

Product News

New

1:1 million Geology of Eastern Australia

available

Seamless outcrop geology data is now available for all of the eastern states of Australia, from Tasmania to Cape York, at 1:1 million scale. The data provides an invaluable baseline dataset for large-scale regional and national evaluation of resource potential, environmental issues, and land use.

The digital data is available either in state sections on CD or can be downloaded free from the Geoscience Australia website (www.ga.gov.au/products/). The data includes:

- a first edition dataset for the whole of Queensland
- a first edition dataset for New South Wales
- updated second edition datasets for Tasmania and Victoria.

The Queensland dataset replaces previously released data sets of 'South Queensland' and 'Northwest Queensland, western Cape York and Torres Strait'. The new dataset includes first time coverage of the Townsville–Georgetown–Coen region at this scale, and also a significant upgrade of the geology of the New England Fold Belt, between Warwick and MacKay, in the southeast of the state. The new digital data were largely compiled from regional 1:500 000 and 1:1 million scale maps but also include significant re-compilations from the Geological Survey of Queensland's 1:100 000 series, notably through the New England Fold Belt and in the Townsville–Georgetown area.


The New South Wales 1:1 000 000 scale dataset is the most detailed seamless geology data available for the state. The dataset was compiled primarily from the NSW Department of Mineral Resources statewide 1:250 000 and 1:100 000 database, as well as several broader scale regional datasets in the Broken Hill and Murray Basin areas. The work involved edgematching over 40 individual maps and applying a consistent stratigraphic and regolith classification scheme across the state and into Queensland and Victoria.

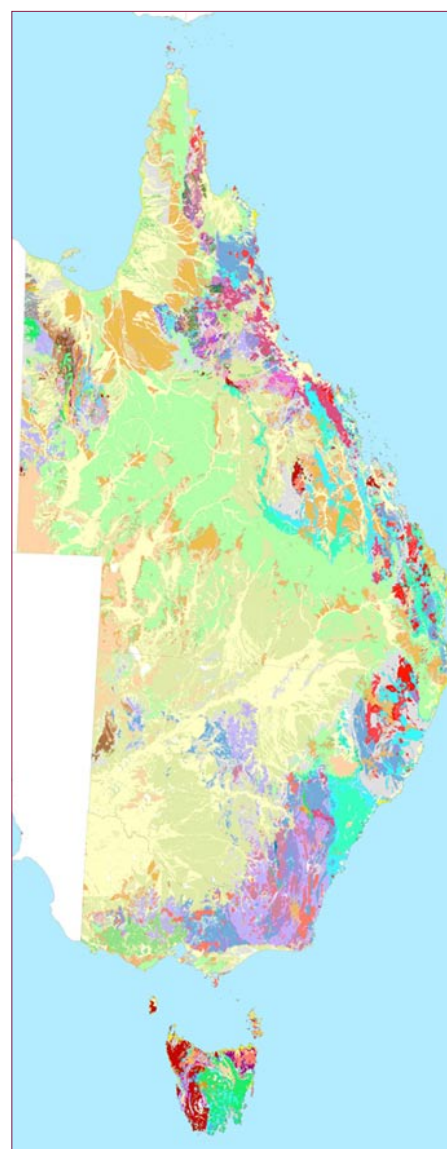
The second edition Tasmanian and Victorian datasets have been updated to include geological unit names and descriptive information for nearly 300 granite plutons which were grouped together in first edition data releases.

The digital data are intended for use at 1:1 million scale and have a spatial accuracy of between 200 metres and one kilometre depending on the quality of the original source data. Geological unit (polygon) attributes include stratigraphic name (linked to the Australian Stratigraphic Units Database), map symbol, unit description, maximum and minimum age, and summary lithology information. Faults and stratigraphic boundaries are also coded in the data. The datasets come with comprehensive metadata attached.

The new data are designed primarily as a digital tool for GIS applications. It is not planned to issue a printed map—a paper map of Australia at 1:1 million scale would be almost four metres tall—and a legend for the several thousand stratigraphic units would be enormous! A 1:5 million hardcopy map was released in 1999 and is still available through the Geoscience Australia Sales Centre.

The data for the new releases are available in ESRI coverage and shapefile and Mapinfo formats, and this is the first Geoscience Australia dataset based on the new National Geological Data Model for GIS data (www.geoscience.gov.au/geoportals/standards.html).

For more information phone Alan Whitaker on +61 2 6249 9702 (email alan.whitaker@ga.gov.au). To order copies of the CDs phone Freecall 1800 800 173 (in Australia) or +61 2 6249 9966 (email mapsales@ga.gov.au) 



Dive into MARS

The new national MARine Sediments (MARS) database provides detailed information on seafloor sediment characteristics for the entire Australian continental margin.

