



# iah news

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Newsletter of the Australian Chapter  
International Association of Hydrogeologists

**January to March 2015**  
**Volume 31, No. 1**



On the cover and below:

***Bai Shui Terraces, Yunnan Province, China***

The Bai Shui Terraces (White Water Terraces) are located at the foot of Haba Snow Mountain at an elevation of 2,380 metres above sea level. They were formed by continuous sedimentation of calcium carbonates from mountain springs.

Photographs by Ben Rotter.



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## 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 20<sup>th</sup> 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](http://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 IAH Newsletter!

As a profession, we continue to face a range of challenges. It is important that the IAH as an organisation supports and equips our members to meet the challenges faced. This is not just a need in Australia, but mirrors challenges across the globe.

IAH international has a “forward look” strategy to 2020. The five key principles within the strategy are: developing the science of hydrogeology, education and professional development, informing and influencing global policies, enhancing alliances and partnerships and the internal development of IAH. Within Australia, we are delivering on these principles, but there is more to do. We are partnering with the National Centre for Groundwater Research and Training to deliver the 2015 Australian Groundwater Conference (3-5 November, Canberra). This is a great opportunity for members to develop technical skills, hear the latest thinking on what our professions future holds and network across our diverse membership. We continue to support education and professional development through the “WetRocks” website and through the active participation of members in a range of groundwater training courses across Australia.

Our organisational focus over the last year has been to upgrade our web presence and functionality. We are continuing to update the site content. Functionally, the updated web site successfully delivers on-line capacity to renew membership. If you have ideas as to how we can further enhance the web content, then contact the IAH Secretary or your local State Chairperson.

This year we are looking, as an organisation, to increase awareness of the IAH as an authority on groundwater. Our state branches have done an excellent job of contributing to state issues through formal submissions and responses to key activities that impact groundwater (see our “IAH Correspondence” section on the website). There is an opportunity to better coordinate responses and to also be more proactive in providing comment into discussions on groundwater issues. Our aim this year is to start that process of increasing our profile. This will increase our opportunities to influence groundwater policy and science, if not at a global scale, at least in Australia!

If you have suggestions or ideas on our website, on ways we can increase our profile or other key alliances that would benefit groundwater, talk to your state chairperson or contact me directly.

Regards,

Chris McAuley

President, IAH Australia

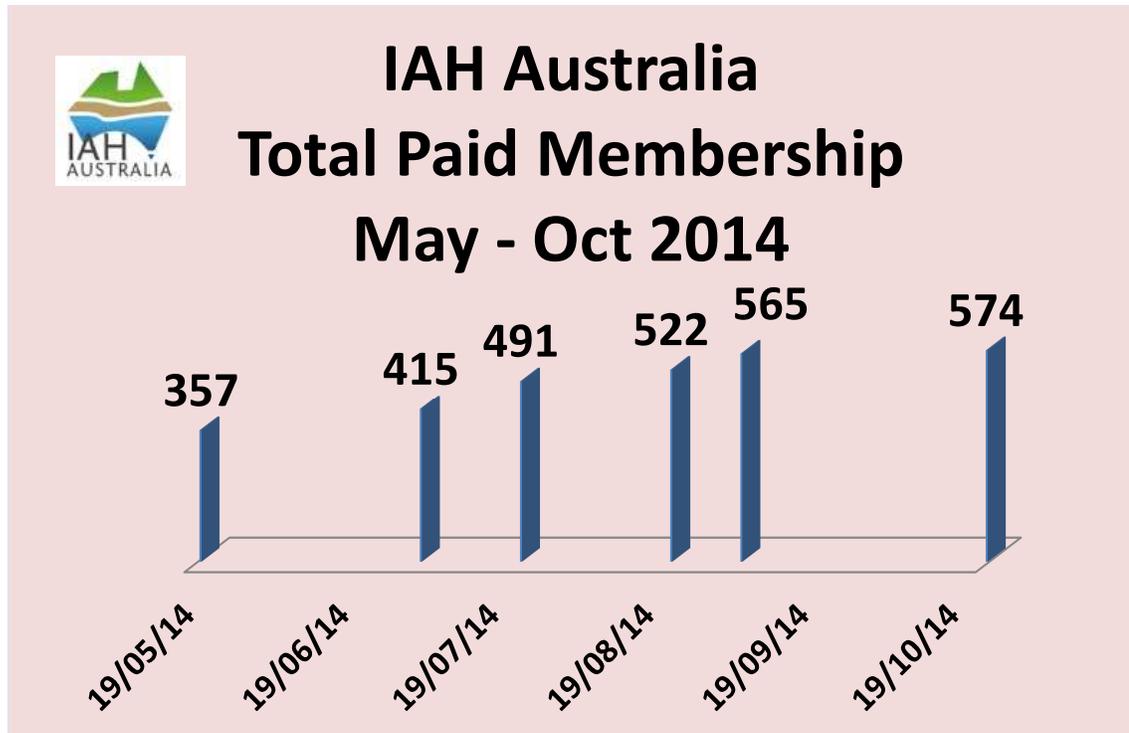
## NATIONAL CORPORATE SPONSORS

We gratefully acknowledge the support of our national corporate sponsors.

