Newsletter of the Australian Chapter of the *International Association of Hydrogeologists*

January to March 2018
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In this issue

International Association of Hydrogeologists Australian National Chapter

The International Association of Hydrogeologists is a professional association for those within disciplines related to groundwater, its occurrence, utilisation, testing and management. IAH is a scientific an educational organisation that is truly international, and was established to foster closer ties, cooperation and information exchange related to the study of groundwater. IAH is non-government and non-profit and has over 4000 members internationally from around 120 countries. The Association is affiliated with the International Union of Geological Sciences (IUGS), and was founded during the 20th International Geological Congress in 1956. By its statutes the IAH is an association of individuals and corporate members, and not a federation of national committees. National groups do, however, organise local meetings and other activities. A proportion of the national committee membership goes to the local organisation to support these activities, the remainder to the international body. The country of the international secretariat is changed every several years. The IAH publishes Hydrogeology Journal, various workshop and conference proceedings and an international newsletter.

The main objectives of the IAH are to promote international and national cooperation between involved scientists and engineers; sponsor international and national technical/management meetings and symposia on hydrogeology; publish hydrogeological reports, papers and maps; establish investigation commissions and working groups to report on special topics; encourage the international application of relevant approaches and techniques for the benefit of the hydrological and human environment.

Our national chapter was founded in 1983 and is one of the most active. Activities tend to be organised locally within each state and territory, but national activities also occur. Each state body has its own meetings, usually monthly. Conferences are held in Australia around every two to three years, and seminars on a more frequent basis.

Membership Requirements: IAH will accept as individual members anyone directly or indirectly engaged in study or research on, or management of water in its various forms related to hydrogeology, if sponsored by two members in good standing. Companies and research organisations can apply for corporate membership. The current membership categories and annual subscriptions for 2015 (see www.iah.org.au) are:

- Member $150
- Online member $130
- Student $55 (full time students)
- Online Student Member $35
- Corporate member $830
- Partial sponsor $165
- Full sponsor $200
- Retired $75

The membership rates reflect a minor increase for 2018, which applies to the print and online membership categories (including sponsor versions), and the Corporate member rate. The student and retired member rates remain unchanged in 2018.

Membership of this professional association is tax deductible in Australia, and individual members are entitled to use ‘MIAH’ (Member of the International Association of Hydrogeologists) after their name.

From the President

What does it mean to represent IAH Australia, and what does IAH Australia represent?

As a learned society for the advancement of groundwater science through education, advocacy, management and policy, the IAH represents a science-based discipline with myriad applications in industry, academia and governance. Our members don't fall neatly into the same side of most water-based debates in Australia. It is fair to say that we broadly share a common desire to utilise our groundwater resources to the betterment of society while preserving our environment. However, there are diverse and often conflicting opinions within our membership about what this means in practice with respect to our groundwater resources: what are the priorities, what is practical versus aspirational, what is the "highest and best use", what is the optimal balance of social, economic and environmental outcomes?

This question was front and centre for me recently, when the IAH was invited to provide a submission to a Parliamentary Inquiry into water use by the extractive industry. The focus of the inquiry was the adequacy of the current regulatory framework governing water use in the extractive industry, with five subtopics forming the key focus areas of the inquiry. The nature and wording of the topics made it clear that the impetus for the inquiry was a concern that the current regulatory framework was not adequate to manage the potential risks.

A call for contributions to our submission was sent to the state branches, and as expected the responses reflected a broad spectrum of opinions, based largely on the members' area of employment. Generally speaking, members working for, or consulting to, the extractive industry felt there was duplication in state and federal regulation, and an inequitable regulatory focus on coal mines and coal seam gas projects. Other members pointed to examples of extractive industry project approvals where uncertainties about impacts to high-value groundwater dependent ecosystems were overlooked for the expediency of economic and social outcomes.

An invitation followed to participate in a public hearing on the topic, in which I testified on behalf of IAH Australia. The participating Senators had questions that reflected regional and industry-specific concerns they had received. Most of the participants in the public hearings represented specific industry or community groups with focused, unified messages to deliver. IAH does not have such a singular voice, and my responses to certain questions necessarily reflected positions on both sides of topics that are seemingly at odds with each other.

It is not an easy task to communicate the broad principles of the IAH, while also reflecting the nuanced views of our members. It results in the "voice of IAH" on certain topics being confusing to stakeholders, who are accustomed to advocacy groups falling cleanly onto one side or the other of a debate

(which, occasionally, we do). There is no tidy moral to this President's Report, other than to acknowledge that there are many shades of grey between the black-and-white endpoints of the groundwater debates our members engage in across Australia. Yet as the peak international groundwater society we must never lose sight of our core values of advocating for wise groundwater management decisions supported by strong science – regardless of our personal leanings, I think we can all agree on this.

Lange Jorstad

President - Australian Chapter, IAH

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We gratefully acknowledge the support of our national corporate sponsors.

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www.coffey.com

www.arcadis.com

www.jbsg.com.au

www.rockwater.com.au

Membership

IAH Australia is pleased to announce that membership registration for the 2018 calendar year is now open using our brand-new membership system.

https://registration.iah.org.au/

Note: All users will be required to register a new account during the membership registration process.

Membership enables groundwater professionals to support IAH initiatives in Australia and overseas, including various commissions, networks and working groups such as the Early Career Hydrogeologists Network.

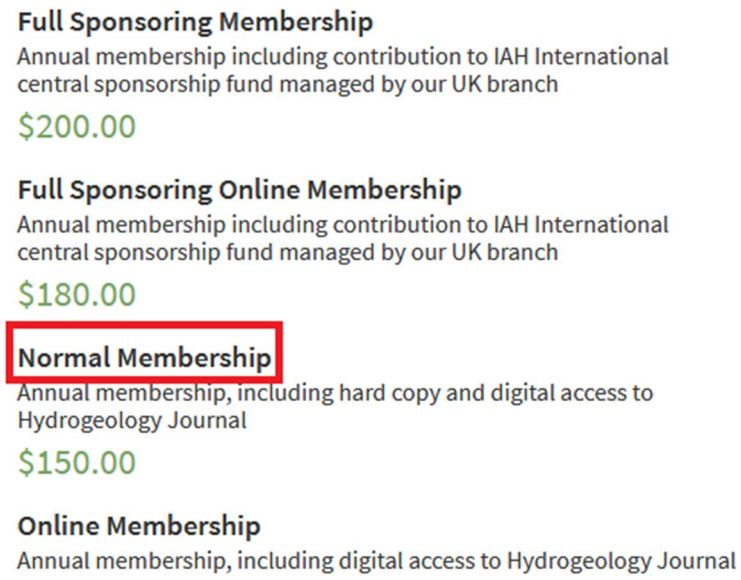
In exchange, IAH members receive a great range of benefits, including a Hydrogeology Journal subscription and discounts on IAH publications and conferences. You will also be able to participate in IAH special interest groups, sharing knowledge and experience with others.

