

NEWS

MAY 2023

& information

IAH – THE WORLD-WIDE GROUNDWATER ORGANISATION

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

In this issue:

IAH & other resources

New publications

Meeting & event reports

Chapters, commissions & networks

Regular IAH announcements & news



INTERNATIONAL
ASSOCIATION OF
HYDROGEOLOGISTS



Hydrogeodía

IAH Members in Spain, Portugal and South America celebrated World Water Day on 22 March with Hydrogeodía, a series of free local events that raise awareness of groundwater and the profession of the hydrogeologist. *Page 10*

HJ Topical Collection

IAH commemorates the 2022 'Year for groundwater', with a series of essays in the February issue of Hydrogeology Journal published by our commissions and networks, which capture issues highlighted across the year. *Page 7*



Technical Insight Series

IAH has launched its new 'Technical Insight Series', aimed at IAH members and our groundwater colleagues, covering topical hydrogeological issues. The first paper, written by IAH's Groundwater Quality Commission, deals with 'PFAS – Groundwater's Dark Matter'. *Page 17*



Find us at <https://iah.org>. Connect by email info@iah.org and on social media:



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Find IAH groups



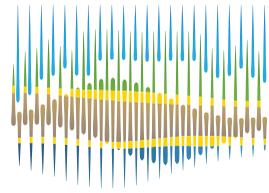
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**EARLY BIRD
REGISTRATION
DEADLINE
31 May**

Click here to Register

1973 **50th** 2023
IAH CONGRESS

CAPE TOWN | SOUTH AFRICA



18-22 SEPTEMBER 2023

The International Association of
Hydrogeologists

EXCITING CONGRESS PROGRAMME REGISTRATION DEADLINE ALERT AND MUCH MORE

We are excited to announce that the 50th IAH2023 Worldwide Groundwater Congress is quickly approaching! To ensure you have the best possible experience at the Congress, we want to share some important information with you.

Early Bird Registration

Don't forget that the Early Bird Registration deadline is fast approaching! Register and pay your registration fee before **May 31, 2023**, to take advantage of the discounted registration fee.

Visa Application

For those who require a visa to attend the Congress, we recommend applying as soon as possible to allow enough time for the visa application process. Registered delegates can request a visa invitation letter from confetal@iafrica.com and providing their full name as it appears on their passport and passport number.

Congress Accommodation

September is a busy tourist season in the Western Cape, so we encourage you to book your accommodation early to avoid disappointment. Discounted rates for Congress attendees are available for a limited period at various accommodation establishments near the Convention Centre. Visit <https://iah2023.org.za/accommodation/> to book your accommodation today.

Congress Programme

We are thrilled to announce that the Congress programme is taking shape, with over 400 abstracts and counting under review. The programme will include oral and poster presentations from six continents, making it an international event. We can't wait to learn from esteemed professionals and discover the latest scientific content.

Sponsorship and Exhibition Opportunities

We still have sponsorship and exhibition opportunities available!

Contact us or visit https://iah2023.org.za/wp-content/uploads/2023/03/IAH_SponsorshipDoc_2023.pdf to view the various options.



Enjoy pre and post tours along the Garden Route or go on safari in the Eastern Cape to view the Big Five.

Website: <https://iah2023.org.za>



Email: deidre@iafrica.com



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Advertising & 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 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.

Introduction

Look out for the Topical Collection of papers in Hydrogeology Journal, prepared by our commissions and networks, which recaps some of the key issues highlighted during IAH’s year of groundwater. We’ve published these as open access papers with the aim of getting our messages across to an even bigger audience than IAH.

IAH had a strong presence at UN’s Water Conference in New York. You can find out in this newsletter how we are proposing to input to the much-needed acceleration for achieving the SDGs.

Making more people aware that sustainable management of groundwater can help achieve the SDGs – and the annual ‘Hydrogeodia’ event in Spain and many parts of the Spanish-speaking world is a great example of this. We would like to see more of this in all linguistic regions...!

At the end of 2022 our bank (HSBC) decided it no longer wanted to provide a service to IAH. No reason was given, but it fits with a trend in the UK where banks are less willing to take on charities as clients. Fortunately, with our finances sound and well-managed we found an alternative service without too much difficulty. We have decided, though, to have a thorough review of our governance arrangements to ensure they are fully up to date and fit for purpose.

We’re always keen to develop and grow IAH and many of you will have seen our latest initiative to offer an ‘entry level’ free IAH membership for students. We’re sure that being involved in groundwater matters across the world and connecting with colleagues will be a great help in launching their careers. If you’re a university professor, why not encourage your students to sign up.

And finally, after 15 years at the heart of IAH, Kellie Nicholson has decided it’s time to move on. We are very grateful for all the hard work and ingenuity she has dedicated to IAH over all these years. We’ll miss her resourcefulness and energy – but we wish her much luck in applying her talents at her next destination!

SECRETARIAT

Corporate members, supporters and sponsors are offered special rates. Contact us for more details.

We are also happy to consider groundwater related articles from our members and supporters.

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

Email info@iah.org for further details.



Media focus

A selection of groundwater related features from around the world

Climate change brings abundant groundwater to Anantapur

Is there a positive side to climate change? Extreme weather events, which appear to be part of 'climate change', led to some damage to standing agriculture crops and breach in some tanks, and flooding of others, but the positive side has been a beneficial rise in the groundwater table in...

Read more at <https://www.thehindu.com/news/national/andhra-pradesh/climate-change-brings-abundant-groundwater-to-anantapur-with-photo/article66508985.ece>

Groundwater concerns grow as Glencore pushes ahead with plan to store waste CO2 in Great Artesian Basin

Glencore has long claimed an aquifer in the Great Artesian Basin where it plans to store the captured CO2 is "saline" and "unsuitable" for agriculture but now an alliance of major agriculture producers claim Glencore's own water samples show this is misleading, and valuable groundwater is at risk. Find out more at <https://www.abc.net.au/news/2023-02-16/glencore-carbon-capture-project-targets-great-artesian-basin/101935874>

Major farm herbicide to be withdrawn in France to protect groundwater

A major herbicide used in French farming is set to be banned by health authorities after it was found to have links to pollution of the groundwater table. S-metolachlor, typically used in maize, sunflower and soya crops, is to be pulled from sale after studies found 'unacceptable levels,' including in...

Read more at <https://www.connexionfrance.com/article/French-news/Major-farm-herbicide-to-be-withdrawn-in-France-to-protect-groundwater>

Satellite data shows sustained severe drought in Europe

Europe has been experiencing a severe drought for years. Across the continent, groundwater levels have been consistently low since 2018, even if extreme weather events with flooding temporarily give a different picture. As part of the EU's Global Gravity-based Groundwater Product (G3P) project, researchers used satellite gravimetry to observe the...

Read more at <https://www.eurekalert.org/news-releases/977646>

Groundwater Resources Recharge Faster than Previously Estimated

New research sheds light on the connection between groundwater and surface water fluxes. The findings show a higher-than-estimated percentage of groundwater returning to the surface via river flow or when used by vegetation. The higher recharge rates suggest that natural phenomena, such as evapotranspiration and streamflow, depend on groundwater much...