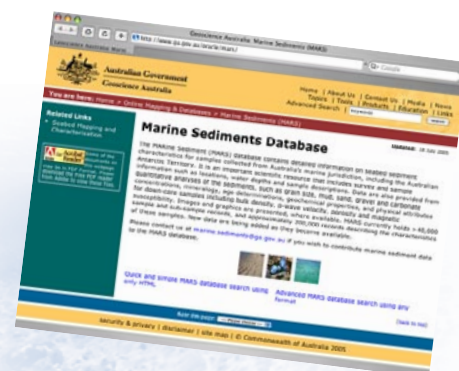
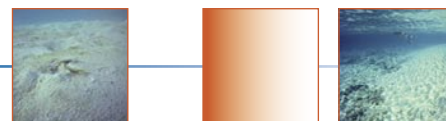
Developed by Geoscience Australia in collaboration with the National Oceans Office of the Department of the Environment and Heritage, the MARS database is now freely available to the public via the Geoscience Australia website.

The MARS web page enables users to map samples spatially and zoom in on areas of interest. It can also produce graphical results of grain size analyses, and will soon display underwater movies and photographs of the sea floor. Users can also access data from other Geoscience Australia databases, including organic geochemistry and estuary data.

The texture and composition of more than 45 000 sediment samples and subsamples collected within the Australian continental margin are described in the MARS database. In addition to this quantitative information, other analyses available include radiocarbon ages, elemental analyses, biogenic silica, mineralogy and water depths.

Most of the data comes from Geoscience Australia's surveys, with some input from external sources. Continually updated with new quality-controlled data, MARS is fast becoming a powerful research tool. Already Australia's most comprehensive marine sediment database, it is expected to become a fundamental geoscience dataset for the marine geoscience community.

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Related information
www.ga.gov.au/oracle/mars

IMPROVED Landsat composite products

Geoscience Australia's remote sensing unit (ACRES) has released new products that resolve problems caused by the malfunction of Landsat 7's Scan Line Corrector (SLC).

The SLC compensated for forward motion of the satellite before a malfunction caused it to be turned off in May 2003. As a result, subsequent images from Landsat 7 contain alternate scan lines of missing data at the edges of scenes.

To restore the value of Landsat 7 data, ACRES released SLC-Off products and SLC On/Off composite products in 2004. The SLC On/Off composite replaced the missing data with data from one SLC-On scene taken before May 2003. However, this approach was limited by potential variation of ground features during the time interval.

The new SLC-Off composite products are a significant step forward in providing more useful Landsat 7 data:

- Customers can now combine SLC-Off scenes acquired in subsequent passes in the same season, reducing ambiguity in interpretation due to temporal changes.
- Customers can now select up to five SLC-Off scenes of an area of interest to maximise the chance of filling data gaps, which vary from acquisition to acquisition.
- One additional SLC-On scene can be included to eliminate all gaps in the final product.

The new SLC-Off composite products are only available as ortho-corrected products and in Fast L7A format. When ordering a Landsat 7 ETM+ SLC-Off

composite product, customers should nominate a primary SLC-Off scene to be used as the base image.

For optimal results, images chosen to generate a gap-filled product should be from the same season and contain minimal transient data such as clouds, snow cover or fires. Customers should also avoid selecting fill scenes with quality problems such as high bit error rate and drop-outs. These are identified in the ACRES digital catalogue.

For more information
www.ga.gov.au/acres/referenc/slcoff.jsp



▲ **Figure 1.** Combining SLC-Off and SLC-On scenes. The edge portion of a primary SLC-Off scene (left), an SLC-On scene with equivalent seasonality (middle), and the composite product generated from these two scenes.



▲ **Figure 2.** Combining two SLC-Off scenes. The edge portion of a primary SLC-Off scene acquired on 2 March 2004 (left), an SLC-Off fill scene acquired on 18 March 2004 (middle), and the composite product generated from these two scenes.

Re-processed seismic data a BIG improvement

Geoscience Australia has recently released reprocessed data from the 1975 Bureau of Mineral Resources (BMR) Galilee Basin Seismic Survey, following the analogue to digital transcription of the original magnetic field tapes.

The survey, which collected 338 km of seismic reflection data in the western part of the Galilee Basin in central Queensland (figure 1), was carried out by Geoscience Australia's predecessor the BMR in 1975 (Harrison 1976). The data provided basic information on the extent and thickness of the western part of the basin, defined the southern margin of the Lovelle Depression, and mapped major faulting within the basin.

