



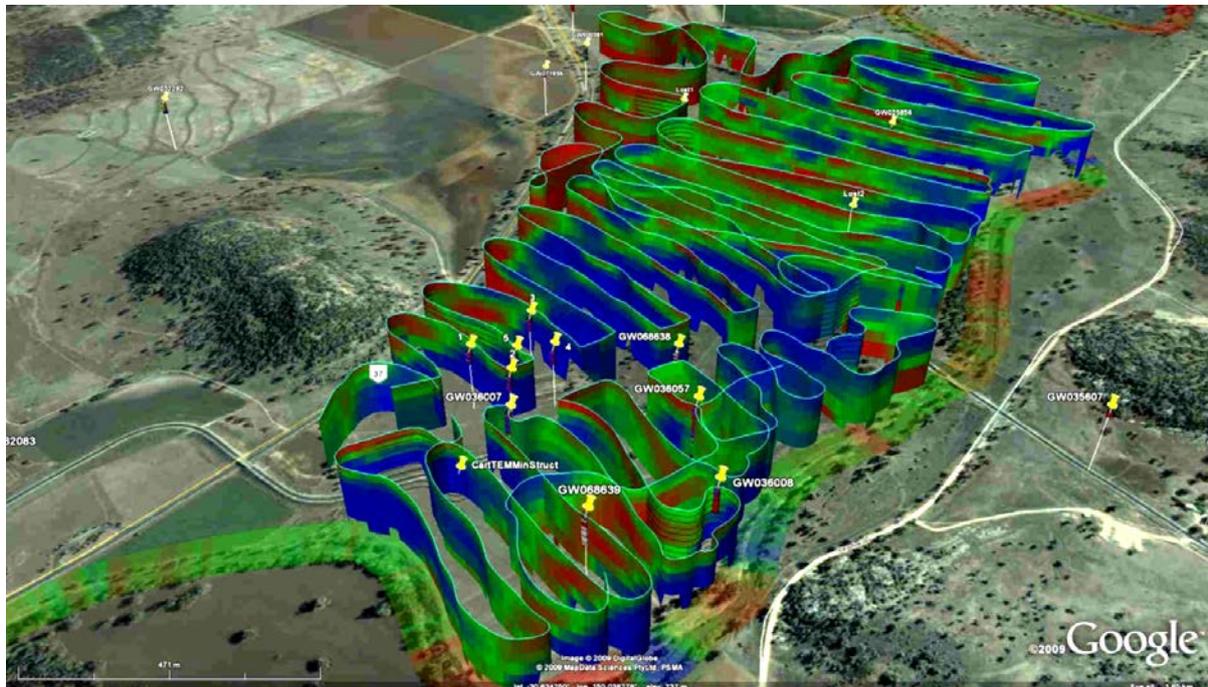
IAH Australia



iah news

Newsletter of the Australian Chapter
International Association of Hydrogeologists

April to December 2014
Volume 30, No. 2



On the cover (from the Seven Wonder of the Hydrogeological World – in Australia):

GINS LEAP GAP UPPER NAMOI VALLEY, NSW

The Gins Leap Gap is located approximately 9 km north of Boggabri on the Kamilaroi Highway in New South Wales. The major tributaries of the Namoi River, including Cox's Creek, the Mooki, Peel, Cockburn, Manilla and McDonald rivers all flow through The Gap as well as the groundwater associated with the unconsolidated sediments of the alluvial aquifer. The Gap also forms the major constriction in the Upper Namoi Valley and represents the northern extent of the Liverpool Plains.

Recent hydrogeological investigations at The Gap demonstrate how geological controls, such as faulting, fracturing and volcanic events, can constrict the alluvial aquifer and limit groundwater flow. A better understanding of major constrictions in hidden valleys is strategically important to measure and monitor groundwater. The Namoi CMA Gins Leap Gap Project revealed some surprises and geological problems that make me wonder at the features of the underground landscape.

In this issue:

- ***Update on IAH Membership***
- ***Minutes of the 2014 Annual General Meeting***
- ***Early Career Hydrogeologists Network “Coolest Paper of 2014” contest***
- ***State Branch Activity***
- ***Events and Resources:***
 - ***2014 Darcy Lecture Tour (in 2015!)***
 - ***2015 Australian Groundwater Conference***
 - ***IAH WA: Water Management for Shale and Tight Gas Resources***
 - ***42nd IAH Congress, AQUA 2015, Rome, Italy***

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 and 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 | \$140 |
| ▪ Online member | \$120 |
| ▪ Student | \$55 (full time students) |
| ▪ Online Student Member | \$35 |
| ▪ Corporate member | \$790 |
| ▪ Partial sponsor | \$155 |
| ▪ Full sponsor | \$190 |
| ▪ Retired | \$75 |

We are pleased to announce that the student membership fees have been reduced by \$20 in 2015 as an added incentive for full-time students to become IAH members. In addition, we have maintained the Member and Online Member fees at their current level, despite a rise in the IAH International fees for these membership categories for 2015.

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

Welcome to the Newsletter of the Australian Chapter of the IAH. Groundwater professionals across Australia continue to face the employment challenges of slowing investment in mining and a general tightening of our economy. Yet the need for industry leading skills has not, and will not diminish. Significant parts of the country are in drought, major reforms to water management are moving into implementation, the need to regenerate former industrial land for other high value uses has not diminished and the push to do things smarter and cheaper are the challenges that we, as a profession, face. I believe that it is important that the IAH as an organisation has an increasing relevance to our members. I would like to increase member engagement with the organisation by supporting and building our state chapters, providing national events in conjunction with other industry partners and participating more in local, state and national debates about groundwater.

I would like to thank Dr Richard Evans on his leadership of the Australian Chapter of IAH over the last 4 years. As a professional, Rick is focussed on how science best informs the important decisions that need to be made in managing our unseen resource. His commitment to the profession of hydrogeology is enthusiastic and unwavering. Under Rick, the national committee has become truly national. State and territory branches have further developed and in some cases reformed so that all are now represented. Australia successfully held the IAH international groundwater congress in Perth in 2013. He has left a foundation of further national events, and will continue to advocate for the profession. Thanks Rick, you have contributed much to the health and vitality of IAH Australia.

Chris McAuley
President, IAH Australia

When is Enough Science Enough?

“Germany bans fracking till 2021” was a recent headline. The NSW Chief Scientist calls for more science to understand the impacts of coal seam gas developments. You would be forgiven if from these two examples (and many others) you drew the conclusion that the science community, with hydrogeologists included, do not know what is going on (in a groundwater sense) in the world. Argument after argument is appearing implying that we don’t know enough to make groundwater management decisions. But there comes a time when government and other decision makers cannot just blame the lack of science (or lack of understanding of science) for not making a decision. (My comments below apply to a broad range of groundwater issues, including site contamination, irrigation projects, mining, dam and tunnel projects and not just CSG and Shale gas. “Government” in this discussion refers to all levels, including Federal, State, Local and especially semi – government agencies/organisations.)

There are often interesting ideas brought to the decision making table that allow for poor or non-existent science and a lack of hard decision making to prosper. Adaptive management is just one example. Adaptive Environmental Management, incorporating monitoring to see how a groundwater system unfolds in real time and then making changes later if an unfavourable scenario does indeed occur, is not appropriate for some groundwater issues because of the effective irreversibility of some processes, the long time scale before monitoring may even detect an unacceptable impact (at which point it may be too late to do anything about it), and the long time scale of recovery. Hence, in cases where adaptive management is not appropriate, decisions made at the initiation of an activity are critical and those decisions must be underpinned by good science. A yes or no decision on a proposed activity must be made – even if that means that a proposal is modified or heavily conditioned.

