory of the Ashmore and Cartier Islands Adjacent Area. They cover a wide range of sizes, water depths and exploration maturity, providing opportunities to a diversity of petroleum exploration companies. The release areas are selected from nominations from industry, the states, the Northern Territory, and Geoscience Australia.

The focus of the 2008 release is on the North West Shelf, where there is strong industry interest in the producing Carnarvon and Bonaparte basins and in the Browse Basin, the home of super-giant gas fields under active consideration for development.

Also included in the 2008 release is the Bedout Sub-basin of the Roebuck Basin, located on the central North West Shelf between the hotly contested Carnarvon and Browse basins. In addition, the release showcases the southern Vlaming Sub-basin, Perth Basin, where



recent studies by Geoscience Australia have provided a new understanding of petroleum potential (figure 1).

Bonaparte Basin

Fifteen of the release areas are in shallow water in the Bonaparte Basin, and represent a range of geological settings. The Bonaparte Basin is on Australia's northwest continental margin and contains up to 15 kilometres of Phanerozoic marine and fluvial siliciclastics, as well as marine carbonates. The basin is structurally complex and comprises Palaeozoic and Mesozoic sub-basins and platform areas with a number of proven petroleum systems for both oil and gas. The 2008 release areas on offer in the Bonaparte Basin (figure 2) include areas on the eastern (AC08-5 and AC08-6) and western (AC08-4) margins of the proven Mesozoic oil kitchen of the Vulcan Sub-basin and on the adjacent Ashmore Platform (AC08-1, AC08-2 and AC08-3).

Also available in the Bonaparte Basin are areas that have access to proven Palaeozoic petroleum

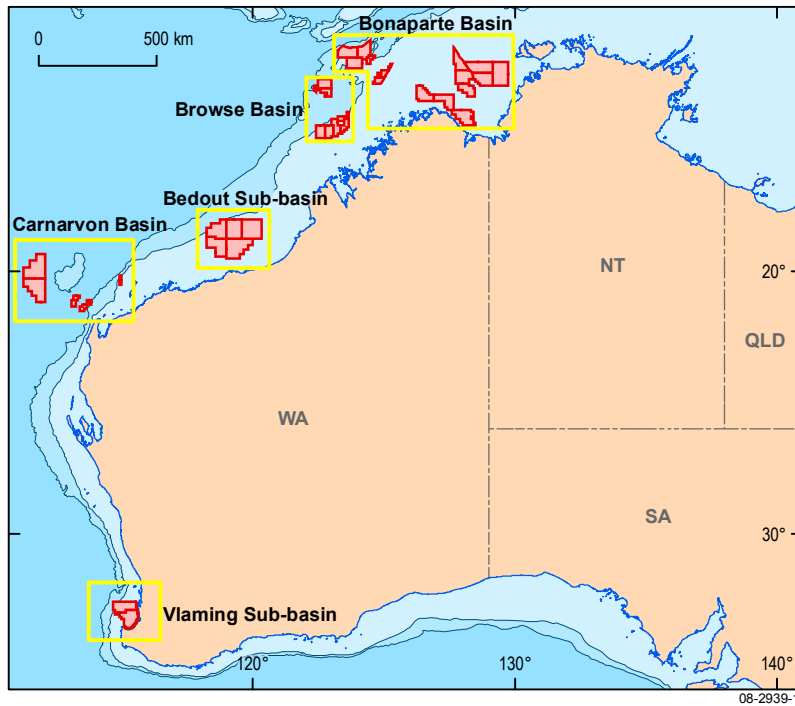


Figure 1. Location of Australia's 2008 offshore petroleum exploration areas.

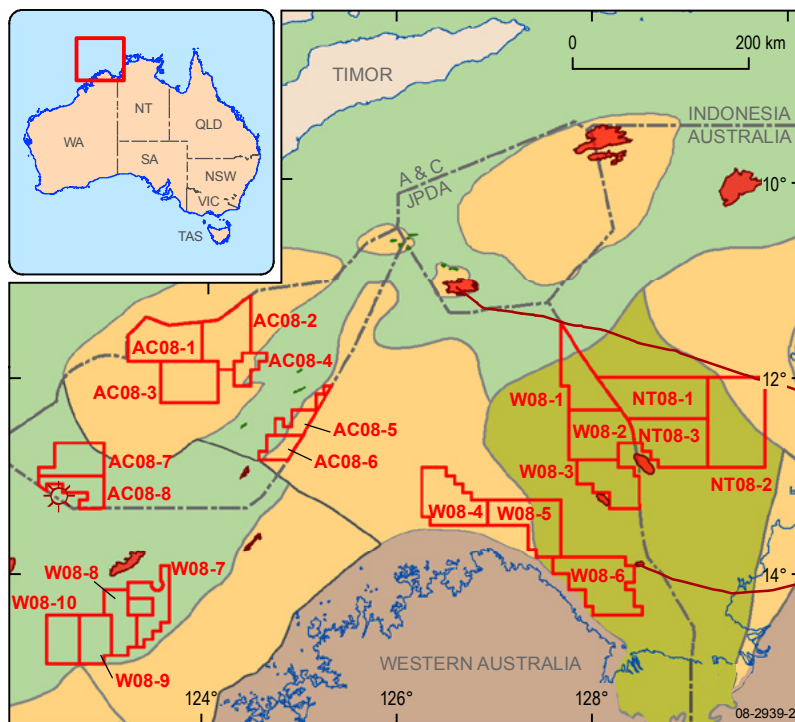


Figure 2. Regional setting of the Bonaparte and Browse basins, showing the location of the 2008 release areas, major fields and structural elements.

Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPInfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year. Field outlines for Comea and Ichthyis are sourced from IHS Energy, 2006.

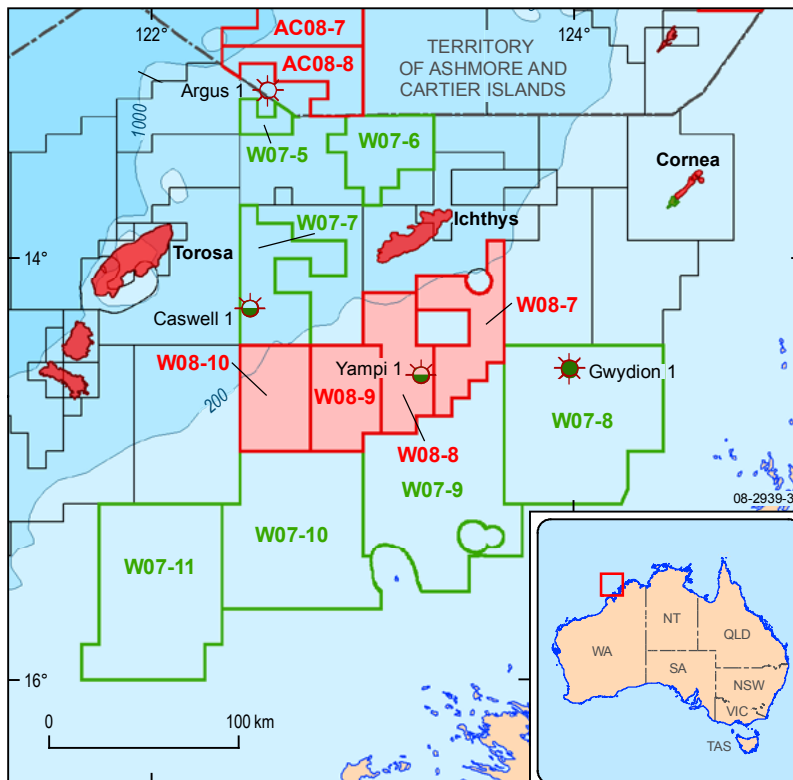
- | | |
|-------------------------|--|
| Mesozoic Sub-basin | Oil field |
| Mesozoic Platform/Shelf | Gas field |
| Palaeozoic Sub-basin | 2008 release area |
| Precambrian Basement | Gas Pipeline |
| | Petroleum exploration well - gas discovery |

systems. Release areas NT08-1, NT08-2 and NT08-3, and W08-1, W08-2 and W08-3 overlie the Petrel Sub-basin and are within the mapped extent of the proven Permian Hyland Bay/Keyling-Hyland Bay petroleum system, which has sourced the nearby major gas discoveries of Petrel, Tern and Blacktip. The Blacktip gas-condensate field is currently under development to supply gas to Darwin via pipeline (figure 2). On the underexplored and shallow water western margin of the Petrel Sub-basin, three release areas are available. Areas W08-4, W08-5 and W08-6 are on the Londonderry High – Berkley Platform and are adjacent to significant hydrocarbon discoveries and to proven Permian and Carboniferous petroleum systems.