The data were recorded on frequency modulated (FM) magnetic tapes using an SIE PMR20 data recorder. Geoscience Australia contracted Echo Surveys Pty Ltd to transcribe the 734 field tapes from this survey to shot records in SEG-Y format. Technical details of the transcription process undertaken are available on request.

The majority of the data was acquired as single-fold. However, some three-fold and six-fold traverses were also recorded (table 1). The geophone group interval used was 45 metres and the shot point interval was 540 metres.

An example of the improvement to data quality achieved from the transcription and reprocessing is shown in figure 2. There is considerable improvement in the section above one second two-way time (TWT).

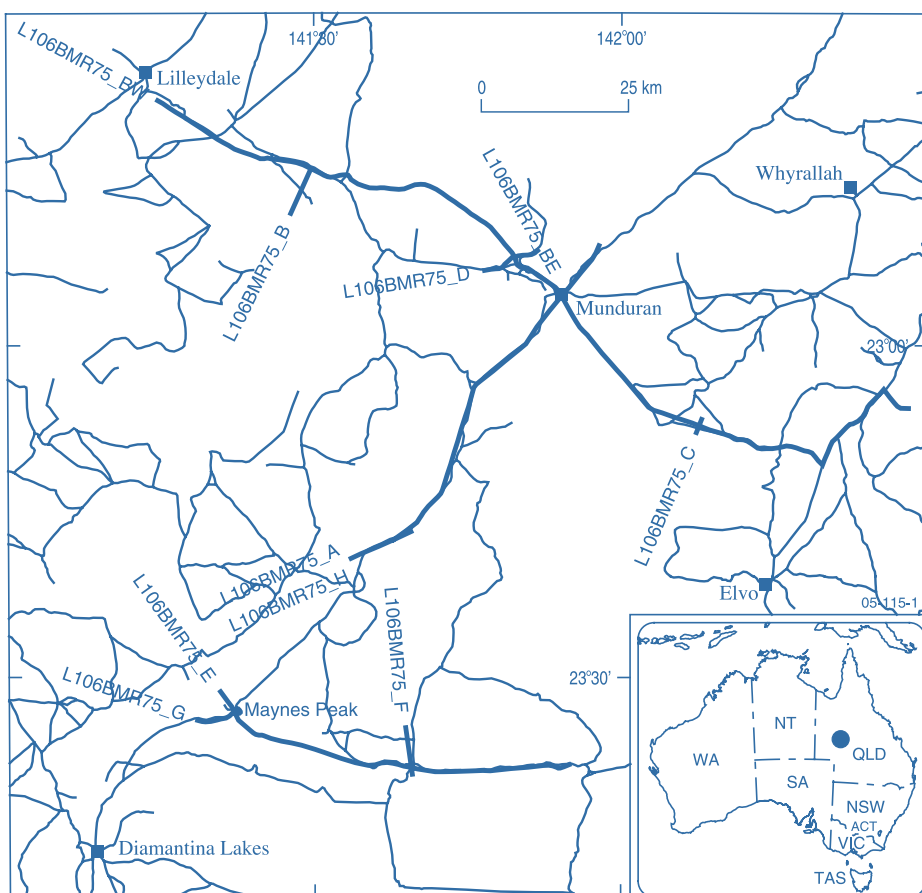
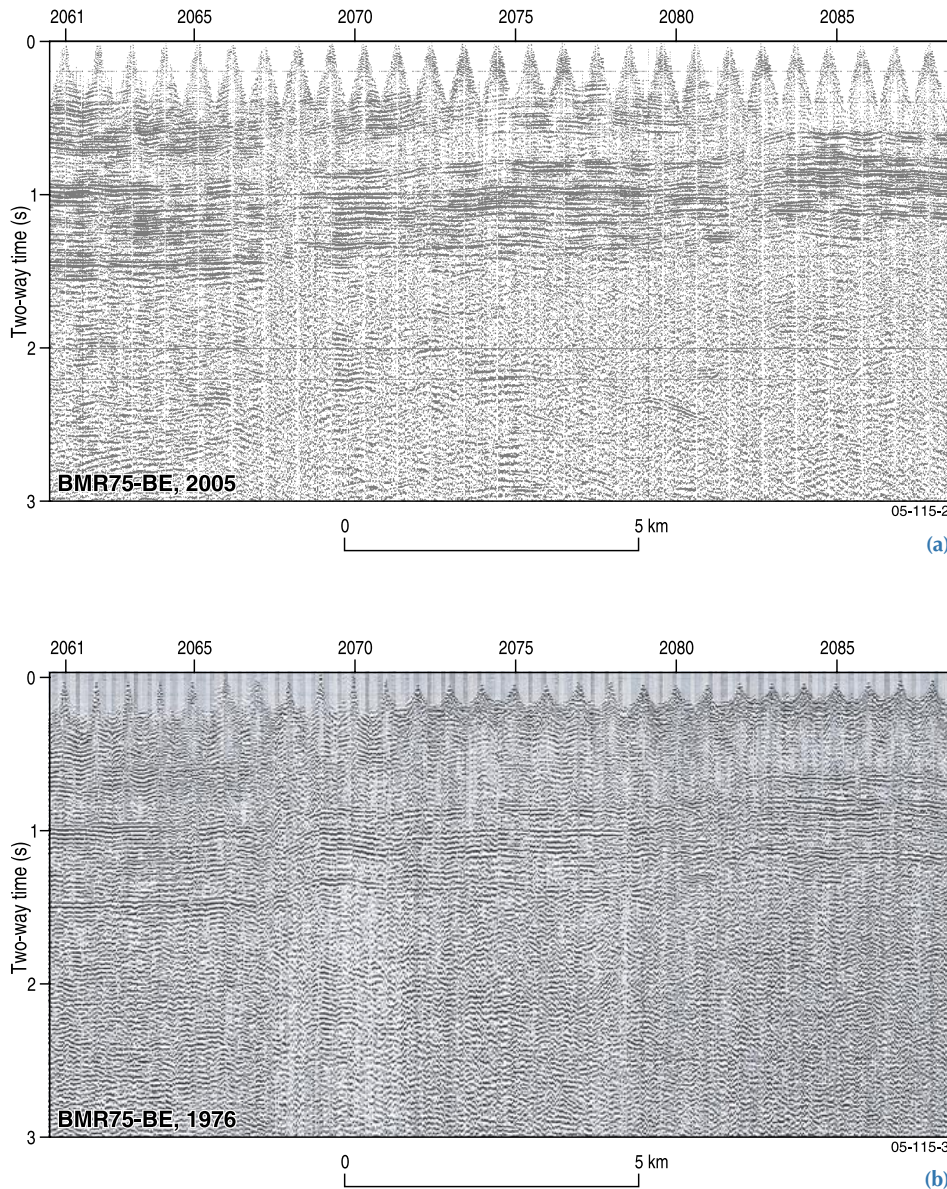