This debate about the amount of science needed in support of decision making would be made a lot easier if good science was available for decision making in the first place. But clearly in many cases it is not. Why? There are many reasons. The current trend is for Government to require proponents to do the science. Good science can be done by companies, but in some cases it may not be for obvious reasons, such as budget constraints. Collecting data for hydrogeologic analyses can be expensive. But let us assume that good science *is* being done by companies (or funded by companies, e.g. outside bodies doing the science). Good scientists within (or funded by) companies will always be subject to company policies and company views. This is not to suggest that the scientists will corrupt the science. But the interpretation of the science is often subjective and putting a “positive” interpretation on the science is inevitable – especially given the “wiggle room” in many groundwater assessment exercises.

Best hydrogeological science is usually demonstrated by private resource developers when the question is asked internally whether or not a project is feasible and whether or not large sums of shareholder money are to be invested (at risk) in a development. To answer these questions the scientists are expected to provide their best possible advice in an objective and unbiased manner. However, once the proposal goes to environmental regulators, the same scientists are under pressure to illustrate that the proposal has little or no adverse impacts and to present findings in a way that will advance the developers objectives. The underlying problem in this case is that government too often delegates the scientific investigation to the developer. If good science is to be used for government decision making then government must be prepared to (at least partially) fund the science or set up a robust independent review process funded by government.

Recently the notion of using the “Best Available Science” has crept into Government thinking and has even been immortalised in legislation. Just because something is the “best available” does not mean it is fit for purpose or will provide a basis for robust decision making. It may be that what is currently the best available is completely inappropriate for the job. In other cases, the “best available” may be entirely suitable. How often do we see a call for more science – but without a clear sense of how the additional science will reduce uncertainty and hence support a more robust decision making environment? More science

can be expensive, time consuming and will not always lead to significantly improved understanding and decision making outcomes. In other cases, it will greatly reduce uncertainty and help decision makers make better, well-informed decisions. But the pursuit of “scientific nirvana” just for the sake of it, or because we think “more is better” or as an excuse for procrastination or indecision is simply unacceptable. Scientists calling for more science may also present a conflict of interest. So, when is enough science enough? We clearly need a much better idea of both the benefits and the costs of doing more science and how the additional science may be reasonably expected to alter decision making outcomes. Specifically, could a robust decision be made today without additional science? Or would additional science have the potential to change the decision?

The hardest decision by politicians (this is why we pay them so much) is to make a decision. Recommending more science is too often just avoiding/delaying any decision and hence it is little wonder that the common recommendation by various enquiries is to do more science.

Government can be good at synthesising data/information across many projects and for major National issues (e.g. the MDB plan) government funded science is called for. But for individual projects, proponents can and should fund good fit-for-purpose science.

There needs to be some process where good science-based independent advice is provided to decision makers within Government. Government must have the technical capacity to assess the varying quality of science and hence provide a technically rigorous assessment of the issues of any proposed project. Alternatively Government can employ external bodies to do, or review, the science on its behalf. But this is too often not the case and the capacity of government to provide this good science based advice is often lacking. Government has a role and a responsibility to require good science. In doing so it needs to make sure that it has the capacity to understand and evaluate the scientific advice being given.

There comes a time when hard decisions must be made. If more science is *really* needed then let's be clear about this and put the necessary resources into getting that science. The investment of major expenditure to achieve a good level of science-based understanding may indeed be an even harder decision for government. If more science is not really needed, then let's be honest and not continue to use the need for more science as an excuse for indecision making.

When it comes to groundwater science and decision making, the hydrogeological profession has both a big challenge and a big opportunity.

Richard Evans
Past President, IAHR Australia

MEMBERSHIP UPDATE

2015 Membership Update

There has been a positive response to the launch of IAH Australia's new membership system. We have had over 200 registrations in the first month following the launch of the system, including corporate memberships.

We are pleased to announce that the IAH National Committee has unanimously voted to lower student membership fees by \$20, effective immediately. And, despite recent increases to regular and on-line member fees by IAH International, IAH Australia has frozen all membership fees for the 2015 membership year. We invite all members to renew at their earliest convenience to ensure there are no interruptions to their membership benefits.

Thanks to everybody who contributed to the redevelopment and testing of the membership portal and to all IAH members for their continued support over the past year. Any inquiries regarding the new membership system can be sent to membership@iah.org.au.

Current/Lapsed Membership Renewal Process

Membership renewal emails were sent to all members in January, with instructions for membership renewal using the new system. For anyone who may have missed the email, the renewal instructions from the email are provided on the following page.

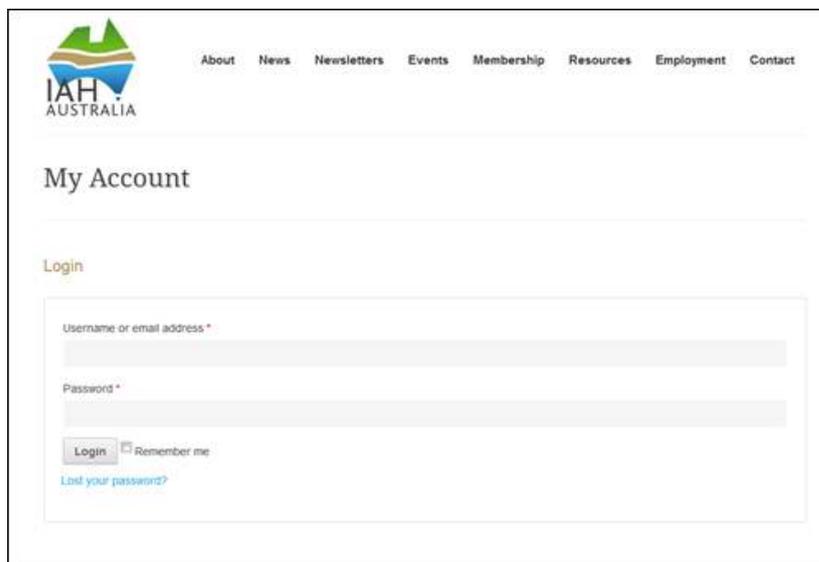
Note that if you were a member in 2014, and **did not receive** a membership renewal email in January 2015, some common issues are listed below:

- The email was intercepted by your **spam filter**. Check your spam folder or quarantine archive for IAH emails received on or about 15 January 2015, and consider adding the IAH sender details to your safe list.
- Your **email details changed** in the past year (for example, change of employment) and you have not yet updated your email address with IAH. You can update your details at any time through the iah.org.au website, by selecting "My Account" under "Membership", and editing account details.
- **Corporate "firewalls"** at some companies block all suspected incoming spam emails (IAH emails may be classified as "marketing" emails by some systems). Speak with your IT administrator about adding IAH to your corporate safe list, or switch to a personal email account.
- Your membership has **lapsed for more than a year** without renewal, and your details have been removed from our database. You can still use the new membership system to renew your lapsed membership.

Feel free to contact membership@iah.org.au with any questions.

Log into [your account page](https://www.iah.org.au/membership/my-account/) on the IAH website (<https://www.iah.org.au/membership/my-account/>).