Read more at <https://phys.org/news/2022-12-groundwater-replenishes-faster-scientists-previously.html>

Could groundwater drilling solve the drought problems in the Horn of Africa?

Climate change continues to make its mark in Africa, disrupting weather patterns and in some cases, making them more extreme. The Horn of Africa is facing the threat of a fifth consecutive failed rainy season – and that's brought with it frequent devastating droughts. But a solution could be much...

Read more at <https://www.youtube.com/watch?v=zI-AHZZE21w>



Groundwater off Malta could provide potable water for 75 years

Scientists believe that offshore freshened groundwater below the seafloor off the Maltese islands could provide potable water for 75 years. Offshore freshened groundwater is groundwater with salinity below that of seawater that is stored in sediments and rocks below the seafloor. However, most of this groundwater appears to be hosted...

Read more at <https://www.independent.com.mt/articles/2023-01-09/local-news/Study-finds-75-years-worth-of-groundwater-in-the-seafloor-off-Malta-s-coast-6736248728>

Using satellites to track groundwater depletion

A major cause of land subsidence is the removal or disturbance of groundwater in soil and between rocks and sand found underground. Because subsidence often makes areas uninhabitable, these conditions can cause water and food insecurity, and potential political issues. To help investigate solutions, researchers are using satellite radar altimetry with...

Read more at <https://phys.org/news/2023-01-satellites-track-groundwater-depletion-california.html>

Already in 2019 the amount of ground water in Central Europe was very low



© Kvas – TU Graz

Earth's oldest remaining groundwater aged at 1.2 billion years old

An international team of researchers have discovered 1.2-billion-year-old groundwater 2.9 km below the earth's surface in a gold- and uranium-producing mine in Moab Khotsong, South Africa, shedding more light on how life is sustained below the Earth's surface and how it may thrive on other planets. The researchers found large...

Read more at <https://theprint.in/science/earths-oldest-remaining-groundwater-aged-at-1-2-billion-years-old-study/1276835/>

Water Summit On Groundwater At UNESCO

The Hon. Konris Maynard of St. Kitts and Nevis addressed the UN-Water Summit on Groundwater held at UNESCO, Paris. He spoke of the chronic paucity of groundwater supplies in St. Kitts and Nevis and across the entire Caribbean, a situation that has intensified as a result of climate change. St. Kitts...

Read more at <https://www.sknis.gov.kn/2022/12/08/minister-konris-maynard-addresses-the-un-water-summit-on-groundwater-at-unesco/#:~:text=As%20his%20second%20UNESCO%20speaking%20engagement%20since%20taking,on%20Groundwater%20held%20at%20UNESCO%2C%20Paris%2C%20this%20week>

Some groundwater resources near major river deltas could run dry in the next 200 years

From the Mississippi to the Niger, river deltas have long drawn people and industry, both with a seemingly unquenchable thirst for fresh water. Much of that water is drawn from underground aquifers deep beneath the sprawling delta systems. But for how much longer? Using computer models to assess these groundwater...

Read more at <https://www.pnas.org/post/journal-club/some-groundwater-resources-near-major-river-deltas-could-run-dry-next-200-years>

A legacy from 2022, the Year of Groundwater



We can affirm that the efforts made during 2022 for “Making the Invisible Visible” have been successful. So many initiatives, meetings, posts on social media have highlighted the relevance and the significant role of groundwater not only in water cycle, but also for achieving the Sustainable Development Goals as soon as possible.

We know now how much communication and dissemination are fundamental in groundwater research and application, to correctly transfer knowledge and data in actions and useful suggestions for stakeholders, end users and decision making. This multiple requirement implies for hydrogeologists the need to be updated both on technical advancements and on societal challenges.

For this reason, IAH with the Editor Team of Hydrogeology Journal promoted a Topical Collection entitled to “the Year of Groundwater”, just published in the 2023 first issue of our journal and available in open access option for all readers, to spread groundwater issues out of our boundaries.

With the outstanding support of the IAH Commissions and Networks, a series of essays tries to verify where groundwater knowledge & science is, and where we are going. From one side the Authors include an updated review of the scientific publications on some trending topics, and from the other side they provide their vision on the future of hydrogeology during the transition towards a sustainable use of groundwater resources for humans and environment.

We invite you to have a look at these short essays, dealing with fundamental questions related to groundwater resources: what are the threats and the opportunities due to climate change, what are the groundwater quality issues at the global scale and how to approach them, how to manage seawater intrusion in coastal aquifers, what are the evolved concepts in regional groundwater flow systems, why we need to care about transboundary aquifers, how managed aquifer recharge can be regulated by a risk-based approach.

From these contributions, we have also identified innovative hydrogeological strategies which can help the IAH community to contribute to the achievement of SDGs, starting from “our” SDG6. The different faces of innovation include: i) the technical innovation, benefiting international collaboration, interdisciplinary research and digital solutions; ii) the conceptual innovation, contributing to the transferability of our knowledge in policy and governance actions; iii) communication and social innovation, promoting the integration of social sciences into hydrogeology and including local perspectives; iv) educational innovation for spreading the relevance of groundwater to the wider public, particularly targeting the younger generation.

It is time for IAH members to deal with new challenges: to improve communication, dissemination and educational skills, and to find the way to simplify the complexity of hydrogeologic groundwater systems and their interaction with other earth systems and human populations.

Marco Petitta

IAH Vice-President for Programme and Science



Hydrogeology Journal 'Topical Collection' of essays

Our Commissions and Networks have published a series of essays in the February issue of Hydrogeology Journal, which capture issues highlighted during the 'year for groundwater' that IAH established in 2022 alongside the UN World Water Day's campaign on "Groundwater – making the invisible visible". This marks the conclusion of a remarkable year for groundwater – but of course IAH's work, and that of all its members, does not end here. As the introductory essay says:

"To improve public understanding and the proper use of groundwater, the hydrogeological community must expand its efforts in groundwater assessment, management, and communication. The International Association of Hydrogeologists (IAH) intends to help achieve the United Nation's water-related Sustainable Development Goals (SDGs) by the adoption of innovative hydrogeological strategies."

