

## Conference update



# ASEG-PESA 2013

'THE EUREKA MOMENT'

11 - 14 AUGUST 2013 • MELBOURNE, AUSTRALIA

The organising committee and our many helpers are working hard to deliver a conference that we hope will provide you with your very own eureka moment! The 22 high-profile keynote speakers, more than 300 submitted papers and posters, up to 20 workshops and 102 exhibition booths are sure to make your attendance worthwhile. In this update we will focus

on the latest developments ahead of the final program being announced in the next edition of *Preview*.

## Technical program

We received a record number of 'Expressions of interest' (to submit a

paper or poster) that should enable the technical committee to build a strong and focussed technical program. At the time of writing, the deadline for submission of the 'Expanded Abstracts' has just passed and our volunteer reviewers are about to get busy. Authors will be notified of the final status of their submission by 5 April.

Workshop title	Workshop leader	Date (in August 2013)	SAUD (incl. GST)
<b>Petroleum and Unconventionals Workshops</b>			
Rock Physics Workflows Forum	DuG, Ikon, David Lumley, Jarrod Dunne	Thursday 15th	165
Seismic P-wave Anisotropy: Hands On	Leon Thompson	Sunday 11th	550
All Things Microseismic	Julie Shemata, Murray Roth	Thursday 15th	605
Structural geology and seismic stratigraphy – West Gippsland field trip	Mike Hall, Alan Tait	Thursday 15th, Friday 16th	440
OpendTect – HorizonCube and SSIS training	Paul de Groot, Jan Stellingwerff	Sunday 11th	330/660/990
Madagascar (open source processing) workshop	Jeff Shragge, Sergey Fomel	Thursday 15th	110
Making a difference with 4D	David Johnston	Sunday 11th	165/275/380
Planning and operating a land 3D survey	Andreas Cordsen	Sunday 11th	220
<b>Minerals Workshops</b>			
Remanent Magnetisation and Self-Demagnetisation Estimation	Dave Pratt, Clive Foss, Phillip Schmidt	Sunday 11th	165
Geophysical Processing, Analysis and Visualisation in Encom PA	Dave Pratt/Pitney Bowes	Friday 16th	275
Precision Interpretation with ModelVision Using Different Inversion Techniques	Dave Pratt/Pitney Bowes	Thursday 15th	275
Inversion Forum	Terry Ritchie, Richard Lane	Saturday 10th	165
Exploration Undercover; the challenge of seeing deep and staying focussed	Ken Witherley, Graham Ascough	Thursday 15th	220
MT/AMT for Mineral Exploration	Mike Hatch	Friday 9th, Saturday 10th	715
Introduction to Hard Rock Seismic Workshop	Tristan Kemp (GA)	Saturday 10th	275
Geophysical Interpretation, Modelling and Inversion in Gocad	Glen Pears, Peter Fullagar, James Reid, Tim Chalke	Sunday 11th	660
A Forum – Using Regional Data Sets to Drive Discovery	Kevin Tuckwell, Richard Lane	Sunday 11th	275
<b>General Workshops</b>			
A one day workshop in Ground Penetrating Radar	Hugh Rutter, Jan Francke	Thursday 15th	330
Geohazards	Tim Rawling, Gary Gibson	Sunday 11th	70
Gradiometry in Exploration for Minerals and Energy Resources	Intrepid Geophysics	Sunday 11th	275

If you haven't done so, it might be worth perusing the list of confirmed keynote speakers on our conference website. Following the example set by the Brisbane organising committee, we've assembled a stellar line up, headed by Stephen McIntosh from Rio Tinto. Where possible, the keynotes will lead sessions within the technical program with broad-ranging presentations of up to 45 minutes in length.

### Workshops

The workshops committee has finalised a list of 20 candidate workshops (as shown in the accompanying table), which will be led by skilled educators and cover a broad range of hot topics in exploration geophysics. The prices have been set to provide exceptional value to ASEG and PESA members making it easier to justify training in a time when many companies are seeking to cut costs.

We urge our members to register early to secure a place in the more popular workshops. Please note that some workshops may be withdrawn if undersubscribed; thus providing another reason not to leave your workshop registration to the last minute. Students are particularly encouraged to attend

as many workshops as possible to supplement their education ahead of entering the workforce.

