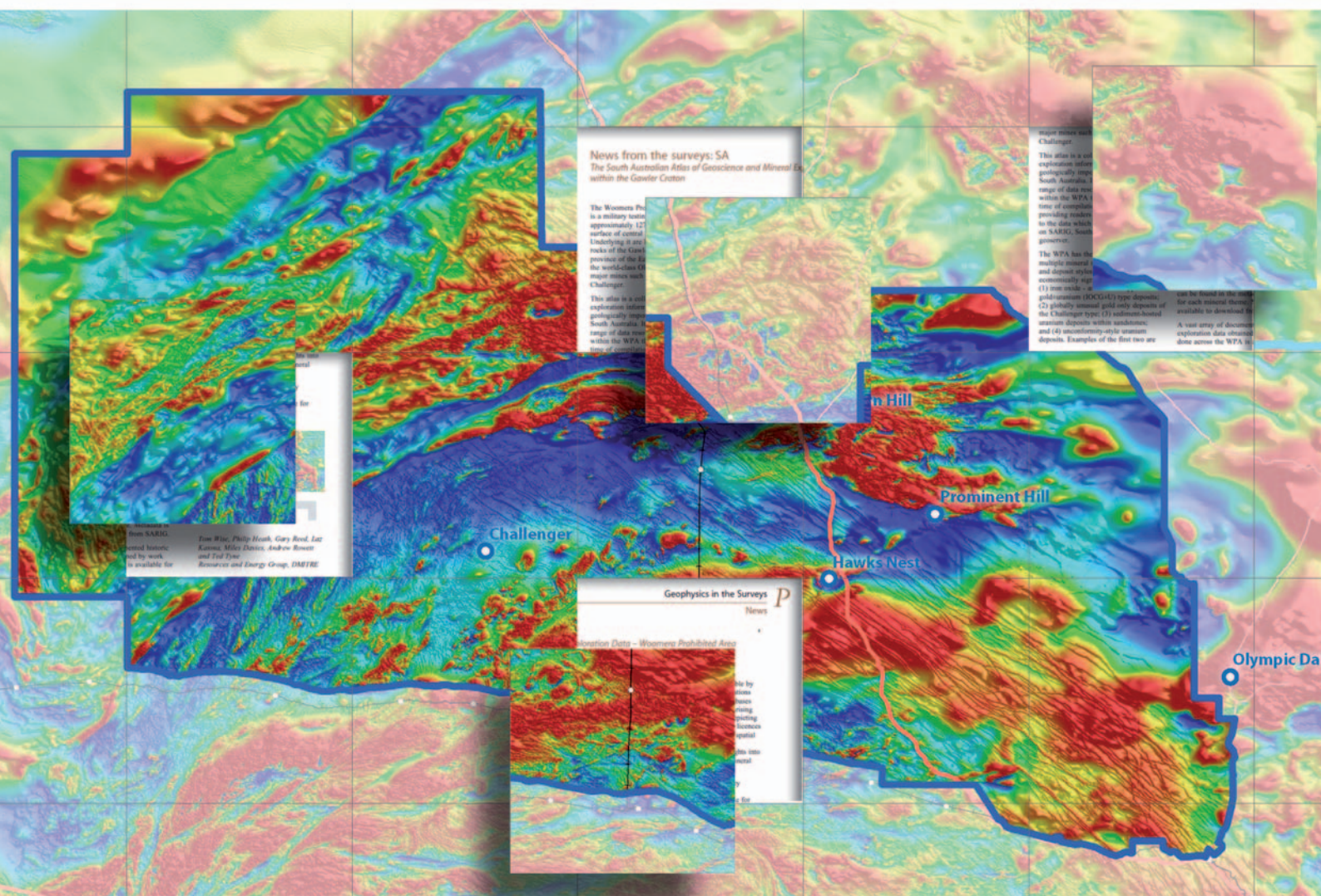


P PREVIEW

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS



NEWS AND COMMENTARY

Early geoscientists: invitation to submit

Call for Associate Editors

Notice of Annual General Meeting

Research: UNCOVER initiative

Education: tertiary geoscience



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FRONT COVER



Mosaic of *The South Australian Atlas of Geoscience and Mineral Exploration Data* – *Woomera Prohibited Area within the Gawler Craton* and respective article (see article p. 25; images courtesy of Resources and Energy Group, DMITRE).

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John A. Theodoridis

In 2013, the ASEG co-produced its first e-book with the SEG, and successfully launched OzSTEP, its answer to DISC. For me, these firsts symbolise adaptation and growth respectively. Guided by such pragmatic principles of innovation, *Preview* shall continue with incremental change, seeking ways to better serve its readership. A *National Calendar of Events (Branch News)*, introduced quietly in Issue 165, arose to complement, what effectively became, the *[International] Calendar of Events*. This new calendar fulfils two objectives: to better promote the activities of the ASEG, and to enable

members of each state branch to feel part of an integrated whole.

The latter point may seem a little odd to some, but it is a crystallisation of the many impressions I experienced whilst attending the ASEG Council Meeting, held in August during the 23rd IGC last year. Notably, the ASEG is more than a mere sequence of branch technical meetings, and its community extends nationally. Not to mention the wonderful opportunity I had in meeting the devoted individuals with whom I've exchanged countless emails. On hearing the developments in other branches, an uneasy feeling grew within me, that through no deliberate design, it seemed that each branch had effectively operated in silo.

For these reasons alone, members are encouraged to participate in the upcoming Annual General Meeting (AGM), to be held in Canberra on 10 April 2014. A Notice of AGM, prepared by the Federal Secretary, Barry Drummond, is posted within this issue. Items of particular importance include

the standing of President-elect, Greg Street, for the position of President, and the call for nominations to fill the positions of a number of executive offices. Please note, nominations are to be received by the Federal Secretary no later than COB 9 March 2014.

Returning to the opening theme of progression through incremental change, a new section is to be created within *Preview*: one that caters specifically to the needs and demands of *Early Career Geoscientists*. As its premise, this section shall endeavour to provide new opportunities to ASEG members undertaking graduate, honours, and postgraduate education. Specifically, those contributing are invited to publish their current research 'in progress', showcasing ability and areas of interest for both peers and recruiters alike, and share their experiences as interns, thereby offering implicit authentic advice to others. Ultimately, it is hoped that this section will facilitate those making the challenging transition from academia to industry.

Call for Associate Editors: *Preview* Magazine

Expressions of interest are sought from ASEG members to fill multiple positions as Associate Editor for the following columns: Industry News; Canberra Observed and Minerals & Environment. Successful applicants shall be required to independently source material and submit quality articles to be overseen by the Editor, whilst adhering

to stringent publication schedules for the bi-monthly publication.

Interested persons are encouraged to contact the Editor of *Preview*, Dr John Theodoridis, by email: previeweditor@aseg.org.au.



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ASEG-PESA 2015

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The Premier Exploration Geophysical Conference in the Southern Hemisphere

You are invited to attend the 24th International Geophysical Conference and Exhibition in Perth, Western Australia, to be held from 15 to 18 February 2015. The event will be jointly hosted by the Australian Society of Exploration Geophysicists and the Petroleum Exploration Society of Australia.

The theme for the conference is “Geophysics and Geology together for Discovery”, invoking the fundamental tenets behind our shared efforts to discover and develop the natural resources needed for future generations. We are promoting a programme with a strong focus on case histories, best practice, and the new methods and technologies that underpin the exploration effort. We will celebrate the diversity and commonalities between minerals, petroleum, geothermal, geotechnical, and environmental geophysics.

Call for Abstract Titles opens March 1

From 1 March 2014 authors will be able to express interest in submitting an abstract and also submit their proposed abstract title/s via the conference website. This initial interest secures a non-binding position for an extended abstract and allows the committee to begin planning the technical programme.

The call for extended abstracts will open on 1 June 2014 and close on 31 August 2014. The conference programme committee encourages you to plan your submission now.

www.conference.aseg.org.au

Sponsorship and Exhibition details from the Conference Secretariat, ASEG-PESA2015@eecw.com.au

Lots of thanks for a good year in 2013

This is the first issue of *Preview* in 2014. The year 2013 was a good year for the ASEG.

We had a successful conference in August. Thanks to the Organising Committee. The ASEG journal *Exploration Geophysics* continued to improve its impact factor. It is now added to SEG's Digital Library. Thanks to Phillip Schmidt, Chairman of Publication Committee; Mark Lackie, the Managing Editor; associate editors, publisher, authors and reviewers.

The bi-monthly publication, *Preview* magazine, both entertained and informed us of the latest news within the geophysical community. Thanks to John Theodoridis, editor, and all the contributors.

Co-published with the SEG, we produced our first e-Book, *Geological Interpretation of Aeromagnetic Data*, by David Isles and Leigh Rankin. Thanks to all those involved.

The new website is up and running with improvements all the time. Thanks to Carina Kemp, webmaster.

In 2013, the ASEG saw another first with an initiative by *Continuing Education*: the ASEG Specialist Travelling Education Programme (OzSTEP). These courses proved successful in all the state branches, with more still to come. Thanks to the lecturers, Mike Asten and Dennis Cooke, and Wendy Watkins of *Continuing Education* for organising the courses. Thanks also to Wendy Watkins for organising the SEG Distinguished and Honorary Lecturer tours. These events needed collaboration with state branches. Thanks to the branch executives and Philip Heath for their coordinating roles.

The ASEG also contributed to the Australian Geoscience Council (AGC), which joined Science & Technology Australia this year. Thanks to Michael Asten, Kim Frankcombe and Greg Street for representing the ASEG.

In addition, the ASEG continued its contribution to the Teacher Earth Science Education Program (TESEP) and Australasian Universities Geoscience

Educators Network (AUGEN). Thanks to Mark Tingay for liaising with them.

In the Federal Executive, Katherine McKenna busied herself tidying up the membership database, enabling subsequent incorporation into the online system by Carina Kemp. The membership renewal process commenced late due to this work and the setting up the new system on our website. Thanks to Katherine McKenna and Carina Kemp for the hard work.

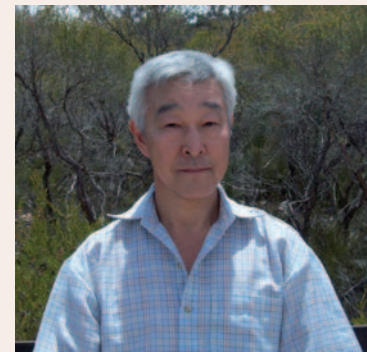
Over the past 10 years, the role of the ASEG secretariat expanded as our membership grew and we do much more than the Centre for Association Management (CASM) started 10 years ago. Thanks to Ron Adams of CASM for the service for the past 10 years. Since December last year, the Federal Executives are working hard to find a new secretariat with extended scope to improve member service. By the time this issue of *Preview* is on your desk, this should have been close to conclusion. Thanks to Kim Frankcombe, Barry Drummond and Greg Street for taking on this onerous task. All these achievements could not have taken place without healthy funds and support from members. Thanks to our Federal Treasurer, Reece Foster, and all the supporting members.

To me this year was full of visits and conference attendances in both official and unofficial capacities. I have already reported on SEGJ's 65th anniversary (Tokyo, May); EAGE (London, June), Near-Surface Geophysics Asia Pacific (Beijing, July) and SEG (September). In November, SEGJ had its 11th International Symposium in Yokohama. Unfortunately, I was invited to another overlapping conference in Japan, so Greg Street represented the ASEG in this symposium. Meantime, I was in Akita for the International Conference on Materials Engineering for Resources. Then I visited Ulaanbaatar, Mongolia to visit the Mongolian Geophysical Society to sign our association agreement.

The SEG's first Near-Surface Geophysics Conference Asia Pacific in July was a good success with close to 300 delegates, mostly from China. This brought a

modest surplus to the ASEG as a financial partner. The next conference is in Hawaii in 2015 and then in Australia in 2017. If you are interested in the near-surface geophysical fields, consider to be a part of the organisation well ahead of time.

In the SEG, I perform the role of Chairman of the Global Affairs Committee to promote geophysics and society activities. As you know, more than half of the SEG membership base resides outside of North America. This is perhaps of no surprise as more than half of geophysicists are outside of North America. One of the things the SEG offers is free subscription to 15 of their online publications. One of them is *Carrying the Torch* a newsletter of the SEG Foundation, which is like our Research Foundation, which also informs members of the latest activities with the SEG. The updates of the Geophysicists without Borders (GWB) are covered by *GWB News*. A few of the projects of GWB took place in Australia, which may be of interest of the members. Others include information on SEG publications, meetings, students and other community activities. These are open to you even if you are not a SEG member. To receive the latest news in the world of the geophysical community, visit the link: <http://www.seg.org/resources/enewsletters/extra/web-collect/subunsubmultiplelists>. From this link, you can browse past issues without committing to a subscription.



Koya Suto
ASEG – President
president@aseg.org.au



Signing association agreement with Dr Tesdenbaljir, President of the Mongolian Geophysical Society.



Koya Suto in Chinggis Khaan armour in front of his huge boot.

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New members

The ASEG extends a warm welcome to the nine new individual members approved by the Federal Executive on 12 December 2013 (see table).

Name	Organisation	Country	Member grade
Hani Abul Khair	University of Adelaide	Australia	Active
Ian Cameron-Smith	Gnomic	Australia	Active
Shane Chambers	–	Australia	Student
Sarawute Chantayord	CGG	Australia	Active
Ida Hooshyari Far	–	Australia	Student
Caroline Jackson-Hicks	International Geoscience	Australia	Active
Jeremy Kuan Ming Lee	–	Australia	Student
Alexandre Steven Lemenager	–	Australia	Student
Simone Pila	–	Australia	Student

Notice of Annual General Meeting (AGM)

The 2014 AGM of the Australian Society of Exploration Geophysicists (ASEG) will be held in Canberra on Thursday 10 April 2014. The meeting will be hosted by the ACT Branch at the Ivy lake view café, Old Canberra House, Lennox Crossing, ANU Campus (www.ivy-cafe.com.au). Drinks will be available from 5.30 pm and the meeting will begin at 6.00 pm.

The business of the Annual General Meeting will include:

- To confirm the minutes of the last preceding general meeting;
- To receive from the Federal Executive reports on the activities of the Society during the last preceding financial year;
- To receive and consider the financial accounts and audit reports that are required to be submitted to members pursuant to the Constitution and to law;
- To consider and if agreed approve two changes to the ASEG Constitution;
- To report the ballot results for the election of the new office holders for the Federal Executive;
- To confirm the appointment of auditors for 2013.

The AGM will be followed by a scientific presentation. The speaker and title will be advised closer to the event.