Browse Basin

Six areas are available for bidding in the Browse Basin, which is a northeast trending, Palaeozoic to Cenozoic depocentre up to 15 kilometres thick situated entirely offshore in the Timor Sea region of Australia's North West Shelf. The Browse Basin hosts significant, but as yet undeveloped, reserves of gas (~30 trillion cubic feet) and condensate (>400 million barrels) mostly in five large gas fields—Scott Reef (Torosa), Brecknock, Brecknock South (Calliance), Ichthys and Crux—together with a number of other smaller discoveries. Release areas AC08-7 and AC08-8 are on offer in the northern Caswell Sub-basin, directly adjacent to the Argus gas field in water depths between 400 and 1450 metres.

Four release areas are available in the central Caswell Sub-basin, nearby or adjacent to the giant Ichthys gas accumulation where aggressive appraisal drilling programs are underway. Thick, rich source rocks and excellent reservoir and competent seal facies have been demonstrated within the stratigraphic section of the Caswell Sub-basin. The release areas W08-7, W08-8, W08-9 and W08-10 lie within this Early Cretaceous petroleum system delimited by the Cornea and Gwydion oil fields to the east and the Caswell 2 oil accumulation to the west (figure 3).



Well symbols supplied by Geoscience Australia (basic data open file) and Encom Petroleum Information Pty Ltd (basic data confidential). These were generated from open file data as at 31 Jan 2008. Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPInfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year. Field outlines for Cornea and Ichthys are sourced from IHS Energy, 2006.

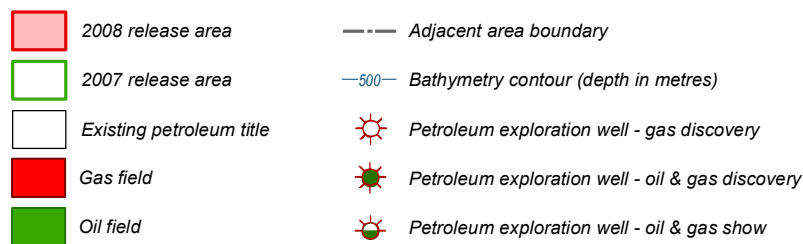


Figure 3. Release areas W08-7, W08-8, W08-9 and W08-10, Caswell Sub-basin, Browse Basin.

Bedout Sub-basin

In the Bedout Sub-basin of the Roebuck Basin, six areas are on offer. The Roebuck Basin is the central part of the northeast–southwest trending Westralian Superbasin, which underlies the North West Shelf. On trend along the shelf, to the south and north respectively are the major Mesozoic petroleum provinces of the Carnarvon and Browse basins, while to the east is the offshore extension of the petroliferous Palaeozoic Canning Basin.

The release areas cover the Bedout Sub-basin, which is the inboard component of the Roebuck Basin (figure 4) and contains up to 7 kilometres of Mesozoic sediments overlying a Palaeozoic section. Only six wells have been drilled in the sub-basin, with the last drilling

occurring 25 years ago. Within release area W08–11 is the Phoenix tight gas accumulation reservoir in Triassic sandstones, and the Triassic Keraudren Formation is interpreted as the local source for the gas. Good reservoir characteristics occur in Middle Jurassic sandstones in a number of wells in the Bedout Sub-basin, and several undrilled prospects are recognised at both the top Triassic and base Cretaceous levels across the release areas.

Carnarvon Basin

Seven of the new release areas are in Australia's major hydrocarbon-producing province, the Carnarvon Basin. The offshore Northern Carnarvon Basin has a thick Mesozoic section that includes thousands of metres of Triassic, Jurassic and Cretaceous clastic sediments that are the source, reservoir and seal facies for a world-class gas and oil province. A number of different sub-basins and structural elements make up the Carnarvon Basin, and on offer in the 2008 release are areas in the Exmouth and Barrow sub-basins and on the Exmouth Plateau and Rankin Platform.

Two release areas are available in the heart of the Carnarvon Basin, surrounded by major gas and oil fields. W08–16 and W08–17 are in the western Barrow Sub-basin on the Tryal Rocks Terrace, with W08–16 extending up onto the Rankin Platform. There are proven

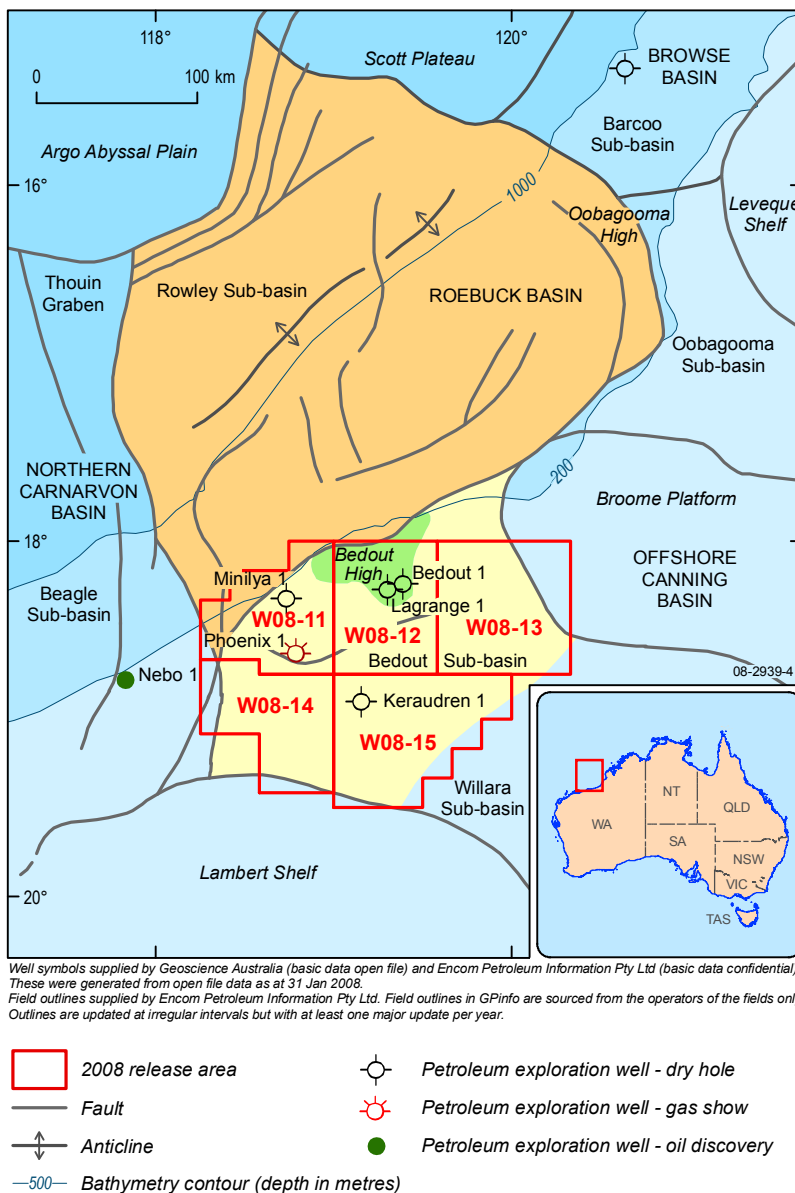


Figure 4. Regional setting of the Bedout Sub-basin showing the location of the 2008 Release areas, major fields and structural elements.

