

# NEWS

# & information

IAH - THE WORLD-WIDE GROUNDWATER ORGANISATION

Furthering the understanding, wise use and protection of groundwater resources throughout the world

## AUGUST 2018

### Also in this issue:

Media Focus

Guarani Aquifer Agreement

Member news and initiatives

Commissions & Networks

Media Focus

Chapter updates

Conference listing

and the regular IAH  
announcements and news



거기서 만나 (geogiseo manna; meet you there)

We're getting ready for IAH's 45th congress in Korea, which is offering a fascinating mix of culture and sights, and the chance to network and share knowledge with global colleagues... are you? *Page 48*

### MALAWI: A NEW IMPULSE FOR GROUNDWATER



Feature from the Climate Justice Fund:  
Water Futures Programme, University  
of Strathclyde, Glasgow. *Page 10*

### HYDROGEOLOGY OF CHALK AQUIFERS



IAH colleagues have been busy  
organising and attending meetings and  
events. *Reports, pages 20-27*

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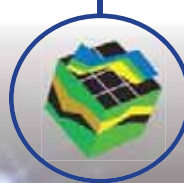
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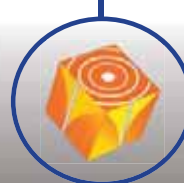
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[www.iah2018.org](http://www.iah2018.org)



**KIGAM**



## Reaching out...

As you will read in this newsletter, IAH continues to be busy engaging in the international debate on sustainable development and water protection. Several IAH members, from Council, Commissions and Networks, and Chapters, have responded to consultations and attended meetings with the World Water Council, groups within the “UN family”, and sister organisations, to get groundwater to those with influence.

Getting the ‘groundwater message’ across to others is critical. Language differences across countries can sometimes be a challenge, but ways of thinking and use of different terminology by other disciplines, including planners and policy makers, can be even more of a barrier to mutual understanding. Explaining complex scientific issues while maintaining the attention of others can be difficult... *And* while keeping abreast of the future, biggest challenges in hydrogeology - we’re making a call for your input on this.

Patience and resilience are often needed in strategic cooperation, as can be seen from former Latin America Vice President Luiz Amore’s article on the signing of the Guarani Aquifer Agreement between the governments of Argentina, Brazil, Paraguay and Uruguay. In Malawi we can also see that perseverance pays off. After some years of ambition to form a national chapter, we now have what is currently an informal grouping of 50 new IAH members, supported by Strathclyde University and the Scottish Government.

We continue to have interest from other countries in establishing national chapters, including recently Afghanistan, Ecuador, Namibia, Panama, Paraguay and Peru. We will be pleased to provide support, and to continue this for existing chapters and members across the world.

This newsletter also mentions the new website feature on hydrogeology courses, with more information to be released on education shortly. It’s also good to see several companies and institutes amongst the list of new members – IAH encourages more corporate supporters, to help develop services to all members.

I hope to see many of you in Daejeon – it is not too late to register! See also, confirmation of Malaga for IAH 2019!

IAN DAVEY



[idavey@iah.org](mailto:idavey@iah.org)

## IN THIS ISSUE

Media Focus .....	6
In Memorium .....	7
Malawi: A New Impulse for Groundwater .....	8
Guarani Aquifer Agreement .....	10
Ask a Member .....	12
Education and Personal Development .....	15
New Members .....	17
IAH and your data .....	19
Meeting Reports .....	20
IAH News.....	28
Commissions & Networks.....	32
Chapter News .....	36
45th IAH Congress Korea information .....	38
Diary Dates and Events.....	40

## ADVERTISING AND COPY INFORMATION

IAH News and Information is published 3 times a year. It is distributed as an insert in Hydrogeology Journal and is also published via IAH’s website and email alerts. It reaches all members and supporters of the International Association of Hydrogeologists – around 8000 people – and can also be freely downloaded by individuals worldwide for personal/not for profit use. We are happy to consider possible news articles from our members and others in groundwater-related professions.

We also accept commercial advertisements.

Advertising rates are €300 per full-page advert and €200 per half page. These rates apply for one issue. If you take an advert in two successive issues then the third is offered free of charge.

Corporate sponsors and corporate members of IAH are entitled to 50% off the above rates.

Copy dates are 1 March, 1 June and 1 October.

Email [knicholson@iah.org](mailto:knicholson@iah.org) for further details.



# MEDIA FOCUS

A selection of groundwater features from around the world

## USA: COAL ASH AND GROUNDWATER CONCERNS

Despite requests from environmental groups for more time to review recent dumps of groundwater monitoring data from power companies, the Environmental Protection Agency (EPA) is moving ahead to finalize a proposed overhaul of the Coal Combustion Residuals (CCR) rule.

<http://www.powermag.com/epa-rampaging-on-coal-ash-rule-despite-groundwater-concerns/>

## AS WELLS DRY, ZAMBIA REGULATES USE OF GROUNDWATER

Faced with longer droughts and growing water demand, the Zambian government has introduced fees on groundwater use.

<https://af.reuters.com/article/topNews/idAFKCN1IH1EN-OZATP>

## SEVERE URANIUM CONTAMINATION IN INDIA'S GROUNDWATER

Scientists have found widespread uranium contamination in groundwater from aquifers across 16 states in India, much above the WHO provisional standard for the country.

<https://www.thehindu.com/sci-tech/science/severe-uranium-contamination-in-indias-groundwater-study/article24122258.ece>

## INDIA FACING THE 'WORST WATER CRISIS IN ITS HISTORY'

India is facing its worst-ever water crisis, with some 600 million people facing acute water shortage, a government think-tank says, with 21 cities likely to run out of groundwater by 2020.

<https://www.bbc.com/news/world-asia-india-44492994>

## GROUNDWATER COULD TRIGGER EARTHQUAKES

Study explores whether seasonal fluctuations in local aquifers might explain cycle of expansion and contraction, potentially triggering earthquakes.

<https://www.livescience.com/62890-groundwater-levels-major-earthquakes.html>

## CHILEAN VILLAGERS CLAIM BRITISH APPETITE FOR AVOCADOS IS DRAINING REGION DRY

British supermarkets are selling thousands of tonnes of avocados produced in a Chilean region where villagers claim vast amounts of water are being diverted and rivers have dried up and groundwater levels have fallen, causing a regional drought.

[https://www.theguardian.com/environment/2018/may/17/chilean-villagers-claim-british-appetite-for-avocados-is-draining-region-dry?CMP=share\\_btn\\_tw](https://www.theguardian.com/environment/2018/may/17/chilean-villagers-claim-british-appetite-for-avocados-is-draining-region-dry?CMP=share_btn_tw)



# In Memorium

We sadly announce the death of the distinguished hydrogeologist Paul Younger.

After studying at Newcastle University and Oklahoma State University, Paul returned to Newcastle University for his Ph.D. on numerical modelling of water resource systems. He went on to establish the Hydrogeochemical Engineering Research and Outreach group at Newcastle and became a Professor there in 2001. He also served as Public Orator (2004–2010) and as Pro-Vice-Chancellor for Engagement (2008–2010). In 2012 he moved to Glasgow University to lead their Energy Institute. His research was broad, spanning geology, water resources, hydrogeology, environmental engineering and most recently low-carbon energy, notably deep geothermal energy, underground coal gasification with carbon capture and storage, and hydropower. He is perhaps most renowned for his internationally leading research on minewater remediation, which was awarded the Queen's Anniversary Prize in 2005. His contribution to science and engineering was recognised at the highest levels when he was honoured as a Fellow of the Royal Academy of Engineering in 2007 and as a Fellow of the Royal Society of Edinburgh in 2016.

We offer our sincere condolences to his colleagues and family.

BRUCE MISSTEAR, IAH SECRETARY GENERAL

Also announcing the loss of Dr. Mario Alberto HERNÁNDEZ (1942-2018) Professor Emeritus of the National University of La Plata, Argentina.

Mario was a very important promoter of science and especially of hydrogeology in Argentina, and within that framework he integrated the Founding Commissions of the Argentine Chapter of the International Association of Hydrogeologists and served as President of the Latin American Association of Underground Hydrology for Development (ALHSUD) in the periods 1998-2002 and 2002-2006.

Mario was a Geologist and PhD in Natural Sciences of the National University of La Plata (UNLP). Holder of the Chair of Hydrology and Environmental Geohydrology (Postgraduate). Director of the Master's in Ecohydrology UNLP. Prize of the National Academy of Cs. Exact, Physical and Natural, of the Argentine Geological Association, Latin American Association of Underground Hydrology (ALHSUD), Honorary Membership of the International Association of Hydrogeologists. Scientific researcher of the National Council of Scientific Research (CONICET) until 2011 (retired). Director of Projects and Research Programs. Director of Scientific Researchers and PhD Thesis. More than 200 scientific articles published in Journals, Seminars, Symposia, Proceedings of Congresses, Books and Chapters of national and foreign books. Independent consultant.

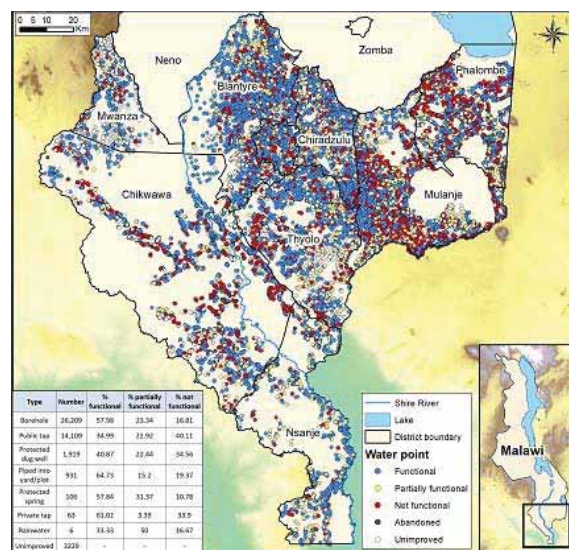
ANTONIO CHAMBEL, IAH PRESIDENT





# MALAWI: A NEW IMPULSE FOR GROUNDWATER

Malawi is a water rich country and home to the third biggest lake of Africa. Malawi's surface waters are not only an important social, environmental and economic asset for the country, but also source of currently 98% of the country's energy supply. Groundwater, on the other hand, is also present in huge quantities, generally identified with three hydrogeological formations: alluvial aquifer, weathered basement and fractured basement. The first two presenting a relatively large potential for groundwater development, although the alluvial systems can contain some clayey sediments. In spite of that, groundwater has historically been seen only as the alternative source for rural communities with no access to surface water. Recently, technology, higher demands and a new regulatory framework are changing this approach and trying to actually incorporate groundwater as a strategic resource for the sustainable development of Malawi.



## Roadmap to SDG6

Malawi is on its way to achieving United Nation's Sustainable Development Goal 6 (SDG6) by 2030. Currently, it is estimated that 85.7% of the rural population have access to improved water supplies, compared to 63.9% in 2005 (Integrated Household Survey IHS2 2004/2005 and IHS4 2016/2017 respectively). Several programmes contemplate the long-term investment strategy to achieve that goal (i.e. National Water Resources Master Plan and Malawi Rural Water Supply Investment Plan) and recognise groundwater as the key supply for rural areas and, therefore, key to achieve SDG6.