Invitation for candidates for the Federal Executive

In accordance with Article 8.2 of the ASEG Constitution ‘...The elected members of the Federal Executive are designated as Directors of the Society for the purposes of the [Corporations] Act.’

The Federal Executive comprises up to 12 members, and includes the following four elected members:-

- (i) a President,
- (ii) a President Elect,
- (iii) a Secretary, and
- (iv) a Treasurer.

These officers are elected annually by a general ballot of members. Greg Street was elected as President-Elect in 2013 and as such will stand for the position of President.

The following offices are also recognised:

- (i) Vice President,
- (ii) the Immediate Past President (unless otherwise a member of the Federal Executive),

- (iii) the Chairman of the Publications Committee,
- (iv) the Chairman of the Membership Committee,
- (v) the Chairman of the State Branch Committees, and
- (vi) Up to three others to be determined by the Federal Executive.

These officers are appointed by the Federal Executive.

Nominations for all positions are very welcome. Please forward the name of the nominated candidate and the position nominating for, along with the names of two members who are eligible to vote (as Proposers), to the Secretary:

Barry Drummond
ASEG Secretary
17 Hayward Street
Macgregor ACT 2615
T: 04 2279 1343 | E: fedsec@aseg.org.au

Nominations must be received via post, fax or email **no later than COB Tuesday 9 March 2014**. Positions for which there are multiple nominations will then be determined by ballot of Members and results declared at the Annual General Meeting.

Proposed Changes to the Constitution

The ASEG Federal Executive will propose two changes to the Society’s Constitution at the AGM.

Change to Clause 5.11 which refers to Office Bearers of the Society.

This proposed change will allow Associate and Student members to hold office.

Clause 5.11 currently reads:

5.11: OFFICE BEARERS

Active Members, Honorary Members, Retired Members, Corporate and Corporate-Plus Members shall be eligible to hold any office, to vote on all matters submitted to the membership, to petition the Federal Executive on any matter, and to publish their affiliation with the Society.

For the purposes of the above, Corporate and Corporate-Plus Members may nominate a

representative who will act on the Member’s behalf from time to time, by notice in writing to the Society.

This change has been discussed and supported at the last two meetings of the ASEG Council. In forming a new version of Clause 5.11, the Federal Executive considered two issues: to allow any financial member, particularly younger members, to take part in the running of the Society as requested by Council, but to ensure that they had enough relevant experience.

The relevant Clause of the Constitution, as amended will read:

5.11: OFFICE BEARERS

Any financial member shall be eligible to hold any office, to vote on all matters submitted to the membership, to petition the Federal Executive on any matter, and to publish their affiliation with the Society.

Members who have less than 5 years membership in the Society cannot hold the office of President of any of the Federal or Branch Executives or Chair of Specialist Group; Federal Executive may agree on a case by case basis to allow Members with less than 5 years membership of the Society to hold the Office of President of a Branch or Chair of a Specialist Group but will appoint mentors for them.

For the purposes of this Clause 5.11, Corporate and Corporate-Plus Members may nominate a representative who will act on the Member’s behalf from time to time, by notice in writing to the Society.

Change to Clause 15, which deals with By Laws.

The Federal Executive has the power under Clause 15 of the Constitution to create By Laws for this purpose.

15 BY-LAWS

The Federal Executive may make such By-Laws as it deems necessary for the proper management of the Society, provided that the By-Laws do not conflict with the Constitution.

The Federal Executive can pass By-Laws setting out detailed procedures for the conduct of the Society's affairs, and generally to give effect to the Objects. Those By-Laws will be binding on members subject to the following qualifications –

Nothing in a By-Law shall give the Federal Executive or any officer of the Society any larger powers than are conferred by the Constitution;

In the case of any inconsistency between the Constitution and any By-Law, the Constitution shall prevail;

The Society in General Meeting may disallow any By-Law passed by the Federal Executive.

Note that although Clause 15 of the Constitution currently allows the Federal Executive to make By Laws and allows members of the Society to subsequently disallow the By Laws, it does not require the Federal Executive to notify members that the By Law exists or has been changed.

The Federal Executive therefore recommends to that the Constitution of the Society be changed by the insertion

of an additional Paragraph in Clause 12, such that the last two paragraphs of the amended Clause 12 will read:

The Federal Executive will publish any new By Law or amendments of an existing By Law in the Society's magazine Preview as soon as practicable after it makes or amends a By Law.

The Society in General Meeting may disallow any By-Law passed by the Federal Executive.

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Australian Capital Territory

To celebrate the end of 2013, the ASEG's ACT branch hosted a joint Christmas Party with PESA at the Mt Stromlo Observatory. Unfortunately, the only stars out were ASEG committee members, but cloudy conditions made for a beautiful sunset over the Brindabella Ranges. The gauntlet was thrown down by branch Secretary, Millie Crowe, and PESA accepted the challenge for a debate in the New Year. We look forward to witty remarks, playful puns and an all-round entertaining evening as ASEG goes head to head with PESA.

December saw the birth of ACT's newest and lightest member, Esmé Kemp. She spends most of her time eating, sleeping, and becoming overwhelmed by her senses. Her activity is cuddling and on weekends she plays peek-a-boo with the President of ACT ASEG Branch.

2013 was a great year for the ACT branch with new members, more social events and record breaking interest from over five new student members! We look forward to 2014 being even bigger and better, with a fine line-up of technical talks, an AGM in February, the SEG Honorary Lecture in March, and for the first time we'll be hosting the Federal Executive AGM – a chance to prove the ACT has more than roundabouts and government buildings! (There's also a lake.)

*Millicent Crowe & Tim
ACT Branch Secretary & Treasurer*

New South Wales

In November, John Triantafylis from the UNSW School of Biological, Earth and Environmental Sciences gave a talk on 2-D and 3-D digital soil mapping (DSM) using electromagnetic (EM) induction instruments and inversion modelling. John presented case studies on how joint-inversions of EM38 and EM31 data can provide useful information about soil variation at the field level and similarly how EM38 and EM34 data can provide equivalent information at the district scale.

In December, Ron Hackney from Geoscience Australia (Basin Resources Group, Energy Division) gave a talk on 'New geophysics in the Browse Basin'. Ron outlined how Geoscience Australia is currently undertaking a study of the CO₂ and petroleum prospectivity of the Browse Basin. A new aeromagnetic survey over a large part of the Browse Basin has recently been completed, and

new 'process-oriented' gravity modelling of the basin has been initiated. Ron discussed how initial modelling shows that observed and calculated gravity matches best over the Caswell Sub-basin if the lithosphere was weak throughout the deposition of post-rift sediments.

An invitation to attend NSW Branch meetings is extended to interstate and international visitors who happen to be in town at that time. Meetings are held on the third Wednesday of each month from 1730 at the Rugby Club in the Sydney CBD. Meeting notices, addresses and relevant contact details can be found at the NSW Branch website.

*Mark Lackie
NSW Branch President*

Victoria

On Wednesday 13 November 2013, Theo Aravanis from Rio Tinto Exploration presented an introduction to the work of the Ground Geophysical Survey Safety Association (GGSSA). All present agreed that this was an initiative whose time has finally come, as airborne geophysics and seismic acquisition has already seen the successful development of similar organisations.

On Wednesday 11 December 2013, it was once again time to let the hair down at our Annual ASEG-PESA-SPE Societies Christmas Lunch at the Victoria Hotel in Melbourne's CBD. Steve Henzell (WorleyParsons and SPE President) gave a very interesting account of the History of Oil and Gas Exploration and Development in Victoria.

In January, when thoughts are typically occupied by other matters than geophysics, we were never-the-less fortunate to have Perth-based Andrew Long from PGS passing through Melbourne. Prompted by Andrew's presence we quickly established a

collaborative effort with our European sister society and offered the EAGE-ASEG one-day course on 21 January 2014: 'Broadband seismic: a platform to understand, measure, compare and exploit the options available today and tomorrow'. A total of 11 attendees from service companies, petroleum companies and government organisations enjoyed a day at the Victoria Hotel with many insights into the newest developments in this area of geophysics. Neither did Andrew miss the opportunity to spruik the ASEG-PESA Conference in Perth in February 2015!

It will be a busy schedule for the ASEG Victoria Branch in 2014:

On Wednesday 12 February 2014, it is time to get reconnected with your geophysical network at the joint ASEG-PESA-SPE Summer Social Function at the Boatbuilder's Yard in Melbourne's South Wharf. Entry will be free for paid-up ASEG members, but registration is mandatory by 7 February 2014 at vicpresident@aseg.org.au.

On Friday 14 March 2014, we are looking forward to host SEG 2014 Pacific South Honorary Lecturer Sandeep K. Chandoola from Petronas, who will present 'Marine seismic acquisition: expanding the possibilities!'. This will be a noon-time lunch meeting at the Victoria Hotel.

On Wednesday 16 April 2014, you really should not miss Richard Schodde from MinEx Consulting presenting 'The rise and rise of geophysics: an overview of minerals exploration trends over the past century'. This will be an evening meeting at the Kelvin Club starting at 1800 (drinks and nibbles) for an 1830 technical presentation.

We look forward to seeing many ASEG Victoria Branch members at the meetings in the coming months.

*Ashbjørn Nørhønd Christensen
VIC Branch President*



Andrew Long of PGS presenting the one day EAGE-ASEG short course on Broadband Seismics, held in Melbourne on 21 January 2014.

Western Australia

The WA Branch has been enjoying the festive season and taking a bit of break, but we're back now and have a busy Tech Night schedule already planned. Check out the branch calendar in this section for talk details; note that these may change as speakers sometimes have to reschedule. We'll also be sending out our regular event notices which have been revamped for 2014. If you're not already signed up and you're interested in what's happening in WA, please feel free to subscribe at <http://eepurl.com/nleOD> (see QR code).

We had a great Christmas Party at City Farm in December and enjoyed some

tasty wood-fired pizza and refreshing ales in the pre-Christmas heat wave. We welcomed Kristian Madaschi, Andrew Pethick and Garrett Kramer who joined the WA committee this year. Many thanks to Tim Dean who left us for an overseas posting this year.

2014 will continue to be busy for our conference organising committee who are beavering away on preparations for the February 2015 conference being held in Perth. You can find out all the latest at www.conference.aseg.org.au.

We hope to host several workshops this year both minerals and petroleum, so look out for further information on that front.

In the meantime, enjoy the start to 2014 and keep cool and safe.



Anne Tomlinson
WA Branch President

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ASEG national calendar: technical meetings, courses and events

Date	Event	Presenter	Sponsor	Time	Venue
2014					
12 Feb	Joint ASEG-PESA-SPE Summer Social Function (Registration by 7 Feb)	-		1730-2030	South Wharf Melbourne
12 Feb	'Image improvements of poor quality legacy seismic data - a case study from the onshore Otway basin, SA'	Peter Strauss, Aus Geos, Adelaide		1730-1900	City West, West Perth
26 Feb	TBA	Brian Spies		1800	The Rugby Club, Sydney
9 Apr	(1) Recent advances in multi-dimensional geoelectrical imaging methods (2) Introduction to the Ground Geophysical Survey Safety Association (GGSSA)	(1) Meng Heng Loke, Geotomo Software, Kuala Lumpur (2) Katherine McKenna, GPX Surveys, Perth		1730-1900	City West, West Perth
16 Apr	'The Rise and Rise of Geophysics: an Overview of Minerals Exploration Trends over the Past Century'	Richard Schodde from MinEx Consulting		1800	Kelvin Club, Melbourne
14 May	TBC			1730-1900	City West, West Perth
11 Jun	Albany-Fraser MT and seismic surveys	Catherine Spaggiari, GSWA, Perth		1730-1900	City West, West Perth
9 Jul	Frequency-domain full waveform inversion: applications to marine and land seismic experiment	Rie Kamei, UWA, Perth		1730-1900	City West, West Perth
13 Aug	Humanitarian geophysics	Jeff Shragge, UWA, Perth		1730-1900	City West, West Perth
10 Sep	New logging and sensing technologies for mineral exploration	Brett Harris, Curtin University, Perth		1730-1900	City West, West Perth
8 Oct	TBC			1730-1900	City West, West Perth
13 Nov	Honours and Masters Students Research Presentations	Various		1730-1930	City West, West Perth
10 Dec	AGM and Christmas Party			1730-2030	TBC
2014 SEG Pacific South Honorary Lecturer: 'Marine seismic acquisition: expanding the possibilities!' Sandeep K. Chandola, PETRONAS, Carigali, Kuala Lumpur, Malaysia (http://www.seg.org/education/lectures-courses/honorary-lecturers/2014)					
Date	State branch	-	-	Time	Venue
12 Mar	WA: Perth			1730-1900	City West, West Perth
13 Mar	SA: Adelaide			TBA	TBA
14 Mar	VIC: Melbourne			Noon	The Victoria Hotel
17 Mar	ACT: Canberra			TBA	TBA
19 Mar	NSW: Sydney			1800	The Rugby Club
18 Mar	QLD: Brisbane			TBA	TBA
14 Apr	TAS: Hobart			TBA	TBA
SEG Distinguished Instructor Short Course (DISC) 2014: 'Microseismic imaging of hydraulic fracturing: improved engineering of unconventional shale reservoirs' Shawn Maxwell, Schlumberger (http://www.seg.org/education/lectures-courses/disc)					
Date	State branch	-	-	Time	Venue
28 Apr	WA: Perth			TBA	TBA
30 Apr	VIC: Melbourne			TBA	TBA
05 May	SA: Adelaide			TBA	TBA

TBA, to be advised (please contact your state branch secretary for more information); TBC, to be confirmed.

ASEG Specialists Travelling Education Programme (OzSTEP)

A successful inaugural year!

In 2013, the ASEG introduced the OzStep courses for the benefit of members throughout Australia. Two one-day courses were offered to the state branches for their respective members. Six states offered the courses, with Dennis Cooke's course, 'Interpreting seismic amplitudes', presented in WA, SA, VIC and the ACT and Michael Asten's Minerals Geophysics course, 'Introduction to geophysics for explorationists', presented in Qld, Vic, Tas and the ACT.

These courses had been a compact one-day overview of the respective minerals and petroleum specialist subjects, presenting many examples and some practical demonstrations. To accommodate different levels of experience, participants

received comprehensive notes to review topics for further information and reading, as per individual requirement.