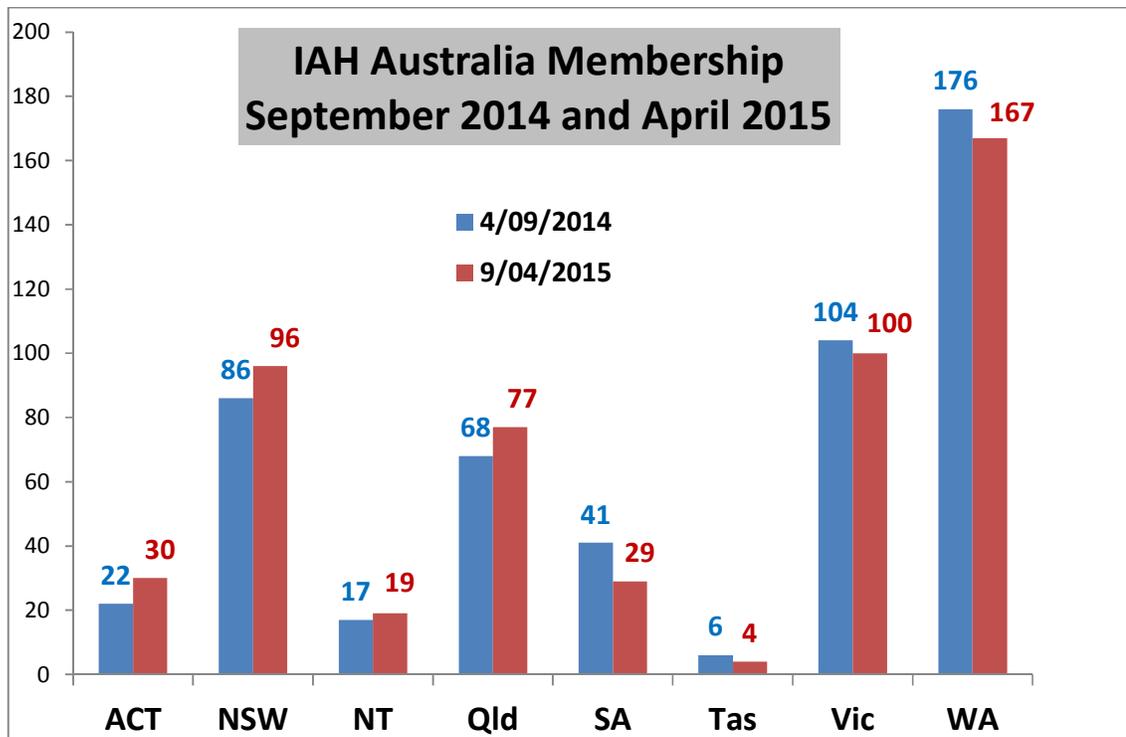


## MEMBERSHIP UPDATE

There are encouraging trends in the number of active (paid up) members since the low point of May 2014. Membership at that point in time had declined to 357 active members - down from over 700 members a few years ago. The graph of membership from May to October 2014 shows the recovery in the numbers to the end of the period when new and returning memberships are deferred to the following year.



There has been much debate about why membership fell so precipitously: was it primarily the reduction in job opportunities with the economic downturn, or was it the difficulty of renewing membership or joining IAH online because of the seemingly intractable problems with the website? Thanks to the excellent efforts of the sub-committee responsible for guiding the development of the new on-line systems for managing membership, last year's difficulties appear to have been overcome. Anecdotally, many members tried repeatedly to pay up before letting their membership lapse. The numbers shown by the graph of membership by State as at 10:00 am on 9th April 2015 – 522 – suggest that many members have become active again and there may be new members included in this total.



Although the restoration of full functionality to the membership page of the website would have persuaded members to become active, much credit for the recovery is due to the State committees and the member champions through their promotional activities at technical meetings and other means. The membership team at the national level will continue to support these efforts and assist in keeping the membership database and other services running smoothly.

The benefits for IAH members are substantial: *Hydrogeological Journal*, conference discounts and the support of a professional network of groundwater practitioners. Nevertheless, some 52 members have unsubscribed from IAH Australia since last year. We respect their decision, but we will continue to actively recruit new members and encourage inactive members to become active once more. Some 550 members is not the end for 2015. It is just the end of the beginning of the drive to regain our membership level at the end of last year – and beyond.

Any inquiries regarding the new membership system can be sent to [membership@iah.org.au](mailto: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.