## Change in the water sector

Significant to the water sector in Malawi was the passing in 2013 of the new legislation, "Water Resources Act 2013". Many entities were created such as the National Water Resources Authority (NWRA), Catchment Management Committees, the Water Tribunal etc. Although still to be fully operational, the NWRA aims to ensure the orderly development, management and protection of the groundwater resources. The Water Resources Regulations will shortly complete this new legislative framework.





## Groundwater research

There are many challenges remaining including deforestation, extreme weather events, available technology, data management, aging and non-functional infrastructure etc. Asset management, monitoring and evaluation and research (including deep formations for groundwater development) are amongst the most important areas of work for the Ministry of Agriculture, Irrigation and Water Development (MoAIWD).

These areas are being targeted by the Climate Justice Fund: Water Futures Programme led by the University of Strathclyde funded by the Scottish Government. Hence, a key objective of the Programme is to map all the water points (boreholes, shallow wells, springs etc.) and potential contamination sources located within a 100 m (pit latrines, wastes sites etc.) by next year. So far, more than 25,000 water points and 70,000 sanitation points across the Southern Region have been mapped. This project will help local and central governments to identify their planning and investment needs and to reduce the pressing issue of non-functional water points currently estimated at 20-40%.

Similarly, joint research in areas such as drilling practices, borehole's preventative maintenance and transboundary aquifers is simultaneously being performed.

## National Groundwater Development Plan

Collaboration with the Groundwater Division of the MoAIWD has been carried out to establish an initial framework for the National Groundwater Development Plan, which might guide the strategy and required investments of future groundwater related projects. Increasing functionality ratios, increasing yields, achieving full potential of shallow aquifers, exploring deeper formations and conservation and other measures have been the proposed solutions to realise the full sustainable groundwater potential of the country, which is estimated to be 22 times current demand.

## IAH Malawi Chapter

In addition to this support, the CJF has sponsored 50 groundwater experts to encourage discussion about sustainable groundwater management in Malawi, facilitate international networking, promote leadership and pursue the creation of the IAH Malawi Chapter. Through the Groundwater Division of the MoAIWD, this future Chapter will seek to foster the management, assessment, protection and research of hydrogeology across the country, including the provision of trained hydrogeological expertise and the raising of public awareness. Hopefully this will become a reality very soon and Malawi will be much better placed to share experiences locally and internationally and enhancing the strategic positioning and profile of groundwater within Malawi's water resources.



Amando Borge. Research Assistant. Climate Justice Fund: Water Futures Programme. University of Strathclyde. Glasgow, Scotland. United Kingdom. ([www.cjfwaterfuturesprogramme.com](http://www.cjfwaterfuturesprogramme.com)).

Michael O. Rivett. Research Fellow. Climate Justice Fund: Water Futures Programme. University of Strathclyde. Glasgow, Scotland. United Kingdom. ([www.cjfwaterfuturesprogramme.com](http://www.cjfwaterfuturesprogramme.com)).

Macpherson G. M. Nkhata. Chief Hydrogeological Research Officer. Groundwater Division. Water Resources Department, Ministry of Agriculture, Irrigation and Water Development. Government of Malawi.

Update from Luiz Amore

# GUARANI AQUIFER AGREEMENT

Approval by national parliaments of Argentina, Brazil, Paraguay and Uruguay

The Guarani Aquifer Agreement has been approved by the four nations' parliaments, with effect from May 2018. This agreement will allow countries to implement technical instruments and a management support system, and consider different institutional levels and available information.

National presidents from each of the four countries signed the agreement in 2010, directly after the Guarani Aquifer Project (Global Environment Facility-GEF) execution in the preceding years. Recent articles on the Guarani Aquifer (GA) have attempted to explain why this agreement took 8 years to be implemented (e.g. Sindico, Hirata and Manganelli, 2018), as well as investigating the potential perspectives of the agreement (e.g. Amore, 2018). Crucial elements to the agreement's implementation are the Guarani Aquifer Strategic Action Plan to be executed by the four countries, the Sustainable Development Goals (SDGs), and the National Determined Contribution of the Paris Agreement (NDC).

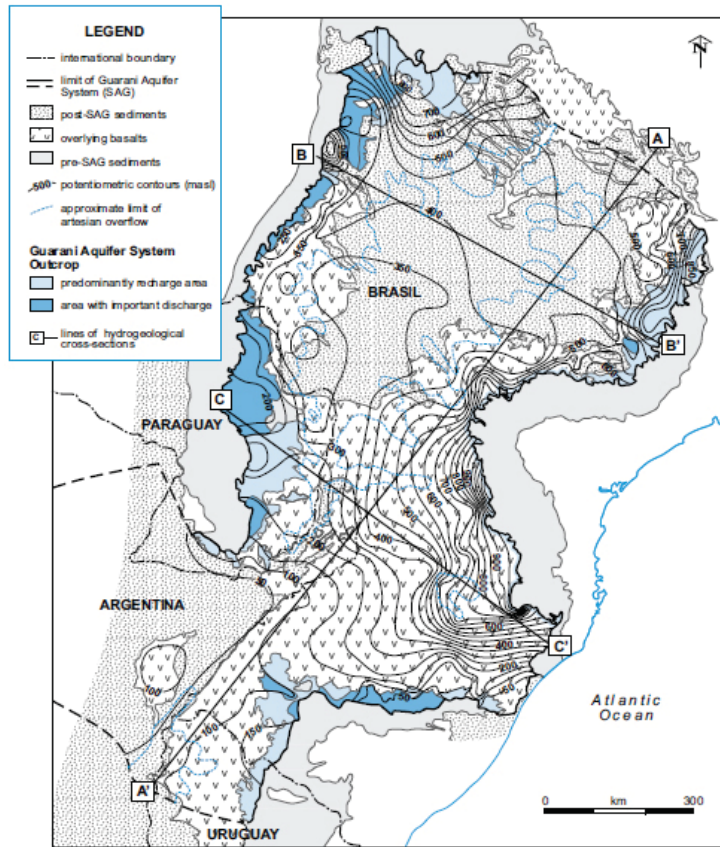
Over the years, organisations and countries have been working on regional programs and South-South cooperation strategies. Some bilateral initiatives on hydrologic monitoring network, early warning systems on floods security and capacity building involving Brazil (National Water Agency) and many South American countries (including all the GA countries) have been implemented, but with very few notable actions on groundwater. A few actions recommended by the International Hydrological Program (UNESCO) and National Agencies (Guarani Recharging Areas in Brazil) were executed since the Guarani Aquifer Project conclusion. A new Centre for Groundwater Management for Latin America and the Caribbean - CEREGAS (UNESCO Category II Centre in Uruguay) - was launched in 2015 and some local initiatives have been developed in the pilot areas of the Guarani Aquifer Project.

Now the strategies for the execution of SDGs and NDCs are under development in all GA countries. Groundwater initiatives from regulatory and academic institutions are being disseminated in national priorities, subnational agencies, in the case of federal countries (Argentina and Brazil), and areas where locally there may be potential conflicts. During the Guarani Aquifer Project groundwater emerged onto the regional policy agenda, but permanent strategies on groundwater, conjunctive water uses and on the Guarani Aquifer are yet to be delivered by countries. Perhaps CEREGAS and new regional initiatives can support national, subnational and local authorities in the agreement's implementation, and to raise groundwater as a top priority once more? Certainly, it is hoped that the immediate implementation of the Agreement can now promote a new era for the countries in their management of groundwater and water in general, recovering their leadership role worldwide.

LUIZ AMORE

FOREIGN AFFAIRS CHIEF ADVISOR OF THE NATIONAL WATER AGENCY OF BRAZIL AND SECRETARY OF THE BRAZILIAN CHAPTER OF IAH

Figure 1 : Schematic hydrogeological map of the Guarani Aquifer System



Source: <http://documents.worldbank.org/curated/en/629071468052154369/Brazil-Paraguay-Uruguay-Argentina-the-Guarani-aquifer-initiative-for-transboundary-groundwater-management> - see 3) below.

## REFERENCES:

- 1) Sindico, F. Hirata, R. and Manganelli A. (2018) The Guarani Aquifer System: From a Beacon of Hope to a question mark in the governance of transboundary Aquifers. *Journal do Hydrology*, Elsevier. <https://www.sciencedirect.com/science/article/pii/S2214581817303464>
- 2) Amore, L. Perspectives on Guarani Aquifer Governance (2018). In: *Advances in Groundwater Governance*. CRC Press. Chapter 27 (540-554pp). <https://www.crcpress.com/Advances-in-Groundwater-Governance/Villholth-Lopez-Gunn-Conti-Garrido-Gun/p/book/9781138029804>
- 3) See also: GW-MATE Sustainable Groundwater Management: Concepts and Tools Sustainable Groundwater Management, Lessons from Practice, Case Profile Collection Number 9, The Guarani Aquifer Initiative – Towards Realistic Groundwater Management in a Transboundary Context (World Bank Publication, authors: Stephen Foster, Ricardo Hirata, Ana Vidal, Gerhard Schmidt & Hector Garduño) <http://documents.worldbank.org/curated/en/629071468052154369/Brazil-Paraguay-Uruguay-Argentina-the-Guarani-aquifer-initiative-for-transboundary-groundwater-management> / [http://siteresources.worldbank.org/INTWAT/Resources/GWMATE\\_English\\_CP\\_09.pdf](http://siteresources.worldbank.org/INTWAT/Resources/GWMATE_English_CP_09.pdf)



# Ask a Member...

A feature for IAH members to share thoughts, experiences and suggestions...

Shrikant Limaye (India) has kindly offered to contribute this issue. A long standing IAH member and groundwater consultant, Shikrant is also Past President of AGID (Association of Geoscientists for International Development) and co-founder of IAPG (International Association for Promoting Geoethics). With such a background and wealth of experience, he has many interesting and useful comments for us...



## Tell us a little about yourself....

I am a hydrogeologist by birth. My father Mr D.G. Limaye graduated in Agricultural Science in 1931 and started working as a groundwater consultant for farmers in 1933. From 1950, when I was 12 years old, I used to accompany him on fieldwork during school vacations. My early training involved travelling by bicycle on village roads, talking to farmers, visiting dug-wells to see the rock types, making field notes, and eating very spicy (hot) food at farmers' homes...

I graduated with First Class Honours in electrical Engineering in 1959 from the University of Poona and was offered a scholarship to study Power Engineering at Purdue University in America. But I really wanted to join my father's profession, so I went on to the Indian Institute of Technology, Kharagpur (IIT – KGP) and graduated with an MTech degree in Exploration Geophysics a few years later.

From 1962 to 1969, I worked with my father. In this period we developed an advanced model of an A.C. Electrical Resistivity Meter, which was quite an improvement over our old D. C. Resistivity Meter. Indeed, we were the first team in India to use a resistivity meter for groundwater exploration in the private (non-government; non-university) sector. Our clients were the industries facing water shortages - farmers could not afford the cost for resistivity exploration by our small team of two experts, four assistants and eight to ten labourers.