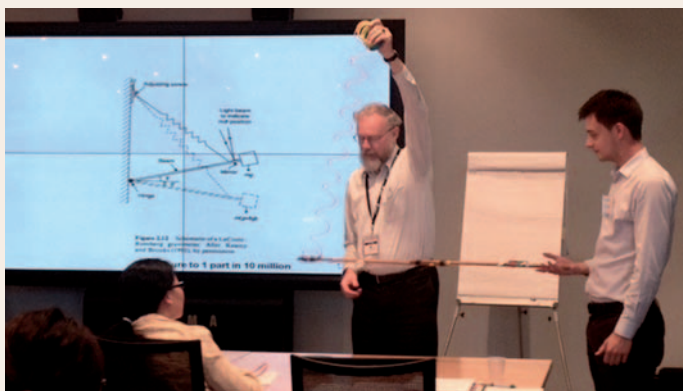
In total, over 90 participants attended the courses, including around 20 students, with good feedback from participants, including:

- *Great presenter, good use of props, great course.*
- *Good to see the ASEG running these educational courses.*
- *Excellent course – good content, good pace, well explained with excellent visual experiments in class.*
- *Very well presented. Remained interested for entire course. I felt engaged throughout the day.*

- *The course content was excellent, with many real world examples shown. Would recommend this course highly.*
- *I thoroughly enjoyed the day and would recommend this course. Wish I did it 15 years ago.*
- *An excellent course initiative by ASEG – keep it going please!*

The ASEG is planning to continue the OzStep initiative into 2014; presenters are currently being selected for a minerals and a petroleum course.

Wendy Watkins
Continuing Education
continuingeducation@aseg.org.au



SEG Distinguished Instructor Short Course 2014

Shawn Maxwell: Schlumberger

The SEG DISC Committee is pleased to offer the Australian SEG - Western Australia an opportunity to participate in the seventeenth annual SEG Distinguished Instructor Short Course (DISC), 'Microseismic imaging of hydraulic fracturing: improved engineering of unconventional shale reservoirs', by Shawn Maxwell of Schlumberger. In his current role, Shawn Maxwell is Chief Geophysicist and Microseismic Advisor for

Schlumberger's Microseismic Services corporate business unit, and is based in Calgary, Alberta. SEG and your local society are proud to provide this premier course in passive microseismic, hydraulic fracturing and unconventional shale reservoirs. A description of the course and a biography of the instructor can be found by visiting www.seg.org/disc. SEG publications office is in the process of producing bound course notes that will accompany Shawn's course and also

available for purchase in the SEG Book Mart.

Tour dates*:

28 April 2014, Perth
30 April 2014, Melbourne
5 May 2014, Adelaide

**Participants are advised to confirm dates and details with their WA, SA and VIC ASEG Branches.*

UNCOVER initiative Ushering in a new era of exploration in Australia

Dean Collett and Phil McFadden

On behalf of the UNCOVER Executive Committee, Australian Academy of Science, Canberra.

The UNCOVER initiative is now moving into an implementation phase. The upcoming open Summit in Adelaide will begin to chart the necessary journey for exploration geoscience in Australia. This is an initiative owned by industry, geological surveys and researchers alike.

Introduction to UNCOVER

It is well-recognised that Australia has benefited enormously from its rich endowment of mineral resources. It is also widely believed that most of Australia's easily-found economically viable mineral deposits have already been discovered and, to a large extent, exploited.

Most of our future mineral discoveries will have to occur in the approximately 80% of Australia that is covered by regolith.

While there is every reason to believe that the prospectivity of these covered areas is similar to that of those areas where Australia has already proven to be richly endowed, exploring undercover presents a new set of difficult challenges and so the success rate of mineral exploration has dropped dramatically. Simply put – our traditional approaches are falling way short of being as effective as they were in the outcrop. This is a global problem, but affects Australia more than most due to the amount of and in parts, the depth of cover.

What we need in reality is a technical and economically attractive value proposition for mining companies so that they are compelled to invest a greater proportion of their exploration and mining development budgets in Australia compared to the alternatives.

Real investment levels, especially in the non-ferrous metals arena, have failed to significantly improve despite efforts by industry, state and federal surveys and researchers to provide the technical solutions. There is little doubt that Australia possesses the intellectual

capability to meet these challenges and to develop the knowledge necessary to usher in a new era of successful exploration in covered areas. UNCOVER was developed from the recognition of the real issue being the development of an effective national collaboration to bring together players from industry, government and academia to define the important questions and then work together to answer those questions in an effective manner.

The goal of the UNCOVER initiative is to develop that collaboration and, through consultation across the sector, identify and define the important questions and datasets. This will then inform a strategic approach that will identify, develop, and deliver the science to create the knowledge and technologies that will improve the success rate of mineral exploration in the covered areas of Australia.

A strategic focus on the questions that are important to industry will facilitate the development by geoscience researchers, leveraging off the work done by geological surveys and industry, of knowledge that will have a much greater direct impact than is currently the case. Between the industry (\$500 M), the geological surveys (\$150 M) and R&D (\$200 M) there is close to \$1 billion a year in funding on an infrastructure base of around \$3 billion. The issue for UNCOVER is to make more effective use of that investment in order to unlock the future mineral potential before the current mining industry exhausts the known reserves base.

It should be noted here that the initiative is not, in and of itself, about science and scientific research. It is, instead, fundamentally about resources for the nation; science is the tool.

It should also be noted that there is no suggestion here of a quick-fix solution. This is a strategic approach intended to position Australia well for the future when it becomes apparent to international mining companies that most of the world's easily-found economically viable mineral deposits have already been discovered and that Australia is providing the technical and economically attractive solutions to attract exploration investment.

UNCOVER history, success so far and immediate future

The Australian Academy of Science (the Academy) dedicated its 2010 Theo Murphy High Flyers Think Tank to the important national issue of the decline in exploration success. Participants proposed an ambitious and integrated research programme to enable Australia to uncover more of its mineral wealth.

A group of science leaders convened under the aegis of the Academy to address, through implementation of the think tank's recommendations, this decline in the success of Australian mineral exploration. This has now become the UNCOVER Initiative.

After broad consultation, UNCOVER released the document *Searching The Deep Earth: A vision for exploration geoscience in Australia*.

That vision has now been broadly accepted and forms the core of the National Mineral Exploration Strategy recently released by the Government's Standing Council on Energy and Resources.

For the first time, each of the state geological surveys, Geoscience Australia, CSIRO geoscience programmes and State and Commonwealth governments are working to the same vision and strategic plan.

UNCOVER was used to frame the arguments leading to Geoscience Australia receiving \$11 million per annum (from 2013–14 onwards) for onshore pre-competitive data acquisition. This funding was announced on 11 November 2012. The work, which will be undertaken in collaboration with state and territory geological surveys and the research community, will involve a systematic drilling programme to test geological models and to identify key indicators that point to mineral resource potential in the subsurface.

Each of the state geological surveys now has regional drilling initiatives firmly in their sights and, as noted above, Geoscience Australia has been funded for a systematic drilling programme. These drilling initiatives will feed into many of the UNCOVER programmes. Companies

are well-aware of these initiatives and may participate via co-funding. The Deep Exploration Technologies CRC is undertaking research and development to deliver the technology to enable these programmes (drilling through the cover and real-time sampling analysis).

Important ARC geoscience Centres of Excellence (such as the Core to Crust Fluid Systems centre) have aligned their goals to the UNCOVER vision.

UNCOVER members, the CSIRO, the Centre for Exploration Targeting (the University of Western Australia and Curtin University) and the Geological Survey of Western Australia, have recently been awarded a 4-year \$4 million grant *'The Distal Footprints of Giant Ore Systems: UNCOVER Australia'* as a specific UNCOVER research programme.

Critical to the success of UNCOVER is that it is, and has been seen to be, neutral and independent; it is not controlled by any of the big players such as the geological surveys, the CSIRO, a university consortium, or an industry consortium. Likewise, it is important that the UNCOVER initiative is not a funding provider.

UNCOVER has a clear and simple agenda: to identify, develop, and deliver the science necessary to improve the success rate of mineral exploration in Australia under covered areas and influence the effectiveness of that science investment to industry.

As an initial step in the implementation phase, UNCOVER has recently undertaken a comprehensive face-to-face and web-based survey of industry, the geological surveys and academia. One of the strong messages from this survey is that there is a strong appetite for greater collaboration in order to strengthen the outcomes as envisaged by UNCOVER.

The UNCOVER summit

As a vital step in this implementation we will be holding an UNCOVER Summit in Adelaide from 31 March through to 2 April 2014. This Summit will bring together key members of the exploration industry, academia, and government agencies such as Geoscience Australia,

the state geological surveys and the CSIRO.

It is the intent of the UNCOVER Executive that this Summit will inform a significant report identifying the important scientific questions that need to be answered and the critical datasets that need to be gathered in order to improve the success rate of mineral exploration in the covered areas of Australia. Reflecting the views of the Summit, the report will also identify an appropriate strategy to achieve a national focus on addressing these important questions and acquiring the critical data.

The report will be provided to the relevant Federal, State and Territory Ministers, the Chief Scientist's office, the Australian Research Council, the state geological surveys, Geoscience Australia, universities, relevant scientific agencies such as the CSIRO, and geoscience societies.

This is not a conference – the UNCOVER summit is a facilitated cross sector collaboration meeting, driven by industry's need to do things differently. Come prepared to work and participate in discussions about the future of exploration geoscience in Australia.

Each of the four UNCOVER themes will be discussed around the table:

- The Cover: Characterising Australia's cover - new knowledge to confidently explore beneath it. Depth, definition, and how we see through it and sample it for maximum benefit.
- The Lithosphere: Investigating Australia's lithospheric architecture – a whole lithosphere architectural framework for mineral systems exploration. Expanding knowledge to understand continental assembly and evolution of the deep crust and its influence on the cover.
- 4-D metallogenesis: Resolving the 4-D geodynamic and metallogenic evolution of Australia – understanding ore deposit origins for better prediction.
- Footprints (and fingerprints): Characterising and detecting distal footprints of ore deposits – towards a toolkit for minerals exploration. Determining camp to regional to continental scale background and

signatures of deposits to improve vectoring to ore bodies.

At the summit we will also be identifying appropriate individuals to populate the UNCOVER action committees: science and network/communications.

Immediately following the 2½ day Summit, Richard Blewitt of Geoscience Australia will be hosting an UNCOVER technical workshop to examine possible improvements to the many geophysical tools for use in determining depth of cover in Australian terrains.

As many have done already during the vision roadshows and the engagement surveys, members are encouraged to have their say on the UNCOVER vision and influence it's future direction at the Summit. If members are not able to attend the summit, you should bring up the topic of UNCOVER as opportunity arises in conversation with surveys and researchers about what you see as vitally important science to exploration in Australia.

Further information

Further information on UNCOVER and a link to the Summit registration can be found at <http://science.org.au/policy/uncover.html>.



UNCOVER Summit 2014 

Searching
THE DEEP EARTH
A vision for exploration geoscience in Australia

Adelaide Convention Centre
March 31–April 2 2014

Post Summit workshop –
Depth of cover Geophysical Techniques
Hosted by Geoscience Australia
April 2–3 2014

Registration and information:
<http://science.org/policy/uncover.html>

For more information:
robert.hough@csiro.au 

2013: not the best year for Australian resource industries

Mineral exploration levels continue to decline

After three years of growth from 2009 until the beginning of 2012 the level of investment in mineral exploration has continued to decline. The trend data compiled from the Australian Bureau of Statistics shows that after the peak expenditure of A\$1.067 billion in the March 2012 quarter there has been a continuous fall in exploration activity (Figure 1).

At the time of writing the most recent data available are from the September quarter of 2013 when only A\$612 million was invested. The good news is that the rate of decline appears to be flattening off and an investment of more than A\$2 billion a year will probably be sustainable for several years. It is unfortunate that the major resource companies don't seem able to smooth out the sharp peaks in exploration activity. After all, they are nothing new; look at the peaks at June 2008 and June 1997 in Figure 1. There will surely be many more similar variations in the future unless the companies take a longer term look at the value of exploration.

Mineral resource shares lose value on ASX in 2013

One might expect that mineral exploration levels and the performance

of the main resource industries on the stock market would be strongly linked. But this has not been the situation on the ASX. In Figure 2, I have plotted the total market capital of the resource industries in the top 150 companies listed on the ASX. Since the peak in April 2011, the total market capital of the larger resource industries has declined to 65% of what it was at its peak at the end of 2013. Not good for investors in resource shares, particularly those who invested in gold. For example, Newcrest's market capital fell from A\$17.5 billion in January 2013 to A\$6.0 billion at the end of December 2013.

Meanwhile the All Ordinaries Index has climbed steadily from September 2011 to the end of 2013 from 4070 to 5324 respectively. This represents a rise of approximately 30%, much better than a fixed interest deposit in any of the banks.

During the last quarter of 2013 the downward trend in the value of resource industries appeared to be levelling off, but it is worrying that the major companies are likely to cut back further on exploration and innovation and focus more on their known resources.

Iron ore was good but gold and coal did not fare so well in 2013

A major factor in the decrease in value has been the falling prices for some of

the main mineral commodities over the past two years. Table 1 shows some of the numbers for gold, iron ore and coal.

Basically, the gold price fell by approximately 28% in the past two years while production levels remained fairly constant. Coal followed a similar pattern with prices declining by approximately 35% while the production values have remained at about 135 Mt per quarter. The iron ore price has declined by less than 10% while production has risen from 130 Mt per quarter to 156 Mt. So for 2013, iron ore was a marquee commodity. Figure 3 shows more details about gold.

The price of gold declined significantly from the peak in March 1980 and it appears that there may be a similar decline from the second peak in March 2012. Production rates appear to have peaked in December 1997 with a quarterly value of 82 tonnes.

Quarterly production was fairly constant at between 60 and 70 tonnes from March 2011 until the end of 2013 and it appears unlikely to reach the peak of 80 tonnes anytime soon.

In the past five years the investment in gold exploration correlates closely with the gold price rather than the production output. Whether these relationships will continue is not clear. Obviously if

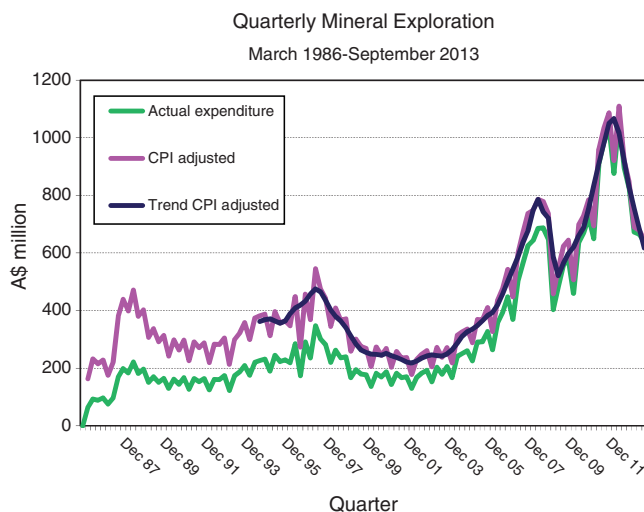


Fig. 1. Australian quarterly mineral exploration from March 1986 to September 2013. The green curve represents actual dollars spent, the purple curve shows the consumer price index (CPI); corrected numbers adjusted to December 2013 A\$. The black line is the trend line. All data were provided courtesy of the Australian Bureau of Statistics.