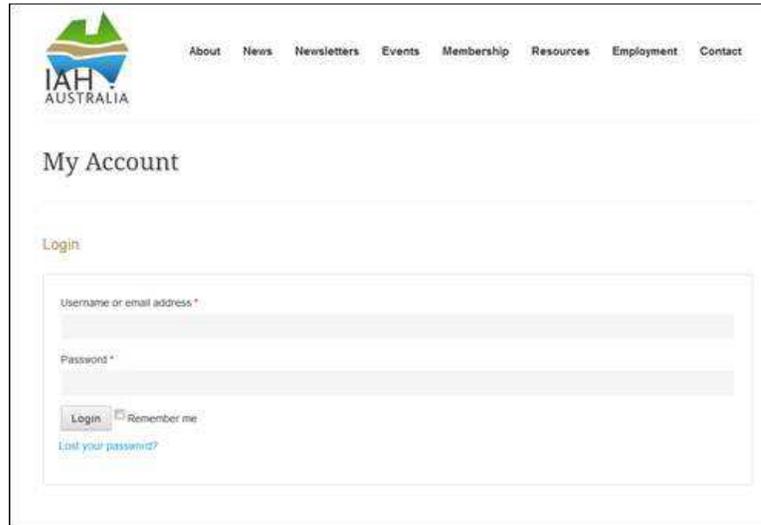
Note that if you were a member in 2014, and **did not receive** a membership renewal email in January 2015, some common issues are listed below:

- 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](https://www.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.

Contact [membership@iah.org.au](mailto:membership@iah.org.au) with any questions.

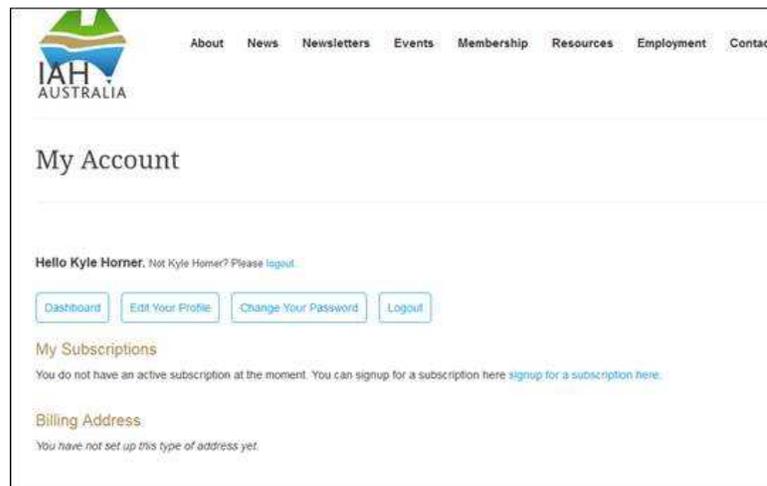
Log into your account page on the IAH website (<https://www.iah.org.au/membership/my-account/>).

**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.**



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.



If you have any questions, please do not hesitate to contact the membership team at [membership@iah.org.au](mailto:membership@iah.org.au).

## IAH AUSTRALIA EXECUTIVE

<b>President</b>	Chris McAuley	Chris.McAuley@depi.vic.gov.au
<b>Vice-President</b>	Dr Lange Jorstad	ljorstad@geosyntec.com
<b>Treasurer</b>	Ron Colman	Ron.Colman@royhill.com.au
<b>Secretary</b>	Dr Kyle Horner	Kyle.Horner@epa.nsw.gov.au
<b>Past President</b>	Dr Rick Evans	Richard.Evans2@jacobs.com
<b>Membership Secretary and Web Administration</b>	Fiona Adamson	secretariat@iah.org.au
<b>Newsletter Champion</b>	Dr Ben Rotter	Ben.Rotter@coffey.com

## FINANCE UPDATE

IAH National Committee finances are summarised in the table below.

Term Deposit as of 14/04/2015	\$45,472.65
Cash Account as of 14/04/2105	\$166,463.22
Total Cash Balance as of 19/11/14	<b>\$211,935.87</b>

Major outgoings over the last quarter include:

- UK IAH Head Office 2014 subscription of approximately \$60,000 on current numbers and exchange rate
- Financial support for 2015 Australian Groundwater Conference.

## 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 31<sup>st</sup> 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

## FEATURE NEWS

# Groundwater Issues Front and Centre In A National Think Tank

Source: [http://www.groundwater.com.au/news\\_items/groundwater-issues-front-and-centre-in-a-national-think-tank](http://www.groundwater.com.au/news_items/groundwater-issues-front-and-centre-in-a-national-think-tank), 1 April 2015

Australia's groundwater community will gather in Canberra in November to bring our pressing groundwater issues to the surface. Scientific, government, research and industry specialists will gather for the largest national think tank on groundwater science and management, in Canberra from 3-5 November.

Calling for the forum are two of Australia's leaders in groundwater science and management; Professor Craig Simmons, Director of the National Centre for Groundwater Research and Training and Chris McAuley, President of the Australian Chapter of the International Association of Hydrogeologists.

"Groundwater is front and centre in many of our pressing, contemporary national problems," said Professor Simmons. "It is essential that industry, scientists, policy and managers are working together as a community to address current and future groundwater issues", he added.