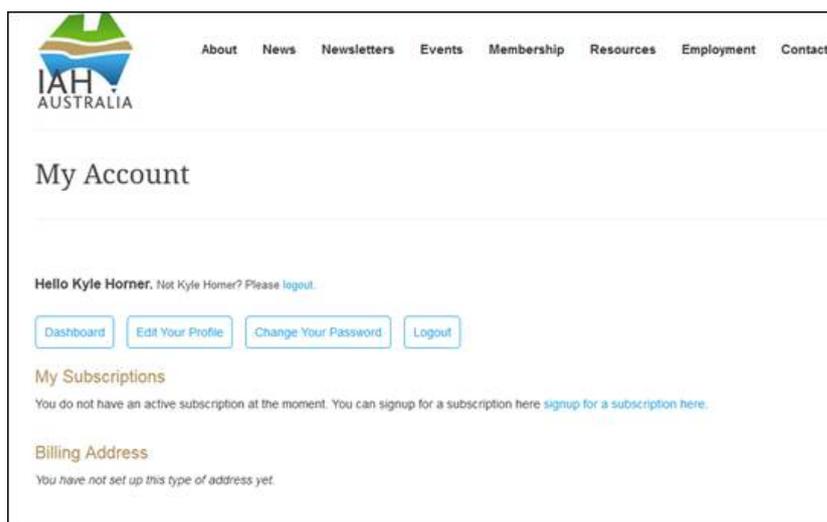
Your username is the email address the email was sent to (which should be the email address you have registered with IAH). If you have forgotten your password, you can reset it using the “**Lost Your Password**” link at the bottom of the page **using the email address the email was sent to.**



The screenshot shows the IAH Australia website's 'My Account' page. At the top left is the IAH Australia logo. To the right is a navigation menu with links for 'About', 'News', 'Newsletters', 'Events', 'Membership', 'Resources', 'Employment', and 'Contact'. Below the navigation is the 'My Account' heading. Underneath is a 'Login' section with a form containing two input fields: 'Username or email address *' and 'Password *'. Below the password field is a 'Login' button and a 'Remember me' checkbox. At the bottom of the form is a link for 'Lost your password?'.

Once logged in, you will see your account Dashboard.

Under the **My Memberships** section, click on the link to sign up for a new subscription. This will direct you to a new page where you can select your desired membership category from the options. Details of each membership type can be found at the bottom of the registration page. Once you have chosen your desired category, follow the prompts to finish your membership renewal.



The screenshot shows the IAH Australia website's 'My Account' dashboard. At the top left is the IAH Australia logo. To the right is a navigation menu with links for 'About', 'News', 'Newsletters', 'Events', 'Membership', 'Resources', 'Employment', and 'Contact'. Below the navigation is the 'My Account' heading. Underneath is a personalized greeting: 'Hello Kyle Horner. Not Kyle Homer? Please [logout](#).' Below the greeting are four buttons: 'Dashboard', 'Edit Your Profile', 'Change Your Password', and 'Logout'. Below the buttons is a section titled 'My Subscriptions' with the text: 'You do not have an active subscription at the moment. You can sign up for a subscription here [signup for a subscription here](#).' Below that is a section titled 'Billing Address' with the text: 'You have not set up this type of address yet.'

If you have any questions, please do not hesitate to contact the membership team on membership@iah.org.au.

MINUTES OF THE ANNUAL GENERAL MEETING

ANNUAL GENERAL MEETING

Wednesday 19 November 2014

Training Room, Level 3, 87 Adelaide Tce, Perth

Election of Chairman

In the absence of the President or Vice President, Grant Bolton moved a motion to appoint Philip Commander to chair the meeting, seconded Ron Colman. The meeting was opened at 6.10pm.

Quorum

There being 31 members signing the attendance roll, a show of hands indicated more than the required 20 financial members were present.

Minutes of the previous meeting

Motion to take the minutes of the previous AGM as read proposed Ron Colman, seconded Grant Bolton. There was no business arising from the minutes.

Treasurer's Report

Treasurer's report (attached) was tabled by Ron Colman explaining the since the last AGM two payments for subscriptions for 2013 and 2014 had been made. Motion to accept the treasurer's report proposed Grant Bolton, seconded Ryan Vogwill.

Election of Officers

There being only one nomination received for President, Chris McAuley, proposed by Alan Wade, the Chairman declared Chris McAuley duly elected. Two nominations had been received for Vice President, Lange Jorstad, proposed by Ron Colman, and Lucy Lytton, proposed by Anne Riesz. Chairman explained that email proxy votes had been counted before the meeting by himself and Mariajose Romero-Segura. A show of hands was then requested for each candidate the results being:

	Show of hands	Proxy	Result
Lange Jorstad	8	17	25
Lucy Lytton	5	12	17

Chairman declared Lange Jorstad to be duly elected to the position of Vice President.

There being only one nomination for Treasurer, Ron Colman, proposed by Lange Jorstad, was declared duly elected.

Two nominations had been received for the position of Secretary, Kyle Horner, proposed by Lucy Lytton, and Peter Hyde, proposed by Chrissy Mc Knight. The voting was as follows:

	Show of hands	Proxy	Result
Kyle Horner	5	16	21
Peter Hyde	4	14	18

Kyle Horner was declared duly elected to the position of Secretary.

Other business

The chairman reported that Kyle Horner had advised that the redevelopment of the website and membership database was now complete and payments will be operational from mid-December.

Close

There being no further business, the meeting closed at 6.25pm

Philip Commander
Meeting chairman

The following financial report was presented at the IAH AGM. This report of the IAH National Committee finances covers the period 17/09/2013 to 18/11/2014.

Term Deposit as of 17/09/13	\$43,270.77
Cheque Account as of 17/09/13	\$201,546.54
Total Cash Balance as of 17/09/13	\$244,817.31

Term Deposit as of 19/11/14	\$44,798.83
Cheque Account as of 19/11/14	\$111,342.93
Total Cash Balance as of 19/11/14	\$156,141.76

Major Outgoings

UK IAH Head Office 2013 subscription	\$61,293
UK IAH Head Office 2014 subscription	\$54,337
2013 Congress Refund to UK Office	\$10,000
States 2014 Capitation	\$5,620
Association Insurance	\$3,397
Website Redevelopment	\$4,254
AGC Subs	\$1,739

EARLY CAREER HYDROGEOLOGISTS NETWORK

The IAH Early Career Hydrogeologists Network is sponsoring a contest called “**the Coolest Paper of the Year Prize**”.

The competition encourages early career hydrogeologists to share their views about the latest hydrogeology research, by nominating and voting for their favourite paper of 2014.

Nominations are open until **May 31st 2015** and are submitted online via the ECHN website:

<http://echn.iah.org/2014-coolest-paper>



After this, the papers will be short-listed and ECH's around the world encouraged to cast their vote on which is the 'coolest'.

The winner will be announced at the IAH Congress in Rome, and will win an annual IAH membership. The IAH is also generously providing book prizes for two randomly drawn competition participants.

We would greatly appreciate if you could circulate this information to your network of contacts and encourage any early career hydrogeologists you know to participate in the competition!

Best Regards,
Matthew Currell and Viviana Re
on behalf of ECHN

Boost for Murray–Darling groundwater research

Source: http://www.groundwater.com.au/news_items/boost-for-murray-darling-groundwater-research
22 Jan 2015

The partnership approach to groundwater research was strengthened this month with the Murray–Darling Basin Authority announcing \$1 million to fund studies by the National Centre for Groundwater Research and Training.

MDBA chief executive Dr Rhondda Dickson said the collaboration would provide important technical and scientific support for decision-making in the Murray–Darling Basin.

“The three-year research program will build on our understanding of some of Australia’s most significant groundwater systems,” said Dr Dickson.

The National Centre for Groundwater Research and Training at Flinders University will use the funding to continue investigations into groundwater and surface water interactions, the way groundwater is replenished, and the impact of social and economic factors on groundwater management.

Dr Dickson said improving the information available on groundwater in the basin was a priority.

“We already have a solid body of research about particular aspects of groundwater, but further work is needed.

“We are looking forward to joining forces with the National Centre for Groundwater Research and Training to further ensure a healthy Murray–Darling system.”

Director the National Centre for Groundwater Research and Training, Professor Craig Simmons said he was delighted to be working with the MDBA in this new partnership.

“We estimate that almost one third of Australia’s total fresh water exists underground within the area of the Murray–Darling Basin.

“The more we learn about this resource, the better our understanding of water in the Basin as a whole”.

Australian Groundwater Explorer released

Source: www.environment.gov.au media release
25 October 2014

The Bureau of Meteorology released a new online groundwater data tool, providing a comprehensive picture of Australia's groundwater resources.

"The Australian Groundwater Explorer presents a uniform approach to groundwater information to support a range of sustainable water resource management decisions at both local and national levels," said Senator Simon Birmingham, Parliamentary Secretary for the Environment.

