

## In Brief

# SMART EXPLORATION gets Geoscience Australia support

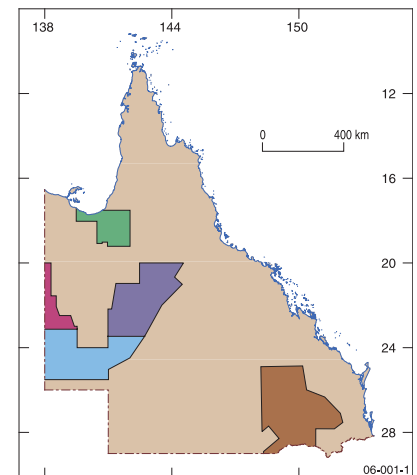
In July 2005, the Queensland Department of Natural Resources and Mines announced a \$20 million Smart Exploration initiative to stimulate mineral exploration in the state over the next four years.

The first two years of the program involve acquisition of airborne geophysical and ground gravity data in areas with the highest potential for discovery of mineral resources. Geoscience Australia is managing the geophysical data acquisition in the Mount Isa region and the Bowen and Surat basins in central and southern Queensland.

The basins are major energy provinces, with large reserves of coal and coal seam gas. While most large coal deposits have been identified, opportunities remain for further discoveries of economic deposits.

The Mount Isa region has delivered several world-renowned mineral deposits over the past century, but further potential exists. The region is highly prospective for base and precious metal deposits of the Mount Isa style (sedimentary-hosted silver-lead-zinc) and Broken Hill style (high-grade metamorphic silver-lead-zinc), breccia-hosted copper deposits, and iron-copper-gold deposits beneath shallow cover.

Geoscience Australia is managing the geophysical data acquisition for the entire program, and awarded five contracts for geophysical data acquisition in November 2005 (see table 1). When completed, these surveys will release more than 11 900 new gravity stations and over 387 000 line kilometres.

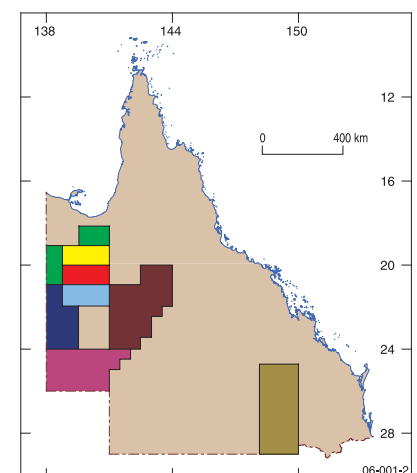


**Queensland Smart Exploration Initiative**

**AIRBORNE GEOPHYSICAL SURVEYS**

- Croydon, 400m E-W, 80m agl, ~35310 sq km
- East Mount Isa, 400m E-W, 80m agl, ~91510 sq km
- West Mount Isa, 400m E-W, 80m agl, ~22030 sq km
- South West Mount Isa, 400m E-W, 80m agl, ~86190 sq km
- Bowen - Surat, 400m E-W, 80m agl, ~114400 sq km

**▲ Figure 1.** Airborne geophysical surveys, Smart Exploration initiative.



**Queensland Smart Exploration Initiative**

**GRAVITY SURVEYS**

- Mount Isa Area A, 2 km spacing, ~26060 sq km
- Mount Isa Area B, 2 km spacing, ~26230 sq km
- Mount Isa Area B, 4 km spacing, ~35020 sq km
- Mount Isa Area C, 2 km spacing, ~25890 sq km
- Mount Isa Area C, 4 km spacing, ~42790 sq km
- Mount Isa Area D, 4 km spacing, ~75460 sq km
- Mount Isa Area E, 4 km spacing, ~97420 sq km
- Bowen - Surat, 4 km spacing, ~85760 sq km

**Table 1. Geophysical data acquisition contracts awarded to date**

Survey name	Contractor	Area (km <sup>2</sup> )	Station/line spacing	Stations/line km	Start date
Bowen-Surat Gravity	Daishsat	85 000	4 km	5 263	Nov 2005
Mt Isa Area A Gravity	Daishsat	26 000	2 km	6 719	March 2006
Bowen-Surat North Magnetic and radiometric	UTS	60 310	400 m	169 882 km	Feb 2006
Bowen-Surat South Magnetic and radiometric	Fugro	54 930	400 m	153 846 km	Feb 2006
Mount Isa West Magnetic and radiometric	Fugro	22 000	400 m	63 533 km	Feb 2006

The completed program will deliver five airborne magnetic and radiometric surveys and six ground gravity surveys (see figures 1 and 2). These surveys will release magnetic and radiometric data from a total of more than 1 200 000 line kilometres and 39 000 gravity stations into the public domain.

The new Bowen-Surat airborne data will be acquired on east-west flight lines spaced 400 metres apart. The Mount Isa West data will be acquired on north-south (north of -21.560813°) and east-west (south of -21.560813°) flight lines 400 metres apart. Ground clearance for both datasets will be 80 metres.