In 1969, I got scholarship to study groundwater exploration in a six-month course at Ground Water Centre (GWC) of the Hebrew University in Jerusalem. In those days, Israel used to suffer from

many terrorist attacks on civilians. But my wife Pushpa fully supported my going to Israel, even though our three children were very young. In Jerusalem, I had first-hand experience with bomb-explosions twice: at the Supersol Market in central Jerusalem and at the cafeteria in Hebrew University. I missed both these explosions merely by a matter of a few minutes.

This course at the GWC was sponsored by UNESCO and the Government of Israel. It was a big step in my career. Prof. Samuel Mandel was the chief instructor for the course - he was a very practical teacher and had worked on groundwater development projects in many countries. He gave case studies from his projects in Iran, Korea, Mexico, Columbia etc. GWC also invited outside experts like Prof. Arie Issar of 'Ben Gurion University of the Negev' to teach at this course. I consider myself very fortunate that I was a student of Prof. Samuel Mandel and Prof. Arie Issar.

AGID & ME: The 24th International Geological Congress (IGC) was held in Montreal in 1972. In this IGC, a group of Canadian Geologists including Prof. Roger Blais (who later on was honoured with the title "Order of Canada"), Dr Antony Berger and other like minded geoscientists from various countries decided to found AGID (Association of Geoscientists for International Development) with financial support from CIDA (Canadian International Development Agency). AGID held its first election of the Council the during the 25th IGC in Sydney, and I was elected as a councillor. This position gave me the opportunity to visit several countries including Venezuela, USA, Russia, France and Thailand, in order to attend Council Meetings.



*“While collecting hydrogeological data, talk to the local people – the farmers, etc. Show interest in their problems. The local people often give valuable information from their experience.”*

Later on in 1996, I was elected as AGID President and worked for 8 years till 2004, when Ms Afia Akhtar, Director General of the Geological Survey of Bangladesh was elected as President. I am still associated with AGID as Past President and Ex-Co member. Like IAH, AGID is affiliated to IUGS. For the past 32 years I have been publishing “AGID Newsletter” from my office in Pune, India.

### Why did you join IAH?

Prof. Arie Issar from Israel, mentioned above, told me about IAH and persuaded me to join as a member. At the beginning of the new millennium I had completed 25 years of membership and received an anniversary certificate from Dr Andrew Skinner, IAH Secretary General. In those days paying membership dues in hard currency was sometimes a problem for a private groundwater consultant like me but somehow my IAH membership survived.

### What would you say have been your career highlights, successes, etc.?

- I had an opportunity to work as a groundwater consultant in Nigeria (on a World Bank project); in Laos (on a project by FAO-Rome) and in Bangladesh (on Asian Development Bank's "1st Agricultural Project").
- My UNECO-IUGS-IGCP Project "Ground Water Network for Best Practices in Ground Water Management in Low-Income Countries" has been perhaps the most successful Project under IUGS-IGCP umbrella. Its website [www.igcp-grownet.org](http://www.igcp-grownet.org) has received around 35,000 visits to date.
- In IAH Congress in Beijing in 2006, IAH honoured me with a citation and with "Honorary Life Membership" of the Association.
- From 2010 onwards, I started promoting Geoethics for eco-friendly and socio-friendly use of Geo-Resources. In 2012, at the 34th IGC in Brisbane, myself and my friend Dr Silvia Peppoloni (from Institute for Geology and Volcanology – Rome) founded the IAPG (International Association for Promoting Geoethics – Website [www.geoethics.org](http://www.geoethics.org)). Nowadays, IAPG has

members in 124 countries and a network of 30 national sections. I am Vice President of IAPG and Dr Silvia is the Secretary General. In 2016, Dr Silvia also got elected to the IUGS Council.

- In 1970s, in an Agricultural Development Project in Chhattisgarh area in India, my father and I surveyed 1,500 farms of small farmers (below 1.5 Ha land-holding) in three years period and advised on dug wells in order to obtain groundwater for small-scale irrigation. These farmers were traditionally taking only one crop of paddy in a rainy season. After digging wells, they started growing wheat in winter and vegetables and flowers on tiny plots in summer season. The improvement in the income and in the living conditions of these poor farmers was an incredible sight for us.
- In my capacity as groundwater consultant for cement factories in the coastal area of Gujarat state in India, I advised that the lowest bench of open-cast limestone mining pits of the factories should be used in the rainy season for collecting rain water and augmenting recharge to groundwater body. Such practice of using the high level mining pits for recharge to groundwater pushed back the sea water/fresh water interface and many dug wells of coastal farmers started providing better quality of water for irrigation. It also created very cordial relations between the cement factories and the farmers in surrounding villages.



Taking water level measurements is a regular work for any Hydrogeologist. (Here I am sitting by the side of a dug well, in drought-prone area.)

[continued over...]

## MEMBER MATTERS

[...continued from previous]

Any career “low points” or experiences you have learned from, that you are willing to share with others? Particular challenges?

In fractured hard rock aquifers, even after conducting proper exploration for selecting suitable sites for digging open wells or drilling bore wells, there is unfortunately 10% failure in bore wells and 5% failure in dug wells. A failed dug well becomes dry in summer but at least gives some water for irrigation in other seasons. A failed bore well is a total failure. Also that hydro-fracturing is not possible in low-income countries.

What piece(s) of equipment/software/item have you found the most useful/you could not have managed without throughout your career?

A geological hammer, a 30m tape to measure depth to water table, a GPS monitor, a drinking water bottle, good quality field shoes, a sunhat, goggles, a packet of biscuits and a notebook are essential for field work by an individual hydrogeologist.

What are your concerns now or for the future, relating to groundwater/hydrogeology?

Watershed protection with soil and water conservation methods and forestation should be taken up with active participation of local people. Watershed is the interface or meeting point climatology and hydrology/hydrogeology. Sustainable surface water and ground water could be obtained only if the watershed is well maintained and forested.

What three tips might you give to someone just starting out on their study or career?

Always remember that:

1. Groundwater is a hidden source flowing through a complex matrix of fractures in hard rocks or through intercalated layers of sand and clay. Whatever we do in mathematical hydrogeology and modelling is often under assuming highly simplified conditions which may not necessarily be true out in the field.
2. Always give prime importance to field work and well-inventory.

3. While collecting hydrogeological data, talk to the local people – the farmers, etc. Show interest in their problems. The local people often give valuable information from their experience.

Your future plans? Aspirations?

At 81 years of age, preparing long term future plans is not practical. In short term, I wish to promote Socio-Hydrogeology. Also, keeping good health is essential for doing field work. I have therefore been practising Yoga and Pranayama for many years.

What has being a member of IAH brought to you?

IAH has got me friends in many countries. The Papers in Hydrogeology Journal give a glimpse of the research being carried out by scientists working in the forefront of hydrogeology, expanding our horizon of knowledge about groundwater.

Is there anything IAH should be doing? Could do better?

IAH as an Association is already doing great in membership service. If possible, a Membership Directory may be published every five years with postal and email addresses of members in each country. *[ed: we have an “opt in” online directory in our Members’ Area...].*

Additional comments – matters you would like to raise?

Hydrogeology Journal is giving us more than 1600 pages per year for reading and thinking. But I do not see any discussions on the published papers - so I wonder how or if the members find time to read them?

In many developing countries including India, there is a tendency to recognise only the work done by Government Institutions/Departments and Universities. The technical work done by the private sector, although appreciated at international levels, remains neglected in India.



[http://www.bgs.ac.uk/agid/AGID\\_Index.html](http://www.bgs.ac.uk/agid/AGID_Index.html)

<http://www.geoethics.org/>





# EDUCATION AND PERSONAL DEVELOPMENT

## New Degree Course Area on IAH website

We are pleased to confirm that we have implemented a new “degree course” area on the IAH website. The listing is intended to provide details of Primary, Masters and Postgraduate degree taught courses in Hydrogeology, Groundwater Hydrology and formal CPD training courses in closely related disciplines. It has been formatted in a similar style to that of our other listings. Further to our first call for submissions last year, at present the listing is small - we hope this will quickly grow, and urge degree course providers to submit details using the form provided.

Over the coming months we will be adding further education pages to our website - the education group are busy finalising additional information for the general public as well as professionals and students. We'll keep you posted.

SECRETARIAT



Degree course listing: <https://iah.org/knowledge/degree-courses>

Submit degree courses: <https://iah.org/knowledge/submit-a-degree-course>

Questions/comments? Email [info@iah.org](mailto:info@iah.org)



## Latest news on IAH Mentoring Scheme

A call for registrations was made in April 2018. Thanks to all those - potential mentors (advisors) and mentees (recipients) - who submitted forms. We have your information safe and will be processing it over forthcoming weeks, making contact as appropriate. Please be patient, we take care over the applications and it takes a little time for us to consider next steps for each individual.

As we are always seeking additional mentors we have kept registrations open for interested individuals. If you have time to spare to help support mentees, we know it would be appreciated.

As part of IAH's “Forward Look” process, we will be undertaking a review of the scheme to date. Look out for further announcements.

SECRETARIAT



<http://iah.org/knowledge/mentoring> (general information)

<https://www.surveymonkey.co.uk/r/IAHmentor18> (mentor registrations)



[continued over...]

AUGUST 2018

## MEMBER MATTERS

[...continued from previous]



# New Members

A warm welcome to the following new members, who joined our Association in the period 5 March - 13 June 2018:

### AUSTRALIA

Dr Sina ALAAGHMAND  
Mark ARMSTRONG  
Ethan BARROWCLOUGH  
Justin BELL  
Madeleine BERGMEIER  
Alexander BUZACOTT  
Sarah CHAPMAN  
Michael COWIN  
Mr Randall COX  
Mr Fraser DALY

### *EMM CONSULTING (c)*

Richard FASSBENDER  
Joel GEORGIOU  
Carl GREENALL  
Lisa GURIEFF  
Anna HAIBLEN  
Julia HEIDE  
Lauren HOUTHUYSEN  
Rezaul KARIM  
Penelope KING  
Hanieh KOSARI  
Jarred LLOYD  
Angus LOVE  
Pride MANGEYA  
Margaret MCCORMACK  
Joshua O'CONNOR-COONEY  
Mrs Elizabeth PLOTNEK  
*POWER AND WATER CORPORATION (c)*  
Michelle RHODES  
Taya RUDOLPH  
Sally SALMON  
Tasha SEEKAMP  
Meegan SMITH  
David TAFT  
Andrew TREASURE  
Isaac TREVIS  
Mr Michael van Mourik  
Willy VAN VAERENBERGH  
Gabrielle WIGLEY

### AUSTRIA

Mr Friedrich VOLKMER

### BELGIUM

Julie PLUNUS  
Kenneth SEYS

### BOTSWANA

Mr Kabelo RAMADITSE

### BRAZIL

Augusta Briebe Busata MORAES DE OLIVEIRA

### CANADA

Jason ABBOUD  
Colleen BARFOOT  
Boyan BRODARIC  
John COX  
Mitchell DAWLEY  
Isabelle DE GRANDPRE  
Albanie DOUGLAS  
Curtis EDGINGTON  
Katrina ELLIOTT  
Ms Tara FORSTNER  
Adam GILMORE  
Rebecca HARDIE  
Michael HENDRY  
Ms Kelly HOKANSON  
Magdalena KROL  
Terryn KUZYSK  
Scott LAMOUREUX  
Ms Mistaya LANGRIDGE  
Harri LIIVAMAGI  
Dr Maxwell LUKENBACH  
Patrick MORAN  
Ms Emily PUGH  
Ms Meredith RADDYSH  
Nadine ROY  
Brent SCHMIDT