IAH memberships run from January 1 to December 31. All memberships will be back-dated to January 1 to ensure you receive the full benefits of your IAH membership.

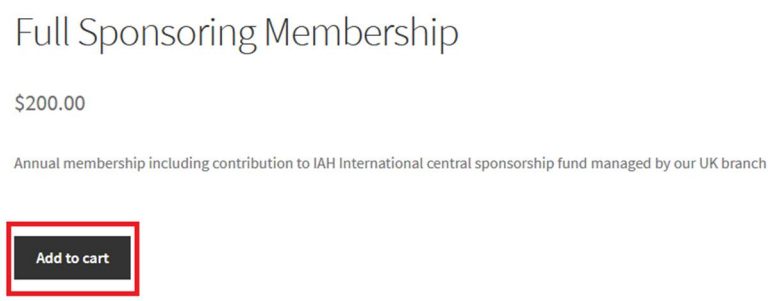
Membership Registration Process

Memberships can be purchased via https://registration.iah.org.au/.

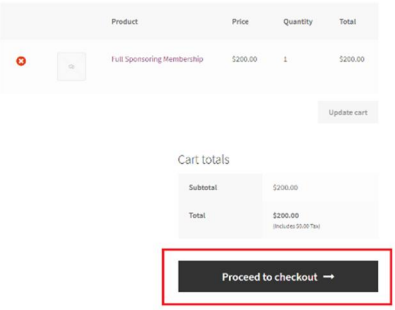
1. To select a membership, click on your desired membership category name (e.g. **Normal Membership**).



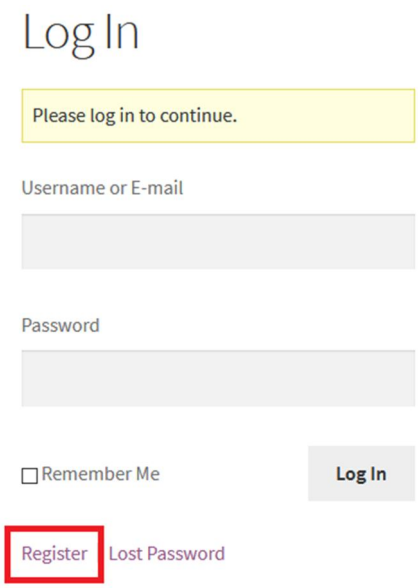
2. Select "**add to cart**" on the next screen.



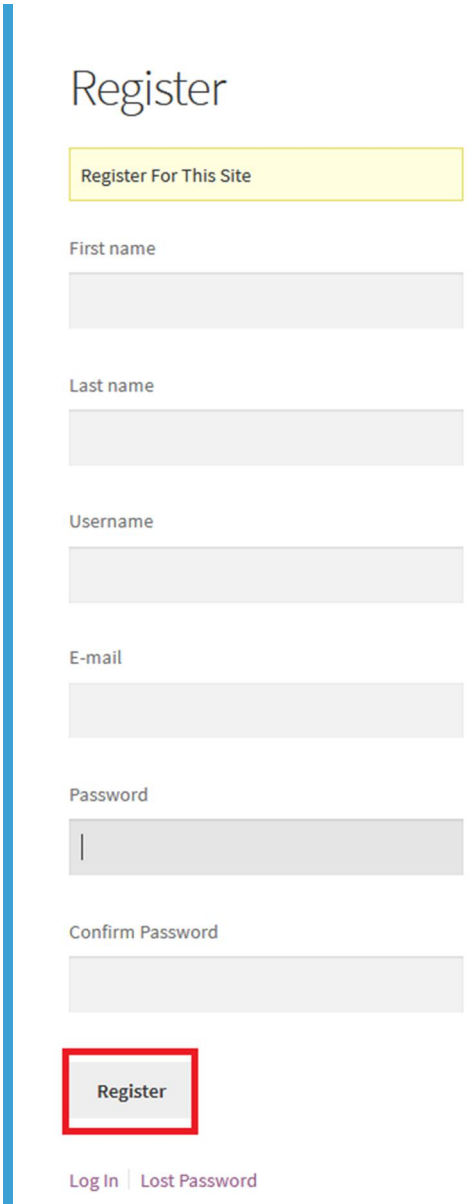
3. Select "**proceed to checkout**" on the next screen.



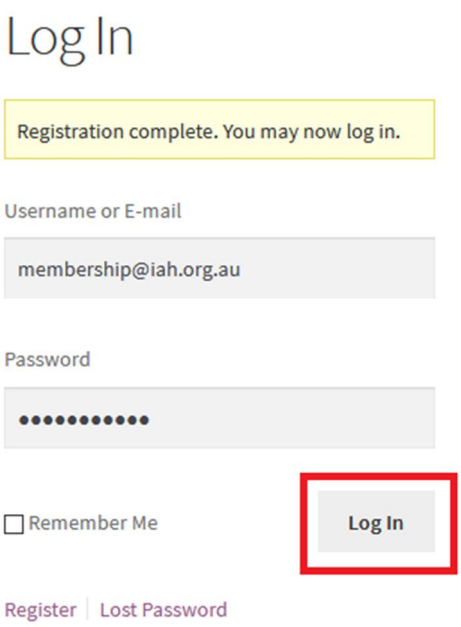
4. Set up an account by clicking the "**Register**" link on the next screen.



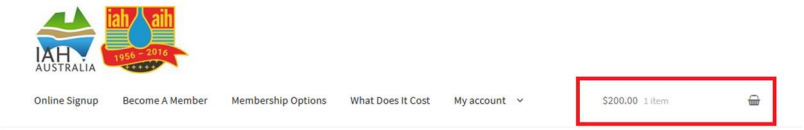
5. Enter your name and select a User ID and Password (anything you'd like) on the next screen, then select "**Register**" when finished.



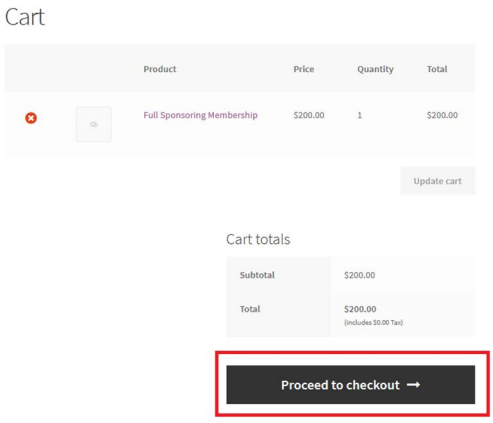
6. Select "**log in**" on next screen.