The three remaining airborne surveys will be on east-west lines 400 metres apart, again with a ground clearance of 80 metres. The four remaining gravity surveys will be at station spacings of 2 x 2 kilometres and 4 x 4 kilometres.

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**Related websites**  
Smart Exploration initiative:  
[www.nrm.qld.gov.au/science/geoscience/smartex.html](http://www.nrm.qld.gov.au/science/geoscience/smartex.html)

**► Figure 2.** Gravity surveys, Smart Exploration initiative.

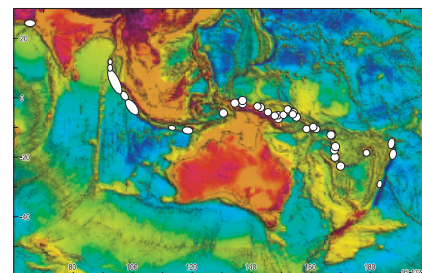
# Geoscience Australia's impact modelling PROTECTING AUSTRALIA

In November 2005, the Australian Emergency Management Committee (AEMC) approved the formation of a working group to address issues relating to tsunami risk in Australia, and the implementation of the emergency management elements of the Australian Tsunami Warning System. The AEMC is Australia's peak consultative emergency management forum and is chaired by the Secretary of the federal Attorney-General's Department and comprises chairpersons and executive officers of state emergency management committees and the President of the Australian Local Government Association. The AEMC's Australian Tsunami Working Group (ATWG) aims to develop a tsunami emergency management preparedness strategy for Australia consistent with an all-hazards framework.

The inaugural meeting of the ATWG, held in Perth between 30 November and 2 December 2005, addressed ATWG governance issues and strategic implementation issues for the community awareness, education and training elements of the Australian Tsunami Warning System. The remainder of the meeting was devoted to a workshop on tsunami risk and impact and the role of inundation modelling for emergency management planning and response capabilities. The workshop was facilitated by Emergency Management Australia and Geoscience Australia.

Geoscience Australia's scientists demonstrated detailed tsunami impact modelling work conducted in collaboration with the West Australian Fire and Emergency Services Authority. The presentation demonstrated the potential of detailed impact modelling to form the basis for emergency management response plans and capacity testing. This message was reinforced by Tony Pearce who chaired the AEMC's Catastrophic Disasters Working Group which used similar models, based in part on Geoscience Australia's research, to help assess Australia's capacity to respond to catastrophic disasters. The international guest speaker was George Crawford from the Washington State Emergency Management Division, who demonstrated how modelling is a core part of his program.

There was unanimous acknowledgment of the usefulness of detailed impact modelling for mitigating the effects of tsunamis. However, the biggest hurdle to detailed impact modelling is the non-availability of reliable, high-resolution bathymetry and elevation data. Consequently, the state agencies and Geoscience Australia will conduct a first pass analysis to identify which communities are most at risk from tsunami, with each jurisdiction then investigating the availability of data to support detailed inundation modelling. Once modelling has been completed emergency services agencies will work closely with the communities to help develop



effective mitigation and response options. Geoscience Australia will also develop a set of guidelines for the state agencies outlining the requirements for the collection of bathymetry and elevation data. These guidelines will assist the exchange of data between agencies as well as providing guidance for third parties in the collection of data.

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#### Related articles/website

Final report and presentation by Working Group on Tsunamis, The Prime Minister's Science, Engineering and Innovation Council  
[www.dest.gov.au/sectors/science\\_innovation/science\\_agencies\\_committees/prime\\_ministers\\_science\\_engineering\\_innovation\\_council/meetings/fourteenth.htm](http://www.dest.gov.au/sectors/science_innovation/science_agencies_committees/prime_ministers_science_engineering_innovation_council/meetings/fourteenth.htm)

## New Chief for Minerals Division

Dr James Johnson has recently joined Geoscience Australia as the new Chief of the Minerals Division. James brings to the position a wealth of experience in mineral exploration, mine geology, research management and leadership. He was also a member of the Executive Research Committee of the Predictive Mineral Discovery Cooperative Research Council (pmd\*cr).

After graduating with First Class Honours from Sydney University in the mid-1980s, James joined Western Mining Corporation (WMC) at their nickel mines in Kambalda before moving to Olympic Dam as a Mine Geologist. He then undertook a PhD on Olympic Dam at the Australian National University. This focussed on identifying metal sources and was followed by two years of post-doctoral studies at the University of Ottawa in Canada studying Australian and Canadian deposits similar to Olympic Dam (iron oxide, copper-gold).