### Erin TAIT

Pamela TWERDY  
Jennifer VANDERMOLLEN

### CHILE

Gonzalo AURIA  
María Fernanda BALADRON  
Dolorinda DANIELE  
Ms Syndia FERNANDES  
Diego FERNANDEZ  
Julian FERNANDEZ  
Stephen FOOT  
Jose Luis FUENZALIDA  
Ms Monica FUENZALIDA DIAZ  
José Miguel GARCIA  
Rodrigo GONZALEZ GWE-TUBOMIN  
David JIMENEZ GAMEZ  
Iker JUAREZ ALVAREZ  
Luis LÓPEZ  
Andre MARTINEZ  
Amaia NEBREDIA  
Alvar PASTOR  
Reynaldo PAYANO  
Loic RAGAS  
Isabel SANTIBANEZ  
*SRK CONSULTING (CHILE) S. A (c)*  
*SUEZ MEDIOAMBIENTE CHILE S.A. (c)*  
Matias TAUCARE  
Begoña URTUBIA  
Julio VALLEJOS ALFARO  
Javier VERDEJO  
Ignacio WAHR  
Juan Carlos ZAMUDIO  
Mr Juan Miguel ZUNIGA

### CHINA, PEOPLE'S REPUBLIC

Dr Xubo GAO  
Hongwei LU  
Prof Wei QIAO



## COLOMBIA

Norehidy Katherín ACEVEDO NEIRA  
Pedro Johann ANAYA JAIMES  
Lina Patricia CANDIA JIMÉNEZ  
Laura Andrea CORREDOR HERNÁNDEZ  
Christian DELGADO  
Julian Stiven DUEÑAS RUEDA  
Nathalia DUQUE GARCÉS  
Gustavo FLORIÁN PACHÓN  
Liseth Carolina GALVIS CORTÉS  
Silvia GARCIA  
María Fernanda GÓMEZ PALENCIA  
Melissa Isabel HERNÁNDEZ PEREA  
Daniela LÓPEZ HERNÁNDEZ  
Carlos Felipe MARÍN RIVERA  
María Paula MEDINA BÁEZ  
Carlos David MESA GÓMEZ  
Lizeth MORENO  
Mr Marcos Julián OSORIO  
Pablo Andrés PINEDA CAPACHO  
Laura Camila RÍOS VÁSQUEZ  
Roberto Carlos SARMIENTO IZASA  
Paula Andrea SARMIENTO TRIANA  
Robert SERNA JIMENEZ  
Yessenia TARAZONA LIZCANO  
Ms Maria Camila VARGAS LÓPEZ

## CONGO, DEMOCRATIC REPUBLIC

Fabrice MUKUNANO ISANDA

## EGYPT

Mr Ahmed HASSANEIN

## FRANCE

Otmane AKERZOUL  
Lisa BARUCCHI  
Clément BERRY  
Caroline COEFFE  
Remi COUDENE  
Willerm DJATCHI  
Sébastien DOLLE  
Lucien DUCASSE  
Hélène GALIA  
Kelly GARCIA

Sébastien GIL  
Franck HANOT  
Nicolas HUCHOT  
Floriane MEIGNEN  
Pierre MONEY  
Cheikh NDOYE  
Claude NOEUEGLISE  
Chloe OLLIVIER  
Ugo PAVIA  
Laetitia ROCQUENCOURT  
Maritxu SAPLAIROLES  
Mr Emmanuel SONCOURT  
Thomas TOURSEL  
Dr Jean-Pierre VERGNES

## GERMANY

Mr Martin BINDER  
Prof Hans Matthias SCHÖNIGER

## HUNGARY

Ms Éva GALICZ

## INDIA

Mr Sumanta BANERJEE  
Eshan JHA  
Dr Suman KUMAR  
Mr Vivekanand PANDEY  
Ms Neha RARH

## IRELAND

Mrs Nikolina BOZINOVIC  
Mr Donal MARRON  
Mr Oscar RYAN  
Mr Oengus SKEHAN

## ITALY

Prof Maurizio BARBIERI  
Raniero MADONNA  
Dr Ron SEMERARO  
Prof Dario TEDESCO  
Mr Filippo TORRESAN

## JAPAN

Dr Yoshitaka SAKATA

## KOREA, REPUBLIC OF

Prof YoungTack JEONG

## LITHUANIA

Dr Anicetas STUOPIS

## MALAWI

Mission BANDA  
Mr Timothy BANDA  
Gibson BOTHA  
Mr Willard BOTHA  
James CHANDAMALE  
Geoffrey CHAVURA  
Roxy CHIKOMPHOLA  
Patson CHIMALIRO  
Rhino CHIMPHIKO  
Fwasani CHINAWA  
Mr John Paitax CHINGAWALE  
Mr Patrick CHINTENGO  
Ronald CHIWAULA  
Mr Waki CHUNGWA  
Maganizo DALISONI  
Roxy HARIDI  
Mr Andrew Alex JOLOZA  
Dwight KAMBUKU  
Modesta KANJAYE  
Mr Rex KANJEDZA  
Ms ELIZABETH KWELEPETA  
Edward LUKE  
Mr Goodwin Jimmy MALIPA  
Grace MASAUTSO  
Mr Swithern MATAMULA  
Ganizani MATIKI  
Nefitale MDIMA  
Mr Steve MEJA  
Mr Jacob MKANDAWIRE  
Samson MKANDAWIRE  
Fanny MKWANDIYO  
Prince MLETA

[continued over...]

NB: Those marked (c) are new IAH corporate members.



## MEMBER MATTERS

[...continued from previous]



# More New Members

Continuing our warm welcome to the following new members, who joined our Association in the period 5 March - 13 June 2018:

### MALAWI (CONT)

Mr Patrick MLOMBA  
Brian MPHANJE  
Kondwani MPONDA  
Kamoza MSONDA  
Francis MTAMBO  
Denis MULAMBYA  
Simion NAMPUTU  
Macpherson NKHATA  
Tony NYASULU  
Lucky PENUMULUNGU  
Chipangano PETRO  
Ambrose PHIRI  
Joseph PHIRI  
Humphrey SAPULAYI  
Mr Chrispine E S Charity SOPO  
Mr Boston TAMBALA  
Ganizani TEMBO  
Zione UKA  
Bill VITSITSI  
Mr Gift Jason WANANGWA  
Mr Bibo YATINA

### MALAYSIA

Dr Nor Bakhiah BAHARIM  
Dr Samira Albati KAMARUDDIN

### MOROCCO

Houria ABAHOUS  
Fatima ABDELFADEL  
Azddine BARBOT  
Khalid BOUKHARI  
Hasna JAMAA  
Imane MANSIR  
Dr Nordine NOUAYTI  
Mr Saadou OUMAROU DANNI  
Latifa RACHID  
Souhaila STELI

### NEPAL

Surendra SHAH

### NETHERLANDS

Mr Rafael Chavez GARCIA SILVA  
Dr Niels HARTOG  
Mr Tebogo Larry MASAKA

### NEW ZEALAND

Mr Nick HAZARD  
Mr Terry HUGHES  
Mr Justin LEGG

### NIGERIA

Prof Ahzegbobor Philips AIZEBEOKHAI  
Taiwo BOLAJI

### OMAN

Mr Ian UNSWORTH

### PARAGUAY

Prof Sandra Fariña DOLSA

### PERU

Ms Betty CELIS

### ROMANIA

Alexandru BALINT

### RUSSIA

Prof Ludmila ALEXEEVA

### SLOVAKIA

Mr Peter BAJTOS  
Mr Ondrej BALAZIK  
Mrs Anna PATSCHOVA  
Dr Vladimir PRAMUK

### SLOVENIA

Ines VIDMAR

### SOUTH AFRICA

Mr Cameron BRAND  
Thokozani DLAMINI  
*SADC GROUNDWATER MANAGEMENT INSTITUTE (c)*  
James SAURAMBA

### SPAIN

Antonio Fermin CASTRO GÁMEZ  
Jaime FERNÁNDEZ ORTEGA  
Mrs Aroa Gutiérrez PAÍNO

### SUDAN

Ali HOUNO

### SWITZERLAND

Claudia DEUBER  
Dr Joel PODGORSKI

### TUNISIA

Siwar BOUGHALI  
Nejmeddine OUICHI

### TURKEY

Mr Tolga Kuşçuoğlu  
Assoc Prof Ozlem Yagbasan

### UNITED KINGDOM

Mr Daniel BROOKS  
Mr Stephen HOWARD  
Leo LAVILLE

### UNITED STATES OF AMERICA

Ms Lauren DEHOYOS  
Mrs Jenny PITTMAN  
Philip VAN BEYNEN

*NB: Those marked (c) are new IAH corporate members.*

## CHECK YOUR DETAILS

Are you receiving your regular IAH messages and alerts with HJ link and latest news digests and initiatives?

Ensuring that our members receive their IAH entitlements such as the Hydrogeology Journal is important to us. Do you work for a large government/commercial/educational organisation? Many such employers have firewalls in place. You may have to provide an alternative email address to receive your member mailings, or speak to your IT department. IAH emails are always sent from an @iah.org address. Please check your details and IAH settings regularly - we'd hate you to miss out.

SECRETARIAT



<http://iah.org/members/edit-details>



## YOUR DATA, OTHERS' DATA

IAH collects various data to help us understand the needs of its members, supporters and users, enabling us to provide our community with better services.

For our members, as you might expect, much of the data collected is so that we can manage your membership of the IAH and to receive member benefits, such as the Hydrogeology Journal. Benefits also include the "Member Directory" - allowing individuals and companies to network, by providing a searchable database on the "Members's Area" of our website, containing contact details of those who have consented to be included. For those on the mentoring scheme, we hold additional non-sensitive information about professional experience and aspiration. You provide your data voluntarily – and clearly we can't manage without this, nor can we give you access to the membership benefits without this. In effect this forms a contract that we comply with, and which is in the mutual interests of members and the IAH administration to manage effectively. IAH encourages everyone to check their data, and settings, regularly.

We also hold names and email addresses for non-members, specifically only where they have requested that we keep them in touch with IAH news and information. This most commonly happens by opting in via our eNews form on the website.

As has always been the case, we are committed to managing your data securely, including where this is held by national chapters, commissions and networks. In turn, being a professional membership organisation, we would expect the same level of commitment with regard to data security - to treat others' data as you would wish your own to be treated.

For more information, view our privacy policy at <https://iah.org/privacy-and-cookies-policy>.

Questions or comments? See the links below.