These essays are freely available at:

<https://link.springer.com/journal/10040/topicalCollection/ACfa79a32dc5b38b7b0b78e5be26c97dd0>

Topical Collection: International Year of Groundwater—managing future societal and environmental challenges; Marco Petitta, David Kreamer, Ian Davey, Jane Dottridge, Alan MacDonald, Viviana Re, Teodóra Sz cs

Groundwater and climate change: threats and opportunities; Tibor Y. Stigter, Jodie Miller, Jianyao Chen, Viviana Re

A global perspective on assessing groundwater quality; Bruce Misstear, Claudia Ruz Vargas, Dan Lapworth, Issoufou Ouedraogo, Joel Podgorski

Groundwater quality: global challenges, emerging threats and novel approaches; Dan Lapworth, Thomas Boving, Bentje Brauns, Jane Dottridge, Paul Hynds, Seifu Kebede, David Kreamer, Bruce Misstear, Abhijit Mukherjee, Viviana Re, James Sorensen, Claudia Ruz Vargas

Challenges and approaches for management of seawater intrusion in coastal aquifers; Shaked Stein, Eyal Shalev, Orit Sivan, Yoseph Yechieli

Regional groundwater flow and the future of hydrogeology: evolving concepts and communication; Judit Mádl-Szőnyi, Okke Batelaan, John Molson, Hanneke Verweij, Xiao-Wei Jiang, José Joel Carrillo-Rivera, Ádám Tóth

Why do we need to care about transboundary aquifers and how do we solve their issues? Alfonso Rivera, Marie-Amélie Pétré, Christina Fraser, Jacob D. Petersen-Perlman, Rosario Sanchez, Laura Movilla, Kevin Pietersen

The 21st century water quality challenges for managed aquifer recharge: towards a risk-based regulatory approach; Yan Zheng, Joanne Vanderzalm, Niels Hartog, Enrique Fernández Escalante, Catalin Stefan



Left: Fig 1 from *Why do we need to care about transboundary aquifers and how do we solve their issues?*

Below: Fig 1 from *The 21st century water quality challenges for managed aquifer recharge: towards a risk-based regulatory approach*





ECHN at the UN GW Summit

In early December 2022 the United Nations held the first ever Groundwater Summit at their headquarter in Paris, marking a definitive shift in the global water sector towards a groundwater focus for the future. The UN Groundwater Summit was a call for governments and respective stakeholders to step up their collective efforts to better manage the invisible, life-sustaining groundwater. The two day summit was preceded by one day of side sessions in which delegates could actively engage with each other. The ECHN has been a direct liaison with the newly established UN Groundwater Youth Network (GWYN), where our ECHN steering committee has contributed to the planning and implementation of early career events at the summit. Including a workshop on engaging and connecting youth across the water sector. In this session youth delegates that attended the summit, as well as senior officials and experienced researchers, were separated by global region and given a groundwater related scenario to discuss and come up with an action plan to address the issue or challenge. The workshop was well attended with a full to capacity room and a great distribution of participants from around the world.

The ECHN members present also had a great opportunity to participate in the IAH organised session on Innovation, where Dave Kreamer (IAH president) and his team of invited speakers held a very engaging and interesting session around the wide array of groundwater related innovations defining our water future. Some take home messages from these sessions were:

- GW specialists must lead the change
- Creating conditions to sustainable development
- Five Accelerators: Data and information, Capacity Development, Innovation, Finance and Governance
- We found themes around nature based solutions the most interesting as well as ethical/social hydrology
- Great sessions on tapping into indigenous knowledge of GW systems
- Novel financing tools are in development that are GW specific for the first time
- Specific to developing countries, early careers and the longevity of capacity
- Scarce skills retention



A symbolic highlight of this session was the mixing of a world groundwater sample. Dave Kreamer had asked participants in advance to bring water samples to Paris for mixing. Each participant was able to take home a mixed sample as a memento of this significant moment. In this way, the invisible global groundwater was made symbolically visible.

ECHN members both participated and reported on several sessions at the summit, all culminating in the Groundwater Youth Forum co-convened by Sabina Katri (GWYN) and Jared van Rooyen (ECHN). The forum aimed to present youth considerations around the groundwater space, encouraging young water researchers and professionals to engage with professors, policymakers and groundwater stakeholders in both a keynote address (Prof. John Cherry) and a panel discussion. The Groundwater Youth Network said “it will constitute an opportunity for the youth to be at the forefront of decision-making in the field of groundwater”. We have summarised some of the take home messages below:

- The solutions to past problems are rarely the solutions to future problems and often the cause of the current problems
- Youth participation is not a tick-box exercise, but an active co-relationship at all levels of decision making
- ECRs play a critical role in providing novel ideas and solutions
- Insufficient data cannot be an excuse for inaction
- The new generation of hydrogeologist must be skilled in multidisciplinary approaches to groundwater problems

Ultimately the youth participation has set a great standard for future summits and meetings. Having early careers researchers and professionals participating in global discussions on groundwater practice and policy. We look forward to continuing these initiatives in other events and congresses, such as the next IAH Congress in South Africa in September 2023.

Jared Van Rooyen and Richard Hoffmann
Early Career Hydrogeologists’ Network Steering Committee

ECHN and GWYN at the UN GW Summit



Mulling over the future





Hydrogeodia

Hydrogeodía is a series of free local events, with a field trip to somewhere of groundwater importance and interest, eg karst springs. It helps to raise awareness of groundwater and the profession of the hydrogeologist. It celebrates and is linked each year to World Water, 22 March. There’s a photo competition too using social media.

Hydrogeodía started life in Spain and is promoted by the Spanish Group of the International Association of Hydrogeologists (AIH-GE). It now takes place across all the regions of Spain and has spread to Portugal and South America, with events this year in Brazil, Chile and Ecuador.

The day consists of free activities in the field, guided by hydrogeologists and open to all members of the public, regardless of their knowledge. The basic format of the activity is an excursion in which people of all ages can participate. Visits are made to an area that shows how groundwater exists and the role it can play in everyday life. It shows too how hydrogeological techniques can be used to understand, manage and correct problems. In some cases a course, seminar or conference on groundwater is organised. The details depend on the local organisers, who aim to involve administrations, institutions and companies related to groundwater planning and running the event.

Below: In search of groundwater (Castillon, Spain)
Right: places where Hidrogeodia has been celebrated in 2023 and amount of attendants

The objectives of the Hydrogeodía are:

1. To raise awareness of groundwater and its importance for the development and well-being of society, but also for the proper functioning of ecosystems.
2. Highlight the role played by groundwater in a context of global change, both from a climatic and socio-economic point of view.

An informative guide of the activity is prepared for the activity and also for use as publicity.

IAH Secretary General, Jane Dottridge, would like to see this celebration of World Water Day reach across all continents and chapters from 2024. Tell us what you think. More than this – tell us what you propose to do in 2024!

Contact us at info@iah.org

Find out more about Hydrogeodía in Spain and South America at <https://www.aih-ge.org/hidrogeodia-2023/>

IAH SPAIN NC



UN 2023 Water Conference, New York

With nearly 7000 participants from Government, UN agencies, NGOs and the Academia, this was one of the largest gatherings dedicated to the global water crisis – the first in almost half a century. There were new commitments (financial, institutional, technical) to accelerate the achievement of the SDGs. Groundwater featured in side events, the main one led by Namibia, Botswana and South Africa, coordinated by UNESCO, and supported by IAH and other partners.