"The effective implementation of the Murray-Darling Basin (MDB) Plan, securing the Great Artesian Basin, urban and rural water security, potential impacts of unconventional gas and hydraulic fracturing, mining, Australia's agricultural competitiveness, and the impacts of climate change on groundwater are just a few of the hugely important contemporary issues that will require rigorous groundwater technical investigations, science, management and policy."

Chris McAuley added "Our industry needs to continually improve. Learning from the experience of others is critical to ensuring we continue to advance our capacity, as professionals, to solve the challenging groundwater issues our industry faces."

"The Australian Groundwater Conference will provide an important and engaging forum where groundwater industry, scientists, policy makers and managers can work together to share experiences and insights, discuss and debate the important issues, and collectively define a pathway forward for the groundwater profession and practice in Australia," says Professor Simmons.

"Our regional communities rely on groundwater. It supports rural economies and offers social benefits. To continue to realise and increase these values, groundwater professionals need to think smarter about the resource and how it is managed," says Mr McAuley.

Held at the Shine Dome in Canberra, the Australian Groundwater Conference will run from 3-5 November 2015. The conference will be opened by Hon Bob Baldwin MP Parliamentary Secretary to the Minister for the Environment followed by an impressive list of Plenary and panel speakers from organisations including Geoscience Australia, Bureau of Meteorology, Murray-Darling Basin Authority, CSIRO, Department of the Environment, NSW Office of Water, Jacobs, Origin, CO2CRC, UNSW and the University of Queensland to name a few.

The conference also features presentations highlighting the latest groundwater projects. There will also be excellent opportunities for delegates to network throughout the 3-day event.

The Conference Committee is currently looking for stimulating and engaging presentations. Abstracts should be submitted by 5.00pm AEST on 1st June 2015 via this link:

<http://www.groundwater.com.au/pages/abstract-submission>.

The conference website can be viewed here:

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

The National Centre for Groundwater Research and Training is an Australian Government initiative, supported by the Australian Research Council and the National Water Commission.

Web: [www.groundwater.com.au](http://www.groundwater.com.au) | [www.iah.org.au](http://www.iah.org.au)

## FROM THE BRANCHES

### NEW SOUTH WALES

#### IAH NEW SOUTH WALES BRANCH

##### 2015 Committee:

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

#### ***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 Brinkerhoff, 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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## ***Recent Meetings***

### **February 2015, Dorthe Wildenschild - 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**

Dorthe Wildenschild, Associate Professor in the School of Chemical, Biological and Environmental Engineering at Oregon State University, presented 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. X-ray tomography has advanced to where it is possible to probe porous media in great detail, allowing for fully quantitative analyses of processes and mechanisms at the pore scale.

Also discussed were limitations of the technique, as well as new potential advances that will allow for exciting new research in coming years. Applications of the technique to remediation of non-aqueous phase liquid in groundwater, the fundamentals of multiphase flow, and geologic sequestration of carbon dioxide were also discussed.

### **March 2015, Kent Novakowski - Flow and Transport Properties of Fractured Bedrock Aquifers in the Vertical Direction**

Assessing the ability of an unconfined bedrock aquifer to transmit infiltrating water and contaminants vertically downwards has long been a difficulty for practising hydrogeologists.

In this presentation, Kent S. Novakowski (Head of the Department of Civil Engineering, Queen's University, Kingston, Canada), discussed results of studies conducted recently at two field sites, one set in sedimentary rock and the other in a gneissic terrain, will be presented. The studies include the development of pumping and pulse interference methods for estimation of vertical hydraulic conductivity, and the completion of tracer experiments from a surficial source to depth in a pumped well for the estimation of transport porosity.

The results point out the significant importance of vertical fracture geometry, spacing and aperture in determining bulk vertical hydraulic conductivity and vertical transport porosity,

and the difficulty we have in estimating these properties. In particular, the methods typically used in porous media to estimate vertical hydraulic properties, such as the pumping test, fail in fractured bedrock settings due to uncertainty in the estimates for specific yield and vertical specific storage.

## ***Upcoming Events***

### **April 2015, Fabienne dHautefeuille - GDE management - GAB springs**

Fabienne dHautefeuille of Cardno will discuss the management plan known as the Joint Industry Plan for the Monitoring and Protection of EPBC Springs in the Surat/Bowen Basin and was approved in late 2013.

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) many coal seam gas (CSG) projects within the Surat Basin are required to carry out a survey to identify EPBC springs over a geographical area extending beyond 100 km of the furthest predicted impact, a baseline of the springs and, a management system to identify the impact and respond to it.

The Surat Basin CSG Industry undertook a number of projects collectively to address the regulatory requirements. Most importantly, the CSG Industry developed an early warning system, to understand impact propagation to the EPBC springs, and an impact management and response plan. Both the early warning system and management plan are based on the monitoring of water pressures in the springs source aquifers between the zones of CSG production and the springs.

### **May 2015, Elders Night**

The annual Elders Night, to be held on 12 May, will see three senior members from our local groundwater profession offer their collective wisdom. The senior professionals will share memorable experiences from their careers with the audience, provide insight into lessons learnt and challenges overcome, and discuss the changes they have seen in the industry, and the future of hydrogeology and groundwater engineering. There will be opportunity for the audience to ask questions.