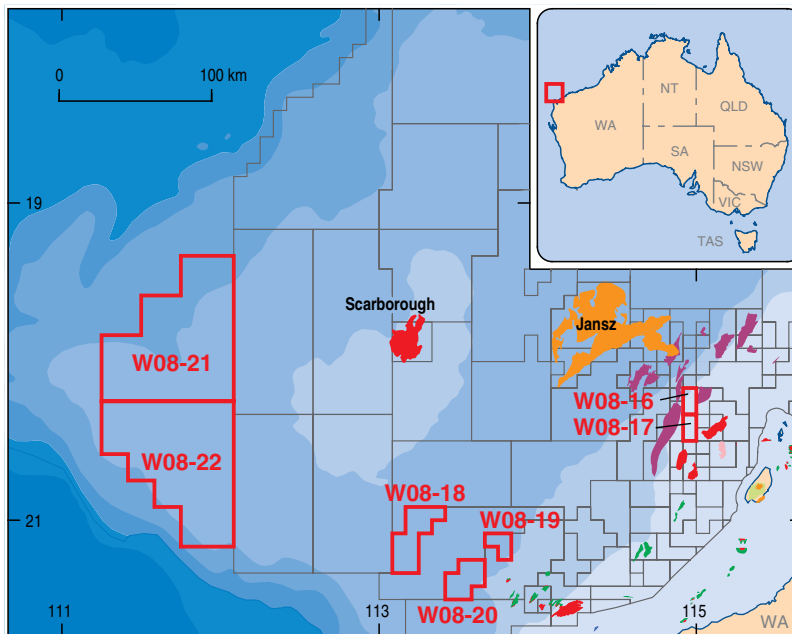
plays in the adjacent acreage at the Triassic, Early Cretaceous and Palaeocene levels (figure 5). Gas charge in these reservoirs has seismic expression, which has been successfully used to guide exploration.

Further south, three release areas are on offer in the Exmouth Sub-basin, the most southerly of a series of oil-bearing Jurassic depocentres that lie inboard of the Exmouth Plateau. Areas W08-18, W08-19 and W08-20 are in water depths of around 1000 metres along the western margin of Exmouth Sub-basin and on the Exmouth Plateau. Oil production from the sub-basin began in 2006; since 1993, 11 oil and gas fields have been discovered in the region immediately to the east of the release areas (figure 5).

The Exmouth Plateau is the deepwater frontier of the Carnarvon Basin. A subsided continental platform dominated by a thick fluvio-deltaic Triassic sequence, it hosts several giant gas accumulations and is an area of active and successful exploration. W08-21 and W08-22 are large (each more than 6400 square kilometres) undrilled release areas across the southwestern corner of the Exmouth Plateau and upper

slope, with water depths in the range from 1000 to 2500 metres. The super-giant Jansz gas field and the giant Scarborough gas field, along with the recent discoveries at Chandon and Thebe, clearly demonstrate that the Exmouth Plateau is prospective for large gas discoveries.

Two release areas are offered in the Vlaming Sub-basin of the Perth Basin (figure 6). The Perth Basin is an elongate, north-to-northwest trending sedimentary basin extending about 1300 kilometres along the southwestern coast of Australia.



Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPinfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year.

2008 release area Existing petroleum permit

08-2939-5

Period (Formation)	Oil accumulation	Gas accumulation
Paleocene		
Barremian (Windalia Sandstone)		
Valanginian & Berriasian (Barrow Group)		
Tithonian, Oxfordian and Middle Jurassic		
Upper Triassic (Brigadier and Mungaroo Formations)		

Figure 5. Major oil and gas accumulations of the northern Carnarvon Basin indicating age of main reservoir and showing the location of the 2008 Release Areas.

There is onshore and offshore oil production from a Permo-Triassic petroleum system in the northern Perth Basin. In the offshore southern Perth Basin there are known accumulations of oil and gas in Early Cretaceous and Late Jurassic reservoirs in the Vlaming Sub-basin. Release areas W08-23 and W08-24 are in the sub-basin, and recent basin modelling studies indicate the potential for hydrocarbon accumulations to occur.

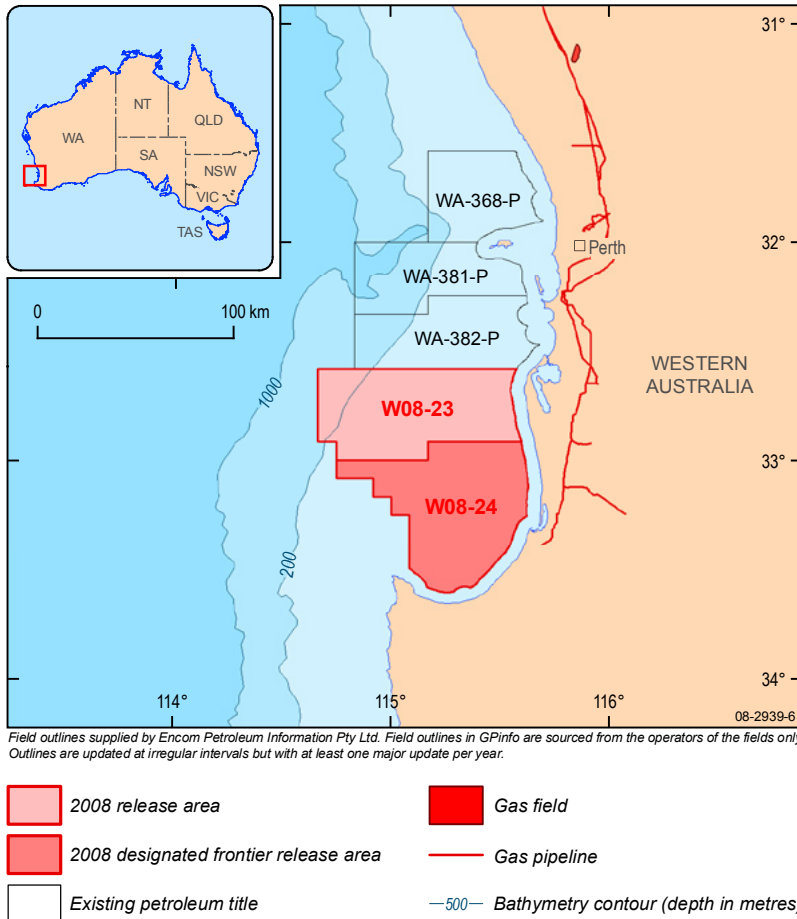


Figure 6. Release areas W08-23 and W08-24, Vlaming Sub-basin, Perth Basin.

For more information

For further information on the 2008 release areas or to book into the 2008 Acreage Release Data Room,

phone Megan Lech on +61 2 6249 9459

email megan.lech@ga.gov.au

visit www.ga.gov.au

For more information to assist prospective applicants in preparing an exploration area application,

phone +61 2 6249 9222

Related websites/links

2008 offshore petroleum exploration areas (Department of Resources, Energy and Tourism)

www.ret.gov.au/petexp

CD-ROM version

petroleum.exploration@ret.gov.au

Data supporting the 2008 acreage release (Seismic data is available in GeoFrame™, Kingdom and Landmark™ formats)

ausgeodata@ga.gov.au

Associated digital well data

biu@ga.gov.au

Assessing natural disaster risk in the Asia-Pacific region

Supporting international development through natural hazard risk research

Alanna Simpson, Phil Cummins, Trevor Dhu, Jonathan Griffin and John Schneider



The Asia-Pacific region experiences some of the world's worst natural hazards—frequent earthquakes, volcanic eruptions, cyclones and annual monsoons. It also includes many of the world's megacities—those with more than 8 million people—so the number of people exposed to hazard risks in the region is very high.