"The Australian Groundwater Explorer brings together comprehensive groundwater information from state and territory water agencies, making it publicly available in a nationally consistent format on the Bureau's website," Senator Birmingham said.

"As groundwater systems often span jurisdictional boundaries, policy and planning managers will value the national consistency afforded by the Australian Groundwater Explorer.

"National Water Week is a great time to increase community awareness around water issues and how best to use our valuable water resources. The Federal Government is working to improve our national understanding of all water resources, including groundwater, through the Bureau's Water Information Program.

"Groundwater has traditionally been considered our water resource safety net, but in this highly variable climate, with increasing demands from population growth and the pressures of development, we are relying more and more on our groundwater resources.

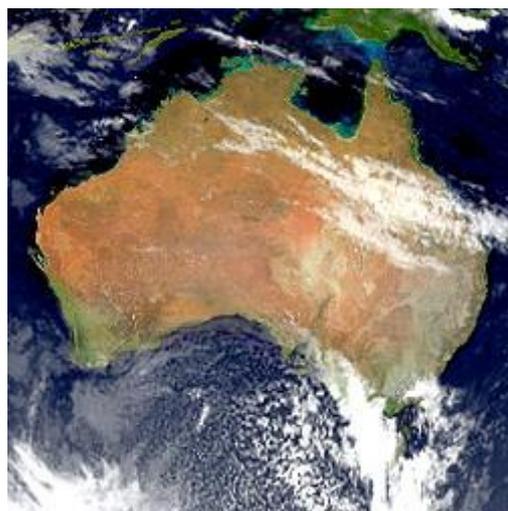
These increased pressures are part of the reason why we recently reinstated the \$15.9 million Great Artesian Basin Sustainability Initiative funding, which Labor had left without funding.

"The Australian Groundwater Explorer is a valuable tool which will enhance public understanding of Australia's groundwater resources and lead to improvements in their management."

Senator Birmingham said with the Australian Groundwater Explorer users can access a wide range of groundwater data, including around 800,000 bore locations and bore logs.

"Users can pan and zoom using the interactive map, tailor and search information for their area, view bore logs and aquifers in 3D, or download tables and graphs."

Further details are available from the [Australian Groundwater Explorer](http://www.environment.gov.au) website.



FROM THE BRANCHES

NEW SOUTH WALES

IAH NEW SOUTH WALES BRANCH

2014 Committee:

Chair	Katarina David	(UNSW)
Presentations Secretary and External Communications	Graham Hawkes	(AECOM)
Treasurer	Tingting Liu	(Hydrosimulations)
Secretary	John Fennel	(RPS Aquaterra)
Sponsorship Champion	Mark Peterson	(ANSTO)
Meeting Facilitator and Internal Communications	Sean Daykin	(Parsons Brinkerhoff)
Awards Secretary	Dr Anna Grieve	(Xstrata Copper)
Newsletter Champion	Dr Ben Rotter	(Coffey)
Web Champion	Doug Anderson	(Water Research Laboratory, UNSW)
International Sponsorship Champion	Dr Jay Punthakey	(Ecoseal)
University Liaison	Dr Bill Milne-Home	(UTS)
Members Champion	Andrew McCallum	(Office of the NSW Chief Scientist and Engineer)
National Vice President	Dr Lange Jorstad	(Geosyntec)
International Vice President - Australasia	Dr Wendy Timms	(UNSW)

Changes to the 2014 Committee:

- We thank Sara Mehrabi for her work as Treasurer over the past three years. Sara was a valued member of the IAH NSW committee, contributing beyond her role as Treasurer by managing the website, awards, moderating Elders night and managing communication with our African sponsored students. We wish her all the best in a new country and position.
- We thank Ellen Kwantes for organising our meetings over the past three years. Ellen contributed significantly to IAH NSW, modernising the delivery of IAH flyers, organising technical events, and providing IAH representation at IAH conferences. We wish her all the best.
- We welcome Tingting Liu as the new Treasurer and Sean Daykin as the new Meeting Facilitator.

Local News

Our regular branch meetings continue to be held at the office of Parsons Brinckerhoff (PB) located in the Sydney CBD. Thank you to PB for supplying the convenient central venue, first class facilities, and food and drinks. Thank you also to AECOM for hosting this year's Darcy Lecture in their central Sydney CBD office and providing 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 recognises young professionals. For mid to late career hydrogeologists, a platform is provided for technical presentations. Highly experienced professionals join our panel during Elders Night, with esteemed NSW hydrogeologists recognised by the receiving of the Woolley Award at or near retirement.

NSW Sponsors

IAH NSW gratefully acknowledges the contributions of its 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 include AECOM, CDM Smith, Coffey, GHD, Hydrosimulations, Parsons Brinckerhoff, RPS Aquaterra, and UNSW.

Our Silver Sponsors include C. M. Jewell & Associates Pty Ltd, EcoSeal, EMM, Environmental Strategies, Frans Kalf and Associates Pty Ltd, NSW EPA, and NSW Office of Water (NOW).

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2014 Events

The Australian Earth Sciences Convention 2014 in Newcastle (AESC)

The Geological Society of Australia's Australian Earth Sciences Convention 2014 was held in Newcastle in July 2014. The IAH NSW supported the conference and organised the groundwater session. The IAH NSW held a booth at the conference, which was manned by IAH volunteers. The booth was well visited and it served to promote groundwater issues. Overall the conference had over twelve groundwater sessions which included groundwater chemistry, coal seam gas and groundwater-surface water interaction topics.

The conference and focused on the themes of energy, basin geology, geodynamics, resources, the environment, the geological record of life, and the role of the Earth Sciences in the community.

The keynote presentation in the groundwater section was by Mr George Gates, who presented on “Groundwater requirements for a mining or coal seam gas gateway application”. George Gates has had a 40 year career in hydrogeology and, until March 2013, he was Director of Water Management at the NSW Office of Water. He has extensive knowledge of the State’s groundwater systems and has developed a number of groundwater policies for NSW. George is a member of the NSW Mining and Petroleum Gateway Panel which undertakes independent, scientific assessments of how State significant mining or coal seam gas proposals will impact the agricultural values of the land on which it is proposed to be located.



IAH NSW representatives Ellen Kwantes, Graham Hawkes and Doug Anderson at the convention



George Gates presenting at the convention

2014 Meetings

August 2014, Mitchell Isaacs - The NSW Aquifer Interference Policy: From the eyes of a regulator

Mitchell Isaacs oversees the NSW Office of Water’s review and assessment of major developments. His presentation discussed the significance and implications of the Aquifer Interference Policy, and what NSW Office of Water seeks to understand when it assesses projects. The presentation was well attended by over 35 professionals.

Mitchell’s full presentation can be found on the IAH website at:

https://www.iah.org.au/wp-content/uploads/2014/08/NOW_presentation_IAH_August2014_AIP.pdf

July 2014, Regional Meeting, Dubbo - Prof Andy Baker - Groundwater research stories from the Central West NSW

On 22 July 2014, IAH NSW had its annual regional meeting in Dubbo and Prof Andy Baker, Director of Connected Waters Initiative Research Centre at University of NSW, presented.

The presentation provided research results from the UNSW research team working in Central West NSW. The research utilises borehole transects and bore fields in the Wellington region, funded through the Groundwater Education Investment Fund. At the Wellington Caves, the caves have been used as a 'hydrological observatory'.



Prof Andy Baker presenting at regional meeting

Using artificial rainfall events to generate infiltration and recharge, a better understanding of the soil and karst system was gained. The results of long-term monitoring (2010 and ongoing) and infiltration experiments in the summers of 2013 and 2014 are presented.