An elder will be acknowledged for the Woolley Award. The Woolley award is a lifetime achievement Award for a prominent hydrogeologist who has spent the majority of their career working in NSW. Previous hydrogeologists recognised include:

2009	Don Woolley
2010	Frans Kalf and Michael Knight
2011	Bill Milne Home
2012	Peter Dundon
2013	George Gates
2014	Michael Williams

### **Workshop Seminar in November**

NSW IAH are to support the Australian Geomechanics Society with a one day seminar, titled "Recent Developments and Experiences in Excavations and Groundwater," to be held in Sydney in November. IAH will be providing keynote speakers and calling for suitable papers soon. Further details are to follow.

## AUSTRALIAN CAPITAL TERRITORY

### IAH AUSTRALIAN CAPITAL TERRITORY BRANCH

#### 2015 Committee:

<b>Chair</b>	Lucy Lytton	(Geoscience Australia)
<b>Vice-Chair / Secretary</b>	Scott Lawson	(Office of Water Science)
<b>Treasurer</b>	Peter Hyde	(Murray-Darling Basin Authority)
<b>Events Committee</b>	Sarah Marshall Gabby Yates Tim Ransley Tim Evans Chris Harris-Pascal	(Geoscience Australia)
<b>Communications Champion</b>	Stephen Hostetler	(Hostetler Hydrogeology)
<b>Membership Champion</b>	Hashim Carey	(Geoscience Australia)
<b>Student Coordinator</b>	Michael Short	

#### *Local News*

#### **Australian Groundwater Conference 2015**

Don't forget to set your calendars for 3-5 November for the [Australian Groundwater Conference](#) in beautiful Canberra. Planning for the conference is well underway with IAH ACT members part of the organising committee.

#### **IAH ACT – membership renewal**

The window for renewing memberships and retaining your prized membership number is rapidly diminishing. IAH Australia will shortly update IAH International on your current membership status which will result in the loss of journal access for members who have yet to renew. You will receive notification from IAH International regarding the cancellation of your membership.

Membership renewal is also a good time to ensure your contact details are up to date. For any membership queries please contact [act.membership@iah.org.au](mailto:act.membership@iah.org.au).

#### **Thanks to our Sponsors**

IAH in the ACT continues its strong relationship with the professional groundwater community. Thanks to the generosity of our Gold Sponsors: [HydroAlgorithmics](#) and our Silver Sponsors: [GHD](#) we can continue to provide members and non-members alike with free access to world-class speakers.

#### **IAH ACT Twitter Account continues to soar**

The IAH ACT branch has set up a Twitter account to provide up-to-date groundwater information to members and non-members in and around Canberra and the world. Follow

us [@IAHACT](#) to keep informed about upcoming groundwater talks in the Capital Region, news, important scientific papers, hydrogeology job postings, conferences, workshops, and other events.

### **March 2015, Is groundwater in the Pacific Islands vulnerable to future climates? - Prachi Dixon-Jain (Geoscience Australia)**

In honour of UN World Water Day, Dr Prachi Dixon-Jain gave an IAH ACT seminar talk on the some recent work at [Geoscience Australia](#). Geoscience Australia has undertaken a first-pass regional assessment to better understand the vulnerability of fresh groundwater systems to future climates for 15 Pacific Island countries and territories. The assessment has found that there are a large number of islands in the region with groundwater systems that are potentially vulnerable to future low rainfall periods and projected sea-level rise

Islands in the Pacific region rely heavily on groundwater, and for many islands it is the only reliable source of freshwater throughout the year. Sea-level rise and changes in rainfall patterns are likely to put water resources – already under pressure from increasing populations and pollution – at further risk, threatening the long-term viability of communities and islands.

### ***Recent Meetings***

#### **December 2014, Geosocieties Christmas BBQ – GSA, AusIMM, AMSA & IAH**

IAH ACT got together with the other Canberra based geological societies for fun, BBQ and beer at the annual Geosocieties BBQ,

#### **November 2014, Field Trip to Captains Flat Mine – Led by Ian Roach and David Huston**

Gold - , silver and copper - bearing gossans at what became the Lake George mine were discovered at Captains Flat in 1872. These gossans were mined between 1882 and 1899. Between 1937 and final closure in 1962 primary zinc - lead - silver - gold - copper ores were mined, producing a total of over 4 Mt or ore grading 10%Zn, 6%Pb, 0.67% Cu, 56 g/t Ag and 1.7 g/t Au.