Building on the outcomes of the successful Groundwater Summit in 2022, IAH led the discussion on *‘Innovative Practices, New Technologies, Social engagement and Transformative Policies for Integrated Solutions for Groundwater’*, with panellists:

- Ms Myeonghwa Kang, Deputy Director, Ministry of Environment of Republic of Korea
- Mr Ernst Überreiter, Federal Ministry of Agriculture, Forestry, Regions and Water Management of the Republic of Austria
- Mr Peter van der Keur, EuroGeoSurveys

In her introduction, IAH Secretary General, Jane Dottridge said, *“Innovations to accelerate sustainable groundwater use come in a variety of ways. It is critical that they are equitable and inclusive, recognise different approaches, indigenous knowledge and FAIR data access, and always involve skills development and capacity building. Innovations in governance need to be participatory and recognize fundamental connections between groundwater and surface water, such as baseflow to rivers and groundwater dependent ecosystems.”* Scaling up innovations must work and must recognize the challenges in different contexts

In other sessions, highlighted successful international transboundary aquifer collaboration (South Africa, Namibia, Botswana) . UN-affiliated agencies’ work, using the power of data and information, partnership, capacity building, financing and innovation has been critical to this.

UNDP, World Bank and UNICEF focussed on groundwater under UNDP’s Africa Borderland Initiative. This aspires to reach millions of people in Africa’s dryland environments with water services, relying on abundant groundwater storage in these regions. The World Bank showed how the economic case for using groundwater to aid in poverty reduction justified investment, particularly for shallow groundwater. IAEA described its support for networking and strengthening of African Water Laboratories (under its GloWAL initiative) and the government commitments for this.

Representatives from governments, academia, industries, and NGOs proposed billions of dollars and voluntary measures for improving water security. However, the organisers accepted more was needed. Henk Ovink, special envoy for water for the Netherlands, which co-hosted the conference along with Tajikistan, concluded, “This conference did not give us a mandate for this, but we brought the world together to ensure there is a follow-up. We have fragmented water governance across the world, fragmented finance and not enough science and data in place.”

Certainly, there is more to do. See IAH’s voluntary commitments at: <https://sdgs.un.org/partnerships/iah-strategic-plan>. Let us know how you can help at info@iah.org.

Human right to water and sanitation





SDG Commitments

Our new strategic plan provides particular support to the SDG6 capacity development accelerators, with a focus on support for education and dissemination of awareness-raising information. We want to raise awareness about groundwater issues and help ensure a better-skilled workforce that improves service levels and increases job creation and retention in the water sector. We want to help enhance capabilities of those working in field of groundwater management throughout the world. We intend to link with our partner organisations to bring particular benefits for those working in lower income countries.

The concerns and wider aspirations of IAH leading to 2030 are enshrined in the São Paulo-Brussels Groundwater (BraBel) Declaration: Groundwater is critical to Earth's survival: Aquifers, our planet's natural water reservoirs, hold 97% of the fresh and liquid water

- Everyone must face these issues: Sustainable groundwater management needs monitoring, regulation, and communication.
- It is imperative to protect groundwater through the following urgent actions: Strengthen the institutions responsible for the governance of groundwater so that they promote efficient, inclusive, ethical, democratic, and socio-ecologically conscientious policies.
- Let's make the invisible visible: There must be an effort by governments, hydrogeologists, NGOs, and all of society to make perceptible this crucial resource for planetary well-being and dignified human life.

Find out more about the voluntary commitments made by IAH and other organisations to help accelerate the achievement of the SDGs at <https://sdgs.un.org/partnerships>

You can find out more on our website about how our strategic plan will help achieve our commitments:

<https://iah.org/news/make-a-difference-in-groundwater>

<https://iah.org/education>

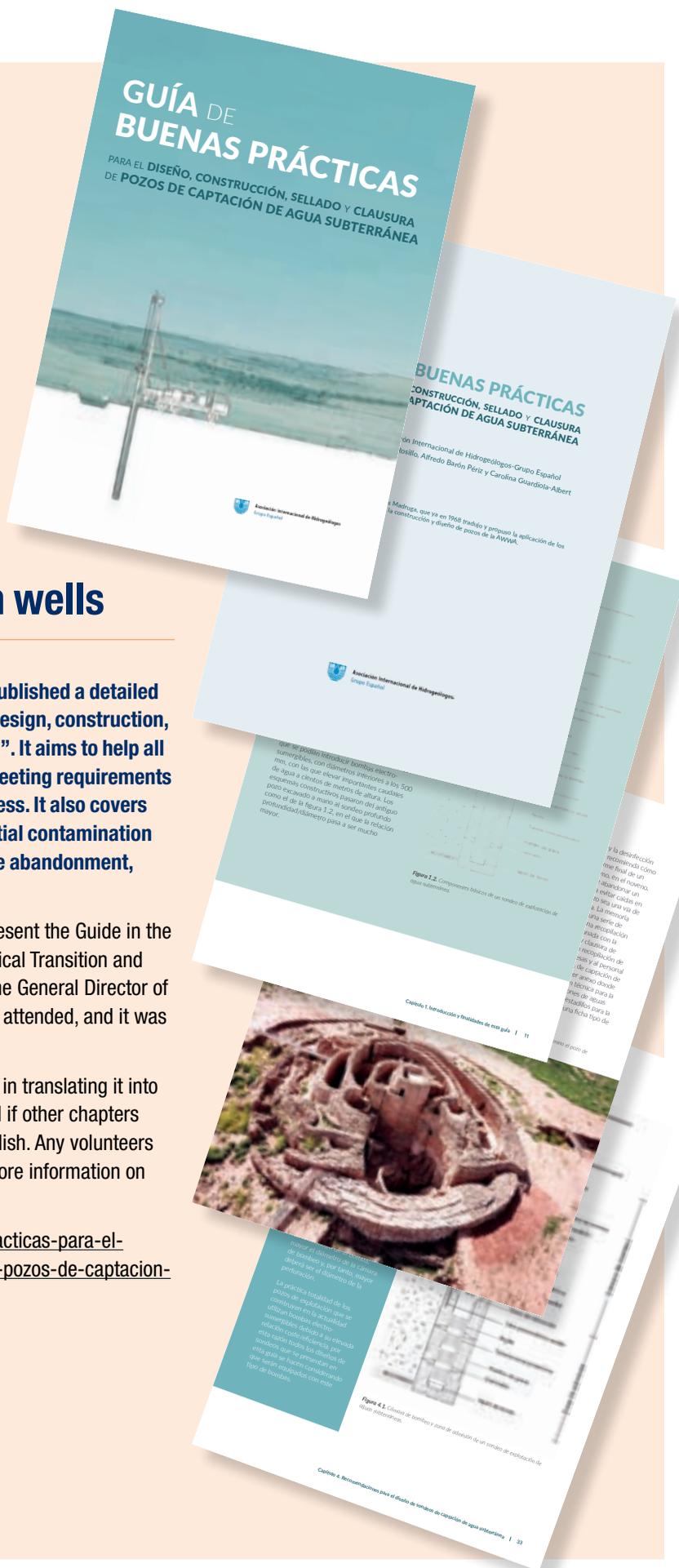
<https://iah.org/join-us/sponsorship-scheme>

<https://iah.org/publications>

<https://iah.org/events>

<https://iah.org/join-us/student-membership-of-iah>





Spanish guidance on wells

Last year IAH Spanish National Chapter published a detailed Guide: “Guide for good practices for the design, construction, sealing and closure of groundwater wells”. It aims to help all parties involved in well construction in meeting requirements for quality, durability and cost-effectiveness. It also covers the issues of avoiding a route of preferential contamination of aquifers via the well and, critically, safe abandonment, including for protection of life.