At a slightly larger scale, the relationship between water level in the Bell River and adjacent alluvial and karst aquifers has been investigated. Using a combination of bore and cave water level monitoring at Wellington from 2010, the reported results provide improvements in our understanding of surface water – groundwater interactions in the catchment. Comparison of Macquarie River and alluvial groundwater levels demonstrates the importance of large dam releases on the alluvial groundwater system. In the fractured rock aquifer, the use of in-situ fluorescence probes and drawdown experiments was undertaken to investigate the effect of groundwater abstraction on dissolved organic carbon fluxes. The meeting was well attended by about 30 hydrogeologists mainly from government and universities.

November 2014, Prof. David K. Kreamer - Preserving Springs in the Grand Canyon National Park, USA – Tracking Groundwater Geochemically

Professor Kreamer of University of Nevada, Las Vegas, is the Vice President of the International Association of Hydrogeologists North American and President of the Universities Council on Water Resources.

Professor Kreamer delivered a presentation on the springs in Grand Canyon National Park. The springs support wildlife in an arid environment, and are also important to Native American religious cultural traditions and recreational enthusiasts. The springs are vulnerable to the impacts of municipal and industrial development outside the park boundaries.

Spring flow in the Grand Canyon is controlled by geological structure and stratigraphy, and waters can be dated and tracked using environmental tracers. Use of traditional environmental groundwater tracers in the Canyon will be discussed, as well as less often used parameters, such as trace elements in the sub-parts per trillion range, and uranium isotope disequilibrium. The results of this work give resource managers basic data to address concerns of visitor traffic, land use, and future development.

Upcoming Events

2014 Darcy Lecture – Dr Dorthe Wildenschild – 19 February 2014

“What Happens in the Pore, No Longer Stays in the Pore: Opportunities and Limitations for Porous Media Characterization and Process Quantification Using X-ray Tomography.”

Date/time: Thursday, 19 February 2014, 5:30 for 6pm start

Venue: Parsons Brinckerhoff offices, Level 26, 680 George Street, Sydney CBD

Dorthe Wildenschild, Ph.D., is an associate professor in the School of Chemical, Biological and Environmental Engineering at Oregon State University. Research in her group focuses on physics, chemistry, and microbiology of relevance to flow and transport in porous media. Much of her work is supported by high resolution imaging and applications primarily involve subsurface multiphase flow phenomena.

During this presentation, you will receive an overview of the current state of imaging of porous media systems—and processes taking place within them—using x-ray tomography, a technique that allows for three-dimensional observation and measurement of variables internal to an otherwise opaque object.

The lecture is free and attendance is open to anyone who is interested. Advanced RSVP would be appreciated for seating and catering purposes – please RSVP to Katarina David at katarinadavid@hotmail.com.

AUSTRALIAN CAPITAL TERRITORY

IAH AUSTRALIAN CAPITAL TERRITORY BRANCH

2014 Committee:

Chair	Lucy Lytton	(Geoscience Australia)
Vice-Chair	Scott Lawson*	(Dept of the Environment)
Treasurer	Gabby Yates*	(Geoscience Australia)
Secretary	Scott Cook	(Geoscience Australia)
Sponsorship	Peter Hyde	(Murray-Darling Basin Authority)
Events Committee	Sarah Marshall Gabby Yates	(Geoscience Australia)
Communications Champion	Kyle Horner	*
Membership Champion	Hashim Carey	(Geoscience Australia)

* - see notes below:

- Anne Riesz stood down as Treasurer in June 2014 due to family commitments. Gabrielle Yates of the Events Subcommittee has acted as Treasurer since that time, and Scott Lawson has acted as Vice-Chair.
- Kyle Horner moved to Sydney in September 2014 to join the NSW EPA and stood down as Communications Champion in August 2014. Steve Hostetler acted as volunteer Communications Champion since Kyle's resignation.
- A non-Committee role of Student Coordinator was trialled to encourage student participation at IAH events and student membership. The role was filled by Michael Short who actively promoted the IAH to Canberra's student community, assisted with organising events in Canberra, and participated in several Committee meetings.
- Chris Harris-Pascal attended several Committee meetings as an observer from July 2014 and acted as a volunteer with the Events Coordinating Subcommittee.

Local News

Sponsors

IAH ACT appreciates the sponsorship provided by Hydroalgorithemics and GHD.

IAH ACT Twitter

The IAH ACT branch has a Twitter account to provide up-to-date groundwater information to members and non-members in and around Canberra. Follow us **@IAHACT** to keep informed about upcoming groundwater talks in the Capital Region, as well as hydrogeology job postings, conferences, workshops, and other events.

Proposed Australian Groundwater Conference

The concept of a national Australian Groundwater Conference was announced. ACT IAH branch members commenced planning for input to organising the first conference which is proposed to be held in Canberra in November 2015.

Recent Meetings

The ACT IAH branch continued its program of monthly committee meetings, local evening seminars and hosting / co-hosting visiting lecturers. Events included:

May 2014

Evening technical seminar - 'Hydrogeology of the ACT Past and Present' - Jim Kellett (Geoscience Australia) and Heath Chester (ACT government)

NCGRT Distinguished Lecturer: 'Groundwater dependent ecosystems: key questions, new methods and a response curve' - Prof. Derek Eamus

July 2014

Evening technical seminar - 'Findings from baseline hydrogeochemistry studies of the GAB' - Andrew Feitz (Geoscience Australia)

August 2014

Combined Geosocieties Quiz Night

Student Societies afternoon (Gabby Yates, Michael Short)

Evening technical seminar double:

- 'Water Foot Printing: the basics and work in progress' - Maartje Sevenster (Sevenster Environmental)
- 'Water issues and Unconventional Energy: Shale Gas and Tight Gas' - Stephen Hostetler (Hostetler Hydrogeology)

VICTORIA

IAH VICTORIA BRANCH

2014 Committee:

Chair	Alan Wade	(Aquade)
Vice-Chair / Treasurer	Anthony Brinkley	(Jacobs)
Secretary	Anne Northway	(EPA)
Events Committee	Katy Kijek	(Port of Melbourne Authority)
Communications Champion	Heath Pawley	(Golder Associates)
Membership Champion	Alexis Valenza	(Valenza Engineering)
IAH 2014 Liaison, VIC	Tim Robson	(Kleinfelder)

Local News

Our regular branch meetings continue to be held alternatively at the RMIT and office of Jacobs located in Melbourne CBD. Thank you to RMIT and Jacobs for supplying the convenient central venue and first class facilities.

The Victorian IAH Branch Christmas Function was held on Tuesday December 16 2014 in Jacobs' premises on Flinders Street, in Melbourne CBD.

Victorian IAH Branch submission regarding the Victorian Water Bill Exposure Draft

The Victorian Government is carrying out a comprehensive review of Victoria's water laws to deliver a streamlined and effective legislative framework for water management and use in Victoria. Water Minister Peter Walsh appointed an expert Advisory Panel with legal and water industry experience to oversee the review and make recommendations.

The Victorian IAH Branch has provided comment on the Victorian Government Water Bill Exposure Draft, which can be accessed on the Victorian Branch webpage.

IAH/AIG 2014 Fieldtrip: Ballarat Area - 28th / 29th November 2014

AIG and IAH organised a joint two days field trip on Friday 28th and Saturday 29th November 2014. The trip successfully covered aspects of the hydrogeology, geology, mine and municipal water management in the Ballarat area. The topics were guided by Phillip Kinghorn (Independent Geological Contractor).

On the 28th, the group was able to visit geological highlights of the Ballarat area, including the Black Hill Lookout, Norman Street Cutting, CGT Ballarat Gold Project Tailings dams, stormwater dissipation dams, Gnar Creek Retention Basin, Ring Road Groundwater Wellfield (urban supply).

On the 29th, the group visited the Gong Reservoir, Imery's Mine and Lal Lal Falls, Mt Buninyong Lookout and Redan Wetlands.

As you can see below, the trip was a success!