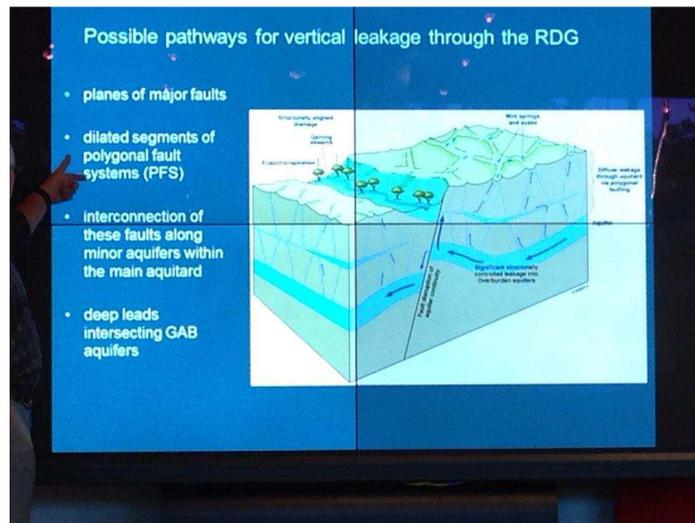
During operation of the mine, mine and mill waste water was discharged directly into the Molongolo River, resulting in significant contamination of river water. In addition, three serious pollution events involving collapse of tailings dams during floods occurred during mine operation.

After closing in 1962, the workings were filled with groundwater with the overflow going into the river. This and previous discharges during mine operations produced a major pollution problem that was the subject of joint Commonwealth - New South Wales report in 1973. In 1976 a \$2.3 million remediation program was undertaken involving tailings dam stabilisation and vegetation. This resulted in improved conditions, but in 1982, a study by Jacobson and Sparkman (1988) found that under low water flow conditions a significant pollution problem remained with detectable zinc in river water 50 km downstream from Captains Flat.

On the field trip we examined acid mine drainage at Captains Flat by looking at the geology that causes the acid mine drainage. We then tracked changes in chemistry along the river, from above the mine, at the entry of the acid mine drainage into the mine, and then down the river.

## ACT IAH AGM and Recent Advances in the Conceptual Understanding of the Great Artesian Basin - Dr Bruce Radke and Tim Ransley (Geoscience Australia)

The Great Artesian Basin (GAB) is Australia's largest groundwater basin, supporting thriving pastoral and agricultural activities, while also being host to coal seam gas, petroleum and mining extraction industries. State and Commonwealth governments have a history of supporting research on the architecture of the GAB, and the magnitude and dynamics of its groundwater resource. This talk will give a brief history of the Commonwealth's involvement in hydrogeological research, will cover some of the recent advances in the conceptual understanding of the GAB, and suggest how these new findings can assist improved groundwater resource management across the Basin.



Bruce Radke explaining the importance of vertical leakage in the GAB.



IAH ACT members at our AGM enjoying refreshments.

## **VICTORIA**

### **IAH VICTORIA BRANCH**

#### **2015 Committee (as of 14<sup>th</sup> April 2015):**

<b>Chair</b>	Alan Wade	(Aquade)
<b>Vice-Chair</b>	Ben Hall	(Eartheon)
<b>Secretary</b>	Tara Smith	(Jacobs)
<b>Treasurer</b>	Anthony Brinkley	(Jacobs)
<b>Events Committee</b>	Katy Kijek	(Port of Melbourne Authority)
<b>Communications Champion</b>	Heath Pawley	(Golder Associates)
<b>Membership Champion</b>	Alexis Valenza	(Valenza Engineering)
	Matt Currell	RMIT
	Anne Northway	EPA
<b>General Committee</b>	Riki Gresswell	CDM Smith
	Ben Moore	AECOM
	Lynton Bourne	Noel Arnold & Associates
	Mike Hoban	DEPI

### ***Local News***

Our regular branch meetings continue to be held alternatively at the RMIT City Campus. Thank you to RMIT for supplying the convenient central venue and first class facilities.

### **Annual General Meeting, April 14<sup>th</sup> 2015**

The Victorian IAH Branch Annual General Meeting will take place at RMIT on the 14<sup>th</sup> April. A number of committee positions are up for nomination, including the Chair and Vice-Chairperson, Secretary, Treasurer, General Committee Member and Student member.

Each role will be for a nominal period of TWO YEARS. Members will bring knowledge and ideas to the Committee to foster the development of the hydrogeology profession through IAH in Victoria, and through the Chairperson, to the National IAH program.

### ***Recent Meetings***

#### **3 March 2015, RMIT City Campus, Melbourne - The National Groundwater Association's 2015 Henry Darcy Lecture Series with Dorthe Wildenschild. What Happens in the Pore, No Longer Stays in the Pore: Opportunities and Limitations for Porous Media Characterisation and Process Quantification Using X-ray Tomography**

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

During this presentation, VIC members received 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.

Gained insight on how x-ray tomography has advanced to the point where it is possible to probe porous media in great detail, allowing for fully quantitative analyses of processes and mechanisms at the pore scale. Detail resolution ranges from hundreds of microns for cm-sized samples down to hundreds of nm for micron-sized objects. Contrast depends on density and atomic number of the imaged object, and creative use of contrast agents can help delineate otherwise difficult-to-identify features.

Also discussed were technique limitations, as well as new potential advances that will allow for exciting new research in coming years. Applications of the technique to remediation of non-aqueous phase liquid in groundwater, the fundamentals of multiphase flow, and geologic sequestration of carbon dioxide will be presented.