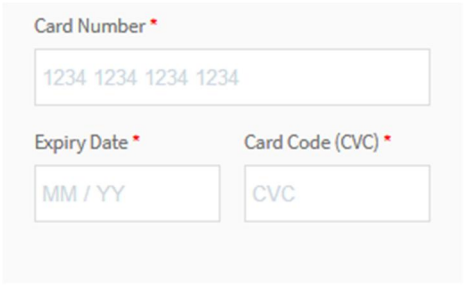
7. Once logged in, click on the **shopping cart** to finish purchasing your membership.

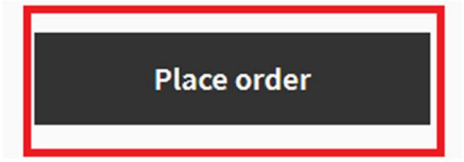


8. Click "**proceed to checkout**" to finalise your membership purchase



9. Complete billing and postal details, then click "**Place Order**" to purchase 2018 membership.





10. Thank you for supporting IAH in 2018! Any questions, please contact membership@iah.org.au.

IAH National Committee

President	Dr Lange Jorstad	ljorstad@geosyntec.com
Vice-President	Ian Brandes	ibrandes@rockwater.com.au
Treasurer	Ron Colman	Ron.Colman@royhill.com.au
Secretary	Vacant	
Past President	Chris McAuley	chris.mcAuley@delwp.vic.gov.au
Membership Secretary and Website	Kyle Horner & Fiona Adamson	secretariat@iah.org.au
Newsletter Champion	Ellen Kwantes	Ellen.Kwantes@wsp.com

Finance Update

No update available this edition.

National Conferences and Events

Progress Towards AGCC 2018

By Bill Shaw, President Australian Geoscience Council

Introduction

This note updates previous advice on how the Australian Geoscience Council's Convention (AGCC 2018) is shaping up, with more information about the program, the next steps by each of the Subcommittees and plenty of suggestions about how you can start to get involved.

Scientific and Technical Program

Chris Yeats has now developed the Program Committee with *convenors* for each of the five scientific themes as follows:

Theme 1: Understanding the Earth - *Professor Dietmar Muller. (University of Sydney)*

Theme 2: Life on Earth – origins and diversity - *Professor Simon George (Macquarie University)*

Theme 3: Resources – discovery, development and sustainability - *Dr Jon Hronsky (Consultant, Western Mining Services)*

Theme 4: Applied Geosciences in the 21st Century – innovation, technology and the future - *Chris Woodfull (Consultant, SRK Consulting)*

Theme 5: Beyond the rocks – geoscience in our society: current application and future trends – *Dr Anna Littleboy (CSIRO)*

Each of the Themes has between 4 and 7 nominated Symposia. There are already constraints on the total number of oral presentations that can be accommodated during the four days of the Convention. In addition to the technical sessions, five one-hour plenary sessions are planned, to cover the following topics:

- Earth Climate – Past and Future

- Life Origins and Evolution
- Resource Security into the Future
- The Future of Geoscience in Our Society
- Applied Geoscience – Geohazards, Risks and Society

There will also be an entire day during the Convention set aside for discussion of the following Big Issues and Ideas:

- Our Energy Security Options – Dirty Words in a Clean World (Coal, Nuclear, Fracking and Alternatives)
- Resource-Driven Development of Northern Australia
- Geoscience Education and New Modes of Communication and
- Smoothing the Impact of Boom and Bust Commodity Cycles.

The current plan for the technical sessions is to run 10 concurrent sessions (nominally 2 at a time per Theme) with 15 minute talks. This equates to 560 speaking slots, or nominally 56 per Theme. Theme Convenors will also have the flexibility to assign longer timeslots for session keynotes should they wish.

We expect that there will be an extensive poster presentation component of this Convention, given the expected number of high-quality abstracts that will be submitted and consequent competition to present at this prestigious event.

Sponsorship

The partnership prospectus is being finalised by Mike Smith's team and discussions are already underway with a number of parties that have expressed interest in supporting our big event. The preliminary program has already generated excitement and interest as a way of blending the important traditional role of broad-themed geoscience conferences with a new approach to focusing on issues that are important to all geoscientists and to the general public.

If your company or organisation is interested in being aligned with the Convention, please consider getting in early while the choice packages and exhibition sites are still available. The new look of the $400 million Adelaide Convention Centre East Building redevelopment is being celebrated with a gala opening at the end of August. AGCC 2018 will be one of the first events to take full advantage of the flexibility this provides.

Field Trips and Workshops

Dale Sims is developing a list of the potential field trips and workshops that we are currently considering. If you are interested in running field trips additional to those already on the following list please let us know:

- Gawler Craton
- Great Ocean Road – volcanics of eastern Victoria
- Flinders Ranges – Fossil Ediacaran Flora
- McLaren Vale – terroir for wine making

- Self-guided Geotourism –the Brachina Gorge trail.

There will be opportunities for our Member Organisations (MOs) to host workshops in their specialist disciplines. A package is being put together to seek expressions of interest so that these can all be fairly evaluated.

Early Career Geoscientists and Volunteers

Genna McDonagh is developing contacts across our eight MOs to provide volunteer coordination and opportunities for innovative ways to connect with the Convention. She is looking for support and engagement, especially in ensuring that we address broad social themes that are important now to all professionals in academia, industry, consulting and government. If you are passionate about diversity, representation, networking, STEM or making a difference, please get in touch through our website.

Education

The AGC Education Subcommittee has been very successful in building support and connections across the full spectrum of geoscience education from Primary School to Professional Development programs. At the recent Australian University Geoscience Educators Network (AUGEN) meeting in Sydney there was strong interest in using our Convention during Earth Science week next year to host their AGM and to champion one or more sessions. This will be an opportunity to see some of the amazing resources that are being developed, such as the work of Michael Roach (University of Tasmania) on precision outcrop photography and 360º imaging for "virtual field trips". There will lots of other interesting technologies and applications being presented.

Advocacy and Media

We are making progress in developing the media strategy and have been recently advised that there will soon be significant further support forthcoming. As we move towards being only a year out, Angela Riganti's team has preparations underway for a media launch and mail-out of our First Circular by all the Member Organisations during September. We are looking to maximise the impact of our event through innovative use of social media, forums, poster sessions and other approaches that Angela's and Genna's teams will develop.