In January, the AIH-GE were honoured to present the Guide in the Assembly Hall of the Ministry for the Ecological Transition and the Demographic Challenge (MITECO), for the General Director of Water, Teodoro Estrela. One hundred people attended, and it was also broadcast on YouTube.

The Portuguese chapter has shown interest in translating it into Portuguese. The Spanish Chapter has asked if other chapters would like to prepare a translation in English. Any volunteers please contact us at in@iah.org. Find out more information on the guide at:

<https://www.aih-ge.org/guia-de-buenas-practicas-para-el-diseño-construcción-sellado-y-clausura-de-pozos-de-captación-de-agua-subterránea/>

IAH Spain NC

UN World Water Development Report: Partnerships and cooperation for water

The UN World Water Development Report, 'Partnerships and cooperation for water', was published on World Water Day, 22 March. IAH contributed to the chapter on education.

"Safeguarding water, food and energy security through sustainable water management, providing water supply and sanitation services to all, supporting human health and livelihoods, mitigating the impacts of climate change and extreme events, and sustaining and restoring ecosystems and the valuable services they provide, are all pieces of a great and complex puzzle. Only through partnerships and cooperation can the pieces come together. And everyone has a role to play."

Find out more at <https://www.unwater.org/publications/un-world-water-development-report-2023>



International Union of Geological Sciences (IUGS)

Nomination of the next IUGS EC 2024-2028

IAH has been an Affiliate of the International Union of Geological Sciences since this was founded in 1961. IUGS represents a global membership of one million Earth scientists from around 120 countries and 50 other affiliated organisations. IUGS encourages international co-operation and participation in the Earth sciences to improve understanding of earth processes and earth resources, especially in relation to human welfare. IUGS' Commissions, Task Groups, and Joint Programmes, with the support of its international affiliated bodies, address Earth science issues of relevance to society.

Nominations are requested for: President, Secretary General, Treasurer, two Vice Presidents and four Councillors. Tenure will be for the period 2024 to 2028. The nomination committee will review and prepare a list of candidates, in readiness for the next IGC in Busan in August 2024.

Nominations, including a letter of recommendation, the nominee's CV and publication list, agreement and motivation should be sent to the chair of the nomination committee Qiuming Cheng qiuming.cheng@iugs.org by 31 October 2023.

Candidates for the positions of President, Secretary General and Treasurer must be supported with an adequate travel grant from the nominating institution. The President and Secretary General would typically travel to 8-10 international meetings each year and the Treasurer 4-6 meetings.

Find out more about IUGS at <https://www.iugs.org/>

**78th IUGS Executive Committee Meeting, Belfast, United Kingdom
February 2023, Belfast, UK**



Executive meeting

The IAH Executive Committee held their first meeting of the year, online, in February. Part of the meeting was taken up with consideration of IAH's new banking arrangements and setting out proposals for updating the Association's governance arrangements. An assessment of the Association's finances showed these were sound and that there was a solid basis for setting the budget for 2023.

During 2022 Carlos Molano had decided to step down as Regional Vice President for Latin America. President Dave Kreamer led the Executive in thanking Carlos for his many years of dedicated service to IAH. For the time-being past President Antonio Chambel has been covering the responsibilities for Latin America and he is in contact with colleagues there in order to decide how the role should be covered until the next Council elections in 2024.

Marco Petitta, Vice President for Programme and Science reported on an online meeting held with our commissions and networks, of which around half had been able to join in. Our commissions and networks are generally active, some highly so, though competing commitments of those involved mean that some are not so dynamic. The Commission on Groundwater and Energy is no longer active and has now been closed. Following the closure also of the Network on Groundwater and Ecosystems, it has been suggested that a new water-energy-food nexus commission could be established to take the place of these. Clearly this would depend on volunteers stepping forward to manage the activities of a new group.

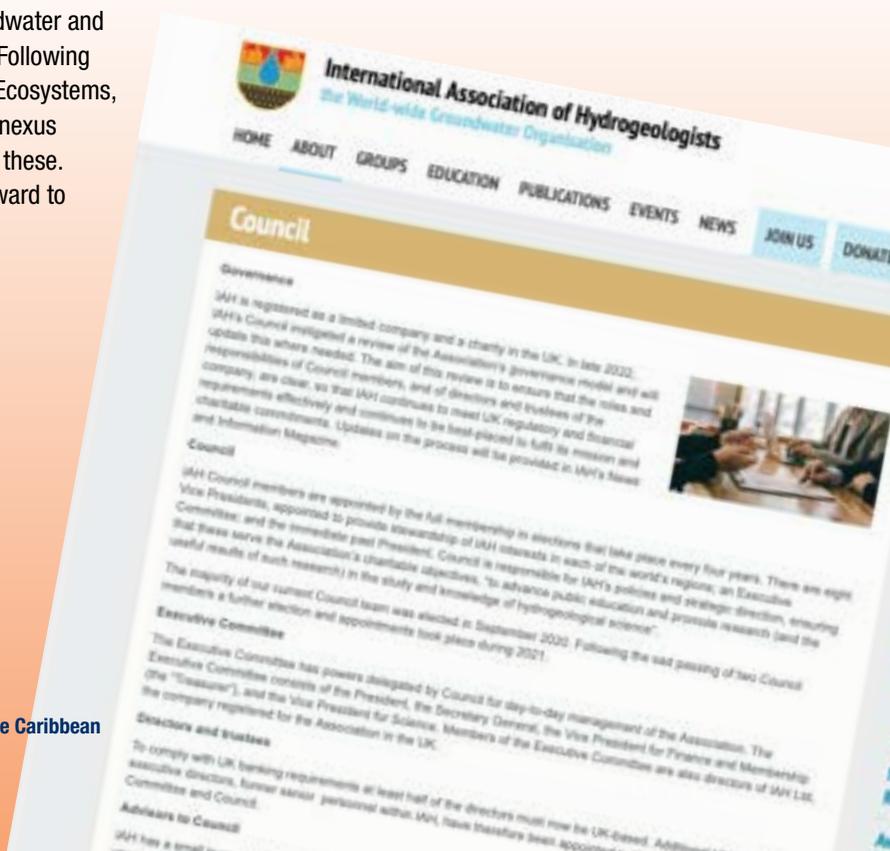
The Executive recognise the need to do more on member support and also outreach to raise the profile of both groundwater and IAH. With this in mind, and with the need to do more to try to bring progress with the sustainable development goals on track, commitments have been made under the Water Action Agenda. The programme of translation for the 'Strategic Overview Series' papers will be boosted and a new paper is due to be published by the Groundwater Quality Commission under the banner of our new 'Technical Insight Series' (a title suggested by Stephen Foster). The Executive encourage other commissions and networks to prepare papers on their own issues of concern.