There is abundant evidence that natural disasters disproportionately affect developing countries. Between 1991 and 2005, more than 90% of natural disaster deaths and 98% of people affected by natural disasters were from developing countries (OFDA/CRED International Disasters Database EM-DAT). Moreover, disasters are increasing in number and size every year due to a number of factors including rapid population growth, urbanisation and climate change.

Implications for international aid programs

The high risk of natural disasters in developing nations has considerable implications for international aid programs. Natural disasters can significantly compromise development progress, reduce the effectiveness of aid investments, and halt or slow progress towards the achievement of Millennium Development Goals (MDGs). For example, progress on MDG 1—halving poverty and hunger by 2015—may be halted or reversed during a natural disaster. Furthermore, aid resources may be diverted to humanitarian and emergency responses which can impact on development programs in areas not directly affected by a disaster.

Natural hazard risks also influence the type and scale of disaster relief and humanitarian response required of aid agencies. Relatively infrequent, high-magnitude, natural disasters, such as the December 2004 Indian Ocean tsunami, are most likely to overwhelm the capacities of local and national governments and to require significant international humanitarian assistance.

With increasing recognition that disasters erode hard-won development gains, international policymakers have focused on disaster risk reduction (such as the Hyogo Framework for Action). In line with this trend, the Australian Government, through the Australian Agency for International Development (AusAID), has

placed greater emphasis on the reduction of natural hazard risk in developing countries.

Improving our understanding of the frequency, location and magnitude of sudden-onset natural disasters will help the Australian Government and AusAID plan and prepare for natural disaster response (for example, through the strategic placement of emergency supplies). Recognising the impact of disasters on the progress of development, the Australian Government decided in 2007 to enhance the humanitarian response, preparedness and capacity of partner governments. In particular, that decision recognised a need for better natural hazard risk assessments.

In 2007, as part of this strategic approach, Geoscience Australia's Natural Hazard Impacts Project conducted a broad hazard risk assessment of the Asia-Pacific region for AusAID. The assessment included earthquake, volcanic eruption, tsunami, cyclone, flood, landslide and wildfire hazards, with particular attention given to countries the Australian Government considered to be high priority, of interest or of secondary focus (figure 1).

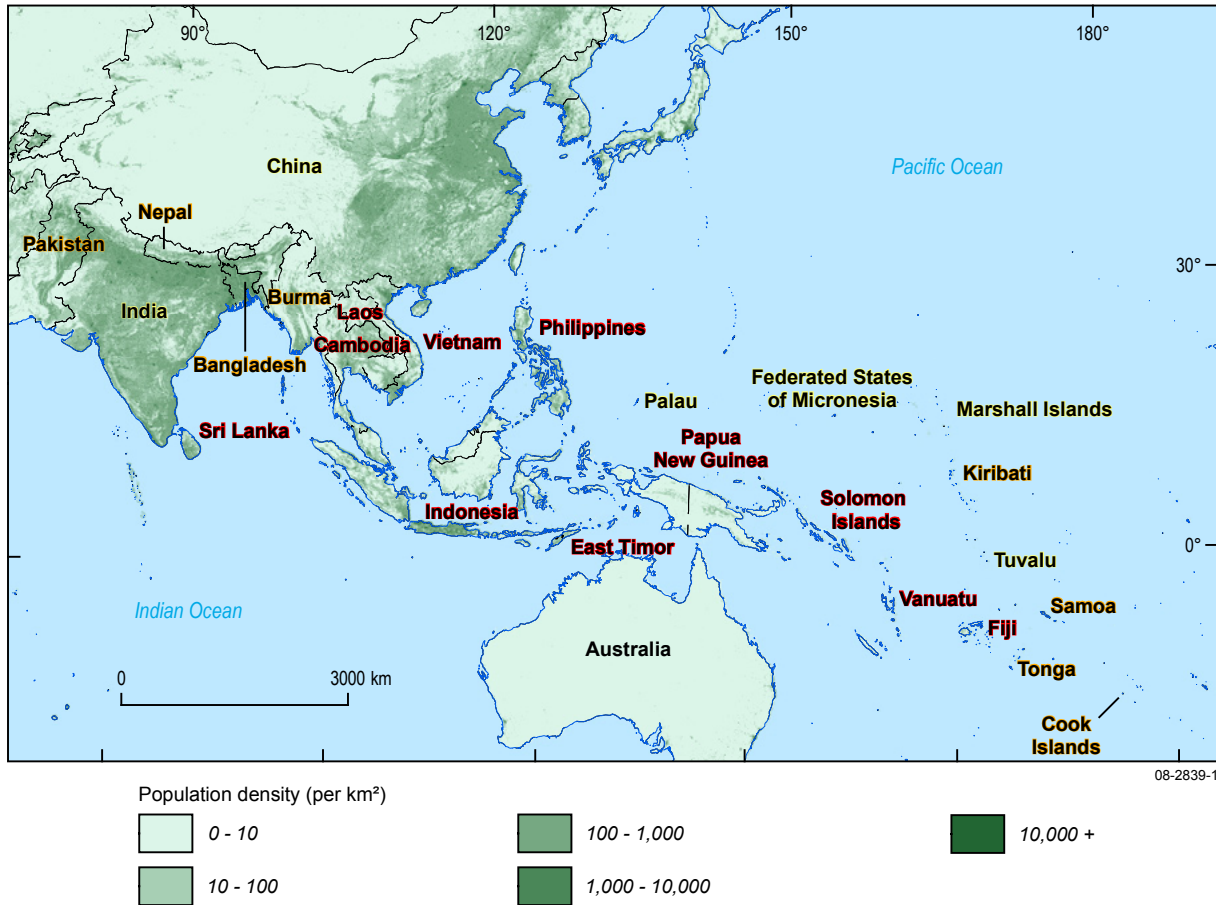


Figure 1. Countries included in this study, colour-coded according to the priority their natural hazard risk was given for the study. Primary focus countries are highlighted in red, countries of interest in orange, and secondary focus countries in pale yellow.

Determining natural hazard risk in a development context

Disasters are not the inevitable consequence of natural hazards. A volcanic eruption on an uninhabited Alaskan island is unlikely to be a disaster, but a similar eruption in the densely populated Asia–Pacific region could be catastrophic.

For a natural hazard to become a natural disaster, populations need to be exposed to the hazard. However, if we analyse disasters, we find that the scale and impact of a natural hazard is determined by inherent vulnerabilities within populations. A magnitude 6 earthquake in New Zealand (such as the 2007 Gisborne earthquake), is unlikely to cause mass fatalities, as that country has strict building codes. Yet an earthquake of the same magnitude could lead to many fatalities in the developing countries of the Asia–Pacific region if building codes are not enforced. To rewrite a familiar adage, ‘earthquakes don’t kill people, buildings do’.

A crucial aspect in the assessment of natural disaster risk is the metric used to define a previous disaster and therefore the risk of future disasters. While the number of fatalities is the typical metric

used to classify disasters, this ignores the number of injured, homeless and displaced people, the need for international humanitarian assistance and the economic impact.

This study uses ‘significantly impacted population’ as the risk metric. This deliberately vague term covers death, injury, displacement, prolonged loss of access to essential services and/or shelter, and/or significant damage to agriculture, horticulture and industry.