Recent Meetings

Groundwater Challenges in Humanitarian Emergencies, 8th July 2014 Jacobs

The world faces Humanitarian Emergencies on a massive scale from war, droughts, cyclones and earthquakes. In Syria and Iraq, Phillipines and Haiti, millions of people have become homeless, moved from their homeland or are currently living in a variety of camps and shanty towns. Some of the largest of these settlements are around Dadaab, Kenya with more than 400,000 Somali refugees. This is like a city the size of Canberra springing up overnight. And all of this happens without the luxury of planning for water infrastructure. So wells are dug, latrines are installed and people try to get by as best they can. This can lead to a number of problems. In this presentation, Paul will speak about the

challenges facing humanitarian workers as they try to balance critical human need with competing interests such as contamination, sustainability and equity of access.

Paul Bolger is currently the Senior Humanitarian Trainer for RedR Australia. He has nearly forty years' experience in geology, hydrogeology and environmental engineering. He has worked for a number of Government, Private sector and Non-Government organisations on projects in Australia (all States), New Zealand, Thailand, the Philippines, Indonesia, Timor Leste, Namibia, Sierra Leone, Chad and Ethiopia. Paul is specialised in hydrogeology in a range of aquifer systems and subsurface conditions. He combines strong geological and stratigraphic skills with groundwater expertise, including modelling, to undertake water management and related environmental investigations. He has worked on water resource development and protection projects, catchment- scale water and land use studies, including salinity, groundwater management projects for coal and metal mining operations and a wide range of contamination, municipal and industrial solid waste disposal and municipal and industrial effluent projects. He has undertaken a number of Environmental studies including effects of development on groundwater quantity and quality. His experience covers hands-on technical investigation work, extensive management and project management experience, as well as training. This project was completed to provide guidance to support jurisdictions preparing water resource plans for meeting the requirements in sections 10.18–10.21 of the Basin Plan, relating to sustainable use and management of groundwater. The report identifies the types of rules and RCLs that could be included in water resource plans to manage local impacts of groundwater take and provides a suggested framework on how an assessment of the need for rules could be undertaken. Guidance on selecting rules to address identified needs in different circumstances and how RCLs might be developed has also been prepared for different hydrogeological set.

IAH Victoria Presentation - 23rd September at RMIT University. University student research showcase

The event of the Victorian technical presentation calendar is the student research showcase, where three current honours and postgraduate students at Victorian universities presented their hydrogeology research.

Three speakers have been scheduled to present on the evening:

- Emma White (University of Melbourne): Evaluating the success of groundwater management plans
- Ben Hall (RMIT University): Impacts of land use change on groundwater recharge in Melbourne's Southeast
- James Horne (La Trobe University): Impact of dewatering on hydrogeology and landfill gas migration around the Cranbourne landfill.

Victorian IAH Branch December Presentation and Christmas Function

Salinity in the Murray-Darling Basin: mirage or sleeping dragon?

The salinity threat posed to land and water resources in the Murray-Darling Basin was at the forefront of water policy and management initiatives throughout much of the second half of the 20th Century. In response to the salinity threat, monitoring and works programs have been implemented by partner governments under the Basin Salinity Management Strategy (BSMS) 2001-2015 and its predecessor (the Salinity and Drainage Strategy 1988). These programs and the transition to a drier climatic regime, has led to a substantial reduction in land and water salinization across the southern Basin. Looking beyond the life of the BSMS 2001-2015, implementation of the Basin Plan will substantially increase the flow regime in the river compared to the recent past. Hence further water quality improvements may be anticipated in the short term. On-the-other hand, the legacy of historic land use change may be yet to reach the river and hence poses a longer term threat to River Murray water salinity. Salt will always be a feature of the Australian landscape, but is it still the threat that was posed late in the last millennium? In light of uncertainty in climate and the future management of land and water resources, where to for Basin salinity management beyond 2015?

Greg Holland has been in the salinity game for over 25 years, having worked for state government, Goulburn-Murray Water, Murray-Darling Basin Commission and most recently, SKM and Jacobs. He will bring his insight and domain knowledge to cover the recent history of salinity management across south eastern Australia and what could be in store for the future.

WESTERN AUSTRALIA

IAH WESTERN AUSTRALIA BRANCH

2015 Committee:

<i>Position</i>	<i>Officer</i>	<i>Position</i>	<i>Officer</i>
<i>Chairperson</i>	Ian Brandes de Roos	<i>Presenter Coordinator</i>	Pauline Amez-Droz
<i>Vice – Chairperson</i>	Mariajose Romero-Segura	<i>Seminar Coordinator/Sponsorship Champion</i>	Geoff Pettifer
<i>Secretary</i>	Carsten Kraut	<i>Newsletter Champion</i>	Keith Brown
<i>Treasurer</i>	Peter de Broekert	<i>Newsletter Assistant</i>	Melissa Nyga
<i>Meetings Secretary</i>	Todd Hodgkin	<i>Web Champion</i>	Eduardo de Sousa
<i>Ministerial Liaison</i>	Keith Brown	<i>Web Assistants</i>	John Enkelmann Lynn Reid
<i>Education Representative</i>	Ryan Vogwill	<i>Student Champion</i>	Gemma Bloomfield
<i>Media Liaison</i>	Ryan Vogwill	<i>ECHN Champion</i>	Rachel Wroe
<i>Membership Champion</i>	Mal McGivern		Philip Commander
<i>State Liaison</i>	Grant Bolton		

2015 Welcome

On behalf of Melissa and myself, hello and welcome to the New Year. We trust everyone has had a break and are looking forward to 2015.

To outgoing committee members thanks for your contribution; to new members it's great to have you on board and we look forward to working with you with whatever challenges and triumphs the new year will bring.

There are many great professional and social events planned for the coming year including the co-hosted Two Day seminar, **Water Management for Shale and Tight Gas Resources** to be held at the Parmelia Hilton 8th to 9th of June. Note early bird registration closing date is **15 February**. We ask our members to please support this seminar. See flyer attached.

Local News

Gateway Project Field Trip – written by Ian Brandes de Roos

On the afternoon of 21 May, under threatening skies, a team of IAH hydrogeologists attended a field trip to the Gateway Project near the Perth International Airport.

The Gateway Project is one of Western Australia's major infrastructure projects, with groundwater proving to be an important consideration for the design and construction team. The Gateway team faced the challenge of constructing a major arterial road project, complete with overpasses, in an environment where the window between the shallow groundwater table and flight paths from the nearby Perth International Airport is very narrow.

We witnessed first-hand the groundwater conditions as we toured the extensive dewatering infrastructure. We witnessed first-hand the flight path envelope as passenger jets made low passes over our head. Civil engineering hydrogeologists noted the design and construction considerations for the below-watertable 'bath' structures and the acid sulphate soil mitigation schemes. Pilbara-focussed hydrogeologists noted the elegance and simplicity of the shallow dewatering systems. Many thanks go to the Gateway team, whose presenters matched our rapid-fire questions with engaging insights into this very professional operation.





IAH Social Evening at the Belgian Beer Café – written by Bradley van Blomestein

On 27th June the IAH (WA) held their fifth Annual Social Evening at the Belgian Beer Café. The evening was again kindly sponsored by Connector Drilling (part of the Ausdrill Group).

The venue inside the café was the newly renovated Trappist Bar, which has a 1940's feel. We were apparently the first group to use it as it hasn't officially opened. Putting a bunch of hydros and drillers in such an environment with free booze could have been a recipe for disaster but everyone behaved very well (from what I remember...).

About 45 hydrogeologists attended as well as representatives of Connector Drilling. It was a great opportunity to meet people we did not know in our industry and chat about what's happening in hydrogeology. Thanks must go out to Toby Genillard (Connector Operations Manager) for his kindness in again supporting the IAH.





Recent Meetings

Monthly Technical Talks at the Melbourne Hotel

Pit lakes, What Matters and What Doesn't *Dr. Clint McCullough (Golder Associates)*

25th June 2014

In another very well attended talk Clint gave an extremely engaging talk providing an excellent overview of the social, environmental and economic impacts associated with Pit Lakes. The talk generated plenty of questions so thanks to Clint for his presentation.