SECRETARIAT



<https://iah.org/privacy-and-cookies-policy>

[info@iah.org](mailto:info@iah.org)

<https://www.eugdpr.org/>



# MEETING REPORTS

## Seventh Meeting of the Inter-Agency and Expert Group on the Sustainable Development Goal Indicators (7th IAEG-SDG Meeting)

President António Chambel represented IAH at the Seventh Meeting of the Inter-Agency and Expert Group on the Sustainable Development Goal Indicators (7th IAEG-SDG Meeting), which took place from 10 to 12 April 2018 in Vienna, Austria. For the first time, this expert group of international and national representatives invited observers to be present, which gave the opportunity for around 50 institutions, associations and individuals to participate and comment, but without the right to vote.

Discussion centred on the evaluation of the SDG indicators and the redefinition of some of these for the future, by reflecting on past experience. Many members of the group are specialists in statistics and results were presented of the analyses done by different working groups during the past year on all the SDGs. The goal of the meeting was to know which indicators have really worked and which are not working, including when only a few countries report on a specific indicator, making it useless as global indicator. In many cases this is a consequence of countries' lacking the ability to collect the data needed for a specific indicator.

Although many changes were recommended by the expert group just a few minor amendments were presented for goal 6, Clean Water and Sanitation. IAH and other institutions dealing with groundwater highlighted the lack of specific indicators for groundwater and this was accepted by the expert group. Three "core parameters" are specifically defined for groundwater monitoring (EC, pH and nitrate, the last one indicated in the official documents as suggested for groundwater due to associated human health risks).

These indicators are recommended but not obligatory for countries to report and as a result reports on groundwater at global level are very weak. Prof Chambel made the case that reporting of groundwater indicators should become obligatory. However, the scope of this expert group meeting was only to discuss and approve possible changes previously identified by



separate working groups. Other information presented at the meeting by the observers will be considered by the expert group in the future, but no action could be taken during the meeting.

As a conclusion, the presence of IAH in these kinds of meeting is important for addressing groundwater issues at the international level, though it may take many years for actions on groundwater to appear on the international agenda. Despite this, the expert group acknowledged that groundwater must be a key point to address in the future for SDG 6 water indicators and for other SDGs, such as for agriculture and health matters, which were also considered at the meeting. IAH will cooperate with other institutions (for example UNESCO, IGRAC, UN-Water, UNEP) to bring new ideas to the discussion around groundwater and other SDGs.

ANTÓNIO CHAMBEL AND IAN DAVEY



<https://www.unido.org/resources/statistics/seminars-and-meetings/seventh-meeting-iaeg-sdg-indicators>

<https://unstats.un.org/sdgs/meetings/iaeg-sdgs-meeting-07/>



# IAHS Vienna Catchment Science Symposium

The International Association of Hydrological Sciences (IAHS) held a symposium on 14 April 2018 in Vienna to identify the “23 unsolved problems in hydrology that would revolutionise research in the 21st century”. It was also intended to raise the level of excitement for the science.

As defined by IAHS, to make tangible progress, the problems should:

1. ideally relate to observed phenomena and why they happen;
2. be universal i.e. not only apply to one catchment or region; and
3. be specific, with the possibility that they can be solved.

Through panel discussions, breakout groups and plenary sessions, a list of unsolved problems in hydrology, along with priorities, was identified and voted on. This would provide support to all hydrologists to drive research forward in this field.

President António Chambel represented IAH in these discussions. In preparation for the meeting 10 key groundwater issues were put forward by the Secretary General Bruce Misstear in consultation with the different IAH Commissions and Networks. These were added to the initial list of unsolved problems on groundwater already identified by IAHS experts. In total, more than 30 groundwater issues were included in the total of around 200 hydrological problems identified.

Around 100 participants at the meeting were distributed to 4 rooms according to their skills, to discuss the issues

and reduce these to a manageable number – and then repeated! The remaining questions from the working groups were then reviewed in a plenary session and voted on. The result was a list of about 50 questions, to be analysed further by IAHS to obtain the final list of between 30 and 50 problems.

Many of the groundwater proposals were rejected in the plenary session, probably because only around 10% of the participants were hydrogeologists and there was a lack of understanding by other plenary members of hydrogeological problems and specific needs. This was understood by the IAHS and subsequently some of the rejected hydrogeological issues were reinserted into the list.

The final list is still being prepared. The intention is that the identified list of problems can be used as a guide for researchers and to influence financing for science across the world in the next years.

This meeting is a good example of cooperation between the sister associations, IAH and IAHS. The organisations have organised congresses in the past together (as in Hyderabad in 2009) and the possibility for organising a future congress together was discussed in this meeting. We thank IAHS for the invitation to participate in this discussion and we wait for future developments.

ANTÓNIO CHAMBEL AND IAN DAVEY



<https://iahs.info/IAHS-UPH/>



Image credit: <https://iahs.info/IAHS-UPH/>

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## MEETING REPORTS

[...continued from previous]

# International Mining Conference Turns Spotlight on Groundwater

The 14th International Congress on Energy & Mineral Resources was held in Sevilla, Spain and attracted over 300 delegates, including many from the Andean and Sub-Saharan African regions, together with numerous Australians. Its general focus was 'Sustaining the Future', and the wisdom of Dr Felipe Lobo-Ruano (Chair of the Organising Committee) led to inclusion of a full session exploring the interface of water resource management with the mining and hydrocarbon industries in the programme.

The session comprised :

- An excellent keynote lecture by Prof Dr Rafael Fernandez-Rubio (Emeritus Professor of the Universidad de Madrid) on the 'Re-Utilisation of Mine Waters'. In this he detailed various cases : two of direct re-use for urban water-supply in Komaru-Hungary & Belo Horizonte-Brasil, two of indirect re-use via aquifer management in the provinces of Nevada-USA & Sevilla-Spain, and three of major aquatic ecosystem development post-mine closure in Cottbus-Germany, Rother Valley-UK & Galicia-Spain.
- An extended roundtable discussion on 'Water Governance & Sustainability' chaired by Dr Jose-Luis Manzanares (AYESA President) with Antonio-Ramon Guinea (Guadalquivir Confederation President), Inmaculada Cuenca-Fernandez (Junta de Andalucia Infrastructure Director), Dr Carlos Fernandez-Jauregui (UN-WASA Network Chief) & Dr Stephen Foster (IAH Past President).

The main observations and conclusions of the session comprised :

- The image of the mining industry in respect of water resources and aquatic ecosystems, which historically was tarnished by the legacy of inadequately-controlled activity in past decades, has improved considerably with the introduction of high-efficiency water use, appropriate treatment of mine-water drainage and systematic environmental risk evaluation and reduction.
- The duty of water-resource regulatory agencies to

the public means that they have to put priority on the fundamental roles of groundwater in drinking-water provision and sustaining certain ecosystems. This requires that they act independently to exert strict control on the mining and hydrocarbon industries, but this should not be disproportional to the control they exert on other groundwater-user sectors.

- Constructive partnerships need to be forged between mining companies and water-resource regulators to optimise investments in groundwater use, pollution protection and aquifer monitoring. And it is always better for water and environmental interests when companies which operated mines remain in charge of restoration measures after their closure.

STEPHEN FOSTER, IAH PAST PRESIDENT

 [www.congresomineriasiasevilla2018.org](http://www.congresomineriasiasevilla2018.org)

## Hydrogeology of Chalk Aquifers

The 22nd technical days of the French Chapter (CFH) of the International Association of Hydrogeologists were organized in Le Havre, Normandy, from 24 to 26 May 2018, in co-operation with the French Association of Hydrogeologists from Public Services (AHSP) and the University of Rouen. The event was devoted to the hydrogeology of chalk aquifers, with around 120 participants, mainly from France, but also other regions of Europe interested in chalk hydrogeology, such as England and Belgium.

The topics covered current research questions and scientific challenges, and also the operational aspects associated with management, exploitation and protection of this resource. Accordingly, speakers came from diverse backgrounds - researchers, engineers from small and large companies and public organisations.

The conference was organized in 3 thematic sessions, a round table, and 3 scientific and technical excursions spread over 3

half-days. The success of the conference was in large part guaranteed by the excellent complementarity between the different aspects covered during the 3 sessions.

Session 1 focused on the latest knowledge of chalk stratigraphy for characterizing the aquifer. The results highlighted. This emphasised the importance of knowledge of stratigraphy and structure for understanding the hydrogeological functioning of chalk aquifers. One conclusion was the need to increase communication between the geology and hydrogeology communities, particularly for improving how models take account of and represent physical and chemical processes.

Session 2 looked at different modelling approaches, based on physical, conceptual, or statistical/machine learning (neural networks) and characterisation of geochemical or physico-chemical fluxes. The session highlighted the importance of modeling and observation, in particular through the exploitation of data from long-term monitoring observatories for pilot sites.

Session 3 considered vulnerability of chalk groundwater to human activities such as intensive agriculture, given the triple-porosity of Chalk (matrix, cracks, karst). Protocols were proposed for assessing and managing risks including sinkhole management and diffuse contamination. Various studies have highlighted how observation, quantitative and qualitative monitoring approaches at pilot sites, and modeling, as presented in Session 2, could be used as decision support tools to optimise groundwater management.

A review of the Geological Society of London's April 2018 symposium on the hydrogeology of chalk was presented (<https://www.hydrogroup.org.uk/the-chalk-conference/programme/>). This led to discussion of possible future exchanges on chalk hydrogeology between the European hydrogeology communities.

A round table on the theme of the sensitivity of water resources under environmental changes, organized with the help of consultants, public agencies and scientists, considered questions on the role of chalk aquifers



in supporting baseflow, in the dynamics of floods by rising water table, the role of changes in land-use in the dynamics of recharge and the triggering of floods and turbid floods accentuated by possible karstic contexts. Water resource managers highlighted the limited understanding of decision-makers about anthropogenic pressures on water resources and emphasised that too little regulation may significantly weaken the resilience of chalk hydrosystems under global changes.

The 2 days of the conference were followed by 3 technical visits addressing the operational issues of exploiting chalk groundwater resources, the geological and hydrogeological contexts of the characteristics of this resource, and the specific considerations of karstic conditions.

MICHEL BAKALOWICZ AND LAURENCE CHERY



<http://www.cfh-aih.fr>

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## MEETING REPORTS

*[...continued from previous]*

# New Approaches to Groundwater Vulnerability

The International Conference on “New Approaches to Groundwater Vulnerability” was held from 4-8 June in Ustroń, Poland. It was the third conference on contemporary groundwater vulnerability issues to be organised in Ustroń, one of the best known Polish resorts and spas in the Beskidy Mts. The conference was organised by University of Silesia in Katowice, forming part of its 50th anniversary celebrations, with co-operation with IAH, UNESCO IHP, and the Association of Polish Hydrogeologists.

The conference brought together 79 delegates from 21 different countries. The conference program included seven thematic sessions of oral presentations, a poster session and a field trip. The topics covered: development of the vulnerability concept (two sessions), groundwater vulnerability assessment for karstic areas, groundwater vulnerability to nitrate pollution, groundwater vulnerability assessment in order to climate change and efficient land use management, groundwater vulnerability and pollution risk in agricultural and industrialized areas and also international and national projects related to groundwater and surface water management and protection (special session). Both oral and poster presentations were of high quality, and individual sessions ended with lively and fruitful discussions.