Engagement with Stakeholders

Steve Mackie has developed a fortnightly dot-point summary of progress that goes out to all our stakeholders. You can get on the list by contacting him to see how the Convention is developing at a very granular level. Of course that level of interest means you are so motivated that you are probably already on one of our Subcommittees …

Venue and other practicalities

Our Professional Conference Organiser, Carillon is on top of all our contractual requirements and we now have the Adelaide Convention and Exhibition Centre, and appropriate accommodation, booked up sufficiently to enable us to develop all the various scenarios that we can envisage. A visit to the venue is planned for the end of August. Work on the social program that underpins the networking aspects of the Convention is also getting going.

Conclusion

I am still seeking your thoughts on how you would like to get involved. Many years of volunteer work in the AIG, AusIMM, JORC and now the AGC has taught me the huge personal value of commitment and engagement with like-minded professionals.

To let us know your views, what you want out of this Convention, and how you can help make it a success, please get in touch with any member of the Organising Committee at our website: https://www.agcc.org.au/committee

Bill Shaw, on behalf of the Organising Committee.

From the Branches

Australian Capital Territory

IAH ACT BRANCH

2018 Committee:

Chair	Lucy Lytton	Geoscience Australia
Vice Chair/Secretary	Scott Lawson	Office of Water Science
Treasurer	Tim Evans	Geoscience Australia
Student Coordinator	Sharon Gray	Research School of Earth Sciences, ANU
Communications Champion	Stephen Hostetler	Hostetler Hydrogeology
Membership Champion	Laura Gow	Geoscience Australia
Events Coordinating Committee	Tim Evans	Geoscience Australia
	Chris Harris-Pascal	Geoscience Australia
	Peter Hyde	Murray-Darling Basin Authority

No update available this edition.

New South Wales

IAH NEW SOUTH WALES BRANCH

2018 Committee:

Chair	Katarina David	UNSW
Vice President	Graham Hawkes	AECOM
Presentations Secretary and External Communications	Dr Richard Cresswell	Eco Logical Australia
Treasurer	Tingting Liu	HydroSimulations
Secretary	Lee Douglass	Arcadis
Student and Young Professional Coordinator	Sienna Xue	WSP
Meeting Facilitator	Pepijn van Ravensteyn	WSP
Internal Communications	Sean Daykin	Jacobs
Newsletter Champion (NSW and National)	Ellen Kwantes	WSP
NSW Sponsorship Champion	Richard Green	DPI Water
Web Champion	Serena Yeung	AECOM
International Sponsorship Champion	Dr Jay Punthakey	Ecoseal
Membership Champion	Angus McFarlane	AECOM
National President	Dr Lange Jorstad	Geosyntec
International Vice President - Australasia	Dr Wendy Timms	UNSW

Local News

Our regular branch meetings continue to be held at the office of WSP located in the Sydney CBD on the second Tuesday of each month. Thank you to WSP for supplying the convenient central venue, first class facilities, and food and drinks. IAH NSW branch provides events that span all stages of a career in hydrogeology. Our Student Night event provides a platform for students, and our Young Professional Award that recognises young professionals. For mid to late career hydrogeologists, a forum is provided for technical presentations.

NSW Sponsors

IAH NSW gratefully acknowledges the contributions of its 2017/18 sponsors. Details of sponsors can be found on the website at http://www.iah.org.au/about/new-south-wales/nsw-branch-sponsors

Our Gold Sponsors are AECOM, DPI Water, Earth Science Information Systems, Eco Logical Australia, EMM Consulting Pty Limited, Jacobs, NSW Environment Protection Authority and WSP.

Our Silver Sponsors are C. M. Jewell & Associates, Ecoseal and HydroSimulations.

Recent Events

13th February 2018 – NSW Branch Annual General Meeting

The IAH NSW Annual General Meeting was held before the February presentation to discuss general matters and elect the 2018 committee. We welcomed several new members to the committee.

13th February 2018 – Hydrogeology of the Dry Zone, Central Myanmar – Dr Len Drury

Our first meeting for 2018 was presented by Dr Len Drury (Aqua Rock Konsultants) who spoke about his latest book on the hydrogeology of Myanmar, developed in conjunction with the Australian Water partnership and the Australian Department of Foreign affairs and Trade. This book is freely available and can be downloaded from the Australian Water Partnership website.

Approximately 15.4 million people, just under 30 percent of the population of Myanmar, live in the Dry Zone, Central Myanmar. Most villages, towns and cities rely on groundwater for potable water supplies. The Dry Zone is extremely short of water especially during the Dry Season. Villagers without tubewells (30 percent) travel great distances to collect small quantities of water from shallow dugwells and polluted earth ponds. The water shortage causes the people to suffer from water-borne and related diseases.

The provision of low salinity, potable groundwater to Central Myanmar is of extreme importance to the development of the nation and socio-economic welfare of its

people. Being in a highly complex geological environment (active tectonics, oil and gas fields, mud volcanics) many tubewells fail to intersect groundwater or encounter saline aquifers. Most drill sites are dictated by local village committees and by politicians.

Information is power, thus a valuable commodity. It is usually hard to obtain the required data from various government authorities who are not willing to provide such information. With an understanding of culture and religion, government policy and non-judgemental respect of individuals such data recovery is possible.

13th March 2018 – Groundwater & mining: advances with pore pressure analysis and environmental tracer techniques – Dr Wendy Timms

Our March meeting was presented by Dr Wendy Timms. Groundwater in mining operations presents a number of challenges and opportunities – this talk presented examples of leading practice and R&D in progress. Evaluating potential hydrological changes due to mining is challenging where there is competition for water from mining, farming and the environment and with more variable climate conditions. Opportunities for mine sites to share and store water are increasingly valuable, provided that water discharged is of suitable quality.

Analysis of high frequency pore pressures can reveal how systems work, and provides in-situ specific storage values to improve numerical groundwater models. Examples from the Gunnedah Basin show how pore pressure response to barometric and earth tide loading provides in situ specific storage values that can replace assumed values in models. A new technique for short-term monitoring of response to small stresses in low permeability formations was highlighted. And a unique example from the Sydney Basin shows where specific storage values can change in response to mining stresses and links with geomechanics and rock core testing.

Leading practice investigations now more commonly include environmental tracer techniques to quantify groundwater connectivity and flows, given a trend towards smaller volumes, less expensive and a greater range of tracer options. Radio-isotopes and geochemical tracers are increasingly applied in mine water studies to better evaluate the possibility of groundwater seepage. An advanced technique was highlighted that enables stable isotope analysis in moist sediments and rock core and comparison with rainwater and groundwater values. A high resolution vertical profile of stable isotopes through the Hawkesbury sandstone shows the critical role of thin layers of cemented sandstone barriers to flow.

Several ongoing technical challenges with groundwater and mining were highlighted that require more strategic baseline monitoring, a variety of conceptual models and adoption of leading practices that are commensurate with the risks of the project.