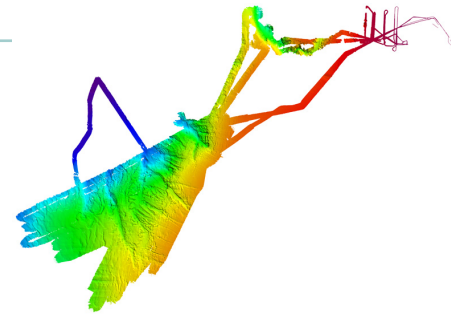
In 1995 James and his wife returned to Perth and he spent two years exploring for Proterozoic iron oxide, copper-gold deposits in the Gascoyne Province. Following a move to Norseman as Senior Exploration Geologist, he transferred to St Ives gold mine at Kambalda in 1999 to manage regional exploration then exploration on the St Ives core tenement and ultimately the company's Geology Department. As Geology Manager at St Ives he supported funding for external research and is aware of the high-calibre research available in Australia.

This period spanned the sale of WMC's gold assets to Gold Fields Limited. He returned to Perth with Gold Fields in 2005 as Regional Geologist managing exploration projects in China and Victoria.



James considers his move to Geoscience Australia as an opportunity to have an impact on geosciences on a national scale. Following a familiarisation with the diversity of current Geoscience Australia projects, James sees his main challenges as ensuring the Minerals Division's programs are relevant and applicable to exploration in Australia, particularly undercover exploration, and working hard to promote Australia as an investment destination

# Exploring the blind canyons off southwest Australia

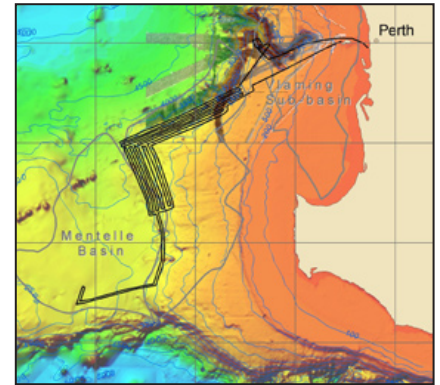


Geoscience Australia and the federal Department of the Environment and Heritage recently completed a survey to explore blind submarine canyons off southwest Australia. The survey, which was conducted during September and October 2005 on Australia's National Facility research vessel *Southern Surveyor*, documented the geological and biological transitions of different seabed geomorphic habitats as well as investigating the Mentelle Basin and assessing this frontier area for petroleum potential.


To date there has been limited knowledge of Australia's deep-water benthic (seafloor) habitats. To gain a better understanding of these environments the survey acquired swath images which allow the topography of the seafloor to be mapped in detail and provide information on seafloor characteristics. The survey acquired comprehensive coverage of the Perth Canyon by using high-resolution swath imagery. Benthic biota found in the Perth Canyon—a well-developed shelf-intruding canyon—were compared with those found in a nearby blind canyon which is confined to the continental slope.

Blind canyons are potentially unexplored habitats and could be home to different varieties of fauna. They are also the most numerous type of canyon on the Australian margin. Investigating the differences in seabed environments in this way indicates the diversity of benthic habitats according to variations in geomorphology. Geoscience Australia scientists also identified two previously unknown canyons, and a 75 km<sup>2</sup> slump block at the head of the Geographe Canyon. The slump block is important because of its tsunami-generating potential.

The survey achieved several firsts including capturing the first images of the seabed below 2000 metres in this region and the first rock samples ever recovered from the Mentelle Basin. The survey also collected the most comprehensive shallow seismic coverage of the area. Core samples taken from the basin will provide insights into the sedimentation history of deep-water deposition in canyons and surrounding areas. The scientific data collected during this survey will provide an improved understanding of the geology and seafloor of the Mentelle Basin and will assist in maintaining its biodiversity and identifying its petroleum potential.



Analysis of data collected during the survey is currently underway and final results are expected later this year.

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## Successful launch of ALOS satellite



The Advanced Land Observing Satellite (ALOS), also known as 'Daichi', launched by the Japan Aerospace Exploration Agency (JAXA) on 24 January 2006 is set to provide high quality, low cost earth observation data to the Australian government within the next six months.

A five year Memorandum of Understanding, signed between Geoscience Australia and JAXA in 2005, means that ALOS data can be used to benefit Australia in areas such as topographic mapping, disaster and environmental monitoring, climate change studies and mineral exploration.

Many Australian agencies currently rely on Landsat 5 satellite data to deliver their programs but are also seeking higher-resolution imagery. ALOS is expected to complement the Landsat data, as well as provide a limited back-up service in the event of a Landsat malfunction.

ALOS carries two optical imaging instruments with spatial resolutions of 2.5 metres and 10 metres as well as a radar imaging instrument with a resolution of 10 metres to 100 metres. The new satellite is designed for a three year life span, with enough fuel to last for five years.

ALOS data is expected to be available to users by September following the successful completion of the initial calibration and validation tests. A limited range of products may be available by June for test and validation purposes.

Geoscience Australia previously acquired data from the ALOS predecessor, the Japanese Earth Resources Satellite (JERS-1) which ended its mission in 1998.

**For more information visit Geoscience Australia's ACRES web page ([www.ga.gov.au/acres/](http://www.ga.gov.au/acres/))** 