The mid-conference trip visited the Upper Silesia industrial region, to consider problems of exploitation of coal deposits and the functioning of industrial and service-residential space in the region. Participants visited the historic Guido Mine in Zabrze where the coal exploitation lasted from 1871 until 1996, and an authentic workers' settlement, built in 1908-1918 in Katowice (Nikiszowiec).

The organisers would like to thank all the conference sponsors, with special thanks to the UNESCO International Hydrological Program (UNESCO-IHP) for its financial support, including covering the costs of participation of eight scientists from developing countries.

ANDRZEJ J. WITKOWSKI, CHAIRMAN OF THE SCIENTIFIC COMMITTEE





## KARST 2018 “Expect the Unexpected”

In early June, the symposium Karst 2018 “Expect the unexpected” was organised to honour of 80th Anniversary of Petar T. Milanović’s birth. It was held in Trebinje, eastern Bosnia & Herzegovina, located on the northern rim of one of the spectacular Dinaric karst poljes - Popovo polje in the Trebišnjica River basin, 30 km from the Adriatic coastline. This area in the heart of “classical karst” was thoroughly studied by professor Milanović for many years.

The symposium was organised by the Hydro Power Plant Dabar (Trebinje) and the University of Belgrade, Faculty of Mining and Geology, the Centre for Karst Hydrogeology of the Department of Hydrogeology, and in partnership with IAH’s Karst Commission and the Geological Survey of the Republic of Srpska. We’d like to thank the Municipality of Trebinje and Hydro Power System Trebišnjica for their sponsorship and support.

Around 100 people from 17 countries attended the symposium - from USA, Canada, Russia, China, Turkey, Albania, Hungary, Austria, Romania, Bulgaria, FYR Macedonia, Montenegro, Croatia, Slovenia, Italia, Bosnia & Herzegovina and Serbia. On the first day, the opening ceremony took place in the Cultural Centre of Trebinje. The second day was spent on a day’s excursion to the “Upper Horizons” of Trebišnjica Hydro Energy Power System. On the last day, four oral presentations and one poster session were held. Keynote speakers were Derek Ford, Richard Parizek, Ralph Benischke, Lu Yaoru, Zoran Stevanović and Neno Kukurić.

The symposium Proceedings contain 56 papers written by 150 authors. From early July they will be available at web sites [www.karst.edu.rs](http://www.karst.edu.rs) and [www.karstportal.org](http://www.karstportal.org).

LJILJANA VASIĆ, CO-PRESIDENT AND SAŠA MILANOVIĆ,  
PRESIDENT OF THE ORGANISING COMMITTEE



[www.karstportal.org](http://www.karstportal.org)  
<https://karst.iah.org/>



*[continued over...]*

### UNESCO KING HAMAD BIN ISA AL-KHALIFA PRIZE

Nominations for the 2018 edition of the UNESCO King Hamad Bin Isa Al-Khalifa Prize for the use of Information and Communication Technologies in education are now open. The prize rewards projects that use new technologies to enhance teaching, learning and overall education performance. The theme of 2018 Prize is “The use of innovative information and communication technologies to ensure education for the most vulnerable groups”. Two awards will be granted, and each recipient will receive a monetary award of USD 25,000 during the Award Ceremony at UNESCO Headquarters in Paris. For more detailed information on eligibility criteria, submission and nomination process, please visit UNESCO ICT in education Prize website: <https://en.unesco.org/themes/ict-education/ict-education-prize>



## MEETING REPORTS

[...continued from previous]

# UNESCO International Hydrological Programme



The International Hydrological Programme (IHP) of UNESCO is an intergovernmental programme devoted to water research, water resources management, education and capacity building. IHP is implemented in six-year phases; the current eighth phase (2014–2021) aims to promote international hydrological research, facilitate education and capacity development, and enhance governance in water resources management. These activities help countries meet the UN Sustainable Development Goals (SDGs) on environmental sustainability, water supply, sanitation, food security and poverty alleviation. IAH has long been a partner in the groundwater activities of IHP and in supporting UNESCO in developing successive phases of IHP.

Progress of the Programme's activities was reviewed at the 23rd session of the IHP Council, which took place from 11–15 June 2018 and was attended by 253 participants from 79 Countries (see <https://en.unesco.org/news/key-outcomes-intergovernmental-council-international-hydrological-programme>). The activities increasingly represent the interlinkages between IHP and other UNESCO programmes.

Agreement was reached on several matters.

Mr Thierno Hamet Baba Ly (Senegal) was elected as Chairperson and will lead the IHP Bureau that steers the Programme. The Vice-Chairpersons are Mr András Szöllösi-Nagy (Hungary, outgoing Chairperson), Ms Yosmary Gil Leal (Republic of Cuba), Mr Farhad Yazdandoost (Islamic Republic of Iran), Mr Alan Jenkins (United Kingdom) and Mr Mahmoud Abu Zeid (Arab Republic of Egypt).

A proposal will be submitted to the UNESCO General Conference in 2019, to change the name from "International Hydrological Programme" to "Intergovernmental Hydrological Programme", as a more accurate reflection of its structure.

UNESCO-IHP and the United Nations Economic Commission for Europe (UNECE) as co-custodians of SDG Indicator 6.5.2 on "transboundary water cooperation", presented the results of the Member States' first reports. They highlighted that 107 of the 153 countries that share transboundary waters provided reports.

IHP will develop, with the Organisation for Economic Co-operation and Development (OECD), the World Health Organization (WHO) and the United Nations Environmental Programme (UN Environment), and the UNESCO Water Family, a proposal for an effective indicator on water education. This will support monitoring of the implementation of SDG 6, particularly in regard to capacity–development.

The Council supported the establishment of the Global Network of Water Museums. The 60 institutions involved, with 5 million visitors annually, will strengthen IHP's communication activities and support formal and informal water education.

Ms Charafat Afilal, Minister for Water, Morocco, presented the Water for Africa initiative, which follows the declaration in July 2016 by African water ministers. This aims to: highlight the impact of climate change on African countries' water resources; promote climate justice through regional initiatives and existing programmes; improve access to water and sanitation, and ensure food security and energy in Africa.

The meeting incorporated the 1st Water Science-Policy Interface Colloquium. This provided an opportunity to consider how IHP can help identify science-based solutions for effective policies and practices on water and sanitation, to support achievement of the 2030 Agenda.

Stefan Uhlenbrook of the UN World Water Assessment Programme summarised the SDG Synthesis Report on Water and Sanitation and representatives from several countries gave updates on progress with implementation. Some countries had made great strides but many were not on track to achieve the 2030 target of basic access to water, particularly in Sub-Saharan Africa. Sub-regional and sub-national dynamics were often found to be critical. Ongoing issues about data collection, reporting and ensuring availability of comparable data were highlighted. It was also emphasised that 'if it's not measured, it can't be managed and won't get done'.

A discussion panel emphasised that science is critical for informing policy and underpinning water-governance. It was acknowledged that translating research to policy is not

straightforward, with potential language barriers between policy makers, practitioners, members of the public and others. It was also essential for scientists and others to understand societal and environmental constraints and to adapt targets to the local context.

IAN DAVEY, IAH SECRETARIAT



<https://en.unesco.org/themes/water-security/hydrology>



Image source: <https://en.unesco.org/news/1st-water-science-policy-interface-colloquium>

## UN-HLPF: Transformation towards sustainable and resilient societies

Callist Tindimugaya, IAH Vice President for Sub-Saharan Africa, was invited to address the high-level political forum on sustainable development, which took place in July at UNHQ in New York. Dave Kreamer, IAH VP for Science and Programme, was also present for one session, and met with Callist.

The overall theme for the conference was “Transformation towards sustainable and resilient societies”. The HLPF’s review focused particularly on the following, for many of which groundwater is an important consideration:

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development, that will be considered each year.

CALLIST TINDIMUGAYA AND DAVE KREAMER



<https://sustainabledevelopment.un.org/hlpf/2018>

## EXECUTIVE MEETS IN BUDAPEST, HUNGARY

The Executive met at the end of June at the Mining and Geological Survey of Hungary (MBFSZ) in Budapest, as guests of Teodóra Szőcs, the Vice President for Finance and Membership. The meeting was held in the geological museum, which is one of the most important works of Ödön Lechner, a prominent architect of the art nouveau style (he has also been called the Hungarian Gaudi).

As ever, finance was one of the main topics of discussion. The final accounts for 2017 are currently being prepared and will be made available at the congress in Daejeon. Although we recorded a healthy operational surplus (primarily because it was not possible to complete a number of activities that were included in the 2017 budget) it seems that the continuing uncertainties in exchange rates have not been so kind to us as in other years and it is likely that the final figures will show a small reduction in our overall reserves. This underlines once again how important it is to protect and develop our sources of income to ensure that services to members can be maintained.

Several other matters that were on the agenda are discussed elsewhere in the newsletter: education and website development, Hydrogeology Journal, Commissions and Networks, National Chapters, Congresses. In addition, the last few months have also seen quite a lot of activity engaging with other organisations.

We have received several requests for inputs to reviews by the UN on implementing SDG6 (Clean water and sanitation for all people), including Water and Ecosystems, Water Quality Indicators, Monitoring Methodology, Water Stress, Water Use Efficiency and the overall synthesis report. Several IAH members have been invited to take up roles on UN-Water Expert Groups, dealing with Agenda 2030, transboundary waters, water quality and waste water, and climate. Responding to these helps to highlight the vital importance of groundwater, where it might not be given prominence, and is part of our mission to “further the understanding, wise use and protection of groundwater resources throughout the world”. Involvement in these matters can of course be time-consuming and support from those who are well-placed to help is welcomed.

There has been further input to GRIPP (Groundwater Solutions Initiative for Policy and Practice (see <http://www.iwmi.cgiar.org/issues/groundwater/gripp/>) and it is proposed that the President, Antonio Chambel, and the Secretary General, Bruce Misstear, will attend their meeting during World Water Week in Stockholm in August, which aims to bring critical groundwater issues to a wider, politically sensitive audience.

Antonio Chambel met with Patrick Lavarde, President of the International Water Resources Association, an organisation whose purpose is to improve the management of water resources, which also aims to take into account groundwater matters. The next IWRA congress will be in Korea in 2020 and M. Lavarde hopes to join us at our congress in Daejeon as part of the preparations for their next event.



The Executive Manager held a meeting with Jean-Francois Donzier, General Secretary of INBO, the International Network of Basin Organisations, a recipient of our Distinguished Associate Award in 2016. This was an informal discussion about cooperation to support integrated consideration of groundwater and surface water in basin management.

Finally, the Executive identified a number of items that will be developed as papers for formal discussion at the Council meeting in September and highlighted points that will be put to members at the Annual General Meeting.

IAN DAVEY

 <https://iah.org/about/council>



## THE FUTURE OF HYDROGEOLOGICAL SCIENCE AND ENGINEERING

IAH would like your input on what you view to be the future, biggest challenges in hydrogeology. What new areas of groundwater investigation do you view as over the horizon for our science, and what are the next topics that will dominate our discussions in the coming years? As part of IAH's Forward Look, a preliminary panel of Clifford Voss (Executive Editor of our Hydrogeology Journal), Wendy Timms (Vice President for Australasia and the Pacific) and David Kreamer (Vice President for Science and Programme) are asking for your vision, and what you predict will be the most exciting and needed areas of research and investigation in groundwater science in the coming years. Please contact Dave Kreamer at [dave.kreamer@unlv.edu](mailto:dave.kreamer@unlv.edu) with your questions, ideas, and feedback. Your insights are greatly appreciated.