Upcoming Events

10th April 2018 – Hydrogeological Lessons Learned from Deep Subsurface Development of the Williston Basin, Canada – Grant Ferguson Ph.D., P.Geo., Eng.L

The Williston Basin has seen extensive oil and gas production over the past decade, notably from the Bakken Formation. This basin also has a long history of conventional oil production, potash mining and disposal well operation and has more recently become host to two carbon storage projects. This has all occurred in an region that is highly dependent on groundwater resources, particularly in rural areas. Experiences

gained from the development of this basin should provide insights into how unconventional oil and gas development should proceed in other areas.

Analysis of different hydraulic and geochemical datasets has provided an idea of what measurements are useful and how site investigations and monitoring programs should be designed, however, many of our insights come from large datasets generated by the oil and gas industry.

Frontier areas may be able to address some of the challenges encountered with discerning background water quality issues from those arising from oil and gas development or other deep subsurface projects. Whether or not a limited number of detailed site investigations in frontier areas can replace data from tens of thousands of wells is unclear and drilling in the Williston Basin began nearly a century ago, which further complicates baseline studies.

Monday 21 May - NGWA Darcy Lecture - Alpine Hydrogeology: The Critical Role of Groundwater in Sourcing the Headwaters of the World - Masaki Hayashi, Ph.D

Many of us have been awed by the stunningly beautiful view of alpine lakes and streams; and they are not just beautiful. Nearly half of the world's population relies on rivers originating in high mountains for water supply. Source areas of mountain streams have rugged topography with sparse soil and vegetation covers, and were once considered "Teflon basins" that have minimum capacity to store groundwater.

Alpine basins actually have important aquifer units that provide temporary storage of rain and meltwaters from snowpack and glaciers. Gradual release of water from these aquifers sustains streamflow during dry or cold periods. Due to rugged terrain and severely limited vehicle access, alpine hydrogeologists need to rely on creative methods to investigate groundwater, such as geophysical imaging techniques or observation of surface water/groundwater interaction.

This lecture will demonstrate how we can gain valuable insights into groundwater in challenging environments and develop a conceptual understanding of hydrological systems. These ideas and approaches will have broad applicability in a variety of environments, where hydrogeologists are faced with challenging conditions.

IAH NSW on LinkedIn

IAH NSW has gained a presence on professional social media site, LinkedIn. The page provides events newsletters and advertisements for hydrogeology positions in the industry. Link: https://www.linkedin.com/in/iah-nsw-816481125/

Northern Territory

IAH NORTHERN TERRITORY BRANCH

2018 Committee:

Chair	John Wischusen
Vice Chair	Tim Murphy
Treasurer	Bruce Ryan
Secretary	Brayden Briggs
Public Officer/Member champion	Steven Tickell

Recent Events

Women in Water Symposium

To celebrate International Women's Day, the NT Branch of IAH in conjunction with the Department of Environment and Natural Resources held a Women in Water Symposium at the Museum and Art Gallery NT on 8 March 2018.

The Symposium showcased the diverse and impressive body of work being undertaken by some of the Territory's very best water scientists, who also happen to be women. It brought together water scientists working for various organisations including Geoscience Australia, Charles Darwin University, the Bureau of Meteorology and Northern Territory Government. Topics ranged from rural groundwater use, spring protection and rehabilitation, groundwater-dependent ecosystems, flood mitigation and Rum Jungle rehabilitation.

Jayne Brimbox presented on Spring Protection and Rehabilitation in the Arid Zone while Catherine Nano continued the Central Australia theme with her presentation titled Tracking the Health of Terrestrial Groundwater-Dependent Vegetation in Central Australia. Ursula Zaar presented Surface and groundwater Assessment – Wildman River and Wadeye, Mardi Miles presented Berry Springs - Using Modelling for Management and Robyn Delaney presented Mapping the Future.

This was followed by an insightful panel discussion on gender equity in the Water Sector, where panel members Professor Jenny Davis (CDU Head, School of Environment), Kate Peake (2017 NT Rural Women's Award Winner), Tania Laurencont (Principal Mining Scientist at Department of Primary Industry and Resources Energy) and DENR's Jo Townsend discussed what it takes to be influential and successful in this industry.

The event surpassed all expectations, being so successful the venue had to be changed several times to accommodate the 120 final registrations. There was significant interest from Larrakia Nation, Geoscience Australia, Australian Water Association, Power and Water Corporation, Research Institute for the Environment and Livelihoods, Bureau of Meteorology, Department of Primary Industry and Resources, Department of Infrastructure, Planning and Logistics and Regional Development Australia NT.

It was particularly encouraging to see a big attendance from both industry and government as well as a strong cohort from the future industry leaders studying at Charles Darwin University.

A huge ‘thank you’ to everyone that did the hard yards to ensure the event ran smoothly, whilst too numerous to mention individually the net result was a tremendous success. Special mention goes to Joanna Ellis who initiated the concept of a Women in Water Symposium and to the tireless Dale Cobban who got the event underway and invested an enormous amount of her personal time, adding event management to her long list of skills and capabilities.

IAH NT Field trip Sunday 22nd April 2018

Thirteen members, friends and family went on a half day hydrogeological jaunt, visiting sites of interest in and around Darwin, led by Steven Tickell. We started at Howard Spring, a karstic spring with a flow of around 300 l/s. The rainforest surrounding the spring was damaged by the recent cyclone Marcus, which meant the team had to do a bit of bush bashing over and around fallen trees. Another planned stop, Peels Well was cancelled due to cyclone damage.

Power Water Corporation production bore M55

Queensland

2018 Committee:

President	Lucy Reading	QUT
Vice President	Kelly Jane Wallis	SLR Consulting Pty Ltd
Treasurer	Zach Van Haaften	QUT
Secretary	Thomas Neame	Eco Logical Australia
Communications Manager	Jim Stanley	QUT
Technical Representative	Jim Undershultz	UQ
North Qld Representative	Angela Bush	AGE Consultants
Other Committee Member	Jorge Martinez	Klohn Crippen Berger
Other Committee Member	Nick Coulson	Golder Associates

Local News

April 2018 brought some changes to the Qld Branch Executive Committee (as listed above) with some new members getting involved.

The Qld Branch continues to host regular presentations from a variety of guest speakers, the details of which are communicated

via the website https://www.iah.org.au/about/queensland/ and our LinkedIn page https://www.linkedin.com/company/iahqld/

We also have 2 new corporate sponsors; SLR Consulting and See Built Earth.

Qld Branch Sponsors

Recent Events

Wednesday 14th February 2018

Dr Rick Chalaturnyk from the University of Alberta presented "Failure of a "Geological Pressure Vessel" – A Steam Release Event in the Oil Sands".