Future work to improve our understanding of natural hazard risk in the Asia–Pacific region will need to test more

specific risk metrics, particularly those most useful in an international development and humanitarian context. It could be useful to calculate risk in terms of the number of fatalities and injured, the extent of building destruction, the period of compromised access to essential services (such as water, electricity, communications and health), the impact on food supply (such as effect on the annual harvest) and/or the effect on the economy.

A particularly useful risk metric, and one touched on in our study, is the risk of a government's disaster response capabilities being overwhelmed and requiring external aid assistance. The potential for this is proportional to the percentage of the population seriously affected and the country's level of development.

If a very small proportion of a developed country's population is affected by a disaster, internal resources can be readily mobilised for response and recovery. When cyclone Larry hit northern Queensland, it seriously affected less than one per cent of Australia's population and Australia was well equipped to support those affected without external assistance. In contrast, a similar percentage of Papua New Guinea's population was directly affected by cyclone Guba, but the response required significant foreign support in the post-disaster phase.

A final question concerns the priorities of the international aid community: should we be most concerned about relatively frequent and lower impact hazards, such as the near-annual flooding of the Mekong Delta in Southeast Asia, or comparatively rare but often catastrophic disasters, such as the December 2004 Indian Ocean tsunami? Both types of events seriously compromise development progress, and an all-hazards approach is optimal, but in a reality of limited resources what event has the highest priority?

Natural hazard risk assessment

Geoscience Australia's preliminary natural hazard risk assessment of the region aimed to help AusAID identify countries and areas at high risk from one or more natural hazards. The frequency of a range of sudden-onset natural hazards was determined and, allowing for data constraints, an evaluation was made of potential disaster impact. Extra emphasis was placed on relatively rare but high-impact events, such as the December 2004 tsunami, which might not be well documented in the historical record.

Our assessment suggests that it seems inevitable that the Asia-Pacific region will see one or more 'megadisasters', seriously affecting millions of people, during the 21st century.

Some researchers have predicted that an earthquake with a million fatalities could occur in the Himalayan belt of South Asia and we would argue that megacities in China, Indonesia and the Philippines are also candidates. From the available research, the case for volcanic disasters on that scale has not been argued, but analysis suggests that millions could be seriously affected by a large eruption in the

Philippines or Indonesia. Finally, the population explosion in the megadeltas of Asia (for example, Bangladesh), combined with increasing vulnerability to climate change, indicates that a flood or cyclone event affecting tens of millions of people is also likely.

Megacities with a very high earthquake risk

The 18 million residents of Manila in the Philippines dwell in an area particularly vulnerable to earthquakes—the city has sustained heavy damage

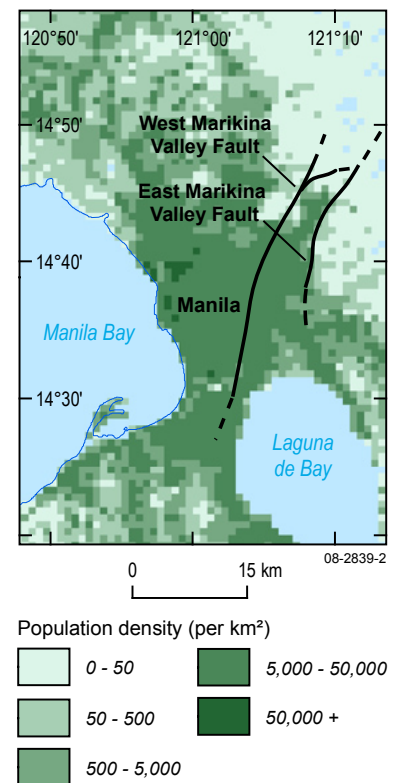


Figure 2. The convergence of high population density and active faults in Manila, the Philippines. Movement on the Marikina Valley fault could have a devastating impact on Manila, depending on the earthquake magnitude and epicentre. Population data are from Landsat, with more intense colour signifying higher population density. The fault location is from Nelson et al (2000).

from earthquakes at least six times in the past 400 years (Nelson et al 2000). In part, this results from movement on the Marikina Valley fault system, which cuts through the northeastern part of the city (figure 2). Studies suggest that magnitude 6–7 earthquakes are generated on this fault every 200 to 400 years (Nelson et al 2000).

A combination of rapid urbanisation, location on a floodplain prone to amplified ground motion and liquefaction, and frequent large earthquakes results in a high potential for an earthquake to impact on a large proportion of Manila's population. Indeed, our analysis suggests that Manila is the Asia–Pacific megacity most at risk to earthquakes, with magnitude 5 earthquakes occurring on average once every 37 years. A magnitude 5 earthquake centred near Manila is predicted to significantly impact on several hundreds of thousands of people; a larger earthquake striking at Manila's centre could be catastrophic.

“With increasing recognition that disasters erode hard-won development gains, international policymakers have focused on disaster risk reduction.”

Across the Asia–Pacific region, the countries with the largest total populations exposed to very high earthquake hazard are China, India, Nepal, the Philippines and Burma, while other megacities with a particularly high risk from earthquakes include Dhaka (Bangladesh) and Beijing. Countries with a high percentage of their populations exposed to very high earthquake hazard are Vanuatu, Solomon Islands, Nepal, Burma and the Philippines.

Potential impact of dormant volcanoes

‘The most dangerous situation of all is that of a large, unexpected explosive eruption from a long-dormant volcano in a densely populated area’ (Simkin 1993).

Our analysis suggests that 180 million people in the Asia–Pacific region live within 50 kilometres of a volcano that has not been active in the past 40 years. Consequently, the ‘dangerous situation’ referred to by Simkin (1993) is prevalent in the region.

To illustrate the potential impact of one of these long-dormant volcanoes erupting in the densely populated Asia–Pacific region, Geoscience Australia developed a simple simulation of the impact of Indonesia's Tambora eruption on today's population. The 1815 eruption of Tambora volcano, 300 kilometres east of Bali, killed

around 92 000 people. With the growth of population during the 20th century, the impact of the same eruption today would be catastrophic. This is illustrated by the following scenario, which uses ash thicknesses from Self et al (1984).

If the warning signs of an impending eruption were recognised and appropriate action taken, more than 200 000 people would require evacuation from within 50 kilometres of the volcano. The evacuation would provide protection from the most life-threatening of volcanic hazards.

Assuming wind patterns similar to those during the 1815 eruption, around 8 million people would be within range of deposits of at least 20 centimetres of ash during the eruption, potentially collapsing around one-third of roofs. Roughly one-third of Indonesia's population would be within range of deposits of one centimetre of ash (figure 3). This relatively thin layer could damage electrical equipment, disrupt power supplies, contaminate water sources, cause health problems and significantly interrupt food production, industry and tourism. In addition, at least one tsunami was triggered by the 1815 eruption, with a wave height of 4 metres near the volcano and 1–2 metres in East Java (Stothers 1984). Such a tsunami today could cause extensive coastal damage.

Similar eruption scenarios could be played out in many Asia–Pacific countries, with



Figure 3. The current population density of Indonesia overlaid by the ash-dispersal pattern from the 1815 Tambora eruption. The area 100 kilometres from the volcano received between 50 and 100 centimetres of ash, and pyroclastic flows are thought to have extended about 30 kilometres from the volcano. More than 500 000 square kilometres of the Java Sea and surrounding islands were covered by more than one centimetre of ash. Eruption details from Self et al (1984).

Indonesia and the Philippines having the greatest number of people exposed to very high volcanic hazards. Geoscience Australia’s analysis suggests that volcanic disasters seriously affecting more than 100 000 people can be expected about once a decade in Indonesia and once every few decades in the Philippines. Volcanic disasters impacting on tens of thousands of people in Papua New Guinea are expected about once a century, while Vanuatu has the potential for a catastrophic volcanic disaster (one that affects at least one per cent of the population) about twice in a century.