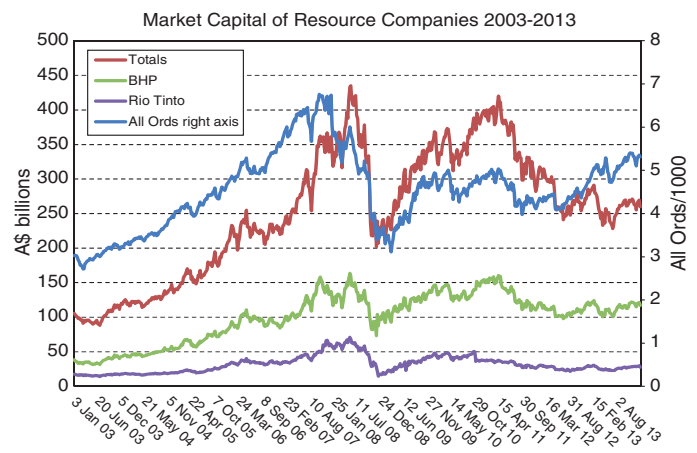


Fig. 2. Total market capital (in A\$ billions, left axis) of resource companies in the top 150 companies listed on the ASX (red), together with plots for BHP and Rio Tinto. The All Ords Index is plotted in blue (right axis). The graphs cover the period January 2003 to December 2013. No corrections have been applied for increases in the CPI. Since the peak in April 2011, the total market capital of the larger resource industries has declined to 65% of what it was at its peak at the end of 2013.

Table 1. Quarterly production and prices for gold, iron ore and coal during the past two years

Commodity	Dec 11	Mar 12	Jun 12	Sep 12	Dec 12	Mar 13	Jun 13	Sep 13	Quarter
Gold	64	62	63	62	66	62	65	68	t
	1753	1814	1676	1735	1753	1658	1381	1358	Price A\$/Oz
Iron	130	119	130	133	138	133	150	156	Mt
	133.4	133.4	126	103	96	118	116	122	A\$/t
Coal (high quality)	123	109	123	133	136	123	135	133	Mt
	237	237	203	188	146	150	152	146	A\$/t

there is no exploration, gold production will eventually decline to zero, so there should be an optimum level that produces maximum returns. At present 60 t/quarter should realise about A\$2.3 billion, so the exploration component of A\$150 M/quarter should be a good investment.

Petroleum exploration very healthy in 2013

Meanwhile, petroleum exploration has been going from strength to strength (Figure 4). Since 2008 the quarterly spending on petroleum exploration has been of the order of A\$1 billion. As can be seen from the figure the incentive to find more petroleum and gas is still very strong. This is in spite of Australia's oil production peaking in March 2000.

One of the driving factors is the gradual increase in oil price since the end of 1998. There has been considerable volatility, but the long-term trend is upwards. The other driving factor is the high cost of offshore exploration. Many

of the exploration areas are beneath sea water that is 1000 m or more deep. In fact, of the current 15 areas open for offshore bidding, 12 contain water depths greater than 1000 m. As soon as explorers go offshore the cost to develop a prospect increases dramatically; not so much from the geophysical surveys, but from the exploration wells that have to be drilled to test targets and develop fields.

Another factor is the development of coal seam and shale gas in eastern Australia. I don't want to get into a debate on the environmental issues involved in hydro-fracturing coal seams and shale deposits, but there can be no doubt that these sequences hold huge hydrocarbon resources. As long as the price of oil continues to increase there are going to be incentives to explore in these basins. As a result, the onshore component of oil exploration is steadily rising as a percentage of the total investment. During 2010–11 it made up 23% of the total, in the September quarter it had risen

steadily to 27% – quite significant when the total is over A\$1 billion.

Summary

During 2013 petroleum exploration activity in Australia maintained a level of investment of over A\$1 billion; there is likely to be more of the same in 2014, particularly if the oil price continues to rise.

The mineral industry has big challenges. In the past year mineral exploration fell from A\$895 M in the September quarter of 2012 to A\$638 M in the September quarter of 2013 – that's a massive 29% in one year.

Fortunately, geophysicists are always going to be in demand to find new deposits, but the situation is not that simple. Companies, like politicians, are also tending to look in shorter time frames. Unfortunately the time from exploration to development can cover at least three election cycles, and it seems to

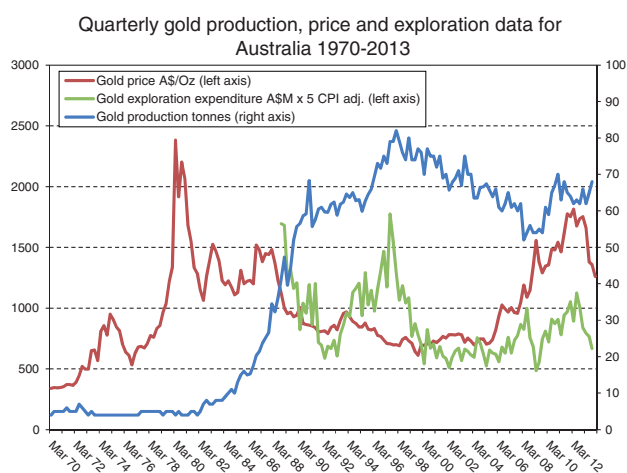


Fig. 3. Australian quarterly gold production (blue curve), investment in gold exploration (green curve) and gold price (red curve) for the period 1970 to September 2013. All prices are plotted in A\$ CPI adjusted to December 2013.

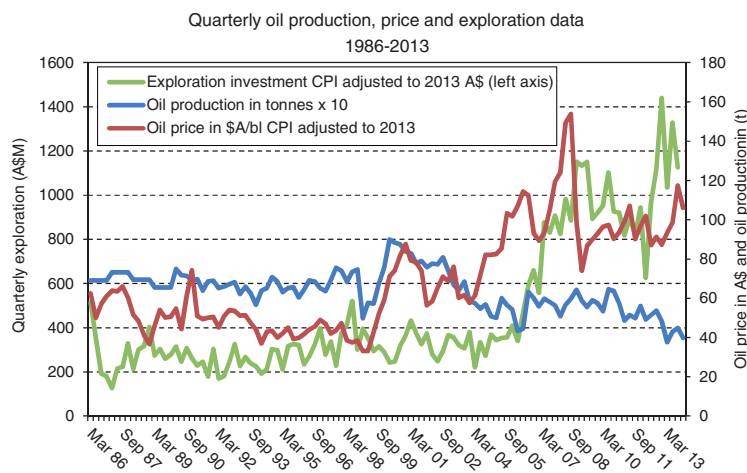


Fig. 4. Quarterly oil production (including condensate) in Australia from 1986 to September 2013. All dollar values are in A\$ adjusted to the CPI number in December 2013. A conversion factor of 0.8581 has been used to convert kl to tonnes.

me that this short-term vision is not going to go away.

Acknowledgements

I thank the Australian Bureau of Statistics and the Bureau of Resource Energy Economics for the use of their data. I hope that the government's razor gangs leave these wonderful organisations, which provide invaluable sources of data, intact – we need them for our national wellbeing.



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Opportunities for offshore petroleum exploration in 2014: but explorers will need deep pockets

The Minister for Industry, the Hon. Ian Macfarlane MP, is scheduled to announce the 2014 Offshore Petroleum Exploration Acreage Release (Acreage Release) at the Australian Petroleum Production and Exploration Association (APPEA) Conference in Perth in April 2014.¹

In the meantime 15 areas are already available for bidding. These comprise the 2013 round 2 areas and re-releases of some 2012 areas. Twelve of these areas are situated where water depths are greater than 1000 m. This indicates the extent to which exploration is being encouraged in unexplored high-risk areas. Exploration in water depths greater than 1000 m is expensive enough, but if new gas or petroleum fields are found, the number of dollars needed to market the product will be in the billions of dollars.

Bidding for all these areas (see table) closes on 22 May 2014.

Summaries of the prospects of these areas are given below. The legend for all figures is the same as that shown in Figure 1.

Northern Petrel Sub-basin: NT13-1, NT13-2 and NT13-3

These areas are located in shallow water (40–200 m) in the north east Bonaparte Basin in the Timor Sea. Areas NT13-1 and NT13-2 are in the Malita Graben, with NT13-1 also partly overlapping the Darwin Shelf. Area NT13-3 is mostly situated in the northern Petrel Sub-basin (Figure 1). These areas are situated in an underexplored gas province.

The active petroleum system in the region has been defined as the Jurassic Plover-Plover Petroleum System. The main structural plays are broad faulted anticlinal structures over tilted fault blocks at the base of the regional seal.

For more information, go to: <http://www.petroleum-acreage.gov.au/2013/release-areas/northern-petrel-sub-basin.html>.

Barcoo Sub-basin: W13-4 and W13-5

Areas W13-4 and W13-5 are located in the Barcoo Sub-basin (Figure 2). W13-5 also overlies the Oobagooma Sub-basin of the offshore Canning Basin in the

Area	Basin	Sub-basin
NT 13-1, 13-2 and 13-3	Bonaparte	Northern Petrel
W13-4 and W13-5	Browse	Barcoo
W13-6, W13-7, W13-8 and W12-11	Northern Carnarvon	Exmouth Plateau
W13-19 and W13-20	North Perth	Houtman and Abrolhos
V13-2 and V12-3	Gippsland	
T12-2	Sorrell	Sandy Cape and Strahan
W12-7	Browse	Scott Plateau

¹This article is based on the Offshore Petroleum Exploration Acreage Releases for 2012 (<http://www.petroleum-acreage.gov.au/2012/release.html>) and 2013 (<http://www.petroleum-acreage.gov.au/2013/release.html>). The text does not necessarily represent the views of the Department of Industry. Readers should refer to the website for any clarification or more information.

south and the Rowley Sub-basin of the Roebuck Basin in the southwest. These underexplored areas span the continental shelf, with water depths ranging from 60 m to over 1000 m.

The Barcoo Sub-basin is approximately 200 km long by 130 km wide and contains up to 12 km of Paleozoic to Cenozoic sediments. Miocene fault-reactivation inversion anticlines

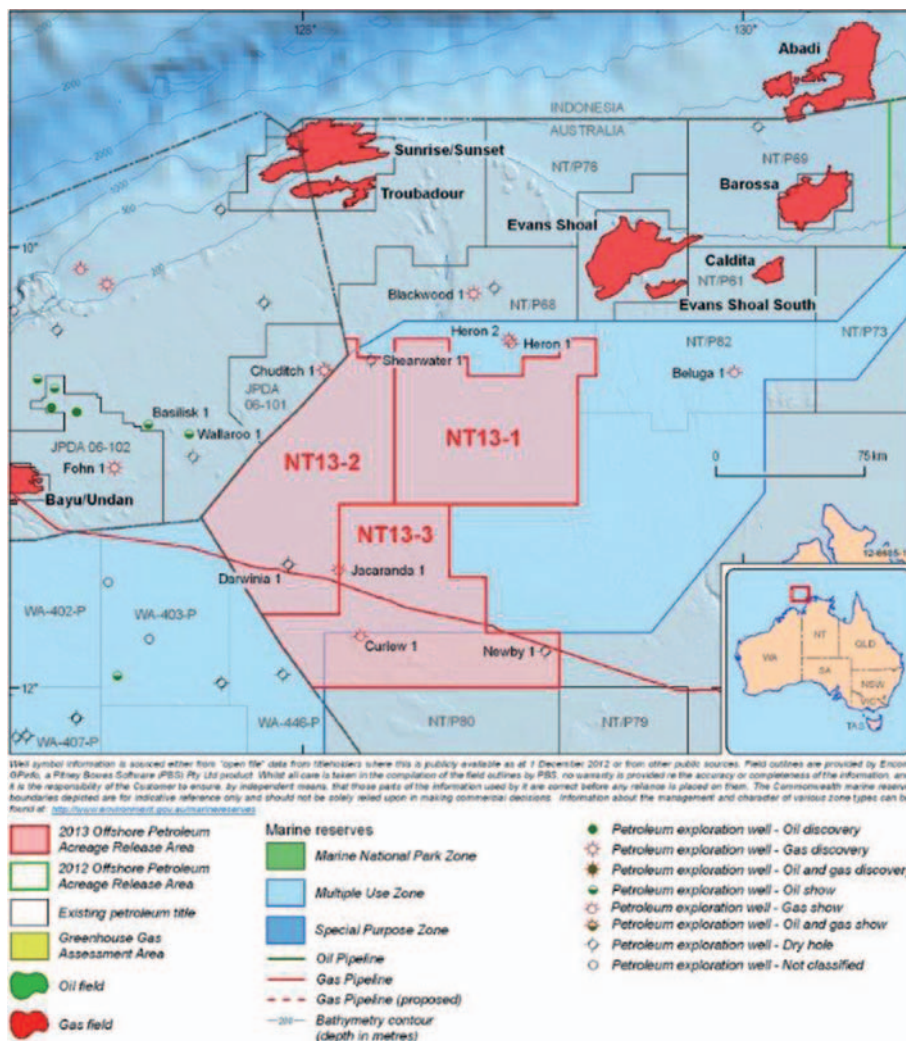


Fig. 1. Location of the NT13-1, NT13-2 and NT13-3 areas. Note the paucity of wells in these areas (image source: http://www.petroleum-acreage.gov.au/2013/documents/release-area-maps/Release-Area_Map-Northern_Petrel.jpg).