DAVE KREAMER

 [dave.kreamer@unlv.edu](mailto:dave.kreamer@unlv.edu)



## APPLIED HYDROGEOLOGY AWARD - UPDATE

Thank you! We are pleased to confirm that we received a selection of nominations for our Applied Hydrogeology Award. A panel of three appointed by the Executive will now evaluate the proposals. Look out for further news later in the year.

SECRETARIAT

 <https://iah.org/about/awards>

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# 46TH IAH CONGRESS TO BE HELD IN MALAGA

We are very pleased to announce that the Spanish Chapter of the International Association of Hydrogeologists, with the aid of the Center of Hydrogeology of the University of Malaga (CEHIUMA) will host the 46th IAH Congress in Malaga in 2019. The theme chosen will highlight the water resources stresses forecast as a result of global change, which will be especially relevant in the Mediterranean region.

- Groundwater management and governance
- Groundwater and climate change
- Impact of growing population and changes in land use on groundwater resources
- Groundwater sustainability
- Groundwater footprint and virtual water
- Tools, methods and models to study groundwater
- Groundwater, wetlands and natural heritage
- Groundwater and socio-economic development in Latin-America

The congress will take place at the Malaga Congress Center from Sunday, 22 September to Friday 27 September 2019. Further information, including website URL, will follow soon.

## SECRETARIAT



Organising an event in 2019? Submit details on our website to feature on the listing.

Go to: <http://iah.org/events>

# HYDROGEOLOGY JOURNAL EDITORIAL CHANGES

After 5 years as an Editor for Hydrogeology Journal (HJ) we say a final thank you to Liz Screaton, as she bows out from this role. Liz began as an Associate Editor in 2009, before becoming an Editor in 2013, both roles that she found the time to perform alongside her main duties as a Professor at the University of Florida. We wish her all the best with her future activities.



Workload for the HJ team has risen enormously during the last few years as hydrogeologists have made HJ their journal of choice for publication and submitted increasing numbers of manuscripts. In consequence, following Liz's departure, we have now taken on 2 new Editors, Rui Ma and Jean-Christophe Comte. They join Martin Appold of University of Missouri in the USA, Jean-Michel Lemieux of Université Laval in Canada, and Maria-Theresa Schafmeister of University of Greifswald in Germany.



Jean-Christophe Comte completed his PhD in Hydrogeology at the University of Avignon, France while working part-time in consultancy. He continued in full-time consultancy before becoming a researcher at Queen's University in Belfast. He is now at the School of Geosciences at the University of Aberdeen where his research focuses primarily on the use of geophysical methods to improve the application of groundwater models. He has a particular focus on coastal and weathered/fractured aquifers, understanding the resilience of groundwater systems to climate change and human activities and groundwater security in developing countries.

Rui Ma is a Professor at the China University of Geosciences-Wuhan, Department of Water Resources and Hydrogeology in School of Environmental Studies. Her main interests are in groundwater and surface water interaction, groundwater-dependent ecosystems in the cold alpine and arid area and contaminant reactive transport. Rui is convening a special session on Chinese hydrogeology at the IAH Congress in Daejeon, Korea, in September 2018, with many of the August special issue's authors proposing to participate in this.



We also welcome Alexis Vizcaino to the HJ team, who took on the responsibilities at our publisher, Springer Nature, for development of HJ at the start of 2018. Alexis obtained his Ph.D. at the University of Barcelona investigating the offshore paleoseismology record for the Iberian peninsula.

HJ itself remains in good health and continues to be one of the premier earth sciences journals. Its usage factors are particularly encouraging, with more than 270 000 downloads of articles in 2017 and a median of 323 downloads for articles published in 2016/17.

IAN DAVEY AND CLIFF VOSS

# COMMISSIONS & NETWORKS

Activities of IAH's commissions and networks include contributing to the science of groundwater and undertaking outreach, education and training. Many will be participating in IAH's congress in Korea and/or other events worldwide. We encourage you to find out more and to make direct contact with them (you do not have to be an IAH member to participate). We also welcome suggestions for new topics or activities.

## SECRETARIAT



<https://iah.org/groups/commissions-networks>

Questions, ideas or comments? email [info@iah.org](mailto:info@iah.org)

## COMMISSION ON MANAGING AQUIFER RECHARGE (MAR)

I am pleased to report on behalf of co-editors Paul Pavelic, Adriana Palma Nava and Weiping Wang that the second special issue to be published out of ISMAR9 has recently been published in the Springer journal Sustainable Water Resources Management on the theme MAR in Integrated Water Management. This special issue has open access only until 11 August 2018. You can download free copies of the 19 papers until then from the Springer web site : <https://link.springer.com/journal/40899/4/2/page/1>. Thereafter you will be able to have indefinite free access to the author formatted final manuscripts of these papers from the IAH MAR web site, by agreement with Springer. For more information, and list of papers, please see the relevant page on the IAH-MAR web site <https://recharge.iah.org/thematic-issues-journals>.

The first ISMAR9 special issue in the open access J Water edited by Pieter Stuyfzand and Niels Hartog and published last year on the topic Water Quality Considerations for Managed Aquifer Recharge Systems, also contains 19 papers, and remains open for free access indefinitely. If you haven't checked the list of papers yet please see <https://recharge.iah.org/thematic-issues-journals>

This is a chance to reinforce the prompt from Enrique Fernandez Escalante that ISMAR10, Madrid 20-24 May 2019 is coming up. Look out for a call in early September for papers - please start thinking about yours now with a view to sharing your highest value practical scientific information in a form worthy of enduring record.

Last but not least, it can be reported that the working group on 60 years history of MAR now has 16 countries with national summaries on the IAH-MAR web site at <https://recharge.iah.org/60-years-history-mar>. If your country is missing and you would like to take this on please let me know. A paper has been submitted to Hydrogeology Journal giving a global summary, but web site national updates are welcome at any time.

PETER DILLON



<https://recharge.iah.org/>

<http://www.ismar10.net/en/ismar10-3/>

## BURDON GROUNDWATER NETWORK FOR INTERNATIONAL DEVELOPMENT (BGID)

### New network logo

We are pleased to present you the new IAH-BGID logo!

The concept was developed by Viviana Re (IAH-BGID co-chair) who coordinated the input of many others to try to represent the network mission of fostering cooperation among IAH members for international development. We are really grateful to Henry Holbrook, from the British Geological Survey (BGS) for turning the ideas and sketches into a logo. The logo will be available for all members and national chapters interested in organizing an event in collaboration with IAH-BGID, or under the umbrella of the network activities.



### Free book scheme

In Spring 2018 all books were shipped to members who had made their request - a total of 147 people from Sub-Saharan Africa. If you follow IAH social media, you will have seen a number of posts from happy individuals, posing with their books. We are really grateful for the contribution of Robert DiFilippo and Megan Breen whose precious help made possible the realization of this initiative. Thanks also to publishers Taylor and Francis, Practical Action Publishing and Wiley, for their administration and discounts. And last but not least - we'd also like to thank all the IAH members who've contributed to the Burden Fund over the years alongside their renewals - we hope news such as this will show that your donations are put to good use - now and in the future.



### Has Africa run out of water?

In March 2018, IAH-BGID chair Alan was invited to talk about groundwater at a TEDx event in Edinburgh, Scotland. TEDx is an international community that organizes TED-style events anywhere and everywhere, celebrating locally-driven ideas and elevating them to a global stage. In his talk, Has Africa run out of water? Alan presents an overview of groundwater challenges and opportunities in Africa. We'd like to encourage other IAH members to participate in TEDx events and help spread the news about groundwater.

You can watch the talk at: [https://www.youtube.com/watch?v=y00iu6gb\\_wE](https://www.youtube.com/watch?v=y00iu6gb_wE)

### Let's meet in Korea...

Join our special session "Socio-hydrogeology for ground water development in low-income countries " on Tuesday 11 September from 16:00 to 18:00.

If you are interested in groundwater and international development, if you are curious about our activities and you want to be involved: join our Annual General Meeting that will be held during the forthcoming IAH Congress on Sept 10 from 18:00 to 19:00.



**ALAN MACDONALD AND VIVIANA RE**



<https://burdon.iah.org/>

*[continued over...]*

**AUGUST 2018**



## Commissions & Networks

[...continued from previous]

### REGIONAL GROUNDWATER FLOW COMMISSION (RGFC)

The RGF Commission is organizing two sessions at the upcoming IAH Congress, 9–14 September 2018, Daejeon, South Korea.

The session entitled T2.6 Innovation in regional groundwater flow understanding.

The session attracts abstract related to theoretical or practical aspects of regional groundwater flow. The main focus is put on innovation which can be interpreted in relation to the applied approach or method or simulation technique, theoretical development. Moreover, we are waiting for abstracts demonstrating the practical application possibilities of regional groundwater flow concept in water management, mitigation of climate change or in the exploration of hydrocarbons, geothermal energy and ore deposits.

Furthermore, one whole topic is powered by our Commission, entitled T7 Advances in Karst and Fractured-rock Hydrogeology. Fractured and karstified rock aquifers show different characteristics than porous media, related to the heterogeneity and scale-dependency of hydraulic conductivity. Therefore, the investigation and simulation of flow and contaminant transport in these aquifers represent particular challenges in hydrogeology. Groundwater from these aquifers is a major freshwater resource for human consumption and ecosystems. Furthermore, the specific structure and properties of these hard-rock aquifers also affect the performance and safety of artificial underground facilities. This topic aims to discuss the recent advances in understanding groundwater flow and contaminant transport in karst and fractured-rock aquifers.

#### RGFC COMMITTEE



<https://regionalgwflow.iah.org/>

### EARLY CAREER HYDROGEOLOGISTS NETWORK

ECHN is looking forward to meeting everyone in Korea in September! As with previous congresses, we are working in close collaboration with the local organising committee. We are preparing a series of interesting activities for early career hydrogeologists, which are also open to all interested attendees.

All early career hydrogeologists attending congress are invited to include the ECHN logo (available for download from the congress website) in their poster and oral presentations - this will enable them to be eligible for the ECHN Best Poster and Presentation Awards.

Look out for further updates on the ECHN and congress.

#### ECHN STEERING COMMITTEE



<http://echn.iah.org/>

### URBAN GROUNDWATER NETWORK (UGN)

UGN has a number of activities lined up, including:

IWA-IAH UGN workshop 2018, Tokyo, 16–21 September

The IAH UGN is holding a jointly organised IWA-IAH UGN special workshop at the World Water Congress event. This will be focusing on developing discussion amongst researchers, government, regulators, water utilities, and wider professionals at to how sustainable groundwater management can be integrated into urban infrastructure development, including water utility facets; what are the key research understanding required; and what strategies are needed to resolve scarcity and quality constraints.