### Conference dinner

We are very excited to announce Professor Geoffrey Blainey AC as the Conference Dinner speaker. Professor Blainey is widely regarded as Australia's most prominent historian and undoubtedly will impress all who attend with his lucid depiction of Australia's economic growth that has been underpinned by the quest for mineral resources. The dinner will be held in the Great Hall at the National Gallery of Victoria. Dinner tickets for delegates and guests can be purchased for \$150 per person when registering for the conference.

### Student night

The Wharf Hotel, located on the north bank of the Yarra, has been selected as the venue for the student night. Attendance is free for students that are registered for the conference and the night offers a chance to network with peers and meet industry representatives in a relaxed and informal setting.

### Honours and Awards nominations 2013

The conference provides an important opportunity to recognise and thank members who contribute to the profession and to our society. There are a range of categories covering contributions to the science, practice, innovation and promotion of geophysics as well as recognition of distinguished service by members. See this current issue of *Preview* (p. 7) for more details.

### Early bird registration

Discounted registration (at \$995) for early birds and authors closes on **26 April** so be quick to take advantage of this special offer. Students are offered a heavily subsidised fee of only \$150 (proof of student ID must be submitted).

Please visit our website to secure your conference registration, in addition to signing up for workshops, purchasing tickets for the gala dinner and to book accommodation.

We look forward to seeing you in Melbourne!

*Suzanne Haydon and Jarrod Dunne  
On behalf of the Organising Committee  
[www.aseg-pesa2013.com.au](http://www.aseg-pesa2013.com.au)*

## Near-surface geophysics

The majority of ASEG members are engaged in resource exploration in either minerals or petroleum. Publications and conference presentations are dominated by development and application of these areas. Yet, the ground we stand on is another subject of geophysics. It is the domain of human activity: we need firm ground to build our homes, and we need those buildings to be safe against natural hazards like earthquakes, landslides and tsunami.

The geophysical techniques developed for resource exploration are often tried in engineering and environmental applications for near-surface investigation. For example, the frequency domain electromagnetic survey technique is often

used for groundwater surveys, specifically modified for near-surface applications with a high-frequency transmitter.

Near-surface applications of conventional geophysical methods can be problematic. To use the seismic reflection method for very shallow investigation, the geophone interval must be extremely small to achieve high fold to combat the noise, hence the survey will be very expensive.

On the other hand, geophysical methods like ground-penetrating radar are specifically developed for near-surface application.

For those who explore deeper targets, near-surface disturbance is often

a problem. Thus, understanding near-surface anomalies may help to improve imaging the earth at greater depths.

The first Asia-Pacific Near-Surface Conference aims to address these unique features of near-surface geophysics. It is organised by the SEG and the Chinese Geophysical Society with cooperation of the ASEG, SEGJ and KSEG. Held in Beijing in July 2013, it offers an opportunity to learn and discuss the near-surface application of geophysical methods (see p. 15 for full announcement).

*Koya Suto  
President Elect & Research Foundation*



# Near Surface Asia Pacific Conference

17–19 JULY 2013 • BEIJING, CHINA



## 1st Near Surface Asia Pacific Conference and Exhibition

17–19 July 2013 • Beijing, China

The Society of Exploration Geophysicists and the Chinese Geophysical Society along with co-sponsors The Australian Society of Exploration Geophysicists, the Society of Exploration Geophysicists, Japan and the Korean Society of Earth and Exploration Geophysicists announce the first conference on Near Surface geophysics and related topics to be held in Beijing, China in 17–19 July 2013.

The conference will focus on near surface issues within the Asia Pacific region and will bring new technology and the application of various techniques to advance near surface geophysics in the fields of engineering, construction, hydrogeological, environmental and humanitarian areas.

### **Technical Program**

The event will provide the participants an opportunity to present and discuss the latest scientific results, issues and research within the Asia Pacific region.

*Sessions will cover the following topics:*

- ▮ Near-Surface Geophysics and Human Activities
- ▮ Shallow Seismology
- ▮ Ground Penetrating Radar
- ▮ Electric, EM, and NMR Methods
- ▮ Engineering Geophysics
- ▮ Mining and Geothermal Exploration
- ▮ Remote Sensing and Lidar Applications
- ▮ Hydrogeophysics
- ▮ Rock and Soil Properties
- ▮ Borehole Geophysics
- ▮ Modeling and Inversion
- ▮ Geophysical Instruments

### **Exhibition**

The exhibition will feature companies displaying the latest in sensing equipment, ground penetrating radar, instruments and service companies.