With the steady stream of requests from United Nations agencies for IAH to support preparation of reports, and other initiatives, the Executive Committee is setting up a new working group to deal with these and to support our commitments under the Water Action Agenda. It is intended that a meeting for the working group should be arranged at the Cape Town Congress.

If you would like to know more about any of the points above, please contact us: info@iah.org



Carlos Molano,
VP Latin America and the Caribbean



IAH Governance

IAH Council has made changes to the Association's governance, ahead of further consideration at the annual general meeting in September. This has been necessary following a decision at the end of 2022 by our bank, HSBC, to discontinue providing a service to us.

Although no reason was given, we know that mainstream banks in the UK now require that at least half of a company's directors to be based in the UK. There are similar requirements now in other countries. Combined with this, there has been a growing reluctance amongst UK banks to maintain accounts for charities in the UK and it is clear that IAH's situation is not an isolated occurrence. Our finances remain well-managed and in good health, as confirmed by the accounts prepared annually by our auditors and submitted each year to the regulatory authorities.

The Charity Commission, IAH's regulator, advises that it is preferable for at least half of a UK charity's trustees to be based in the UK. However, they have told us that this is not an absolute requirement, and other factors, such as where the charity has its base, are also taken into account when deciding on continued eligibility for charitable status.

IAH governance in action



Changes have however been put in place on an interim basis to bring IAH's governance structure in line with the expectations of banks in the UK and we have moved our account to another mainstream UK bank.

IAH Council have proposed that Regional Vice Presidents should no longer have the formal legal responsibilities for IAH Ltd, or act as trustees for IAH as a UK-registered charity. They will, though, continue to direct IAH's activities in pursuing its mission statement and charitable aims, and maintain their critical regional responsibilities for members and national chapters.

Two additional UK-based non-executive directors have been co-opted to IAH's board so that, together with the members of the Executive Committee, 50% of IAH's directors (and trustees) are UK-based. Former senior IAH officers, John Chilton and Nick Robins, have agreed to take on these roles.

It is proposed that a further comprehensive review will be carried out of IAH's governance arrangements. This will ensure they are in line with present-day requirements and that they reflect the way that IAH expects to work in the foreseeable future. The review will be carried out as part of IAH's latest strategic plan. A specialist contractor will be engaged to support this review and appropriate legal advice will also be sought.

Ian Davey
Executive Manager

Technical Insight Series

IAH has launched a new **Technical Insight Series**, which is designed both to inform professionals in other sectors of key interactions with groundwater resources and hydrogeological science, and to guide IAH members in their outreach to related sectors.

The first in the Series, written by our Groundwater Quality Commission, describes the chemistry and detection of PFAS in groundwater samples, their current water quality limits, and potential treatment options for PFAS polluted water.

PFAS – Groundwater’s Dark Matter

Thousands of per- and polyfluoroalkyl substances (PFAS) compounds have been produced — many at industrial scale — since the early part of the 20th century. They have been used in various applications including non-stick cookware and firefighting foams, and by well-known brands such as Teflon® and Gore-Tex®. The extreme persistence of PFAS has earned them the name ‘forever chemicals’. There are various sources of PFAS which end up in the environment, including in groundwater. Events which may lead to contamination include runoff from sites where a certain kind of firefighting foam was used or releases of untreated industrial process water. PFAS also spread around the globe by airborne transport.

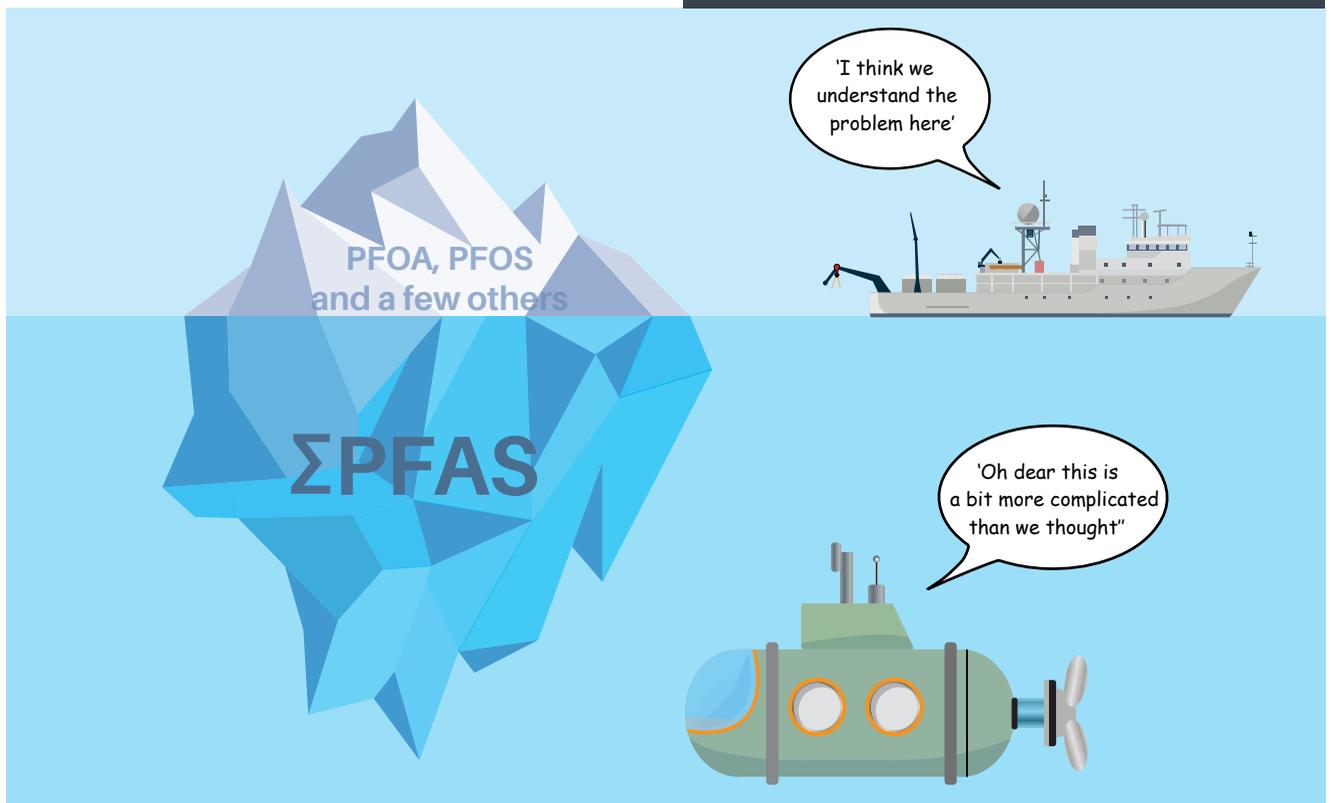
The potential for long-term adverse human and environmental health impacts related to PFAS exposure has come into focus in the last few years. PFAS exposure may affect the immune system, may increase cholesterol levels and may increase the risk of kidney or testicular cancer. At this time, however, the health effects of short- and long-term exposures to mixtures of different PFAS are poorly understood. Many PFAS compounds are now banned or are being phased out.