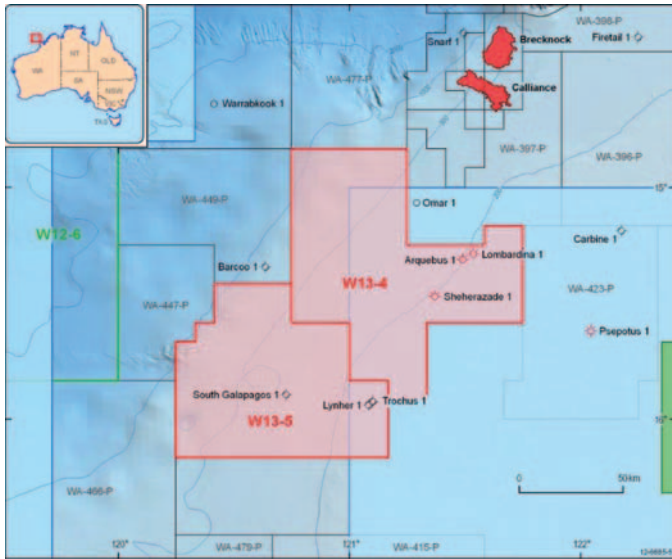


Fig. 2. Location of the W13-4 and W13-5 areas (image source: http://www.petroleum-acreage.gov.au/2013/documents/release-area-maps/Release_Area_Map-Barcoo.jpg).

along the margin of the Barcoo Sub-basin and Leveque Shelf provide structural traps. An inferred hydrocarbon column was found at Arquebus 1 ST1 and a gas accumulation was intersected in the lower Cretaceous drape on the Leveque Shelf at Psepotus 1.

For more information, go to: <http://www.petroleum-acreage.gov.au/2013/release-areas/barcoo-sub-basin.html>.

Exmouth Plateau: W13-6, W13-7, W13-8 and W12-11

Areas W13-6, W13-7 and W13-8 are underexplored regions of the northern

Exmouth Plateau of the Northern Carnarvon Basin (Figure 3), with water depths ranging 850–4500 m.

The plateau is underlain by 10–15 km of flat-lying and tilted, block-faulted Paleozoic to Mesozoic sedimentary rocks, deposited during periods of extension before continental breakup in the Middle Jurassic and Early Cretaceous. The Triassic fluvio-deltaic Mungaroo Formation has been the target for many explorers in the Exmouth Plateau, acting as both source and reservoir in places. Other reservoirs include the Jansz Sandstone and sandstone units in the Barrow Group and the Brigadier

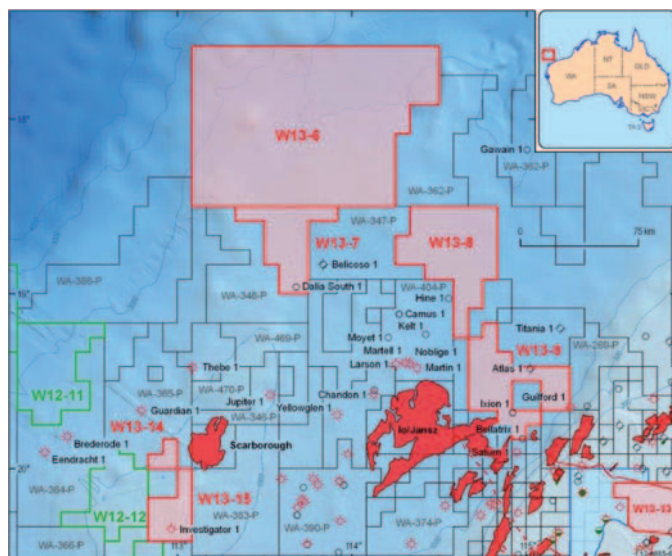


Fig. 3. Location of the W13-6, W13-7 and W13-8 areas. These are real frontier tenements (image source: http://www.petroleum-acreage.gov.au/2013/documents/release-area-maps/Release_Area_Map-Exmouth_Plateau.jpg).

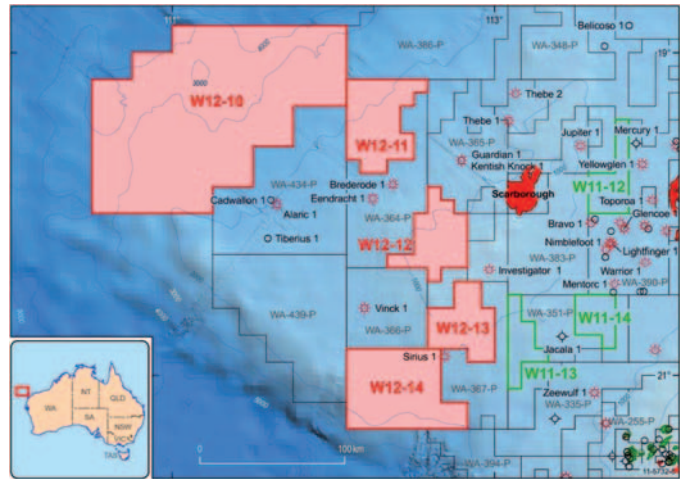


Fig. 4. Location of area W12-11; this is a re-released 2012 area (image source: http://www.petroleum-acreage.gov.au/2012/release-areas/documents/carnarvon/Quicklookexmouthplateau_11-5732-5.jpg).

Formation. Proven play types include Triassic fault blocks and drapes, and stratigraphic traps of Late Jurassic Early Cretaceous age.

For more information, go to: <http://www.petroleum-acreage.gov.au/2013/release-areas/exmouth-plateau.html>.

W12-11 is located on the Exmouth Plateau, a deep-water marginal plateau of the Northern Carnarvon Basin, with water depths ranging 1400–2500 m (Figure 4).

The plateau hosts numerous giant to supergiant gas fields and has recently become Australia's premier deep-water gas exploration province. The plateau comprises a thick pre-rift section of block-faulted Permo-Triassic sediments overlain by thinner Jurassic–Lower Cretaceous syn-rift and thin, condensed, post-rift sediments. Top Triassic fault blocks and their associated overlying drape features, as well as deeper intra-Triassic cross-faults provide numerous proven structural traps. Proven stratigraphic traps include Lower Cretaceous basin floor fans and Upper Jurassic sandstones, while Upper Triassic pinnacle reefs represent a potential new play type.

For more information, go to: <http://www.petroleum-acreage.gov.au/2012/release-areas/carnarvon-exmouth.html>.

North Perth: W13-19 and W13-20

W13-19 and W13-20 are located in the offshore North Perth Basin (Figure 5) covering large areas of the Houtman and Abrolhos sub-basins and parts of the Gascoyne and Zeewyck sub-basins. The



Fig. 5. Locations of the W13-19 and W13-20 areas (image source: http://www.petroleum-acreage.gov.au/2013/documents/release-area-maps/Release_Area_Map-North_Perth.jpg).

water depths vary between 70–2500 m and are adjacent to recently awarded permits.

The northern Perth Basin formed through continental extension between the southwestern margin of Australia and Greater India during the Paleozoic to Mesozoic. The Abrolhos Sub-basin contains a Permian–Cretaceous sedimentary section up to 6000 m thick and the Houtman Sub-basin is a predominantly Jurassic–Cretaceous depo-centre. A number of wells within these areas have hydrocarbon shows and paleo-oil columns indicate the presence of mature source rocks, including the Hovea Member of the Kockatea Shale. There are also potential plays are within Triassic to Middle Jurassic strata.

For more information, go to: <http://www.petroleum-acreage.gov.au/2013/release-areas/north-perth.html>.

Gippsland Basin: V13-2 and V12-3

V13-2 straddles the modern continental shelf edge and extends into the Bass Canyon (Figure 6) where water depth increases to 3000 m. The basin developed during the Early Cretaceous as part of the breakup of Gondwana. Rifting continued into the Late Cretaceous and generated a classic extensional geometry. Sixteen exploration wells have tested top-Latrobe Group and intra-Latrobe Group targets. Several petroleum systems operate in the basin with proven plays in anticlines, tilted fault blocks, stratigraphic pinchouts

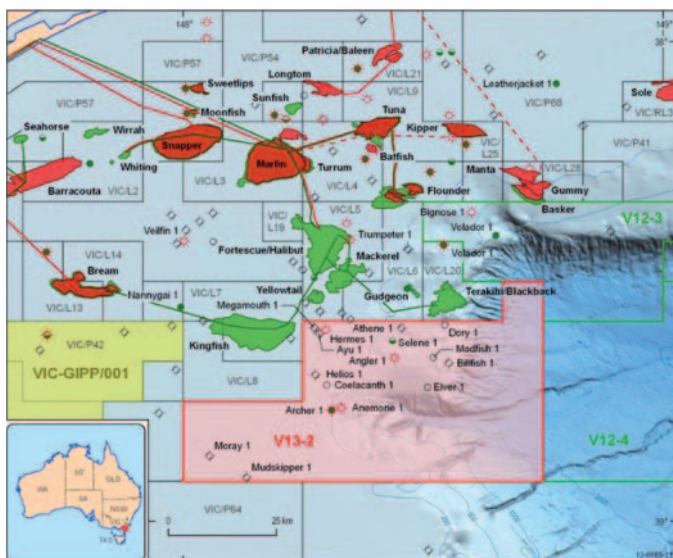


Fig. 6. Location of the V13-2 area (image source: http://www.petroleum-acreage.gov.au/2013/documents/release-area-maps/Release_Area_Map-Gippsland.jpg).



Fig. 7. Location of the V12-3 area; this is a re-released 2012 area (image source: http://www.petroleum-acreage.gov.au/2012/release-areas/documents/gippsland/Quicklookgippsland_11-5732-7.jpg).

and channel sandstones. Oil and gas fields have been discovered that are hosted by top-Latrobe Group (Eocene) shallow marine barrier sandstones with additional discoveries made in intra-Latrobe (Paleocene) coastal plain and deltaic channel sandstones.

For more information, go to: <http://www.petroleum-acreage.gov.au/2013/release-areas/gippsland.html>.

V12-3 offers exploration potential in the underexplored eastern deep-water part of the basin (Figure 7) with water depths ranging 150–3000 m.

The Gippsland Basin was Australia’s premier hydrocarbon province until the early 1990s, when large-scale production started on the North West Shelf. Despite its mature age, the basin is still recognised as a world class petroleum province, with annual production rates of around 25 MMstb oil and condensate and 250 MMscf gas.

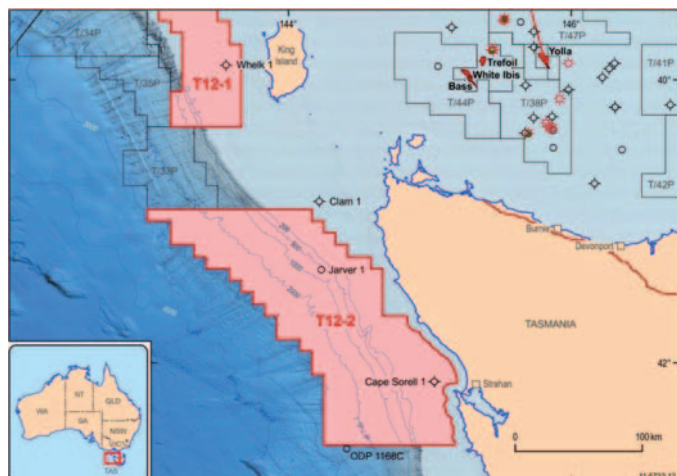


Fig. 8. Location of the T12-2 area; this is a re-released 2012 area (image source: http://www.petroleum-acreage.gov.au/2012/release-areas/documents/sorell/Quicklooksorell_11-5732-12.jpg).

Good geological control is provided by several successful wells indicating the presence of both gas and liquids in the northern area, while the southern area represents the remaining frontier of the basin.

For more information, go to: <http://www.petroleum-acreage.gov.au/2012/release-areas/gippsland.html>.

Sandy Cape and Strahan Sub-basins: T12-2

Area T12-2 is located over the Sandy Cape and Strahan Sub-basins in the Sorell Basin (Figure 8) in water depths ranging 50–3000 m. It is an underexplored frontier Cretaceous–Cenozoic basin containing up to 6.5 km of sediment with a variety of untested Cretaceous plays.

The Sorell Basin joins the Otway Basin to the north and the basins have a similar geological history and stratigraphy. The complex structural and depositional history of the Sorell Basin reflects its location at the transition from a divergent rifted margin to a transform continental margin. T12-2 is covered by extensive open file 2-D seismic and magnetic data.

For more information, go to: <http://www.petroleum-acreage.gov.au/2012/release-areas/sorell.html>.

Scott Plateau W12-7

W12-7 is located over the outer, deep-water Scott Plateau in the Browse

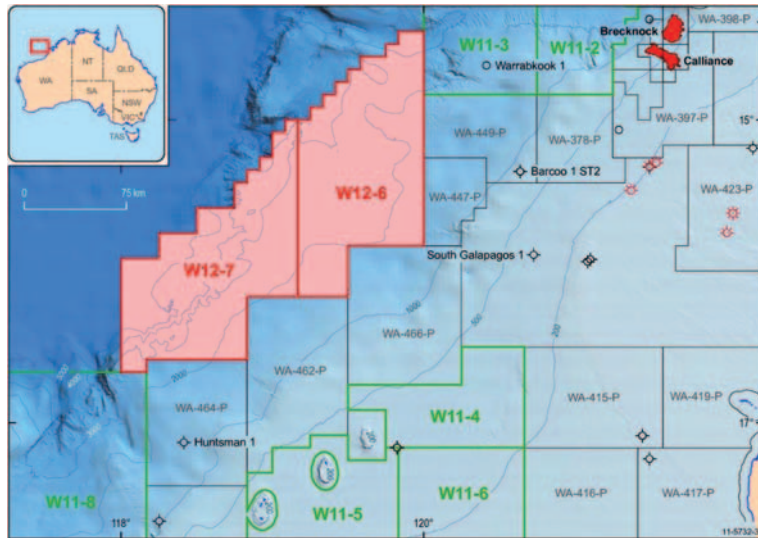


Fig. 9. Location of the W12-7 area; this is a re-released 2012 area (image source: http://www.petroleum-acreage.gov.au/2012/release-areas/documents/roebuck/Quicklookscottplateau_11-5732-3.jpg).

Basin; water depths range 1400–5000 m (Figure 9). This underexplored part of the North West Shelf lies to the southwest of the Torosa, Brecknock and Calliance gas fields in the Browse Basin, and to the northeast of established oil and gas fields and production infrastructure of the Northern Carnarvon Basin. W12-7 does not contain any wells, but inboard parts of these areas have good coverage of publicly available 2-D seismic reflection data. Nearby wells indicate that there is the potential for active petroleum systems to occur in the area and that a range of structural and stratigraphic plays are possible.

For more information, go to: <http://www.petroleum-acreage.gov.au/2012/release-areas/roebuck-scott.html>.



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Update on Geophysical Survey Progress from the Geological Surveys of Western Australia, South Australia, Northern Territory and WA Department of Water (information current at 21 January 2014)

Tables 1–3 show the continuing acquisition of the airborne magnetic, radiometric, gravity and AEM data of the Australian continent respectively. The

accompanying locality map for Table 3 can be found in Figure 1. All surveys are being managed by Geoscience Australia (GA). 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.