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.

#### **14 April 2015, RMIT City Campus - Pumping Test and Type Curves – the good old fashioned way!**

Have you ever wondered how those old fart hydrogeologists analysed pumping tests before computers? Ever wondered about those mysterious words “Match Point”? Or whether recovery data is really worth hanging around for? All will be revealed at the next IAH meeting. Remember to bring along your prehistoric pen, ruler, and calculator for an interactive festival of pumping test analysis.

Between them Mike and Alan have more than half a century of experience in hydrogeology including considerable aquifer testing experience. For both presenters, this experience includes long-term pumping and injection testing in a broad range of aquifers and using a broad range of analytical methods. However, both presenters are big fans of getting back to basics – and a bit old fashioned...

#### **23 June 2015, Jacobs, Melbourne - NCGRT Distinguished Lecturer, Dr. Peter Dillon. Progress in Managed Aquifer Recharge and the Water Banking Frontier followed by an interactive session: "Listening to local MAR progress, plans and implementation issues".**

Twenty two years of CSIRO and partners' scientific research on managed aquifer recharge with urban stormwater and recycled water, has involved a combination of monitoring of first of breed demonstration projects, synthesis across projects, laboratory studies and modelling.

This free lecture will cover a retrospective on some key research findings that together with our national treasures have given Australia an international head-start on the practice of MAR with urban stormwater and on MAR guidelines and policy. Myths that have deferred uptake and remaining research gaps will be exposed.

The talk will also project forward to reveal new technical, policy and institutional considerations for implementing water banking for drought security. It will conclude with a concise summary of current activities of the IAH Commission on MAR.

## **WESTERN AUSTRALIA**

### **IAH WESTERN AUSTRALIA BRANCH**

#### **2015 Committee:**

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

#### ***2015 Local News***

On behalf of the WA committee hello and welcome to our members new and old to the first quarterly catch up for 2015.

The focus of the WA committee in the first Quarter of 2015 has been on Membership and locking in our professional and social events calendar for the year.

We have had two talks so far; Dorthe Wildenschild's Darcy Lecture (2014) and Anastasia Boronina & Russell Clayton's joint presentation on the Gateway Project. See reviews below.

The next quarter is a busy one and includes our co-hosted Two Day seminar, **Water Management for Shale and Tight Gas Resources** to be held at the Parmelia Hilton **8<sup>th</sup> to 9<sup>th</sup> of June**. Please check our website for details.

## ***Recent Meetings***

### **February, Darcy Lecture – Dr Dorthe Wildenschild – Optimizing Capillary Trapping as a Carbon Dioxide Mitigation Strategy: Pore-Scale Findings in Support of Larger-Scale Implementation**

Dorthe's well-presented lecture examined how x-ray microtomography is being studied for possible use as a technique to optimize capillary trapping of carbon dioxide. Capillary trapping is a mechanism supporting carbon capture and storage, which is being considered as a mitigation strategy for emissions from concentrated sources such as coal-fired power plants.

Results so far indicate that carbon dioxide injection can be manipulated to facilitate optimal trapping of residual carbon dioxide.



### **March, Dr Anastasia Boronina and Russell Clayton: An improved methodology for the determination of design groundwater levels for civil construction projects**

We're a resources-focussed IAH branch, on the whole, and when we model groundwater levels to within 1m accuracy we're usually doing well. Anastasia's talk on 10 March outlined a different set of challenges. The Gateway Project team needed a higher-resolution assessment and faced the dilemma: be conservative with the predicted maximum groundwater levels and add tens of millions of dollars to the design costs; or be less conservative and face the prospect of flooding within 'bath' structures. Anastasia and Russell's talk turned out to be an interesting and well-attended insight into the challenges and opportunities facing civil engineering hydrogeology. Thanks to the Australian Geomechanics Society for co-hosting the event.



### ***Upcoming Events***

Follow event updates <http://www.iah.org.au/events/western-australia> or on [Facebook](#)

#### **20th May 2015: Jon Hanna - Hydrogeology of the West Canning Basin**

Jon Hanna will present the recent work being undertaken at the West Canning Basin.

**When:** 20th May 2015, 5:30 pm to 7:00 pm

**Where:** The Fortescue Training Centre, Level 3/87 Plain St, East Perth WA (corner of Adelaide Terrace)

**Cost:** The event is free to attend

#### **8-9 June 2015: 2015 Seminar – Water Management for Shale and Tight Gas Resources, Joint IAH / SPE / ASEG Annual Seminar**

**When:** 8 and 9 June 2015, all day

**Where:** Parmelia Hilton, Perth

**Cost:** See event details at <http://www.iah.org.au/events/watershale2015/>

## **SOUTH AUSTRALIA**

### **IAH SOUTH AUSTRALIA BRANCH**

#### **2015 Committee:**

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

***No update available in this edition.***

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

## NORTHERN TERRITORY

### *Recent Meetings*

A field trip around the local Darwin area was held on the 22nd of February in conjunction with the Darcy lecture. Our distinguished guests and members got to experience the Wet season first hand but a good time was had by all despite the rain.