*Cosponsored by:*

**Australian Society of Exploration Geophysicists**  
**Korean Society of Earth and Exploration Geophysicists**  
**Society of Exploration Geophysicists of Japan**

*For additional information, [awatson@seg.org](mailto:awatson@seg.org)*

## Update on Geophysical Survey Progress from the Geological Surveys of Western Australia, South Australia and WA Department of Water (Information current at 12 March 2013)

Tables 1–3 show the continuing acquisition of the airborne magnetic, radiometric, gravity and AEM data of

the Australian continent. Accompanying locality maps for Table 2 can be found in Figures 1 and 2, and for Table 3 in

Figure 3. All surveys are being managed by Geoscience Australia (GA).

Table 1. Airborne magnetic and radiometric surveys

Survey name	Client	Contractor	Start flying	Line (km)	Spacing AGL Dir	Area (km <sup>2</sup> )	End flying	Final data to GA	Locality diagram (Preview)	GADDS release
South Pilbara	GSWA	GPX	14 May 12	136 000	400 m 60 m N–S	42 500	100% complete @ 22 Jan 13	TBA	150 – Feb 11 p21	TBA
Mt Barker (South West 4)	GSWA	GPX	24 Apr 11	120 000	200 m 50 m N–S	20 000	100% complete @ 27 Jan 13	TBA	150 – Feb 11 p22	TBA
Marree	GSSA	UTS	29 Oct 12	130 473	400 m 80 m N–S	46 169	53.8% complete @ 7 Mar 13	TBA	160 – Oct 12 p16	TBA
Widgiemooltha – Norseman	GSWA	Thomson	15 Nov 12	131 900	100 m 50 m E–W	11 520	79.7% complete @ 10 Mar 13	TBA	161 – Dec 12 p16	TBA

TBA, to be advised.

Table 2. Gravity surveys (also see Figures 1 and 2)

Survey name	Client	Contractor	Start survey	No. of stations	Station spacing (km)	Area (km <sup>2</sup> )	End survey	Final data to GA	Locality diagram (Preview)	GADDS release
Esperance	GSWA	TBA	TBA	TBA	2.5 km and 1 km along roads/tracks	TBA	TBA	TBA	158 – Jun 12 p23	The survey is expected to proceed but will not be conducted until the 2013/14 fiscal year
Woomera Prohibited Area	DMITRE	TBA	TBA	34 500	1 km/2 km regular grid	TBA	TBA	TBA	This issue	Quotation request closed on 4 March 2013
North Perth – Gingin Brook	WA Dept of Water	TBA	TBA	1230	1.5 km regular grid	TBA	TBA	TBA	This issue	Quotation request closed on 7 March 2013

TBA, to be advised.

Table 3. AEM surveys (also see Figure 3)

Survey name	Client	Contractor	Start flying	Line (km)	Spacing AGL Dir	Area (km <sup>2</sup> )	End flying	Final data to GA	Locality diagram (Preview)	GADDS release
Swan/Scott Coastal Plain and Albany/Esperance	WA Dept of Water	Fugro Airborne Surveys	Est. 25 Mar 13	8607	300/600 m	TBA	TBA	TBA	This issue	Contract executed by GA on 4 March 2013

TBA, to be advised.

Further information on these surveys is available from Murray Richardson at GA via email at Murray.Richardson@ga.gov.au or telephone on (02) 6249 9229.