Low-lying coastal areas exposed to potential large tsunamis

The December 2004 Indian Ocean tsunami provided a catastrophic reminder that the Asia–Pacific region is far from immune to tsunami. The region is traversed by one-third of the world’s subduction zones, capable of producing the world’s largest earthquakes and tsunamis. Furthermore, many of the subduction zones are adjacent to densely populated low-lying coastal communities.

Geoscience Australia’s broad assessment focused on the largest earthquakes (magnitude 9.0 to 9.5) generated in the subduction zones

of the region at a frequency of around one in 1000 years. The number of people exposed to tsunamis was determined by using a very coarse relationship between earthquake magnitude, proximity of affected coastlines, and populations living close to sea level.

The results suggest that the most dangerous potential source of large tsunamis is at the northern tip of the Bay of Bengal. A tsunami there would threaten several million people in the low-lying coastal areas of Bangladesh, India and Burma. By individual country, Indonesia has the highest population threatened by tsunamis, followed by Bangladesh and India.

While Pacific nations have considerably lower population densities, very high percentages of their populations would be impacted by a tsunami generated from nearby subduction zones. Up to 40% of Vanuatu’s population would be at risk in the event of a tsunami, followed by more than 20% in Tonga. Many other Pacific island nations have more than 5% of their populations similarly exposed.

Conclusion

Our preliminary assessment of natural hazard risk in the Asia–Pacific region highlights the potential for the region to experience a megadisaster affecting millions of people during the coming century.

While the scale of such a disaster may seem greater than



any recorded so far, we reached this conclusion not only because the Asia–Pacific region is home to intense geological and meteorological activity, but also because of the region’s burgeoning population, which has increased more than fivefold during the 20th century. People in the region are increasingly vulnerable because of trends such as rapid urbanisation and their tendency to concentrate in areas especially prone to natural hazards.

Because of the threat natural disasters pose to the progress of development, natural hazard risk management will continue to increase in importance in international development policy in the Asia–Pacific region.

For more information

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Related articles/websites

Natural Hazards Online
www.ga.gov.au/hazards/

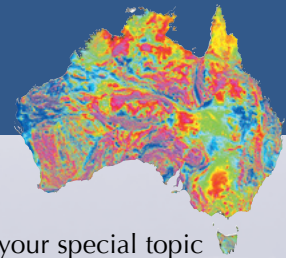
AusGeo News 77: The Boxing Day 2004 tsunami—a repeat of the 1833 tsunami?
www.ga.gov.au/ausgeonews/ausgeonews200503/tsunami.jsp

Acknowledgments

The authors would like to acknowledge the support of AusAID staff, in particular Anita Dwyer, the contributions of Wally Johnson, and Lee Siebert at the Smithsonian Institute’s Global Volcanism Program.

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Australian Government
Geoscience Australia

in
collaboration
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Australia's marine jurisdiction extended

Australia's submission for jurisdiction over an additional 2.5 million square kilometres of seabed has been confirmed by the United Nations Commission on the Limits of the Continental Shelf.

'This is a major boost to Australia's offshore resource potential and also to our ability to preserve the marine environment on the seabed,' Minister for Resources, Energy and Tourism, the Hon Martin Ferguson AM MP, said. This decision means Australia now has jurisdiction over an additional area of continental shelf which is approximately the same size as Western Australia.

The Commission has confirmed the location of the outer limit of Australia's continental shelf in nine distinct marine regions, which entitles Australia to large areas of continental shelf beyond 200 nautical miles. In these areas, Australia has exclusive rights to what

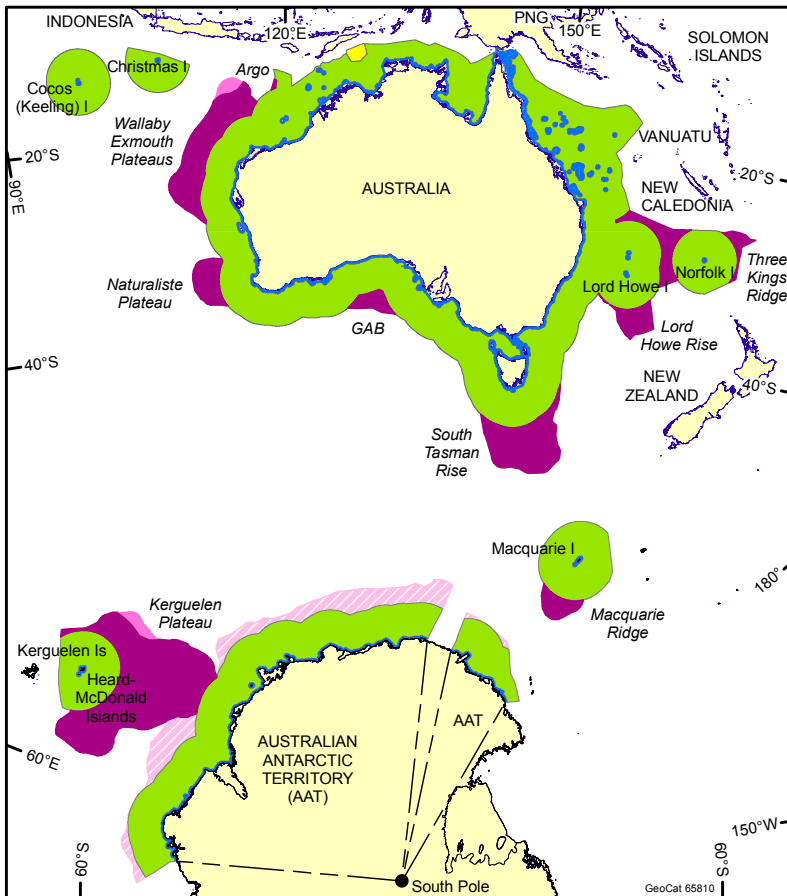
exists on or under the seabed, including oil, gas and biological resources.

The submission was made through a close partnership between Geoscience Australia, the Attorney General's Department and the Department of Foreign Affairs and Trade.

It is the culmination of 15 years of cutting edge work, carried out under Geoscience Australia's Law of the Sea and Maritime Boundaries Advice project.

To support Australia's case Geoscience Australia analysed an enormous amount of new data gathered on 17 marine surveys conducted over eight years in some of the most remote and inhospitable parts of the world's oceans.

Under the 1982 United Nations Convention on the Law of the Sea, the continental shelf extends at least 200 nautical miles from Australia's coastline. Australia is also entitled to the submerged prolongation of its landmass extending beyond 200 nautical miles (the so-called extended continental shelf), to limits defined in the 1982 Convention.



AUSTRALIA'S CONTINENTAL SHELF JURISDICTION

- Territorial sea and internal waters
- Areas of marine jurisdiction within 200 M of Australia and its external territories
- Joint Petroleum Development Area under Timor Sea Treaty 2002
- Area of Australia's continental shelf beyond 200 M as confirmed by the Commission on the Limits of the Continental Shelf
- Area considered by the Commission and yet to be resolved
- The Australian Antarctic Territory region that Australia requested the Commission not consider for the time being

Note: The areas of continental shelf depicted to the north-west of Australia reflect the terms of the 1997 maritime boundary treaty with Indonesia which has not yet entered into force.

1 nautical mile (M) = 1852m
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The outer area of Australia's continental shelf. The area beyond 200 nautical miles, as confirmed by the United Nations Commission on the Limits of the Continental Shelf, is shown in purple.