The workshop aims to provide the basis for concerted knowledge exchange and action on addressing urban groundwater issues — bringing together practitioners and experts to identify challenges and the solutions, as well as how to leverage this into action to move from coping to adaptive management.

IAH-UGN congress session 2018 Daejeon, 9–14 September  
Understanding of Asian urban groundwater resources – key

challenges and opportunities. Groundwater forms a pivotal resource for Asian cities, and worldwide, for water, energy, flood mitigation, integrated surface-ground water management, and low carbon sustainable cities. Developing new integrated planning approaches, where groundwater is accounted and managed requires improved understanding of urban groundwater resources and its resilience, alongside the socioeconomic, groundwater-use drivers and future environmental change. It is essential water utility facets of urban groundwater and investment are understood for future groundwater management in city planning approaches.

Do get in touch if you are interested in participating in or collaborating with the network, or if you are organising any relevant future activities.

HELEN BONSER



<https://urbangw.iah.org/>

## COMMISSION ON KARST HYDROGEOLOGY

The Karst commission is in the midst of a busy few months...

The conference RFG2018 “Resources for Future Generations” was held in Vancouver, Canada between 16-21 June 2018. There were 193 Sessions in 6 Themes involving 3000 people that participated, with 1128 oral and 213 poster presentations. The first annual meeting of the IGCP661 “The Critical Zones in Karst Systems” was held with the thematic karst session, while the second meeting of this project will be in September during the 45th IAH Congress, Daejeon, Korea. About 20 people from Slovenia, China, Columbia, Slovakia and other countries attended karst session.

45th IAH Congress in Daejeon, South Korea - Topic 7 Advances in Karst and Fractured-rock Hydrogeology

Groundwater from these aquifers is a major freshwater resource for human consumption and ecosystems. Furthermore, the specific structure and properties of these hard-rock aquifers also affect the performance and safety of artificial underground facilities. This topic aims to discuss the recent advances in understanding groundwater flow and contaminant transport in karst and fractured-rock aquifers.

Nico Goldscheider will also present a keynote lecture on karst hydrogeology.

Do get in touch if Karst hydrogeology is your area of interest or in regard to collaborating with our commission.

KARST COMMISSION COMMITTEE



<https://karst.iah.org/>

## ABOUT OUR CHAPTERS

We currently have over 40 national chapters – and we would like to expand this number. IAH national chapters can form the focus of the groundwater community in a country and provide great opportunities for meetings and networking. We continue to have interest from other countries in establishing national chapters, including recently Afghanistan, Ecuador, Namibia, Panama, Paraguay and Peru. If you would like to know more about how to set up a chapter, contact us at [info@iah.org](mailto:info@iah.org).

IAN DAVEY



<https://iah.org/groups/national-chapters>



Ireland

“Groundwater matters: science and practice” was the theme of the 38th Irish IAH groundwater conference held on the 24th and 25th of April 2018 in Tullamore, Rep. of Ireland.

Founded in 1976, the Irish group of the IAH looks back on a well-established network and activities. As a result, again the conference was well attended with more than 160 national and international attendees including 17 exhibitors.

For the Irish IAH, it has become tradition to bridge national groundwater matters along with international up-to-date research topics. Accordingly, the invited keynotes were delivered by Dr. Geoff Parkin (Newcastle University, UK) and Dr. John McCray (Colorado School of Mines, USA).

For the fourth year in a row, a session was dedicated to the Early Careers Hydrogeologists

Network (ECHN). This session has received exceptional good feedback in the past. This year, seven early careers presented their work in talks and posters.

For the first time, the conference hosted a mini-field trip on day 2. The content was related to well rehabilitation, and attendees could witness recent state of the art methods to improve the local groundwater supply of Tullamore.

For more information related to the Irish IAH and its activities, visit the website. Further, all past conference proceedings since 1982 can be downloaded.

HENNING MOE



<http://www.iah-ireland.org/>



## The Netherlands

Committee changes for the NL chapter - after nine years in post, Theo Olsthoorn and Sophie Vermooten have stepped down from their responsibilities. Niels Hartog is taking over the presidency and Ane Wiersma will be the chapter's secretary/treasurer. We thank both Theo and Sophie for their efforts, and wish the new team well in future endeavours.

### SECRETARIAT



<http://www.hydrology.nl/>



## Slovakia

### Contaminated Sites Workshop

In April a workshop entitled "Practical experience from contaminated sites remediation – II" was organised at Comenius University in Bratislava, Slovakia. It focused on the legislation in the area of contaminated sites, environmental loads and remediation, and also on principles of risk assessment in the process of risk analysis required by the new Ministerial Decree. Practical experience from the contaminated sites surveys, monitoring and remediation was included in several presentations.

The workshop was co-organized by the Slovak Association of Hydrogeologists, the Slovak National IAH Chapter and scientists from the Department of Hydrogeology, Faculty of Natural Sciences, Comenius University Bratislava and the EPS Slovensko company. It was attended by 80 participants.

PETER MALÍK



<http://sah-podzemnavoda.sk/cms/news.php>



## Japan

### Joint Seminar

In May our Japanese Chapter and the Japanese Association of Groundwater Hydrology (JAGH) co-hosted a joint seminar "Alpine Hydrogeology: The Critical Role of Groundwater in Sourcing the Headwaters of the World" at the College of Humanities and Sciences, Nihon University, Tokyo. Ninety-seven participants attended.

The seminar featured guest speakers Prof. Dr. Masaki Hayashi, University of Calgary, Canada, and Prof. Dr. Keisuke Suzuki, Shinshu University, Japan. Prof. Hayashi gave the NGWA Foundation's 2018 Darcy Lecture, discussing the importance of mountain area to hydrological cycle of the world and effects of climate warming on mountain hydrology. He also gave guidance to the students and early career professionals about how to better promote research activities. Prof. Suzuki talked about the current status of alpine hydrogeological studies in Japan, describing characteristics of the Japanese mountain area and its importance to local and regional hydrological systems.

AKINOBU MIYAKOSHI



<https://japan.iah.org/>

AUGUST 2018





# Update from Korea

The IAH Korean National Chapter, Korea Institute of Geoscience and Mineral Resources (KIGAM) and Korean Society of Soil and Groundwater Environment (KoSSGE) will host the 45th IAH Annual Congress in Daejeon at the Daejeon Convention Centre. It will focus on how groundwater science, technology and policy can help ensure all have equal rights for sufficient, safe and affordable water regardless of where they are born and live, or who they are.

Conference topics are:

- Life with groundwater: the role of groundwater in human life
- Environmental change and groundwater
- Sustainable groundwater resource & management
- Groundwater & surface water: an integrated view
- Coastal aquifer management
- Groundwater quality & contamination
- Groundwater and energy
- Challenges for the deep geo-environment
- Advanced tools & techniques for hydrogeology
- Groundwater, society & policy

The organising committee continues to be very active in making preparations. They send their best wishes to colleagues worldwide and remind everyone that, although the early bird registration fees have now ended, there is still time to register.

This year's congress promises to be quite intensive and immensely interesting, with 629 abstracts received from 65 countries. The team is busy preparing the timetable for each topic session and IAH subsidiary meetings such as those being hosted by IAH's commissions and networks, and IAH's Annual General Meeting.

Further details of short courses and excursions have now been published on the congress website.

Short courses prior to the congress are:

- 'Contaminant hydrogeology with a focus on Asia' will take place on Sunday 9 September and will be led by Frank W. Schwartz and Eung Seok Lee
- 'Integrated hydrologic flow and contaminant modelling: from theories to real-world applications' will take place on Saturday 8 and Sunday 9 September and will be led by Hyoun-Tae Hwang, Steven Berg and Damian Merrick
- 'Groundwater flow systems definition: their natural manifestations and control' will take place on Saturday 8 and Sunday 9 September and will be led by José Joel Carrillo-Rivera



Mid-congress excursions are proposed to limestone caves, a national geopark, curative springs, a wetland conservation area and the national groundwater information centre. Pre and post congress excursions and accompanying person's tours include visits to Seoul, the demilitarised zone (DMZ), traditional villages and temples, hot springs and other natural sites of interest.

If you haven't yet booked your place as a delegate or an exhibitor, now is the time to do this – visit the congress website! We look forward to seeing you there to network, share knowledge and experience the local cultures of this stunning location.

 Congress website - <http://iah2018.org/>  
Watch video - <https://youtu.be/m3ARVOuoOfk>

### **2018 IAH ANNUAL GENERAL MEETING**

Notice is given that the 2018 Annual General Meeting of the International Association of Hydrogeologists will be held at the Daejeoun Convention Centre on Tuesday 11th September from 18.15-19.00. All members of the Association who have fully paid their subscriptions for the current year are entitled to attend and participate in the proceedings. Guests are welcome.



## 2018 - UPCOMING SELECTION

2-6 Sept – Bonn, Germany

GeoBonn 2018

The Annual Conference of the Deutsche Geologische Gesellschaft – Geologische Vereinigung (DGGV – The German Geological Society), the Deutsche Mineralogische Gesellschaft (DMG – The German Mineralogical Society), the Paläontologische Gesellschaft (PalGes) together with Dachverband Geowissenschaften (DVGeo). IAH will be running a session on groundwater and climate change; the keynote speaker in this session is Richard Taylor, the former Chair of the IAH commission on Groundwater and Climate Change.

<http://www.geobonn2018.de/index.html>



9-14 Sept – Daejeon, Korea

45th IAH Congress

Groundwater and Life : Science and Technology into Action. The IAH Korean National Chapter, Korea Institute of Geoscience and Mineral Resources (KIGAM) and Korean Society of Soil and Groundwater Environment (KoSSGE) are honoured to host the 45th IAH Annual Congress in Daejeon. This will focus on how groundwater science, technology and policy can help ensure all have equal rights for sufficient, safe and affordable water regardless of where they are born and live, or who they are.

Website: <http://www.iah2018.org/>



6-21 Sept – Tokyo, Japan

IWA World Water Congress and Exhibition

Shaping our Water Future. The IWA World Water Congress & Exhibition brings over 5,500 water, environment and related professionals from more than 100 countries and offers new insights into how pioneering science, technological innovation and leading practices shape the major transformation in water management that is underway. Look out for IAH-related special workshops, including that being co-hosted with IAH's Urban Groundwater Network.

Website: <http://worldwatercongress.org/>



23-26 Sept – Edmonton, Canada

GeoEdmonton 2018

Transportation Geotechnique - Moving Forward. The conference will feature technical sessions on subjects of broad interest in the geotechnical and hydrogeological fields with the aim of highlighting recent achievements in transportation development and their associated geohazards. Organised by Geotechnical Society of Edmonton and the Canadian Geotechnical Society (CGS), in collaboration with the Canadian National Chapter of the International Association of Hydrogeologists (IAH-CNC).

Website: <http://www.geoedmonton2018.ca/index.php>



26-28 Sept – Johannesburg, South Africa

1st SADC-GMI/IWMI Groundwater Conference

Adapting to Climate Change in the SADC Region through Water Security – A Focus on Groundwater. Organised by ASDC-GMI and IWMI, with support from IAH South Africa Chapter.

<http://www.sadc-gmi.org>



<http://iah.org/events>

For a fuller list of conferences, events and meetings and to submit an event