Rick Chalaturnyk joined the University of Alberta in 1997 and is currently a professor in the Department of Civil and Environmental Engineering and holds a Foundation CMG Chair in Geomechanics. Prior to joining the University, Rick helped co-found a reservoir surveillance company called PROMORE Engineering and continues his involvement in the area of reservoir surveillance as Executive VP of Opsens Solutions, a company providing fiber-optic and non-fiber monitoring solutions to the SAGD and CO2 Storage world.

Wednesday, 14th March 2018

A successful Trivia Night was hosted by our sponsor WSP in Brisbane CBD.

Photos from IAH Qld Branch events can be viewed at the website:

https://www.iah.org.au/about/queensland/

Wednesday, 18th April 2018

Bharat Patel (Adjunct Professor at QUT) presented "Microbial ecology and geomicrobiology of the Great Artesian Basin (GAB) aquifer".

Abstract: The Great Artesian Basin (GAB) of Australia is a vast and complex underground water system occupying one-fifth of Australia. The extensive chemical (salinity, alkalinity, metals, aromatic compounds) and temperature (ambient to 96 °C) fluctuations in the GAB aquifer and the large numbers of bore wells (approx 5,000), and gas and oil wells which can be easily accessed for sampling, makes the GAB a fertile ground for microbial ecology and geomicrobiological studies. The seminar will summarise the past 30 years research on microbial diversity of the GAB aquifer and focus particularly on gas producing and non-gas producing wells, the potential role of microbes in bore well metal corrosion as well as the biotechnological potential of the GAB microbes.

South Australia

IAH SOUTH AUSTRALIA BRANCH

2018 Committee:

President	Steve Barnett
Vice President	Neil Power
Membership champion	Tavis Kleinig
Committee member	Russel Martin
Web master/mistress	Fiona Adamson
Modelling Forum	Juliette Woods

Recent 2018 Events

16th January – Investigating the fate of hydraulic fracturing fluid in shale gas formations.

Ryan Edwards, originally from SA (and Aquaterra), is completing a PhD at Princeton University and presented a well-illustrated and accessible talk on numerical modelling of two-phase water and gas flow in a shale gas formation. Hydraulic fracturing in shale gas formations involves the injection of large volumes of aqueous fluid deep underground. Only a small proportion of the injected water volume is typically recovered, raising concerns that the remaining water may migrate upward and potentially contaminate groundwater aquifers. Numerical modelling was carried out of two-phase water and gas flow in a shale gas formation in order to test the hypothesis that the remaining water is imbibed into the shale rock by capillary forces and retained there indefinitely. To see this presentation, click here

Ryan has recently been awarded a Congressional Science Fellowship, which entails working in an office in the US Congress on science policy issues, with the idea to inject scientific expertise into Congressional offices. Obviously a challenging role in the current circumstances…….

2nd March - South Australian basins – Stratigraphy and Hydrogeology

The first SA Basins Workshop was held at the Drill Core Reference Library at Tonsley Park with a focus on the Murray Basin. There were 50 attendees comprising DEWNR, EPA and DPC staff, consultants, Flinders Uni staff, CSIRO and three from the Victoria DEWLP. Sedimentary core from nine boreholes was examined and Steve Barnett gave an overview of the geological history, stratigraphy, hydrogeology and groundwater management approaches in the Murray Basin. 3D visualisations of the various sedimentary layers were seen in the dedicated 3D projection room with the viewing glasses allowing a true cinematic experience !

Later in the year, other basins such as the GAB and St Vincent Basin will also be explored.

17th March - South Australian election

As most of you are aware, the Liberal Party won the State election after 16 years in opposition. We have a new Minister - The Hon. David Speirs, and a new name – Dept of Environment and Water. One of the election promises was to reform the current approach to natural resources management. This will see nine local boards established including locally elected representatives. These boards will have responsibility for whole-of-landscape sustainability throughout their area and will herald a decentralisation of NRM. This will involve repealing the NRM Act which just happens to cover all aspects of water management as well. This may represent a golden opportunity to revamp the water legislation to include resources such as stormwater, MAR etc and to streamline the current processes – watch this space! Meanwhile there will be the usual "savings" imposed on DEW and the usual approach to such changes will be adopted i.e. continue to do what you're doing (and what needs to be done) until you are physically restrained from doing so.

Incidentally, a local driller was telling me that he met the Minister (before he entered politics) and his father when they first emigrated from Scotland about 15 years ago when they set up a business called "Geo-divining" or something similar!! One can only hope his references to "evidence-based science" in his first address to DEW Science staff indicate an evolution of thought.

Steve Barnett

Victoria

IAH VICTORIA BRANCH

2018 Committee:

Chair	Alan Wade	Aquade
Vice-Chair	Ben Hall	Eartheon
Secretary	Tara Smith	Jacobs
Treasurer	Anne Northway	EPA
Events Committee	Katy Kijek	Senversa
Communications Champion	Heath Pawley	Golder Associates
Membership Champion	Alexis Valenza	Valenza Engineering
General Committee	Matt Currell	RMIT
	Ben Petrides	Coffey
	Rikito Gresswell	GHD
	Ben Moore	CFA
	Chris Smitt	EHS
	Matthew Hudson	City West Water

Local News

Our regular branch meetings continue to be held alternatively at the Melbourne RMIT City Campus, Melbourne University, Senversa, Golder, Aurecon and Jacobs Melbourne Branches. Thank you for supplying the convenient central venues and first-class facilities.

Our last VIC Chapter IAH committee meeting was held on 19th April 2018, at Senversa. We had a pretty busy first quarter with some interesting presentations. Read on.

Recent Events

5th December 2017 - Phil McCumber – Groundwater and surface water resource in ancient civilisations. Example of the Middle East. The roles of groundwater and landscape in the occupation of Arabia, against a backdrop of fluctuating climatic and eustatics changes

Bio:

Dr Phil Macumber is a foundation member and past president of IAH Victorian Branch. He has worked since 1964 on the hydrogeology and geomorphology of northern Victoria, where he did his PhD. He is a graduate of Melbourne University with BSc

majors in Geology and Advanced Geomorphology, and has a BA in Philosophy of Science and Middle Eastern Studies including Mediaeval Islamic Studies. He has worked in the Middle East since 1980, in Jordan, Oman and Qatar. Between 2009 and 2015, he worked with the Department of Archaeology of Copenhagen University on the roles of water and landscape in the occupation of Qatar, concentrating on the impacts of eustatic and climatic change over time.