Table 1. Airborne magnetic and radiometric surveys

Survey name	Client	Contractor	Start flying	Line (km)	Spacing AGL dir	Area (km ²)	End flying	Final Data to GA	Locality diagram (Preview)	GADDS release
Browse Basin	GA	Thomson Aviation	21 Aug 13	189361	800 m 80 m ASL N–S	123 187	100% complete @ 7 Nov 13	Preliminary final gridded data supplied to GA 9 Jan 14	Issue 164 (Jun 13) p. 19	TBA
Menzies North	GSWA	GPX Surveys	7 Aug 2013	93 386	100 m 50 m E–W	8200	100% complete @ 26 Nov 13	TBA	Issue 165 (Aug 13) p. 11	TBA
Kalgoorlie East and Kurnalpi North	GSWA	Thomson Aviation	5 Aug 13	122000	100 m 50 m E–W	Kalgoorlie: 11 000; Kurnalpi N: 11 000	71.2% complete @ 19 Jan 14	TBA	Issue 165 (Aug 13) p. 11	TBA
Widgiemooltha North	GSWA	UTS Geophysics	25 Jul 13	92 000	100 m 50 m E–W	8200	93.8% complete @ 19 Jan 14	TBA	Issue 165 (Aug 13) p. 11	TBA
Menzies South	GSWA	GPX Surveys	28 Nov 13	92 000	100 m 50 m E–W	8200	46.4% complete @ 19 Jan 14	TBA	Issue 165 (Aug 13) p. 11	TBA
Kurnalpi South	GSWA	UTS Geophysics	Est. late Jan/early Feb	92 000	100 m 50 m E–W	8200	TBA	TBA	Issue 165 (Aug 13) p. 11	TBA

ASL, above sea level; TBA, to be advised.

Table 2. Gravity surveys

Survey name	Client	Contractor	Start survey	No. of stations	Station spacing (km)	Area (km ²)	End survey	Final data to GA	Locality diagram (Preview)	GADDS release
North Perth – Gingin Brook	WA Dept of Water	Atlas Geophysics	9 Apr 13	1230	1.5 km regular grid	3900	100% complete @ 7 Jun 13	29 Jul 13	Issue 163 (Apr 13) p. 17	Currently scheduled for the end of February
Southern McArthur Basin	NT	Atlas Geophysics	15 Oct 13	6270	4 km regular grid with 2 km infill in 2 areas	74 380	100% complete @ 17 Nov 13	19 Dec 13	Issue 166 (Oct 13) p. 34	Final data released via GADDS 8 Jan 14
Goldfields, WA	WA	Atlas Geophysics	8 Nov 13	8100	2.5 km regular grid	51 140	100% complete @ 13 Dec 13	20 Jan 14	Issue 166 (Oct 13) p. 34	Currently scheduled for the end of February

TBA, to be advised.

Table 3. AEM surveys

Survey name	Client	Contractor	Start flying	Line (km)	Spacing AGL Dir	Area (km ²)	End flying	Final data to GA	Locality diagram (Preview)	GADDS release
Swan/Scott Coastal Plain and Albany/ Esperance	WA Dept of Water	CGG Aviation (Australia)	25 Mar 13	8607	300/600 m	TBA	100% complete @ 15 May 13	Final data to GA 20 Jan 14	Issue 163 (Apr 13) p. 17	TBA
Capricorn Orogen	WA	CGG Aviation (Australia)	19 Oct 13	29 697	5 km N-S	146 300	100% complete @ 9 Jan 14	TBA	Issue 166 (Oct 13) p. 34	TBA
Southern Thomson Orogen	GA/ GSNSW/ GSQ	TBA	TBA	6305	5 km E-W	16 270	TBA	TBA	This issue	TBA

See Figure 1 for locality of the Southern Thomson Orogen survey. TBA, to be advised.

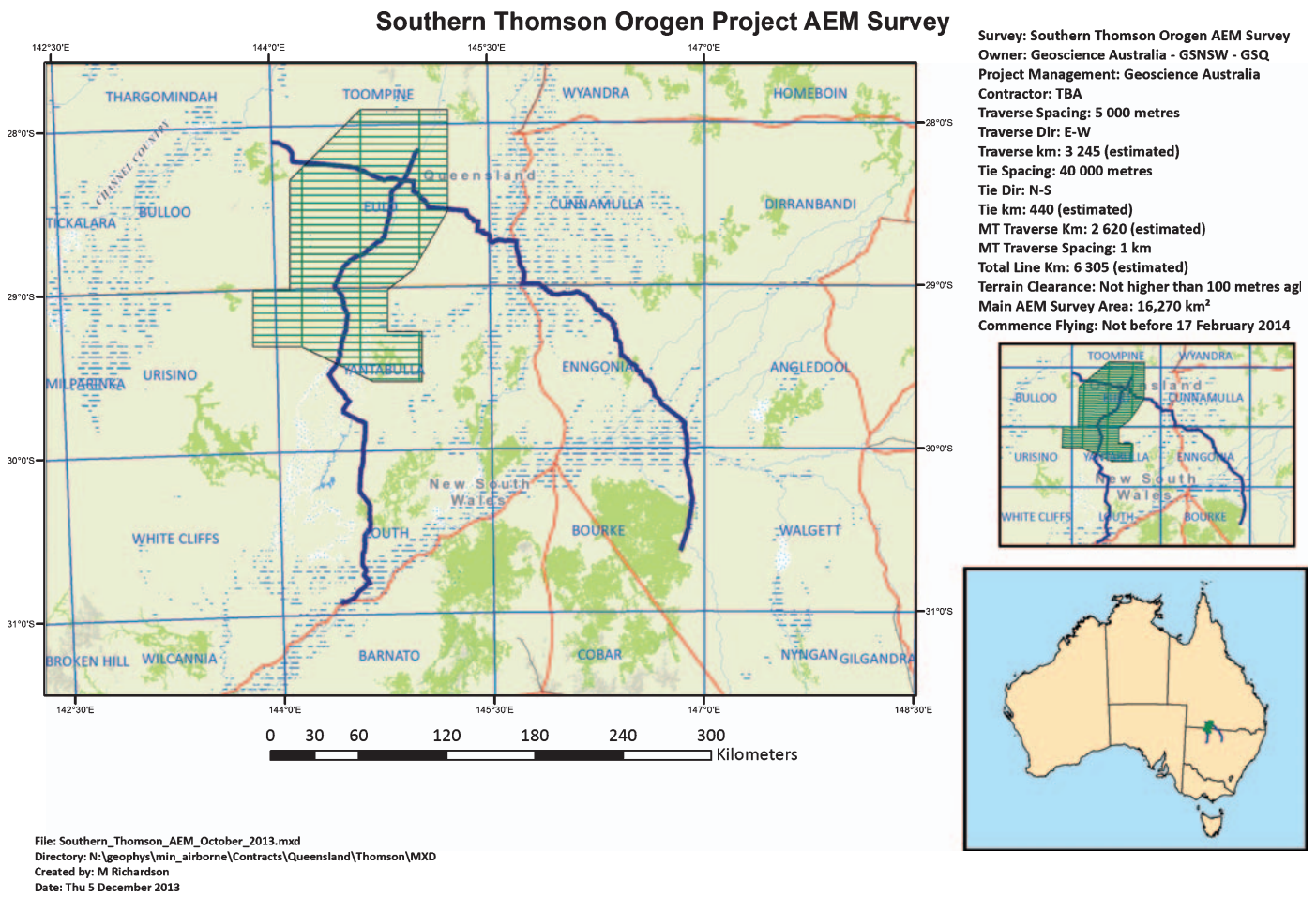


Fig. 1. Locality map outlining the Southern Thomson Orogen survey (detailed within Table 3).

News from the surveys: SA

The South Australian Atlas of Geoscience and Mineral Exploration Data – Woomera Prohibited Area within the Gawler Craton

The Woomera Prohibited Area (WPA) is a military testing range covering approximately 127 000 km² of the land surface of central South Australia. Underlying it are highly prospective rocks of the Gawler Craton, a major province of the Earth's crust that hosts the world-class Olympic Dam deposit and major mines such as Prominent Hill and Challenger.

This atlas is a collation of mineral exploration information relevant to this geologically important region within South Australia. It displays the extensive range of data resources originating from within the WPA that were available at the time of compilation (November 2013), providing readers with a visual reference to the data which is freely available on SARIG, South Australia's online geoserver.

The WPA has the potential to contain multiple mineral resource commodities and deposit styles, but the most economically significant of these are: (1) iron oxide - associated copper-gold±uranium (IOCG±U) type deposits; (2) globally unusual gold only deposits of

the Challenger type; (3) sediment-hosted uranium deposits within sandstones; and (4) unconformity-style uranium deposits. Examples of the first two are known to occur within the WPA, and evidence exists that the potential for finding deposits of the latter two styles is significant.

The atlas also presents information pertaining to land access and administration, including maps about military testing range zones of the WPA, actively explored areas, pastoral landholdings, and native title claims/determinations.

A wealth of geological and geophysical data derived from the WPA is portrayed, from surface to basement geological maps, to state geophysical imagery and derivatives. Coverage of non-potential field data is provided, as well as value-added products, such as the SEEBASE™ Depth to Basement map.

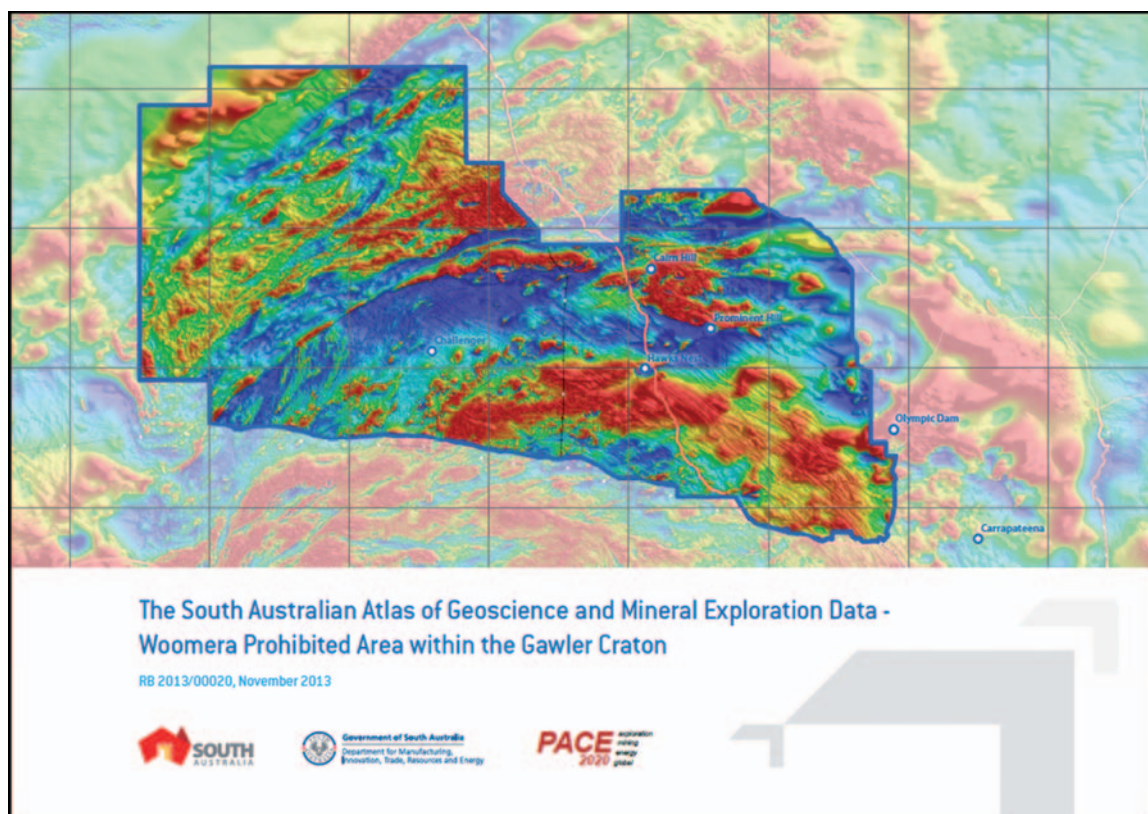
A suite of ASTER-derived surficial mineral distribution maps are contained in the atlas. Note that when interpreting the ASTER mineral maps, information

pertaining to the numerical thresholds of the colour stretch should be consulted and can be found in the metadata document for each mineral theme. Metadata is available to download from SARIG.

A vast array of documented historic exploration data obtained by work done across the WPA is available for review through SARIG, accessible by text searching under the Publications and Reports section of the Databases tab. As a way of briefly summarising the exploration history, maps depicting expired/surrendered exploration licences have been compiled to create a spatial representation of exploration by commodity, thus providing insights into the temporal development of mineral exploration for the region.

The Atlas is a Geological Survey of South Australia Report Book (RB2013/00020) and is available for download through SARIG.

Tom Wise, Philip Heath, Gary Reed, Laz Katona, Miles Davies, Andrew Rowett and Ted Tyne
Resources and Energy Group, DMITRE



Tertiary geoscience education at the crossroads?

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The full report, from which this summary article is derived, is available on the AGC website:

<http://www.agc.org.au/index.php/reports/148-australian-geoscience-council-report-australian-geoscience-education-profile-2013>. – Editor

Introduction

With its latest survey (Powell 2013), the Australian Geoscience Council (AGC) has accumulated 10 years worth of data to the end of 2012 on teaching, enrolment and staffing levels in geoscience at Australian universities.

The status of geoscience and geoscience education in universities has continued the improvement recorded in 2010 with further growth in enrolled students, reversing the decade-long decline prior to 2007. However, the minerals industry downturn represents a potential cloud on the horizon for Tertiary geoscience education.

Results

Eighteen universities (Table 1) have the capacity to teach geoscience as a major in their undergraduate programmes, with an additional university offering an earth science major as part of an environment degree. Of these, six maintain distinct geoscience schools, but one of these is about to undergo a merger with non-geoscience schools. In the remainder, the geoscience discipline is variously amalgamated into schools of ‘earth, geography, environmental and biological science’ or schools of ‘physical sciences’. The consequence for the structure of the undergraduate majors on offer varies. Some schools have created ‘geoscience degrees’ from a blend of physical geography or environment courses and traditional ‘solid earth science’ courses. Others have maintained a clear distinction between degree types.

These changes in university structures and degrees started a decade ago at a time of static or declining enrolments in geoscience and reflect the economic

realities of current university funding. Government funds for teaching are provided on a per-student basis with additional funds being paid by full fee paying students, with the salaries of staff (academic, support and administrative), infrastructure and expendables (including field teaching) being paid from those funds. There has therefore been enormous pressure to improve the economics of teaching.