Lake Muir-Unicup *Eduardo de Sousa*

20th August 2014

An enthusiastic audience were on hand for Eduardo de Sousa's entertaining talk on groundwater modelling and wetlands. In it Eduardo presented examples from the current work being undertaken for the Lake Muir-Unicup Natural Diversity Recovery Catchment (MUNDRC). He focused on practical aspects and current challenges of numerical modelling and expanded on specific topics, including analysis and management of large datasets, numerical representation of complex sedimentary geology, salinization, surface-groundwater interactions and representation of ecohydrological feedback loops.

Analytical modelling of groundwater wells and well systems: how to get it right?

Dr Anastasia Boronia

17th September 2014

Anastasia gave a very well presented talk discussing the important topic of analytical modelling of groundwater wells and well systems. She began with a precis of aquifer testing methods and the plethora of software now available to

analyse tests along with the potential pitfalls that can occur due to a lack of a-priory groundwater concepts and not accounting correctly for such factors as skin-effect, well storage or partial penetration that may result in hydraulic conductivity errors by several hundred percent.

Her presentation also discussed an analytical approach for well systems design presently incorporated in ANSDIMAT software package developed by the Russian Academy of Sciences. The method uses standard and research analytical solutions and it is based on the principle of superposition. Unlike numerical models, the method allows calculating drawdowns inside a pumping well and regional drawdowns, for example, on an open pit contour.

Western Australian AGM 2014 and Student Night

19th November 2014

The big meeting for the last quarter of the year was the combined WA chapter AGM and student night. The meeting was held at the FMG training rooms; thanks to John for organising and facilitating. A new committee was elected as shown in the above table.

Following the AGM were the student presentations. The three presenters and topics were:

- **Daniel Hearn** – UWA Honours Degree: *Source, fate and mobility of groundwater nutrients, metals/metalloids, and organic wastewater contaminants in the unconfined Broome Aquifer.*
- **Evan Heazlewood** – Curtin University Honours Degree: *Analytical techniques employed to gauge the redox conditions in a shallow aquifer; a comparison of ion selective electrode (ISE) analysis versus ion chromatography (IC).*
- **Malinda Kay** – UWA MSc Student: *Hydrogeology of the North Gnamptara Groundwater System.*

Upcoming Events

2015 IAH Seminar - [Water Management for Shale and Tight Gas Resources](#)

8-9 June, 2015

Parmelia Hilton, Perth CBD

IAH WA in collaboration with SPE and ASEG are pleased to announce a technical seminar addressing the challenges of water management for the developing unconventional shale gas sector in WA. The implications of fracking on surface water systems and both shallow and deep aquifers are currently in their infancy and will require careful groundwater management now and into the

future. Aquifer management in these areas is an up-and-coming field for hydrogeologists and those working in groundwater and the unconventional gas industry. Not to be missed! Keep an eye on the IAH website for upcoming details.

2014 Monthly Technical Meetings @ the Melbourne Hotel

Date: Third Wednesday of every month

Technical meetings are free and will be held every third Wednesday of the month. Check website for details. The title of the first presentation is yet to be confirmed, but will be on the topic of geophysics. Presenters kindly give up their time and knowledge for us, so please come along and show your support!

Early Career Hydrogeologists' Network (ECHN) events

Dates: TBA

The ECHN is a network of the IAH and was established in 2011 as a networking group to support young hydrogeologists in the early years of their careers. It is a great way to create professional networks and to socialise with peers at similar stages in their careers. Join the ECHN LinkedIn group and you will be kept updated with future social and professional events, so keep an eye out for posts on our LinkedIn page! The forum is open to all - posts, questions, and ideas are welcome!

Darcy Lecture

Date: Wednesday 25th February 2015

This year's lecture will be presented by Ms Dorthe Wildenschild. For more information on dates and topics check the website.

SOUTH AUSTRALIA

A sudden burst of enthusiasm in response to the recent difficulties has seen the rebirth of a committee in South Australia. It comprises of;

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

Recent Meetings

IAH SA and the NCGRT have joined up to present a seminar on the debate about the risks associated with fracking. Three speakers gave presentations injecting some technical rigour into the discussion with reference to the Otway Basin in SA where groundwater is an important resource.

Fracking – friend or foe ?

26 November 2014, Flinders City Campus

Hydrocarbon Prospectivity of the Otway Basin, South Australia

Tony Hill

Principal Geologist, Energy Resources Division, Dept of State Development

Tony presented an overview of the development history and how gas was produced for 23 years before being exhausted. The prospective area in the Penola Trough lies at a depth of 3000 m with up to 2000 m of low permeability aquitards intervening between the gas reservoirs and the overlying good quality groundwater. Current exploration targets are conventional gas that does not require fracking.

Unconventional Oil and Gas in South Australia

Michael Malavazos

Director Engineering Operations, Energy Resources Division, DSD

Mike gave a brief description of the fracking process and how it has been occurring without problems in the Cooper Basin since 1991. He presented a detailed overview of the regulatory framework in SA including best practice principles and stakeholder engagement. Various issues of concern were discussed (aquifer contamination, impacts on landholders etc).

South East Groundwater Quality Monitoring, Evaluation and Reporting Program

Tavis Kleinig

Senior Adviser Site Contamination EPA

Tavis outlined the basis of this monitoring program and listed the 15 other hazards for groundwater quality in the shallow limestone aquifer, apart from petroleum and gas exploration and production. These include dairies, viticulture, septic tanks, drainage wells, timber mills, agricultural chemicals etc, some of which have already caused aquifer contamination. In conjunction with DSD, monitoring will commence at 14 locations aligning with areas of current & potential future petroleum exploration & development.

All presentations can be viewed at: <https://www.iah.org.au/events/south-australia/>

NORTHERN TERRITORY

Local News and Meetings

NGRGT Lecture

Professor Derek Eamus the current NGRGT visiting lecturer was in Darwin on the 29th of April and presented a talk entitled: "Groundwater dependent ecosystems: key questions, new methods and a response curve." It was held at Charles Darwin University, Derek's former workplace. Local IAH members attended together with staff and students of CDU.

Northern Territory Hydraulic Fracturing Inquiry

In early June the NT branch provided a submission to the Inquiry into Hydraulic Fracturing in the NT. The submission was the collective effort of numerous members keen to ensure that the groundwater resources of the NT receives due consideration and protection from the impacts of a new and burgeoning unconventional shale gas industry.

The detailed submission was based both on evidence and on expert opinion drawing on a wide range of published literature and examples both national and international.

As well as providing a technical overview of the groundwater resources of the NT, the IAH(NT) outlined its major concerns and advice as follows:

- That the NT government should become sufficiently resourced from the proceeds of shale gas extraction to fund the effective long term management of the impacts of this industry on the groundwater environment.
- That a funding requirement on the owner of a gas well at a level that matches reclamation costs would provide the best mechanism to ensure maintenance of well infrastructure, reduce environmental impacts, and protect the Northern Territory from costly liabilities stemming from the failure of gas wells.
- That the NT government does not currently have the local skill set to effectively predict and manage the impacts of fracking on water resources.
- That the regulatory environment needs to be improved both in terms of transparency and effectiveness.

The IAH(NT) was subsequently invited to a meeting with the Commissioner to further discuss our concerns.

The full submission can be viewed online at

http://www.hydraulicfracturinginquiry.nt.gov.au/public_submissions.html

Flora River Field trip

A long weekend trip to the Flora River Nature Park is planned for the 30th August to the 1st of September. The Flora River is a tributary of the Daly River and is fed by springs that maintain a flow of 4 cumecs at the end of the Dry season, typically in late October. The Cambrian aged Tindall Limestone aquifer is the source of the water. One of the main features of the park are a series of spectacular tufa dams. Details of the trip can be viewed on the NT's page of the IAH website:

<http://www.iah.org.au/about/northern-territory/>

TASMANIA

No update available in this edition.