Abstract:

The climate of Arabia is largely arid to hyper-arid, but in the southeast, it is impacted by the Indian Ocean Monsoon. Apart from two major river system, the Tigress-Euphrates and the Jordan, there is little permanent surface water, with perennial flow largely restricted to baseflow streams within or emerging from mountain areas. However, in most cases potable water was dependent on groundwater and came from shallow hand-dug wells or the aflaj systems. Yet throughout the Quaternary, Arabia has been subject to cycles of climatic change which have seen monsoonal conditions spread westward across Arabia during interglacial periods of high sea levels, the last occurring in the early-mid Holocene. The filling of the Persian Gulf between 18-7000 yr BP, is often seen as the origins of the Mesopotamian (Gilgamesh) and Biblical (Noah) Flood Myths. The early-mid Holocene combination of higher sea levels (shallower water tables) and wetter conditions produced a Hydrological Optimum providing the best conditions in some area for 120,000 years, when similar condition last existed. Occupation occurred, then as now, when and wherever there is permanent fresh water, the one element essential for life. During the early-mid Holocene Neolithic archaeological sites occurred throughout what are now hyper-arid regions such as the A'Rub al Khali (Empty Quarter), southern Qatar, eastern Jordan and central-southern Oman. The retreat of the monsoon and the onset of aridity/hyper-aridity at ca 6000 BP saw the end of the Neolithic, and led to 2500 years of massive seawater intrusion into coastal aquifers, the combination forcing abandonment of many regions. Between ca 4000 to 1100 BP sea levels fell to those at present, the regression leading to the development of iconic Persian Gulf coastal sabkha. Despite severe climatic cycles, large permanent springs systems such as those along the Jordanian Rift Valley provided hydraulic buffering against aridity, producing long occupied sites such as Jericho. The Pella (Tabaqat Fahl) region in Jordan which has seen occupation for at least the last half million years, provides perhaps the longest recorded occupation, dating from Lower Palaeolithic times; it is an actual site befitting that described in James A. Michener's The Source. Pella also became the second city of Christendom following the sacking of Jerusalem by the future Emperor Titus in A.D. 70. It is my view that the physical setting along the Rift Valley contributed significantly to the origins of the concept of Good and Evil in biblical literature, normally attributed to the Jewish exile in Babylon and exposure to Zoroastrianism.

6th February 2018 - Natalie Akers, Dairy Farmer in Tallygaroopna; Karina Joy, Goulburn Murray Water; Damien Finlayson, AECOM - Groundwater Management in Northern Victoria

Bio:

Natalie is a dairy farmer in Tallygaroopna. She has held roles as a Director on the Board at Murray Goulburn, CEO at Murray Dairy and as a Water Policy Advisor for the Victorian Farmers Federation. She is the current District Council Secretary of the United Dairy Farmers of Victoria.

Damien has 30 years of experience in hydrogeology, fifteen of which has been based out of Tatura. Damien has acted as the AECOM Agreement representative under consecutive Engineering and Scientific Services consultant panels with GMW.

Karina is a hydrogeologist who has worked with GMW since 2009, focussing on groundwater resource management and licensing. Prior to this she spent a few years working in consulting in QLD, gaining experience in mining, construction and urban development projects.

Abstract:

The Katunga Water Supply Protection Area (WSPA) is located in the floodplain in northern Victoria extending from Yarrawonga in the east to Barmah in the west. GMW recently coordinated the amendment of the Katunga WSPA Groundwater Management Plan. The plan was implemented in 2006 and was one of the first groundwater management plans developed in Victoria.

GMW engaged URS (now AECOM) to fill information gaps in the understanding of surface water and groundwater interactions along the Murray River as well as looking at possible impacts of increasing groundwater use above 70% of entitlement. The Minister for Water appointed a consultative committee to provide advice, chaired by Natalie Akers.

Natalie, Karina and Damien will provide an overview of the stakeholder aspects, technical issues and plan changes in the WSPA.

6th March 2018 - Frederic Cosme, Golder - Groundwater tracing: Breathing new life into a practical approach to test aquifers

Bio:

Frederic Cosme is a Principal Hydrogeologist with Golder in Melbourne. Fred is a geological engineer from Western Europe who joined Golder Australia in 2007. Frederic has a keen interest in groundwater tracing using environmental and applied tracers and how it can be used to practically resolve groundwater contamination issues. He loves doing hand-drawings using colour pencils when developing conceptual site models. During his free time, he enjoys doing handy farm work at his home located east of Dandenongs where he lives with his family.

Abstract:

Environmental and applied tracers have been used for decades to resolve hydrogeological challenges. Ongoing advances in the sampling and analysis of chemicals in water are bringing unprecedented insights in the understanding of groundwater flow systems while removing issues such as affordability, tracer toxicity and water quality. New methodologies to determine groundwater and aquifer parameters have also been developed. The data gathered from tracers can be used to inform a variety of decisions that the groundwater industry is increasingly facing, ranging from the delineation of protection zones around potable groundwater supply wells through to the remedial design for groundwater contaminant plumes and the growing awareness of the importance of source zone characterisation. The talk will provide an overview of applied and environmental tracers, key methodologies, practical examples as well as future developments.

10th April 2018 - Peter Dahlhaus, Federation University Australia - Launching the new VVG portal (Visualising Victoria's Groundwater)

Bio:

Associate Professor Peter Dahlhaus is Principal Research Fellow at the Centre for eResearch and Digital Innovation at Federation University Australia. Peter has expert knowledge of the groundwater and hydrogeological setting of southwest Victoria and has been influential in applying his scientific knowledge to direct policy on salinity and catchment management. Peter's current research focuses on spatial data interoperability and visualisation to ensure that environmental data, information and knowledge is globally and publicly available.

Abstract:

Launching the new VVG portal: implementing data democracy, international groundwater data exchange standards and eResearch, to Visualise Victoria's Groundwater.

In July 2012, the portal was launched, providing access to groundwater data from disparate sources. The time has come to revise the technology and functionality of the portal. The VVG team is launching the new VVG which provides three main functions: an eLibrary of resources, a spatial map interface and a data download catalogue.

The research is an ongoing experiment in data democracy. It helps provide the evidential basis for community debates around the groundwater impacts of energy resource developments, urbanisation and changing climates.

Presentation slides here: https://www.iah.org.au/wp-content/uploads/2018/04/IAH-presentation-on-new-VVG.pdf

Darcy Lecture, Wednesday 23rd May 2018 - Masaki Hayashi, Ph.D., University of Calgary - Alpine Hydrogeology: The Critical Role of Groundwater in Sourcing the Headwaters of the World

Bio:

Masaki Hayashi, Ph.D., is a professor in the Department of Geoscience at the University of Calgary. He holds the Canada Research Chair in Physical Hydrology. Hayashi received his B.S. and M.S. in earth sciences from Waseda University and Chiba University, respectively, in Japan, and his Ph.D. in earth sciences from the University of Waterloo in Canada. His main research interests are in the connection among groundwater, surface water, and atmospheric moisture in various environments ranging from the prairies to the mountains.