Figure 1. Location map of the 1975 Galilee Basin seismic survey.



▲ **Figure 2.** (a) 2005 reprocessed section of part line BMR75-BE, (b) 1976 vintage processing of part line BMR75-BE.

The processing steps used to produce figure 2 were:

1. Line geometry defined, all shots/receivers re-numbered
2. SEG-Y tape input
3. Resample to two millisecond sample rate
4. Static time correction for field time break
5. QC control and trace edits
6. Statics computation and application
7. Common Mid-point (CMP) sort
8. Velocity analysis
9. Residual statics computation and application
10. Spectral equalisation
11. Bandpass filter
12. Normal Moveout (NMO) correction
13. First break mute
14. CMP stack
15. Signal enhancement
16. Add traces for CMP display.

The re-processed data are available from Geoscience Australia in shot ordered or stacked SEG-Y format. Surveying, observers, shot firers, drilling and operations reports as well as scanned images are also available.

References

Harrison PL & Bauer JA. 1976. Galilee Basin seismic survey, Queensland, 1975, Operational Report. Bureau of Mineral Resources, Record 1976/27.

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Table 1. 1975 Galilee Basin Seismic Survey (L106) line summary.

Original Line Name	Shot Point Range	New Line Name	Reprocessed cdp range	Length (km)	Nominal Fold
A	877-100	BMR75-A	2012-4988	67.0	1
A	974-982	BMR75-A	2000-2119	5.4	6
B	2001-2142	BMR75-BE	5828-9236	76.7	1
B	1842-1999	BMR75-BW	2012-5804	85.3	1
C	1-5	BMR75-C	2012-2132	2.7	1
D	2996-3008	BMR75-D	2012-2324	7.0	1
E	3994-4110	BMR75-E	2012-4796	62.7	1
F	5001-5010	BMR75-F	2025-2156	5.9	6
G	5988-5999	BMR75-G	2012-2300	6.5	1
H	6984-6996	BMR75-H	2000-2167	7.5	6
I	85-99	BMR75-I	2012-2372	8.1	1