QUEENSLAND

No update available in this edition.

NATIONAL CONFERENCES AND EVENTS



EVENT ANNOUNCEMENT

NGWA Henry Darcy Australian Lecture Tour



NGWA Henry Darcy Lecture Series: 2014 Dorthe Wildenschild

Proudly supported by NGWA, IAH Australia, State IAH Chapters and the National Centre for Groundwater Research and Training (NCGRT)

Lecture 1: What Happens in the Pore, No Longer Stays in the Pore: Opportunities - Limitations for Porous Media Characterisation and Process Quantification Using X-ray Tomography [Abstract](#)

Lecture 2: Optimizing Capillary Trapping as a Carbon Dioxide Mitigation Strategy: Pore-Scale Findings in Support of Larger-Scale Implementation - [Abstract](#)

Locations

- Sydney:** Thurs 19 Feb, 6pm: PB offices, Lvl 26, 680 George St. [Register here](#)
- Darwin:** Mon 23 Feb, 4pm: CDU, LEBA Theatre Blue 5.1.01. [Register here](#)
- Perth:** Wed 25 Feb, 4pm – **Lecture 2** : Dept of Mines and Petroleum, Auditorium, Mineral House, 100 Plain St. East Perth [Register here](#)
- Adelaide:** Fr 27 Feb, 3pm: Flinders Uni CBD (Room 1). [Register here](#)
- Hobart:** Mon 2 Mar, 1pm Hope & Anchor Tavern, 65 Macquarie St [Register here](#)
- Melbourne:** Tue 3 Mar, 6pm: RMIT City Campus, Building 12, Lvl 13, Theatre 3 [Register here](#)

* Unfortunately **Canberra** and **Brisbane** are not included in the lecture tour due to insufficient time and conflicting commitments in Dorthe's schedule.



The National Centre for Groundwater Research and Training and the Australian Chapter of the International Association of Hydrogeologists are joining forces to deliver the Australian Groundwater Conference in Canberra in 3-5 November 2015. We are looking forward to welcoming groundwater researchers, industry professionals and policy development specialists to this exciting event.

We are strongly committed to delivering a conference that enables delegates to examine the multi-dimensional challenges affecting the sustainable management of Australia's groundwater resources in an innovative and engaging manner. We also want to create opportunities for delegates to share their experiences, inform best practice, and identify the steps they can take to bring about lasting improvements in the management of Australia's vital groundwater resources.

Conference will include but is not limited to

1. State of the art modelling and data management
2. Emerging measurement technologies
3. Urban groundwater issues
4. Climate change, land use and groundwater
5. MDB Plan: Progress and future work
6. Groundwater, Energy & Mineral Resources
7. Groundwater science-policy nexus: Socioeconomic/Governance challenges and opportunities

Call for abstract submissions will be confirmed and open in early 2015.

Further details are available from the conference website:

<http://www.groundwater.com.au/pages/australian-groundwater-conference-2015>

Water Management for Shale and Tight Gas Resources

**2-day Seminar – IAH Western Australia
in collaboration with SPE and ASEG.
8 – 9 June 2015, Parmelia Hilton PERTH CBD**



Groundwater is a scarce resource in Australia, shared by many users and a prime requirement in development of shale and tight hydrocarbons. Groundwater is frequently in close geological proximity to these hydrocarbons. Responsible development of these hydrocarbon resources requires protecting groundwater resources and minimising groundwater and surface water impacts.



With onshore shale gas currently at an exploration and early development stage in WA, this two-day seminar is an excellent opportunity for water and oil and gas professionals to convene and network and learn about responsible practices of all disciplines in the water and shale and tight hydrocarbon fields.



The seminar will have a particular WA focus on the issues of water resources management and protection, technologies available to prospect, assess and develop unconventional hydrocarbons, risk assessment and mitigation as well as government regulations and guidelines. Case studies from Australia and overseas, will help make this Seminar of great relevance for water and shale and tight hydrocarbon exploration and development practitioners.

Early-bird registrations open 15th February, 2015

2-day early-bird: \$350 (save \$50)

1-day early bird: \$270 (save \$30)

<http://www.iah.org.au/>



Upcoming industry training from



National Centre for
Groundwater
Research and Training

Australian Groundwater Modelling School

Last chance to register!

This School is a fundamental course that will introduce attendees to the art and science of groundwater modelling. Each step in the process will be thoroughly examined with practical applications as the focus. Extensive tutorials will allow attendees the opportunity to gain hands-on experience with using MODFLOW, the industry-standard groundwater modelling code. Other codes will be introduced and discussed.

Adelaide: 23–26 February

IAH / AWA / WIA member and student discounts apply.

[Click here for more information or to register](#)



Australian Groundwater School & Field Trip - Adelaide

The premier training event of its type in Australasia is coming to Adelaide in March 2015 including a full-day field trip.

The Australian Groundwater School is vital for professionals working with groundwater. It provides participants with a broad but rigorous introduction to groundwater.

Adelaide: 16–20 March 2015

Sydney: 24-27 August 2015

[**Australian Groundwater School & Field Trip**](#)

Adelaide

[**Australian Groundwater School**](#) Sydney

IAH / AWA / WIA member and student discounts apply.



Environmental Tracers in Groundwater Hydrology: Tools for Improved Process Understanding

Tired of attending courses crammed full of theory, only to return to your daily work and struggle to remember what you learnt or how to apply it?

This brand new course will help you to use appropriate sampling methodologies to acquire reliable data, as well as how to interpret and model analytical results. The knowledge will lead to you making meaningful improvements in your understanding of hydrogeological processes and conceptual groundwater models.

Perth: 24–26 March

IAH / AWA / WIA member and student discounts apply.

[**Click here to register or for more information.**](#)

Group discounts apply, please [email](#) for more info





The Council of the **International Association of Hydrogeologists (IAH)** has awarded the IAH Italian Committee the honour of organizing in **Rome, 13-18 September 2015** the **Annual Congress for 2015**.



The **Congress, AQUA2015**, will be held in Rome, at the prestigious **Angelicum Congress Centre**, located in the heart of the city.



REGISTRATION IS NOW OPEN

Registration for AQUA 2015 Congress is now open. Discounted rates are available for IAH members, students (including PhD students) and ABAS members. Early bird registration is possible until June 2015. During the registration process you can also book your hotel and reserve pre-congress courses and post-congress tours, in addition to the mid-week field trip included in the registration fee. Please go to www.iah2015.org/registration and follow the procedure to register.

[Read more »](#)



PROGRAMME: LIST OF SESSIONS ONLINE

The main theme of the AQUA2015 Congress is summed up by the motto "**Back to the Future**", linking the past use of water over 2000 years with the most advanced techniques of modern hydrogeological research.

The participation of scientists and experts from all over the world, together with key-note presentations by leading international

scientists, will guarantee the high level of the event and provide a unique opportunity for networking and upgrading scientific and technological awareness.

The **Scientific Programme** includes **8 main topics** and more than **65 sessions**, attempting to answer challenging questions posed by the future: the **management** of water resources in relation to food, health and the **environment**, the development of sustainable governance and policy and of new frontiers and new tools.

The draft program of the sessions, with descriptions and the list of convenors, is now available at www.iah2015.org/sessions .

[Read more »](#)



ABSTRACT SUBMISSION

We kindly invite you to submit your abstract following the procedure which is now on line. Please go to the web-site www.iah2015.org/abstract-submission , fill in the required forms, upload your abstract text, and complete your pre-registration. You will receive updates on the **AQUA2015 Congress**. Abstracts can be submitted until March 31, 2015. Don't wait till the last minute to submit your contribution!

Please do not hesitate to [contact us](#) for any additional information.

[Read more »](#)

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