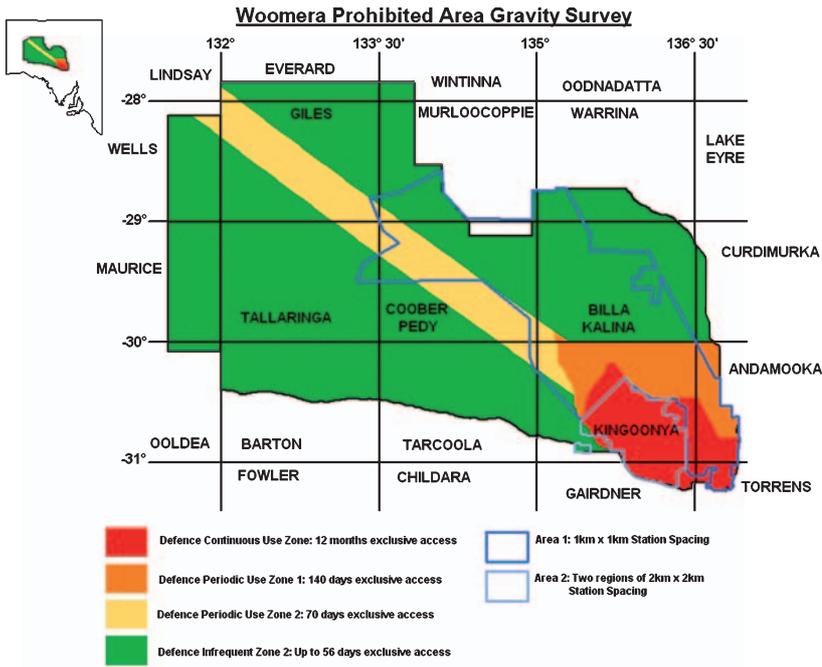


Fig. 1. Locality map for the Woomera Prohibited Area Gravity Survey (also see Table 2).

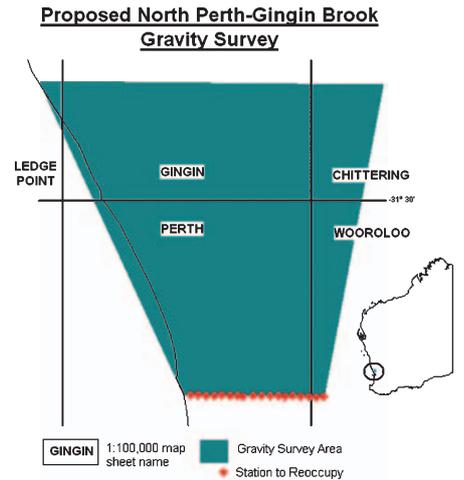


Fig. 2. Locality map for the Proposed North Perth-Gingin Brook Gravity survey (also see Table 2).

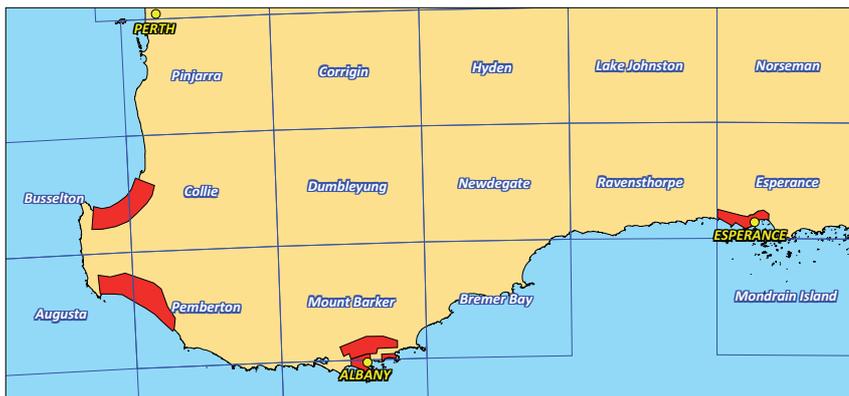


Fig. 3. Locality map for the Swan/Scott Coastal Plain and Albany/Esperance AEM survey (also see Table 3)

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## The Geoscientific Data Warehouse: accessing and delivering NSW geoscience data

D. Collins, P. Gilmore, J. Greenfield,  
T. Barlin and S. Meakin

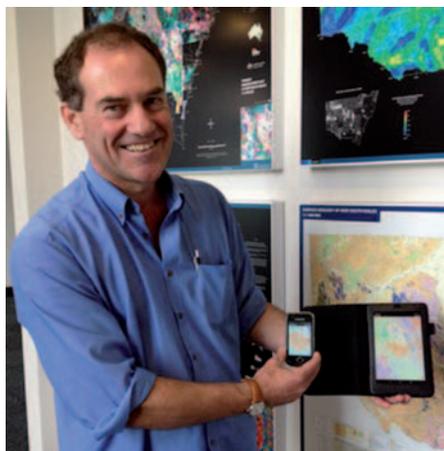
Geological Survey of New South Wales  
NSW Trade & Investment  
516 High Street, Maitland, NSW 2320

*This article is an excerpt from a draft paper for the internal publication 'Quarterly Notes of the Geological Survey of New South Wales'.*