Fortunately and in contrast to the period prior to 2005, the resources boom has progressively attracted additional numbers of students into geoscience, improving the economics of geoscience teaching and easing the concerns expressed prior to 2007 as to the viability of geoscience in universities. Nationally student enrolments, as measured by Equivalent Full Time Student Load (EFTSL), have increased 14% since 2010 continuing

Table 1. Universities offering Earth Science Degrees in 2012 showing total geoscience staffing, Equivalent Full Time Student Load (EFTSL) and degrees awarded in 2012

University – school or structural unit	Geoscience staff total	EFTSL total	BSc major	BSc Hons	MSc	PhD
Adelaide – Earth & Environmental Science	33	533	76	43	7	5
– Petroleum						
Australian National						
– Research School of Earth Sciences	69	81	4	18	2	16
Ballarat – Science, Information Technology & Engineering	5.5	78	14	3	–	–
Canberra – Education, Science Technology & Mathematics	3	65	6	2	–	–
Curtin – Applied Geology						
– Exploration Geophysics	50	300	94	15	16	2
Flinders* – Environment	22	99	9	9	2	4
James Cook – Earth & Environmental Sciences	17	159	24	10	11	3
Macquarie – Earth & Planetary Sciences	23	227	22	10	17	3
Melbourne – Earth Sciences (includes ocean, atmospheric sciences)	20	115	32	9	13	6
Monash – Geoscience	21.4	238	115	27	1	5
New England** – Rural & Environmental Science	3.5	77	11	3	–	–
Newcastle* – Environmental & Life Sciences	8.6	155	27	3	–	2
New South Wales						
– Biological, Earth & Environmental Sciences	22	209	18	16	2	6
Queensland – Earth Sciences	27.2	228	52	8	5	11
Queensland University of Technology						
– Earth, Environmental & Biological Sciences	17	93	22	3	2	2
Sydney* – Geosciences (includes geography, environmental sciences)	19	137	14	8	2	5
Tasmania						
Earth Sciences	31.3	81	53	19	5	6
Western Australia – Earth & Environment	33	161	55	22	19	6
Wollongong – Earth & Environmental Sciences	19	181	36	10	6	7

Notes: Flinders offers geoscience major in BSc Environment Degree. *Denotes enrolments and degrees are from 2010 survey. **Denotes degrees estimated by author from enrolment data.

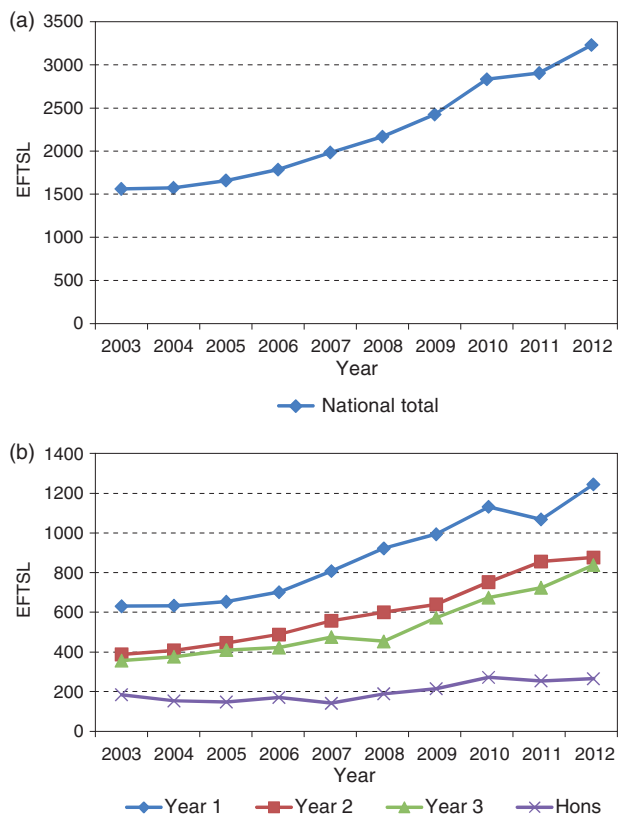


Fig. 1. National trends in undergraduate enrolment in the geosciences expressed in Equivalent Full Time Student Load (EFTL). (a) National total – all levels; (b) National totals by level. EFTSL, Equivalent Full Time Student Load.

the growth recorded in the 2010 survey (Figure 1). This growth is not universal with six universities static or showing declines.

Contrary to the growth in the period 2007–2010, Honours enrolments have stabilised or declined slightly in most universities, although a few are still growing. This has led to an overall slight decline in total Honours enrolments from 2010.

The data show that universities vary widely in their viability as geoscience teaching institutions. There has been a general strengthening of ‘geoscience schools’ as student numbers have increased and courses re-organised to improve the efficiency of teaching. From 2007, there has been a systematic increase in the EFTSL per teaching staff member with now six universities above 20, five between 15 and 20 and only one below 10 – in 2007 there were only three universities above 15. This indicates improving financial viability for many schools. The growth in Masters degrees involving significant coursework also impacts on teaching loads and contributes to financial viability for those departments where this is occurring. Two

universities (Adelaide and Curtin) account for 27 percent of the national student load with EFTSL values of 300 or more. Four universities have values between 200 and 250. The balance has values below 180, of which six are below 100 (Table 1).

The output of Bachelor (BSc) degrees with a major in geoscience has continued to grow to approximately 690 in 2012 (Figure 2), but Honours enrolments and the output of BSc Honours degrees have declined slightly from around 251 in 2010 to around 241 in 2012.

The output of Masters (MSc) degrees by coursework and dissertation, have continued to grow strongly reflecting the change in emphasis to postgraduate coursework at several universities and accounts in part for the levelling off in Honours enrolments and degrees awarded. These coursework degrees are often specifically aimed at training candidates in the knowledge and techniques required for employment in industry, but are also offered as pre-research training. Three universities (James Cook, Tasmania and Western Australia) co-operate in the Minerals Tertiary Education Council (MTEC) Mineral Masters programme. Melbourne and Macquarie

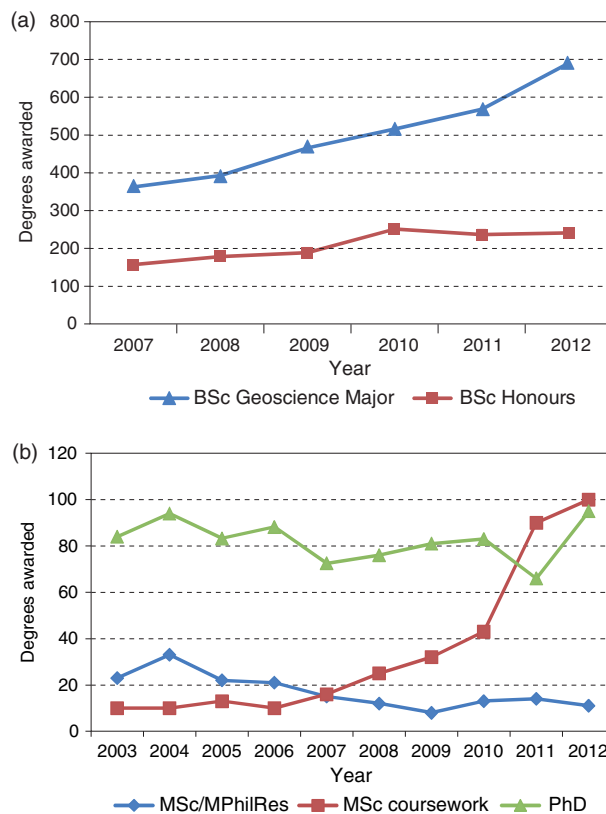


Fig. 2. National trends in geoscience degrees awarded: (a) Bachelor degrees, national total; (b) Higher degrees, national total. Note data on BSc degrees is only available from 2007.

universities now offer a 2-year Masters by coursework and dissertation in lieu of an Honours Degree, with Adelaide introducing this option in 2014. Western Australia has this option predominantly for overseas students and retains the Honours and 1-year Masters Courses for domestic students.

In addition to normal curriculum reviews, several universities continue to take specific steps to meet the needs of potential employers by addressing the core skills requirements of graduates:

- Nine universities participate in the MTEC Honours Minerals Short course Programme.
- They have made (or are in the process of making) specific teaching appointments in resource geoscience.
- They have remodelled courses to meet core skills requirements and strengthened some disciplines including geophysics, field geology, digital geology, minerals geoscience and petroleum geoscience.
- Some have placements in industry as part of a course of study.
- Some provide specific options and specialisations in majors and MSc degrees.

Universities in Victoria and Sydney cooperate in the delivery of electives in the Honours year in their respective locations.

The National Centre for Groundwater Research and Training is based at Flinders University with 11 university partners. It seeks 'to improve our understanding of Australia's Groundwater Systems, and by training the next generation of expert researchers and groundwater professionals. It does not produce graduates in its own right but strengthens the capacity of the university partners in this regard. Similarly the ARC Centres of Excellence in 'Ore Deposits' and 'Core to Crust Fluid Systems' centred at the Universities of Tasmania and Macquarie respectively strengthens their capacity and of that of their university partners. The University of Adelaide provides specifically for the petroleum industry through its School of Petroleum, whilst Curtin University provides specifically for geophysics through its Department of Exploration Geophysics.

The decline in output of Masters degrees through research has continued and is now only about 10 per annum compared output of Masters degrees based on coursework and a dissertation which is now around 100. The latter has more than doubled since 2010 following an increase by 250 percent in 2010 compared with 2007 (Figure 2). The output of PhD degrees recorded a drop of 20 percent to about 66 in 2011 before rebounding to 95 in 2012 (Figure 2).

In 2012, 200 academic staff were engaged in some level of teaching of geoscience in Australian universities whilst there are a further 270 staff engaged in research with no formal teaching commitments. Nationally since 2010 the number of teaching position has declined slightly whilst the number of research positions has increased by 35–22% compared with 13% between 2007 and 2010. The combination of teaching and research positions shows a wide range in capability between the 'geoscience' universities (Table 1) with a variation in the size and profile of schools with differing levels of undergraduate and postgraduate output and differing emphasis on teaching versus research.

It is now clear that the resources boom attracted large numbers of students into geoscience. With the current drawback from the very high levels of activity in the exploration and development industry and the increasing uncertainty as to geoscience employment levels (Australian Institute of Geoscientists 2013) it becomes a question as to whether current levels of enrolment will be sustained. Indeed, could we be about to repeat the boom–bust cycle that led to concerns about geoscience education at the turn of the 21st century? If student enrolments fall it is conceivable that some schools could become financially unviable again.

The question asked at the time of the 2007 survey remains highly pertinent: *What is the minimum economic department size that is sustainable*

in the longer run? This has to have consideration of government funded student load, fee paying students, academic staff numbers, service teaching to other degrees, external funding for teaching and research funding. As this survey once again demonstrates, these considerations vary from institution to institution and are not easily compared. However, the current survey has shown again that some larger schools with wide capability are growing from strength to strength, whilst others with lesser capability are static or reducing.

In general the position has improved again since 2010, but it remains clear that a critical mass of teaching and research capability that creates a vibrant and attractive educational experience is fundamental to sustaining Tertiary geoscience educational opportunities in Australia.

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Sick and alone



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Last issue I wrote a serious article about cloud storage, the future of storage for oil and gas data, and the death of tape.

Since then I have been neck deep in thought about what this all means. Not just thought, but modelling, examination, and theory testing. I have the bug, and this bug is not something you just take a tablet for and have a good sleep. This bug is nasty. It comes with breathing difficulties, sleep deprivation, itchy scalp, heart palpitations, difficulties concentrating, stress-related skin irritation, and bowel dysfunction. Significantly increased caffeine intake

seems to be the only thing that holds it at bay, and even that is only temporary.

It is so odd to be witnessing something so rare, important, and life changing, when everyone around me is just going about their usual business – no skin irritation or bowel dysfunction to report, happy to go about doing it the way they have always done it. Tape zombies, tape drones, tape followers, tape cronies, tape users, tape addicts not looking for a better high, tape status quo junkies, same-same tape jockeys, essentially tape losers.

The fact that I was the only one who seemed to care about this ‘cloud thing’ was emphasised last week at 3 am when I was sitting in my front garden quietly thinking through the implications of the cloud. Thinking about its many manifestations and uses, its many paths (short cuts) to glory, and its many irritatingly simple efficiencies when compared to tape, when my neighbour apparently thought that taking out his garbage was a good idea.

The rabble of the bin wheels along the footpath distracted me from my storage panacea. I was enraged (not so much because of the interruption, but mainly because it was also a recycling day and my son only put out one of the bins).

But did my neighbour have any idea what was going on inside my head at that moment? Did he know that the interruption of my thought process could well be the reason that the future of storage never unfolds, never delivers on its many promises, and never really arrives in any way shape or form for anyone, ever? Okay, that may be a little dramatic, but what was he thinking? How is a man to concentrate with all of these bins rolling up and down the street?

Despite all the negatives of the bin incident, there was also one significant positive. That positive was that I saw in that very moment, while my neighbour was struggling to rotate the bin to face the right direction in the thick uncut grass of his lawn, that I was very much alone in my thinking. And that aloneness made me feel special. I was the only one who knew, who understood, and who cared about the single most important event to occur in my generation – the death of tape and the birth of its prodigal son – the cloud.

Like the assassination of Kennedy or the attack on Pearl Harbour, I will always remember where I was the day tape died. I was in my front garden, it was the second Tuesday of the month, it was 3 am in the morning, a recycling day, a day just like any other – with the exception of one thing – I knew something no one else did.

Seismic window



Michael Micenko
micenko@bigpond.com

Line location look back and more

I'd like to take this opportunity to wish you all well in 2014. After a year of writing Seismic Windows articles I have finally got some feedback, which I'll share later, but first I'd like to follow up last year's articles. The first article looked into the 'funny methods' side of oil exploration and generated some interest in paranormal exploration and dowsing. Unfortunately, during the year the 'most positive CSEM anomaly I have seen' was drilled and failed to find hydrocarbons. This was obviously a disappointment to the exploration company involved.

Not much else raised any comments during the year apart from the Talgeberry article, which was published in the conference issue of *Preview*. I attended the Melbourne conference and several people used this article to commence robust discussions. The seismic polarity standard is still confusing for many geophysicists and there does not appear to be any concerted movement to adopt a standard 'standard'. However, it is pleasing to see copies of the polarity article pinned above desks in various offices. It is even more pleasing to see copies that have not been defaced or graffitied.