For more information

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Related website

Australia's continental shelf confirmed by the Commission on the Limits of the Continental Shelf
www.ga.gov.au/image_cache/GA11214.pdf

SHRIMP joins hunt for exploration targets

Geoscience Australia's Sensitive High-Resolution Ion Microprobe, or SHRIMP was officially launched by the Minister for Resources, Energy and Tourism, the Hon Martin Ferguson AM MP, at Geoscience Australia on 1 April 2008.

The SHRIMP, which weighs 12 tonnes and measures six metres long, allows scientists to analyse trace elements within individual minerals smaller than a grain of sand. The new facility will significantly increase the amount of high quality data about the age of Australian rocks for resource exploration companies, government geoscience agencies and researchers.

The Minister said 'Australia is developing a sophisticated understanding of how the timing of geological events millions, or even billions, of years ago have produced the mineral and energy resources we depend on today'.

'The SHRIMP will help to increase our knowledge of the geological evolution of the Australian continent, the formation of our mineral and petroleum resources today, and the hidden secrets of our new frontiers' Mr Ferguson said.

A product of 20 years' design and research at the Australian National University, the SHRIMP was built by Australian Scientific Instruments (ASI) in Canberra. SHRIMPs have been exported to laboratories in Japan, the United States and China. ASI and Geoscience Australia have entered into a unique 15 Year agreement which allows ASI opportunities to use the Geoscience Australia

Life under the ice

The first recordings of life beneath the Antarctic ice shelves was captured during a recent field expedition carried out as part of the Census of Antarctic Marine Life (CAML), which is a multinational project endeavouring to improve our knowledge of Antarctic marine life during the International Polar Year of 2007/2008.

Underwater video footage captured during this expedition identified live organisms including krill and jellyfish in a cavity below the ice. The cavity began forming at the end of the last ice age, when the ice shelf began to float. This void is now located hundreds of kilometres from the open sea. Researchers suspect that these organisms are feeding from nutrients, swept along in ocean currents.

The video footage captured was not the only evidence of life beneath the sea, with sediment cores containing fossil records illustrating the colonisation of the void. The cores were collected during the Australian Antarctic Division led expedition and were collected using a corer designed and built by Geoscience Australia. The fossil record observed contained successions of microscopic one-celled organism fossils, illustrating that life below the ice has existed for over 9000 years.



After opening the laboratory, the Minister became a part-time geochronologist and dated a zircon mineral from the Mt Neill Granite in the Mt Painter region of South Australia at 1.6 billion years.

facility to test new hardware and software and to conduct customer demonstrations.

Samples collected from New South Wales, South Australia and the Northern Territory have been processed already with some interesting results indicating potential exploration targets.

For more information

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Microscope photo of fossil animals recovered from sediment cores taken beneath the Amery Ice Shelf. They include glass sponges, bryozoa, and molluscs (snails).

For more information

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New Charters Towers region gravity datasets

The Charters Towers region is one of the major mining areas in north Queensland with gold the main metal produced. Datasets from the recently released Charters Towers gravity survey should provide a valuable tool for assessing the mineral potential of the survey area.

The survey was conducted in 2007 and managed by Geoscience Australia on behalf of the Geological Survey of Queensland.

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

For more information

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Related websites

Geological Survey of Qld
www.dme.qld.gov.au/mines/about_us.cfm

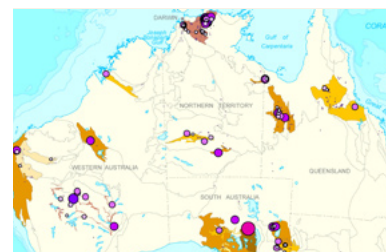
Table 1. Details of the gravity survey.

Survey	Survey Type	Date of Acquisition	1:250 000 Map Sheets	Station Spacing/orientation	Stations	Contractor
Charters Towers (Qld)	Gravity	August – December 2007	Einasleigh, Ingham (pt), Clarke River, Townsville (pt), Hughenden (pt), Charters Towers, Bowen (pt), Tangorin (pt), Buchanan (pt), Mount Coolon (pt), Toompine (pt), Eulo (pt)	8 463 stations 2.0 x 2.0 km east – west and 5 699 stations 4.0 x 4.0 km east – west	14 162	Fugro Ground Geophysics

Proterozoic mineralising events maps

Geoscience Australia has recently released new 1:5 000 000 scale colour maps showing the major Proterozoic mineralising events for gold, uranium, copper and lead-zinc. Two maps have been produced for each of these commodities. The mineralising events shown on Map 1 are superimposed on the Australian Resource Map (showing regions classified according to their metal endowment), whereas Map 2 uses the Australian Proterozoic Regions map as a base.

Ten major Proterozoic mineralising events are identified for copper, nine for gold and six events each for uranium and lead-zinc. The maps include: the mineralising event (based on determined or inferred age) for each deposit, the style of the deposit, and the mineral occurrences within Proterozoic regions. The maps also include enlarged insets of mineralised areas, time-space-event chart, and pie-charts summarising resources by Proterozoic mineralising events. The map series can be downloaded online free from the Geoscience Australia website.



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Related articles/websites

Proterozoic Mineralising Events maps
www.ga.gov.au/map/index.jsp#minerals

New publication on the Lake Violet 100 000 sheet area

The Geological Survey of Western Australia in association with Geoscience Australia has released Record 2007/21 entitled 'Geology, Structure, and Mineral Resources of the Lake Violet 1:100 000 Sheet, Western Australia' by A J Stewart.

The sheet area is part of the auriferous Yandal greenstone belt in the north of the Archaean Yilgarn Craton, and comprises 2700 million years (Ma) old mafic to felsic volcanic and clastic sedimentary rocks, that were deformed, metamorphosed, and intruded by granite at about 2660 Ma. The Record includes descriptions of all rock types, detailed analyses of the structure, metamorphism, and alteration of the greenstones, and summary descriptions of gold deposits in the sheet area. It also includes a new solid-geology map of the area, compiled from previously published maps (Vearncombe et al 2000 and English et al 2000) modified by outcrop and thin-section observations, identification of over 1000 rotary air blast bottom samples, interpretation of aeromagnetic data, and exploration company drilling data.

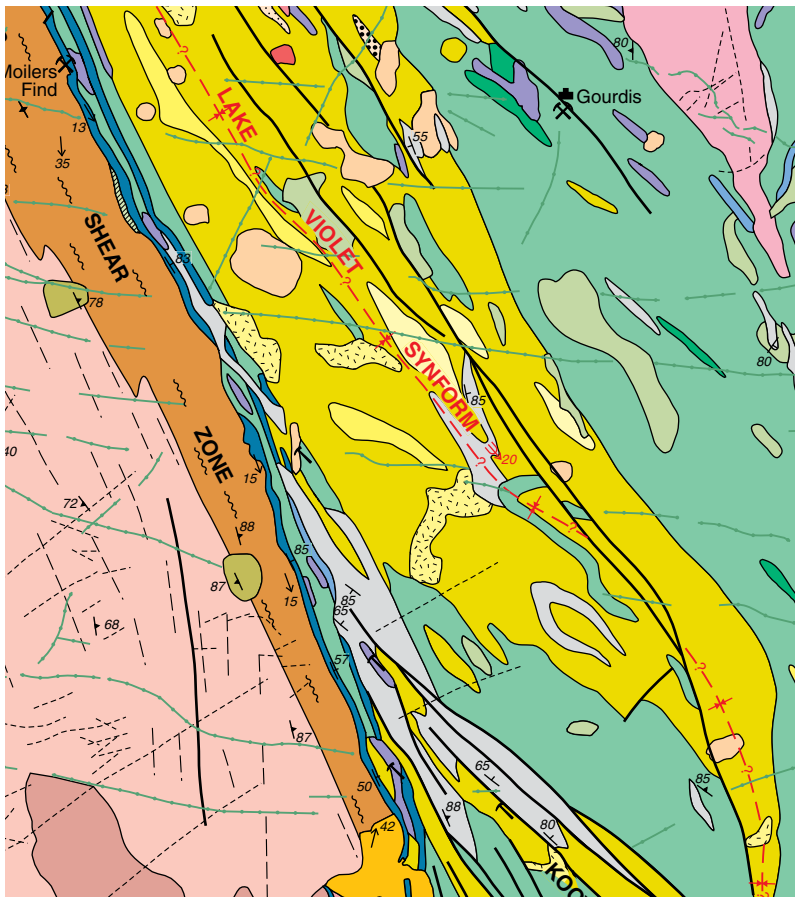
The area historically has produced relatively small amounts of gold compared with large nearby deposits (Jundee, Bronzewing) discovered

in the 1990s, and this may be due to the style of alteration in the Lake Violet area, which is dominated by chlorite and sericite with lesser amounts of quartz, pyrite, and rutile; most gold deposits in the Eastern Goldfields of Western Australia are characterised by carbonate alteration.