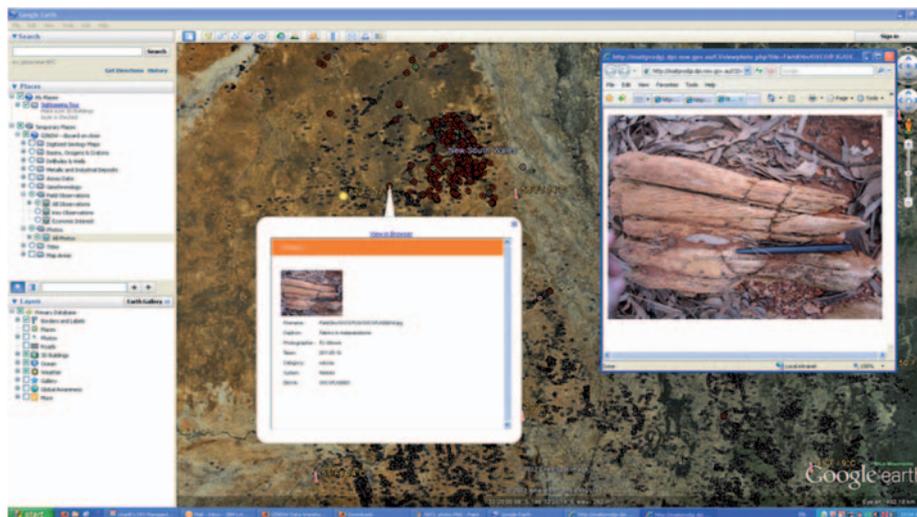
### Introduction

In September 2012, the Minerals Resources unit of NSW Trade & Investment first released its new Geoscientific Data Warehouse (GDW) on the internet. The GDW is the culmination of the COGENT II project (2008–2012) to identify, validate, consolidate and store geoscientific datasets of the highest data integrity secured in perpetuity. This represented the first step in fulfilling the vision of 'providing on demand access to all validated (non-confidential) corporate geological data stored by Mineral Resources from a single spatial-based interface'. The GDW provides access to geoscientific information to attract investment for mineral and petroleum exploration and development and helping inform land use decision-making, a major role of the Mineral Resources unit.

The COGENT I project (1995–1999), funded by the NSW Government's *Discovery 2000* initiative, started the transfer of data to a central, secure



Dave Collins, Senior Geoscientist (Data Systems), Geological Survey of New South Wales, demonstrates the new maps for mobile devices.



*How it works: the GDW is a new online service that provides free, on-demand access to validated, non-confidential, geological data for NSW. The data is discoverable through display in Google Earth™ and also by using simple queries within web pages.*

environment. The COGENT II project is a major project of the continuing initiative now called *New Frontiers*, which continues the government program of pre-competitive geophysical surveys, data compilation and delivery, frontier mapping and interpretation.

The GDW is the delivery vehicle for data captured and stored in the geoscientific database application system. Now that this system is in place, users of the GDW will see a steady stream of new and updated datasets from nightly replication.

### How it works

The GDW uses Google Earth™ technology to enrich the functionality and experience of discovering geoscientific data in NSW. Integrating the 3D and layer transparency features of Google Earth™ with geo-referenced field photos and microphotographs provides a 'virtual field' experience for the user.

The geoscientific data held in the new database is primarily point data, such as field observations, structural readings, geochronology, and non-confidential data from exploration reporting. However, the GDW spatial interface also has layers for geological and metallogenic maps and geophysical imagery (geolocated at all zoom levels), current mineral, coal and petroleum titles as well as title applications for minerals, coal and

petroleum. The GDW also contains a link to the new Geoscience Product Catalogue and to DIGS database (of exploration and geoscience reports and maps).

For those who wish to bypass the spatial interface, comprehensive text-based search facilities are available, including geoscientific database data and reports as well as data and images stored in the DIGS database. These are all complemented by a download facility that supports download in multiple formats including shape files, TAB files and CSV.