But the last article on seismic line locations prompted a string of emails. First Keith Woollard of Geocom wrote to me describing his software that correlates traces on intersecting lines to

find the best intersection point (and hence coordinate assuming you know one real line location). Keith also highlighted the issue of the coordinate reference point, which is often not the actual trace location. But most pleasing was the response I received from Mike Sexton of Geoscience Australia. He's from the government and he really is here to help. He's taken on the task of sorting out the location data held by GA. This is a huge job.

Here is some of what Mike had to say:

When GA purchased SNIP, it was to help with finding surveys that could be included in the Acreage Release packages.

At the time I was working on compilations of bathymetric data that GA had acquired and I noticed that the SNIP data had also captured bathymetric data. As a result I decided to take a closer look and realised that for the modern 3-D surveys the bathymetry wasn't bad...I decided to investigate further.

This was my big mistake. It turned out that the problem was more involved than I thought. GA's databases were worse than a 'dog's breakfast'. We had errors, duplications and omissions. SNIP also had problems. Some surveys were incomplete (missing lines, shortened lines, additional (non-existent) lines). The metadata was also very sparse.

For internal reasons I decided to look at ALL offshore surveys in the Australian Region. These comprised GA's own marine surveys (since about 1966) – 340 of them, geophysical research cruises – about 800 of them, CSIRO surveys – about 200, Antarctic Division surveys – about 200, various university surveys – about 50, various Pacific Island surveys (aid projects) – about 50, and petroleum industry surveys lodged with GA under the PSLA Act – about 2000. All up about 3800 surveys.

Each survey got a unique number starting at 0001. I called the number GAMSIS (Geoscience Australia Marine Survey Index) to distinguish it from the plethora of other numbers in existence at GA.

After I started I have had assistance from 2 others to search out reports, harvest metadata and check the navigation. When in doubt we always put in 'Original datum assumed to be AGD66' or something like that... For many surveys we have used the SNIP file as the basis for our file. For these ones we usually say something like 'Data sourced from SNIP1234' – 'No transformations made at GA'. If SNIP didn't exist or we had an issue with it we created our own but always said what we did (mainly because we know the potential for error is large and we want to be able to backtrack and fix them if problems are found). My overall aim was to make SNIP obsolete and have GAMS take over. I deliberately didn't edit SNIP or try and build on its numbering system as it would have been impossible.

So that's the history. What would Mike like from us?

He wants us to tell him if we find errors or discrepancies in the databases so he can fix them and save all our efforts being duplicated around the country.

One of Mike's aims is to stop data managers spending several months cleaning up their data. As he pointed out in his note to me, 'Your data manager has done this for one project. I hate to think what is happening in all the projects of all the companies'.

So let's try to be more efficient. If you find something wrong with your seismic location data just ring or email mike.sexton@ga.gov.au and he'll have a look at the problem.

Finally, I'd like to mention that the GA repository has made major strides in data management over the past few years and now has a world class system in place.

Call for speakers for <Insert Conference Name Here>

or

Invitation to submit an article to <Journal you've never heard of>

Philip Heath
philip.heath@sa.gov.au

Have you ever received an email from a conference organiser inviting you to either submit a paper, or chair a session, for a conference of which you've never heard? You're not alone. If you decide to register for one of these conferences, don't be surprised if the conference is cancelled, and you can't get your money back.

Perhaps you've received an email from a new open access journal, inviting you to submit a paper? If you choose to submit something, you might find your paper gets accepted within a timeframe suggestive of a somewhat rapid peer-review process, and then you receive invoices for processing charges. Do you pay? There are many legitimate open access journals, and there are others. The websites appear official, the correspondence is real enough, so how do you tell if someone is trying to scam you?

The Australian Competition & Consumer Commission (ACCC) - an independent Commonwealth statutory authority - operates a website called SCAMwatch. SCAMwatch is an online resource that teaches consumers and small businesses how to recognise, avoid, and report scams. Other government websites contain information and reporting options for scams, including the Australian Securities and Investments Commission (ASIC), the Australian Tax Office (ATO) and the Australian Communications and Media Authority (ACMA). State government websites also contain information.

However, these websites don't contain information on the types of scams mentioned above, although they do give information on what to be aware of in emails, facsimiles, phone calls and text messages.

Conferences

For example, in the case of emails inviting you to a conference, do you know who sent the email? Do you know of the conference? Are there obvious spelling mistakes or poor grammar?

Usually it's obvious. The ASEG has sister societies: The Korean Society of Exploration Geophysics (KSEG), the Society of Exploration Geophysics Japan (SEGJ) and the Brazilian Geophysical Society (SBGf). These societies have arrangements to advertise each other's conferences, so any invitations to these conferences will come from the ASEG. If you're a member of the EAGE or SEG you'll receive notification from them regarding their events.

Sometimes it's not so obvious. I recently received an email inviting me to the '1st Annual World Congress of Geophysics (WCG-2014)' in Taiyuan, China. I don't know the person who sent me the email, or how they got my email address, but their email address ended @gphys2014.com which sounds legitimate. The email included a list of 12 Symposia to be held at the conference. Each symposium has a theme, nicely covering all aspects of Geophysics. I was specifically invited to present in Sym 304: 'Global Earth Observation System of Systems'. There was a blurb about the host city and professional looking contact information. The English was fine, but the email began 'Dear Dr. philip.heath' (period inclusive), which rang alarm bells. Nonetheless I decided to risk looking at the website.

According to the website, the operating organisations are BIT Congress Inc., Foreign Experts Databank of SAFEA-Dalian Biotechnological and Medical Experts Subdivision. As I'm not sure what these organisations have to do with geophysics I've undertaken a Google search for BIT Congress. They supposedly organise a range of conferences covering numerous professions (for example the BIT World Cancer Congress and the World Congress of Agricultural Biotechnology).

There is no evidence that these conferences are being organised and run by professionals in their field. Further, there are numerous articles regarding people who have been invited speakers to the conference, but still had to pay for registration. The conference is subsequently cancelled (perhaps due to 'political action') and the invited speaker cannot get a refund.

Publications

Open access journals offer a platform for academics to publish their work for a wide audience to read. With today's 'publish or perish' attitude to academic research, these journals can help an author to increase their citation rate.

Some authors have jumped on the opportunity to publish a large number of papers, most of them referencing their own and their colleague's papers. One author clocked up 512 citations in 169 articles (Masterson 2013). The journal was published by a Nigerian open access group named Academic Journals. The Essential Science Indicators database by Thomson Reuters removed all references to the author in their database.

Some publishers simply don't exist. Once your paper is accepted - possibly without any reviewer's comments - you receive an invoice for processing fees or printing costs, and should you pay it you won't see your article in print, or your money again.

Jeffrey Beall is librarian and associate professor at the University of Colorado Denver and has been investigating the issues around invitations to publish in open access journals (Butler 2013). Ultimately he has formed a list of independent and questionable journals (Beall 2012). The 225 publishers and 126 journals on the 2013 list serve as a useful starting point when receiving questionable emails from publishers. The 2012 list contained 23 publishers, so the list is growing.

Other scams

If your company has a website, you may receive an email from a domain broker to let you know that a .com site has become available with a name similar to your (say) .com.au site. In some instances they come with claims that someone else is applying for it and want to get your permission. Or perhaps they'll simply be looking for a renewal fee for your domain. If they're not the entity that holds your domain registration then you can safely ignore it.

Phishing scams are common: emails asking you to update passwords or

bank details. All these emails should be marked as spam and deleted, and in the case of emails from banks, the ACCC asks that you contact the bank directly – by calling them on the phone number on the back of your card – to let them know. You can also report it on the SCAMwatch website.

The ACCC SCAMwatch website contains excellent advice for how to avoid scams: do your homework. For us in the ASEG community, if you are suspicious of an email inviting you to speak at a conference of which you've never heard, or inviting you to submit a paper to an obscure journal, perhaps contact your local branch committee and see if anyone else has reported it. And if nothing else, research online to see who is organising it at the other end.

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Call for assistant book reviewers

Books. A dying breed? A valuable commodity? Or perhaps simply a traditional product in transition to the electronic world? In whatever form and regardless of whether we manage to read them from cover to cover (or first e-page to last e-page), books are undoubtedly a valuable resource to the geophysical profession.

There are a number of new geophysical books published in any given year – in my field of potential-field geophysics, I've been surprised to see at least four new books focused on gravity and magnetic methods published in the past year or so. I don't recall that many new specialist books on the topic since the time that I wandered into the field around (gulp) two decades ago! But if I decide to buy one or more of these books, which one(s) would I choose, how would I decide which of these books suit my purpose? There is arguably a role for publications like *Preview* to help members decide whether a particular book is suitable, relevant, accurate, up-to-date and good value. Hence the Book Reviews section.

In a moment of inspiration shortly after being asked to take on the role of coordinating Book Reviews, I fired off

quick emails to several publishers of geophysical books. The SEG, EAGE and Cambridge all responded quickly and indicated a willingness to provide complementary copies of their new geophysical books for review by ASEG members. I have already received two of the abovementioned potential-field textbooks from Cambridge for review. The SEG has also offered eBooks for review by interested members (i.e. take your pick) and the EAGE are planning to send copies of new books as they are published.

I think it's sensible to limit reviews to books published in the past year or so and I suggest that we aim for reviews that give us an impression of the breadth and depth of the book's content. Comments on readability, accuracy, etc. are also important considerations for potential purchasers.

If you are interested in reviewing books, have suggestions for other publishers to contact or ideas for specific new books to review, please get in touch. Note that you would normally get to keep a copy of the book after you review it. In the meantime, why not peruse the 'new books' pages for some of the publishers

below – is there anything there that you'd like to review?

There are certainly a number of other publishers of quality geophysical books and this piece will hopefully stimulate further suggestions and offers to review.

Suggested publishers offering books for review:

- SEG: <http://www.seg.org/resources/publications/books/pubsnewbooks#!>;
- EAGE: http://bookshop.eage.org/CMS/structure_page.aspx?UsCode=NEWBOOKS&UsList=NEWBOOKSd; and
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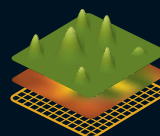
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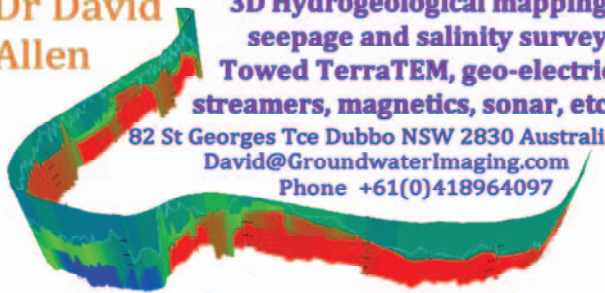
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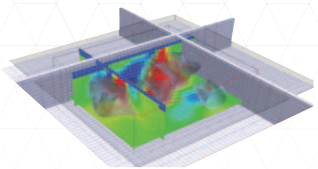
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March			2014
16–20	SAGEEP 2014 (The Symposium on the Application of Geophysics to Engineering and Environmental Problems) https://www.eegs.org/AnnualMeetingSAGEEP/SAGEEP2014.aspx	Boston, MA	USA
April			2014
7–10	The 6th Saint Petersburg International Conference and Exhibition http://www.eage.org/index.php?evp=1979	Saint Petersburg	Russia
21–24	CPS/SEG 2014 Conference: Advancing Geophysical Innovation http://member.seg.org/Default.aspx?TabId=319	Beijing	China
May			2014
28–30	130th SEGJ Conference http://www.segj.org	Tokyo	Japan
June			2014
16–19	76th EAGE Conference and Exhibition incorporating SPE EUROPEC 2014 http://www.eage.org	Amsterdam	The Netherlands
20–23	6th International Conference on Environmental and Engineering Geophysics (ICEEG2014) http://tdem.org/iceeg2014/	Xi'an	China
September			2014
15–17	EAGE Near Surface Geoscience 2014 20th European Meeting of Environmental and Engineering Geophysics of the Near Surface Geoscience Division of the EAGE http://www.eage.org	Athens	Greece
28 Sep–2 Oct	2014 Canadian Geotechnical Conference <i>Conference website pending; please email cgs@cgs.ca for additional information or visit the CGS website (www.cgs.ca)</i>	Regina	Canada (Saskatchewan)
October			2014
26–31	SEG International Exhibition and 84th Annual Meeting http://www.seg.org	Denver, CO	USA
December			2014
10–12	The 8th International Petroleum Technology Conference (IPTC) http://www.iptcnet.org	Doha	Qatar
January			2015
11–14	3rd South Asian Geosciences Conference and Exhibition http://geo-india.com/	New Delhi	India
February			2015
15–18	ASEG-PESA 2015: Geophysics and Geology together for Discover 24th International Geophysical Conference and Exhibition http://www.conference.aseg.org.au/	Perth	Australia
June			2015
1–4	77th Conference and Exhibition http://eage.org	Madrid	Spain
October			2015
18–23	SEG International Exhibition and 85th Annual Meeting http://www.seg.org	New Orleans	USA
December			2015
7–9	The 9th International Petroleum Technology Conference (IPTC) http://www.iptcnet.org	Doha	Qatar
October			2016
16–21	SEG International Exhibition and 86th Annual Meeting http://www.seg.org	Dallas	USA

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section of the *Preview* website at: www.publish.csiro.au/journals/pv.

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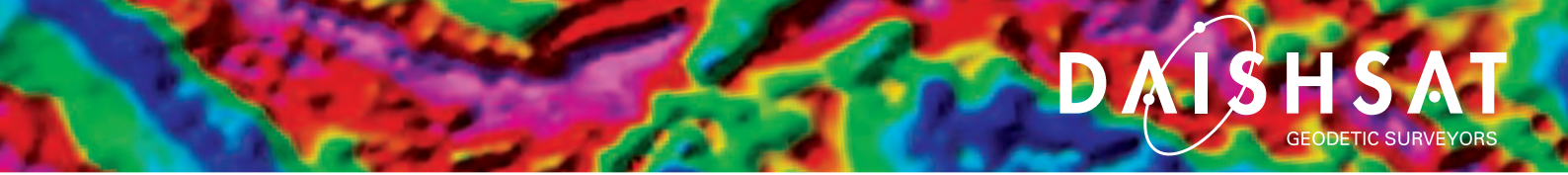
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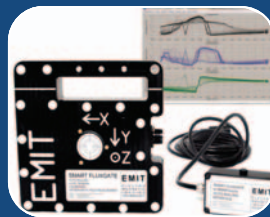
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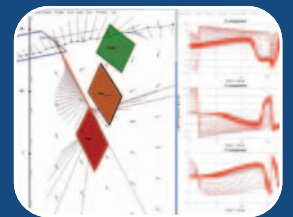
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