Abstract:

Many of us have been awed by the stunningly beautiful view of alpine lakes and streams—and they are not just beautiful. Nearly half of the world's population relies on rivers originating in high mountains for water supply. Source areas of mountain streams have rugged topography with sparse soil and vegetation covers, and were once considered "Teflon basins" that have minimum capacity to store groundwater. Over the past decade or so, a new understanding of alpine hydrogeology has been emerging based on detailed field observations around the world. Alpine basins actually have important aquifer units that provide temporary storage of rain and meltwaters from snowpack and glaciers. Gradual release of water from these aquifers sustains streamflow during dry or cold periods, and is critically important for water supply and aquatic habitats in downstream regions. Due to rugged terrain and severely limited vehicle access, alpine hydrogeologists need to rely on creative methods to investigate groundwater, such as geophysical imaging techniques or observation of surface water/groundwater interaction. This lecture will demonstrate how we can gain valuable insights into groundwater in challenging environments and develop a conceptual understanding of hydrological systems. These ideas and approaches will have broad applicability in a variety of environments, where hydrogeologists are faced with challenging conditions.

Upcoming Event

Tuesday 29th May 2018 - ACLCA presentation opened to IAH members- WSP (15/28 Freshwater Pl, Southbank VIC 3006)

Emily Hepburn (PhD)

"Fishing for Solutions: Decision Support Tools for assessing and managing contaminated groundwater at Australia's largest urban re-development site – Fishermans Bend."

Overcoming barriers to large-scale urban re-development is an essential step in the global drive toward achieving the UN's sustainable development goals. Arguably one of the most significant barriers is land and groundwater contamination. At Australia's largest urban re-development site, Fishermans Bend, complex environmental datasets have been collected with which to characterise hydrogeological processes and contamination extent at the regional-, or precinct-scale. These datasets provide important context for individual 'site-scale' investigations by identifying seasonal variability in contaminant concentrations, and multiple diffuse contaminant sources such as legacy landfills, industrial activities and fill. Where these increasingly complex and varied environmental datasets can be collected, stored and managed within one central database, cross- or inter-disciplinary collaborations may drive improvements in solving environmental issues which typically arise during the re-development process.

Tope Adebowale (Masters)

“Characterising controls on groundwater quality using stable isotopes of nitrate: Boneo, Southeast Melbourne”.

The use of isotopic analysis of nitrates to determine the sources of groundwater pollution, the geological processes that affect the water quality and the impact of the local groundwater on the Groundwater Dependent Ecosystems.

Western Australia

IAH WA BRANCH

2018 Committee:

Chairperson	Ian Brandes de Roos
Vice Chairperson	Mal McGivern
Secretary	Sarah Bourke
Treasurer	Sandie McHugh
Events team	Cassie Turvey
	Josephine Searle
Communications team	Rachel Hamilton
	Giovanni Firmani
ECHN Representative	Margaret McCormack

Local News

WA Sponsors IAH WA is proud to be supported by DWER, Acqua Drill Resources and Airwell Group for the 2018 series of technical presentations.

IAH WA is proud to welcome the **Department of Water and Environmental Regulation (DWER)** as gold sponsor for the 2018 technical talks.

DWER supports Western Australia's community, economy and environment by managing and regulating the state's environment and water resources.

The department is responsible for environment and water regulation, serving as a 'one stop shop' for industry and developers, with the aim of streamlining and simplifying regulation.

DWER support ongoing hydrogeology science and data and looks forward to working with IAH WA in 2018 to help maximise the potential and protection of our groundwater resources.

The Atrium Level 4, 168 St Georges Tce, Perth WA 6000
Tel +61 8 6364 7000
Web dwer.wa.gov.au

Acqua Drill Resources is ongoing and valued supporter of IAH WA. They specialise in large diameter surface drilling using conventional air/hammer or mud rotary methods. Whether the drilling program involves monitoring bores, production bores, dewatering or managed aquifer recharge bores, paste fill holes, or underground mining service holes, Acqua Drill Resources has the in-house experience and modern equipment to deliver successful project outcomes.

Acqua Drill Resources invests heavily in engineering controls which target the risks associated with manual handling, working at heights, equipment guarding and all other identified operational risks. We operate the only Versa Drill rigs in Australia which have been fitted with dual hydraulic breakout assemblies, now a site access requirement for some mining houses.

Acqua Drill Resources' primary goal is to become the water bore drilling company of choice by delivering quality technical outcomes at highly competitive rates.

Carl Davies - General Manager
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IAH WA's Richard Barnes Bursary

IAH WA's Richard Barnes Bursary is awarded to a Master of Hydrogeology student undertaking a research project at UWA. For 2018, the Bursary has been awarded to Hanqing Zhao, who will be investigating rainfall recharge on Gnangara Mound. This project will utilise high-temporal resolution weather, soil moisture and groundwater data to determine the controls on rainfall recharge to this key groundwater resource. This research is being conducted in collaboration with the Department of Water and Environmental Regulation and the outcomes will inform numerical groundwater modelling and groundwater resource management.

Welcome to the new ECHN Perth team

The IAH WA committee is very pleased to have these three ladies (from left Julia Heide, Margaret McCormack and India Jan) on board for 2018.

Groundwater geophysics – special edition

The Environmental and Engineering Geophysical Society's (EEGS) 'FastTIMES' online magazine has a special edition on geophysical techniques for groundwater studies. It includes case studies in Bundaburg QLD, Broken Hill NSW and California. The edition can be accessed free of charge via eegs.org/fasttimes.

IAH WA has a LinkedIn page

Follow this page to stay up to date with all the latest hydrogeological news in Perth! https://www.linkedin.com/company/iah-wa/

28 February 2018 – The ground beneath our feet: a simplified geology of the Perth metropolitan area

Congratulations to our two new 2018 event coordinators for organising a refreshing presentation regarding local geology. Frederic Verheyde did a wonderful job of putting Perth's hydrogeological units into a local context using pictures and locations familiar to most Perthians.

28 March 2018 – Supervising a drilling program: what a young professional should know

We had 77 attendees and would like to give a special thanks to Mal McGivern for facilitating the discussion as well as the panel of experts that were really open with their advice.

National Centre for Groundwater Research and Training

For upcoming courses, see http://www.groundwater.com.au/events/training

IAH Publications

Discounted IAH publications in the 'International Contributions to Hydrogeology' and the 'Selected Papers' series can be ordered by Australian IAH members directly from Macmillan Publishers Australia in Victoria.

customer.service@macmillan.com.au or orders@macmillan.com.au

Remember to quote your IAH Membership Number, which entitles you to a substantial discount. If you don't know your IAH membership number contact the Secretariat at: secretariat@iah.org.au