### Maps for mobile devices

A new feature in November 2012 was the addition of a facility to download



*Exploration applications: a wealth of drill hole data for NSW is available via the GDW (Photo: an exploration company drilling near Koonenberry).*

free statewide geological maps and geophysical imagery to smartphones and tablets. This is a one-off file download via an internet connection. However the feature does not require an internet connection to display, therefore making these maps available in areas without internet reception. GPS technology embedded in smartphones allows the user to instantly view maps or imagery at their location. Maps used are NSW 1:1 500 000 surface geology, Total Magnetic Image and ternary radioelement image. This has proven to be a very popular facility and more maps will be made available for download on an ongoing basis.

### Access

Public access to the GDW is via the entry page <http://dwh.minerals.nsw.gov.au/CI/> warehouse. At this site links can be found for demonstration videos, feedback and request forms and map support for mobile devices.

### Data

Data migration was prioritised with respect to value and risk. For example, radiogenic isotopes were considered the highest priority due to the cost of recollection and reanalysing samples, along with storage of records in multiple versions of spreadsheets on the computer network and on individual computers. Resources were allocated to compile, model and migrate data based on their priority. All data has been secured and has a work plan for implementation into the GDW. As a result of finite resources, not all data has been implemented in the GDW at this stage (Tables 1 and 2).

### Case study: drill hole data

The GDW provides access to non-confidential stratigraphic, coal, mineral and petroleum drill hole information from across NSW. Currently all drill hole data, with assay analysis from drilling is stored

using Micromine’s Geobank geological data management software. All data is stored in tables in Geobank that allow migration of data from both historic sources and the current data template. Non-confidential data is replicated nightly from Geobank to the GDW.

The first priority of COGENT II is to store location information for drill holes. Data captured includes coordinates, title, company, date, purpose, end-depth, and GS report number for further information via DIGS. The next priority is to capture down-hole information such as assay, lithology, geophysical and survey data. The focus to date for capture of these data for minerals drilling has been the Cobar Peneplain Bioregion, to assist mineral explorers and land use planning.

In the GDW, drill hole locations may be viewed by type (coal, mineral, petroleum), whether they are stored in department core facilities (WB Clarke

Table 1. Data implemented as of 28 February 2013

Dataset	Description	Records
Radiogenic isotopes (except Pb–Pb)	Sample and analytical data for U–Pb, K–Ar, Ar–Ar, Re–Os and Sm–Nd isotopic studies.	2169 samples
Petrological collection	Catalogue and description of thin sections of rock samples	93 126 thin sections
Drill holes: minerals	Minerals drilling (mostly industry exploration data plus department stratigraphic) including collar, survey, lithology data	44 117 collars
Drill holes: petroleum	Petroleum wells – department and industry (CSG, oil, gas) including collar, survey, lithology, other downhole data	864 collars
Drill holes: coal	Coal drill holes (department and industry) including collar, survey, lithology, other downhole data	56 303 collars
Exploration geochemistry: down hole assay	Analytical data for down drill hole assays reported by exploration companies	2 668 997 samples (represents data from 96 717 drill hole collars compiled from industry exploration reporting)
Exploration geochemistry: surface samples (stream sediments, soils, rock chips, NITON)	Sample and analytical data for geochemical surveys reported by exploration companies	773 817 samples
Photographs: field photos	Embedded location and metadata for image bank.	2500 photos
Field observations	Geological observations, measurements and sample data by department geologists	114 140 locations

Table 2. Data planned for implementation

Dataset	Description	Records
Seismic	Shot points, line coverage, SEGY and imagery from onshore and offshore seismic surveys (~2500 surveys for ~45 000 line km)	~45 000 line km (2500 surveys)
3D geology	Vector data representing geological (geophysical) features below the earth’s surface in 3D space	
Petrophysics	Petrophysical properties of rocks (magnetic susceptibility, density, radioelements)	~5000 records
Whole rock geochemistry	Sample and analytical data for whole rock geochemical samples	~25 000 records
Palaeontology	Sample and descriptive data for fossil samples in NSW to aid stratigraphic and age discriminations	~65 000 records
Stable isotopes	Sample and analytical data for S, O and other stable isotopic systems	~3500 records
Polished blocks	Sample and descriptive data for polished blocks of mineral samples	~1775 records
Economic rocks	Sample and descriptive data for economic mineral samples in NSW	~30 000 records
Radiogenic isotopes (Pb–Pb)	Sample and analytical data for Pb–Pb isotopic studies	~2000 records

Geoscience Centre at Londonderry and EC Andrews Core Facility at Broken Hill), whether they have been hyperspectral scanned, or have associated lithology data. As with other GDW datasets, the data can be queried, viewed in Google Earth™, and downloaded into GIS or database software.