The unique chemistry of PFAS compounds results in different fate and transport pathways in the natural environment, which are poorly understood compared to better studied organic chemical contaminants such as organic solvents and fuels. In response to this, a large number of research projects are under way around the world to better understand the environmental and health consequences of PFAS, especially in groundwater.

You can read and download the full paper at <https://iah.org/news/pfas-groundwaters-dark-matter>



Image: Although much progress has been made in the understanding of PFAS in the environment.





Hydrogeology Journal – Editors' Choice articles for 2022

The 2022 Editors' Choice articles have been announced for Hydrogeology Journal. This commemorates the UN's 'Groundwater – make the invisible visible' World Water Day Campaign and our own 'year of groundwater' – and not forgetting HJ's 30th birthday. The Editors have selected ten articles. Six are open access and four have been granted free access by our publisher (Springer Nature) until 3 May 2023.

Editors' Choice articles are those that are considered to be exceptional by the editors: Martin Appold, Jean-Christophe Comte, Jean-Michel Lemieux, Rui Ma, Maria-Theresia Schafmeister and Clifford Voss. These have been selected from among the 150 or so articles that were published in HJ in 2022. They illustrate a range of attributes, from outstanding science to philosophical interest, challenging arguments, and more. The editors believe that HJ readers will find these articles to be especially interesting and valuable. They highlight the importance of groundwater in our world, how we humans interact with groundwater, and how we might preserve and manage groundwater resources in the future.

The articles can be grouped into three important areas:

- Measurement and forecasting techniques
- Understanding phenomena
- Human nature and human infrastructure.

You are invited to download, read and share all the articles. Details can be found in an Editor's Message at <http://bit.ly/3kUlkJI>

Congratulations to the authors of these great articles!

Sue Duncan

IAH editorial team (l-r):

Rui Ma, JC Comte, Cliff Voss, Michel Lemieux, Maria Schafmeister, Sue Duncan, Martin Appold, Susanne Schemann, Fritz Schmuhi (Springer)



Hydrogeology Journal meeting

The Hydrogeology Journal team were able to meet again in person now that the covid pandemic has abated. The executive editor, all five editors and the editorial support team met in Stockholm, Sweden, in March. This was combined with the annual meeting with our publisher and Fritz Schmuhl joined us from Springer Nature.

The meetings were hosted by the Swedish Radiation Safety Authority (SSM), with many thanks due to Björn Dverstorp (SSM) for making the arrangements. Björn also organised a technical exchange between SSM and the HJ editors, who gave presentations about their experience in hydrogeological matters that might impact the deep disposal or storage of radioactive wastes. SSM are responsible for regulating radioactive waste management and they introduced the geological repository programme in Sweden, the licensing issues and government approval process. The waste repository must isolate high-level nuclear waste for at least 100,000 years – so long-term climate change (future glaciations and permafrost) impacts on the hydrogeology of crystalline bedrock are key safety considerations for the 500 m deep planned repository.

The HJ team were able to resolve several issues to help smooth the publishing process: improvements in the work flow and manuscript processing; journal scope, size and author instructions; HJ's international footprint; pre-prints and author plagiarism; managing politically sensitive content; the role of journal metrics (e.g. the impact factor) and social media; and concerns about the recent rapid growth in use of artificial intelligence tools for content. Plans for the coming years include the balance of staff resources and ensuring HJ production continues to be efficient and adaptive to changes in the publishing industry.

A reminder of a nation's responsibility towards the water environment and education of the public was seen on the Stockholm waterfront. Two obelisks, erected by the current King of Sweden, highlight the importance of water to Swedish society. Coloured lights show the effectiveness of Stockholm's water supply and wastewater treatment – the photo shows the amount of wastewater treated and the concentrations of nitrogen and phosphorus in the discharge to the Saltsjön Bay.

Elsewhere Stockholmers may have been amused to find this group of geologists admiring and debating (in a variety of languages) the rock formations and groundwater seepage underground in the metro stations. It was a successful and interesting week in many ways!

Sue Duncan



Obelisk on the Stockholm waterfront, showing wastewater treatment status



ShareIt

A paper with several well-known IAH members as authors has been made available as part of the Springer Nature Content Sharing Initiative. 'Global water resources and the role of groundwater in a resilient water future' has been published online in 'Nature Reviews Earth & Environment'.

The authors evaluate the current and historical evolution of water resources, considering surface water and groundwater as a single, interconnected resource. Satellite data from the Gravity Recovery and Climate Experiment (GRACE) show declining, stable and rising trends in total water storage over the past two decades in various regions globally. Groundwater monitoring provides longer-term context over the past century, showing rising water storage in northwest India, central Pakistan and the northwest United States, and declining water storage in the US High Plains and Central Valley. Climate variability causes some changes in water storage, but human intervention, particularly irrigation, is a major driver. Water-resource resilience can be increased by diversifying management strategies.

Full-text access to a view-only version is available using the ShareIt link: <https://rdcu.be/c4xs9>

More information on Springer Nature's commitment to content sharing and the ShareIt initiative is available at <https://www.springernature.com/gp/researchers/shareit>.



SPRINGER NATURE

Member matters

Free registrations for Cape Town!

We are offering free registrations for members for our congress in Cape Town, South Africa. Two registrations via a prize draw for all members and also a call for supported applications for registration, to be paid from IAH's 'Solidarity Fund'.

Cape Town congress prize draw

We have 2 registrations for an open draw to all members for the hybrid Wuhan Congress in September. To enter to win, complete your details including membership number here:

https://www.surveymonkey.co.uk/r/50th_draw

Terms and conditions: Prize draw closes 11.00pm BST on Monday 31st July 2023. Entry is open to current IAH members only (2023 dues paid). One entry per individual (additional entries will be discarded). Winner will be picked by random draw and will be contacted by email soon after the closing date.

Winner will also be announced in the December 2023 edition of "News and Information".

Application for IAH funding: Cape Town congress registration

IAH is able to provide registrations to existing IAH members who may otherwise have difficulty in securing funding to participate in the Cape Town Congress. Traditionally such support has been for those from lower income countries and we would also like to extend this opportunity to younger members on lower incomes who would otherwise be unable to attend. To apply, use the following link where you will be asked to respond to a few questions and provide a short personal statement:

https://www.surveymonkey.co.uk/r/50th_cs

A panel including members of the Organising Committee will assess the applications. They may set other criteria and will contact you in this case.

Terms and conditions: Applications close 11.00pm BST on Monday 31st July 2023. Eligibility is limited to current IAH members only (2023 dues paid, or on sponsorship programme). Winners will also be announced in the December 2023 edition of "News and Information".

SECRETARIAT





Users' Guide IAH MENTORING SCHEME January 2013

...most people will have used their skill
ing to a young relative about which college
his could be called mentoring.