The record was completed as part of a National Geoscience Agreement project between Geoscience Australia and the Geological Survey of Western Australia, and is available online through their website.

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Related websites/articles

Geological Survey of Western Australia—publications
www.doir.wa.gov.au/GSWA/Geosciencepublications

Sharing the geology of Australia and the region with the world

The International Geological Congress (IGC) – the pre-eminent international meeting for geoscientists – is held every four years. There is robust competition from countries and cities hoping to stage an IGC. At the 2004 IGC in Florence, Italy, Australia and the Oceania region mounted the winning bid to stage the 2012 IGC in Brisbane.

The IGC covers all aspects of geoscience, from the deep interior of the Earth to planetary geoscience, and from mineral and energy resources to climate change and geo-medicine. This will be only the second time in the IGC's 130 year history that the IGC has been held in the Oceania region, with Sydney being the venue for the 1976 Congress.

AUSTRALIA 2012, as the Congress will be known, will be a major event for both Brisbane and the state of Queensland. The Congress is expected to attract at least 5000 delegates from about 100 countries.

The Australian Geoscience Council will be the body responsible for organising the Congress. The AGC is the peak council representing nine major geoscience organisations in Australia with a total of more than 7000 professional members.

Queensland Events Corporation, an agency of the Queensland Government, broadened its traditional brief in order to provide support for the Congress. A contract detailing the terms of this

support was recently signed by representatives of the AGC and Events Queensland at the Brisbane Convention and Exhibition Centre, the venue for AUSTRALIA 2012.

A strong and experienced International Geological Congress Organising Committee has already been established. The President and Secretary General are Dr Neil Williams and Dr Ian Lambert of Geoscience Australia, reflecting the agency's strong commitment to the Congress. The Organising Committee are planning to use the 2008 IGC in Oslo, Norway as a major promotional springboard for AUSTRALIA 2012.

For more information

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Related websites

Australia 2012: 34th International Geological Congress
www.ga.gov.au/igc2012/



Figure 1. President of the Australian Geoscience Council, Dr Trevor Powell, and Chief Executive of Queensland Events Corporation, Mr Michael Denton, shake hands after signing the contract in Brisbane on Thursday 3 April 2008.

Another record breaking PDAC

The 76th Prospectors and Developers Association of Canada's (PDAC) International Convention, Trade Show and Investors Exchange eclipsed the record attendance at last year's Convention with more than 20 000 attendees from over 100 countries. The event was held in Toronto, Canada, between 2 and 5 March this year. The Trade Show featured more than 360 exhibitors, including government agencies from 36 countries, promoting technology, products, services and mining jurisdictions.

As in 2007, the mood of this year's Convention reflected the strong state of the industry as explorers and miners continue to enjoy historically high commodity prices. Australia's promotion was boosted by the support of Australia's High Commissioner to Canada, HE Mr Bill Fisher. The Australian exhibitors received valuable support from the Toronto office of Austrade, an Australian Government agency which assists Australian businesses in matters of international trade.

Australia's high-profile promotion at the Trade Show combined industry and government exhibitors. Geoscience Australia coordinated the government promotion which involved all states and the Northern Territory under the 'Team Australia' banner. The exhibition, in the Australian Pavilion, attracted over 300 significant visitors from 29 countries representing mining and exploration companies as well as financial and academic institutions. There was strong interest in all commodities. In addition to the government exhibitors, the Australian Pavilion included Encom Technology Pty Ltd, Intrepid Geophysics, Predictive Mineral Discovery Cooperative Research Centre (*pmd**CRC), Gekko Systems Pty Ltd and AME Mineral Economics. Their participation was again coordinated by



GeoJAG Australia.

Geoscience Australia scientists delivered two jointly authored presentations at a special symposium within the PDAC program entitled Proterozoic Continental Movement and Metallogeny which aimed to highlight new developments in understanding the geology and metallogenesis of the Proterozoic around the world. The presentations were 'New insights into the geodynamic and metallogenic evolution of the Mt. Isa region' by George Gibson and Laurie Hutton (Geological Survey of Queensland), and 'The geodynamics and metallogeny of the Australian Proterozoic' by David Huston and state and Northern Territory colleagues.



For more information

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NZMSS & AMSA Conference 2008	7 to 10 July
New Zealand Marine Sciences Society & Australian Marine Sciences Association University of Canterbury, Christchurch, New Zealand Contact: NZSS & AMSA Joint Conference 2008 School of Biological Sciences University of Canterbury, Private Bag 4800, Christchurch NZ	p +64 3 366 7001 e ms2008@canterbury.ac.nz nzms.srsnz.org/conference.html
Australian Earth Sciences Convention 2008	20 to 24 July
Geological Society of Australia & Australian Institute of Geoscientists Perth Convention & Exhibition Centre Contact: International Conferences and Events Pty Ltd Suite 4, 73 Hay Street, Subiaco, WA 6008	p +61 8 9381 9281 f +61 8 9381 9560 e aesc2008@iceaustralia.com www.iceaustralia.com/aesc2008/
33rd International Geological Congress	6 to 14 August
Norway Convention Centre Contact: Conference-Congress AS PO Box 2694 Solli No 0204 Oslo	p +47 2256 1930 f +47 2256 0541 e secretariat@33igc.org www.33igc.org/coco/
EABS III –Eastern Australasian Basins Symposium	14 to 17 September
Petroleum Exploration Society of Australia (NSW/ACT) Sydney Convention & Exhibition Centre Contact: Conference Action PO Box 576, Crows Nest NSW 1585	p +61 2 9437 9333 f +61 2 9901 4586 e eabs@conferenceaction.com.au
14 ARSPC–14th Australasian Remote Sensing and Photogrammetry Conference	29 September to 3 October
Darwin Convention Centre Contact: Spatial Sciences Institute, Conference Action PO Box 576, Crows Nest NSW 1585	p +61 2 6282 2282 f +61 2 6282 2576 e info@spatialsciences.org.au
Celebrating the International Year of Planet Earth	5 to 9 October
Geological Society of America Joint Annual Meeting George R Brown Convention Center, Houston, Texas Contact: Geological Society of America Sales & Service 3300 Penrose Place, Boulder, CO 80301	p +1 303 357 1000 f +1 303 357 1070 e gsaservice@geosociety.org www.geosociety.org/meetings/
Mining 2008	29 to 31 October
Hilton Brisbane Contact: Vertical Events PO Box 1153 Subiaco WA 6904	p +61 8 9388 2222 f +61 8 9381 9222 e info@verticalevents.com.au www.verticalevents.com.au
China Mining Congress	11 to 13 November
Beijing International Convention Center, Beijing Contact: Vertical Events PO Box 1153 Subiaco WA 6904	p +61 8 9388 2222 f +61 8 9381 9222 e info@verticalevents.com.au www.china-mining.com/