The availability of drill hole data will allow exploration companies to easily access existing drill hole and associated assay and lithology information for their area of interest, and similarly allow department staff access to sub-surface geological information across NSW.

#### Department drilling

Holes drilled by the department include coal resource evaluation drilling, petroleum wells and regional stratigraphic programs. For example:

- (1) A regional drilling programme was conducted by the department under

the *Discovery 2000* initiative to assess petroleum potential of the Darling Basin;

- (2) 138 shallow air core holes were drilled east of Cobar in the late-1990s as part of the *Exploration NSW* initiative to improve geological understanding of the area.

#### Exploration drilling

Reporting of exploration drilling on coal, mineral and petroleum titles to the department is mandatory. Since the late 1990s, reporting of minerals drilling activity has been via digital submission in data templates in line with the 'Australian Requirements for the submission of Digital Exploration Data'. This data is now uploaded to Geobank routinely, with all minerals exploration drilling now stored in Geobank. Pre-digital submission, exploration drilling was submitted in hard-copy reports, scanned into raster format and archived in

DIGS. Under the *New Frontiers* initiative, contractors have been extracting drilling information from DIGS and populating Geobank.

#### Ongoing work

The GDW simplifies the discovery and accessibility of free geoscientific information to aid mineral and energy exploration, inform land use decision-making, and enhance ongoing geoscientific research in NSW. To enable future enhancements, a key feature of the GDW is a feedback form for users to provide comments and suggestions for improving the site and data available.

#### For more information contact:

Graham Butt

Email: [graham.butt@industry.nsw.gov.au](mailto:graham.butt@industry.nsw.gov.au)  
Manager Geoscience Information  
Geological Survey of New South Wales

## Call for case studies to complement the ESWA Earth and Environmental Science textbook

*The following TESEP article has been reproduced from the TESEP website and the March edition of 'The Australian Geologist' (TAG) published by the Geological Society of Australia (GSA).*

Dear geoscience colleagues,

The highly successful Teacher Earth Science Education Programme (TESEP) is seeking your assistance.

We are collaborating with Earth Science Western Australia (ESWA) to produce case studies that complement their fantastic Earth and Environmental Science (EES) textbook.

By updating with Australia-wide examples, the book will more effectively help all Australian teachers when the new Australian Curriculum EES course for years 11–12 is rolled out in the next couple of years. TESEP is encouraging nation-wide adoption of this text and by providing additional complementary case studies we are helping to ensure it is of maximum use across the country.

The book has 19 chapters and we are looking for excellent Australian examples for many areas of text. Each

case study will consist of 2–6 pages, including research, diagrams, maps and activities. The chapters address minerals, fossils, geological time, plate tectonics, geohazards, energy, resources and the three rock types, but also embrace soils, water, weather, climate change, human activity, ecosystems and biodiversity. A complete overview is available on the TESEP website: [www.tesep.org.au](http://www.tesep.org.au).

However, we are not seeking to rewrite the curriculum! You may think there are sections of the book missing, but it is written to meet the WA EES curriculum requirements. It will also be revised to meet the national EES curriculum even better in due course, but either way it will not cover all possible content. Consequently, if you think you have material that does not fit the chapter headings do not be discouraged. The content touched on under those headings is wide ranging and many less obvious connections can be made as a result.

I will be personally contacting those in the geoscience community I know that may be able to provide or easily develop some of the material required, but I encourage one and all to help.

If you have anything of your own or are aware of materials that might suit our needs please contact me as soon as possible. Obviously, we need to be sure that there are no copyright restrictions on the materials you provide, but even if you just have one classic photo of a particular geological phenomenon that you are willing to send, the Australian teaching fraternity and all future students will be very grateful and your contribution will be acknowledged.

Needless to say, in order to ensure national appeal the case studies will need to have national geographic spread. This means we may have the unenviable task of choosing some over others for the first batch of case studies that we hope to have finalised by October 2013. However, since they are likely to be delivered online we should be able to continually add them to the ESWA and TESEP websites as they are written up and inform teachers by email and newsletters.

*Greg McNamara is Executive Officer of the Teacher Earth Science Education Programme. Email: [eo@tesep.org.au](mailto:eo@tesep.org.au); Mobile: 0412 211 797.*