Peels Well, Darwins first water supply



Some Jurassic fauna at our morning coffee stop

The NT Branch recently made a submission to the Controller of Water Resources commenting on a licence application for groundwater extraction at Rocky Hill, Alice Springs. The letter can be viewed from <https://www.iah.org.au/events/northern-territory>.

### *Upcoming Events*

A field trip to Sybil Springs, a hot spring located 140 km south of Darwin will be held on Sunday the 14th of May. More details can be found from <https://www.iah.org.au/events/northern-territory>.

This year's Darcy lecture will be held in Darwin on the 20th of August. More details to follow.

## **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: 2015 Dr Rainer H. Helmig**

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

**Lecture 1: Evaluating the Competitive Use of the Subsurface: The Influence of Energy Storage and Production in Groundwater**

**Lecture 2: Modelling and Analysis of Soil-Moisture Processes in the Subsurface: The Influence of Evaporation and Salt Precipitation in Groundwater**

For abstracts, see <https://www.iah.org.au/events/darcy-lecture-2015>

#### **Locations**

<b>Sydney</b>	Mon 10 August, 6pm; AECOM offices, Level 21, 420 George Street, Sydney Tue 11 August, TBC
<b>Canberra</b>	Thu 13 August, 5:30pm; Golder Associates, Wurundjeri Room, Level 4, Bldg 7, Botanica Corporate Park, 570-588 Swan Street, Richmond
<b>Melbourne</b>	Mon 10 August, 6pm; AECOM offices, Level 21, 420 George Street, Sydney Tue 11 August, TBC
<b>Hobart</b>	<b>TBC</b>
<b>Adelaide</b>	Tue 8 August, 4pm; The Department of Water Auditorium, The Atrium, 168 St Georges Terrace
<b>Darwin</b>	Thu 20 August, 5:30pm; Charles Darwin University, Room TBC:
<b>Brisbane</b>	Tue 8 August, 4pm; The Department of Water Auditorium, The Atrium, 168 St Georges Terrace



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.



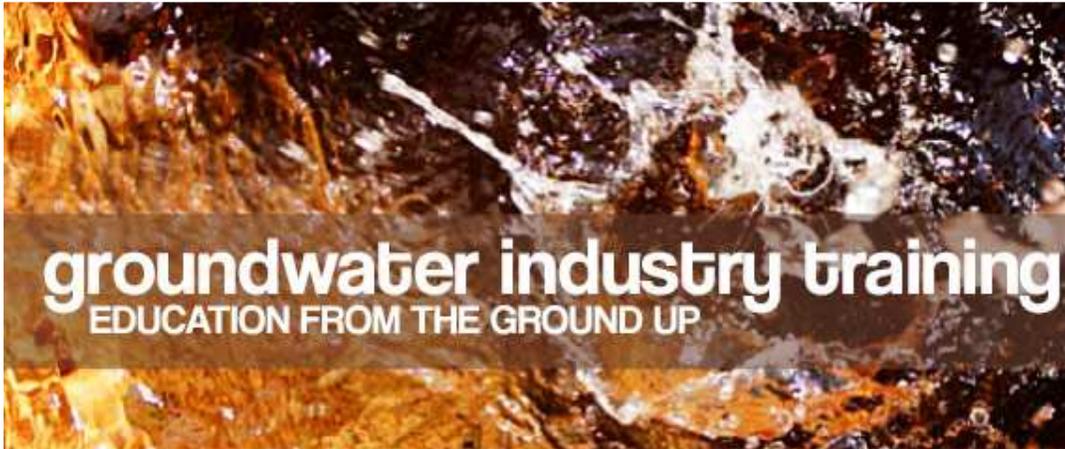
The seminar will have a particular WA focus on the issues of water resources management and protection, technologies available to prospect, assess and develop unconventional hydrocarbons, risk assessment and mitigation as well as government regulations and guidelines. Case studies from Australia and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

**Early-bird registrations open 15<sup>th</sup> February, 2015**

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

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

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



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



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](http://www.iah2015.org/registration) and follow the procedure to register.



## **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](http://www.iah2015.org/sessions) .

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**AUSTRALIAN  
INSTITUTE OF  
GEOSCIENTISTS**

## Hydrogeology in Mining – A One Day Conference

The SA Branch of the Australian Institute of Geoscientists presents a one-day conference on hydrogeology in mining on 1 May 2015 at the Regal Park Motor Inn, North Adelaide.

The conference will focus on mining and energy resources. The speakers are industry professionals drawn from mining and energy companies, government bodies and consulting firms.

The Conference aims to provide information exchange and awareness raising among the South Australian mining and hydrogeology communities. The Conference programme provides talks covering a range of groundwater fields.

For more information, see: <http://www.aig.org.au/events/hydrogeology-in-mining-a-one-day-conference/>.

## **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](mailto:customer.service@macmillan.com.au) or [orders@macmillan.com.au](mailto: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](mailto:secretariat@iah.org.au)