...for who has "been there, done that"
: The goal is to develop the mentee
Our association, mentors could provide:

...clude guidance on job types, interviews,
specific regions of the world or specific

...s (IAH) to develop a mentoring scheme
Given the global reach of the association
ments in which our members work, it is
entoring required for Chartered Engineer
as through national professional
be of benefit to many of its members in

...general... some specifically

...understanding, wise use and protection
web: www.iah.org



Users' Guide IAH MENTORING SCHEME

...will provide:

...ors
...join the scheme

...parties to achieve maximum benefit
...ses and conferences and other ap-
...periences
...olve any difficulties

...es will:
...lete a Mentee Profile
...to work within the IAH framework
...to take part in a feedback
...tion process at the end of the
...ring relationship

...gements outside the scheme.

MENTORING RELATIONSHIP

...nity the mentee's goals
...sure from the beginning that both of you are
...clear about what the mentoring partnership is for

...elo with setting long-term and short-term goals?
...vice about advancing the mentee's career?
...ip with networking?
...mparts sounding-board for the mentee's
...as?

...vice on the application of specific techniques or
...atching else?

...Review this as often as necessary - it's fine
...for goals to change.

...The initiative
...ne to schedule a meeting don't wait for each
...nstitute. Ask for what you want and need
...being demanding).

...nt to the process
...nternal and friendly the mentoring meetings
...reat the process with professionalism.

...ustainable improvements, not quick fixes
...mentoring session to exchange views, ideas
...egies, not just immediate answers to a
...A simple answer to a problem is rarely as
...an understanding of how to approach such
...in the future.

TONSHIP

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...mentee to reflect on the pro

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...e mentoring goals) which they a

...without the mentor's support.

...relationship and what you value about

MENTORING SCHEME NOW OPEN

IAH's mentoring scheme is now open! Whether or not you have participated in the scheme before, if you are a member of IAH you may apply. Choose from the link below (you can also be a mentor and mentee).

- Mentor (giver of advice) apply here:
<https://www.surveymonkey.co.uk/r/IAHmentor2023>
- Mentee (receiver of advice) apply here:
<https://www.surveymonkey.co.uk/r/IAHmentee2023>
- General information about the scheme here:
<https://iah.org/education/professionals/mentoring>

Of course, if you just have a quick question or discussion point you can use our social media channels and engage with IAH's various national chapters and specialist groups, without formally joining the scheme. Don't be shy – we are the global groundwater family – and you will find that if you make contact you'll find people welcoming.

- National chapters listing/contact information:
<https://iah.org/groups/national-chapters>
- IAH specialist groups, commissions and networks (including Early Career Hydrogeologists' Network):
<https://iah.org/groups/commissions-networks>

Demand for mentors continues to outstrip supply. Please, if you could give a little time to help support mentees, we know it would be appreciated. Volunteering as a mentor does not take up as much time as you might think.

The scheme is only open to IAH members – but if you are not yet a member you are welcome to join us now!

SECRETARIAT

Continuing Professional Development (CPD)

To complement our mentoring scheme and to add to the educational information we have on our website, we are developing an informal Continuing Professional Development (CPD) scheme. If you would like to help us finalise the scheme – perhaps some of you who have been mentors in the past may be able to help – contact us at info@iah.org.

For those who want to know more about using the scheme once we can make it available, CPD is the process of tracking and documenting the skills, knowledge and experience that you gain beyond any initial training. The process helps you to identify the further development needs you may have and to set out a plan to achieve them. By documenting and reviewing what you experience, learn and apply, this helps you to plan and manage your own development.

It's for you to own and direct your CPD scheme by considering how you would like your career to evolve and the knowledge and skills you'll need to achieve this.

Steps you can take include:

- Keep a log of your activities, training, and development, including the level
- Write down your overall career goals – where you want to be in two, five and 10 years' time.
- Set out the attributes and requisite skills/capabilities that seem appropriate for these goals.
- Review your current capabilities and where you think you may have gaps

Some of the skills you'll want to achieve can be learned through on-the-job training – and your employer may want to provide guidance on this – while others may require separate formal education or certification.

You'll need to set a time to review your objectives and the progress you've made. Each year you should consider how any shorter-term objectives fit with your overall strategy and set further shorter-term objectives to help meet your longer term plans.

We're aiming this particularly at those who don't have easy access to a formal programme of CPD. It does not take the place of a formal scheme but we hope that you will find it useful in managing how you develop your career.

Find out more at info@iah.org

Free student membership

Since the beginning of the year, students have been taking advantage of our new free student membership option. This entitles students to discounts offered by IAH, to newsletters and email alerts, take part in competitions and prize draws, vote in elections, and opportunities for participating in our national chapters and commissions and networks (though not currently access to Hydrogeology Journal). At the same time, many students have seen the value of our paid-for membership, which also includes Hydrogeology Journal, at a heavily discounted subscription fee.

If you are already a student member and would like to transfer to the new free student membership then let us know at info@iah.org – or via your national chapter if they manage your membership renewal.

To make your choice, you can find out more at <https://iah.org/join-us/student-membership-of-iah>. (Select 'Associate Student Member' for free membership)

We believe that all students enrolled on groundwater and related courses will want to be part of the IAH family. We hope that this new additional free student option in addition to the existing student and early career membership routes will help will set you up for your future career – and long term membership of IAH!

Hydrogeology students in Bolivia





What future for AI...?

At the HJ Editors' meeting there was a wide-ranging discussion about whether and how AI-created content might be seen as usable in a research context. On the one hand it could be used to conduct and present a comprehensive review of contextual information for a paper. But can it be considered to be author? The overall view was 'No' – but it could certainly take a lot of effort out of trawling through potential references, providing a 'real' author could validate the outputs and then use this information properly in a paper. It was agreed that this technology is here to stay and will only get more powerful, so the hydrogeology community should find ways of using it positively.

A presentation from Springer on the role of AI in research can be viewed at: <http://bit.ly/3nUH22p>



The last word – on this occasion – goes to Alfonso Rivera, Chair of the Transboundary Aquifers Commission, and his AI alter ego, with a poem created by OpenAI (ChatGPT):

Beneath the surface of the earth,
A hidden treasure lies,
A life-giving force,
That never sleeps or dies.

Transboundary groundwater,
A precious resource so rare,
It flows across borders,
Without a thought or care.

But as we draw it from the ground,
And put it to our use,
We must remember to be kind,
And never let it be abused.

For though it knows no borders,
And flows without a sound,
Transboundary groundwater,
Is fragile, and must be found.

So let us be its guardians,
And protect it with our might,
For the sake of all who live,
And all who seek its light.



Applied Hydrogeology Award – Call for nominations

We are pleased to call for nominations for the 2023 'Applied Hydrogeology Award'. This award aims to recognise those who have made an outstanding contribution to the application of hydrogeology resulting in an increase in living standards in low and middle income countries. We would especially like to receive nominations for our many colleagues who have less opportunity to publish papers in scientific journals and whose work is perhaps less well-publicised but nonetheless essential.

A panel appointed by IAH Council will review the nominations and it is intended that the award will be presented in September at the 50th IAH World Groundwater Congress in Cape Town, South Africa.

Any IAH member may nominate a candidate, but self-nominations will not be accepted. Candidates do not need to be members of IAH. Nominations should include:

- An explanatory statement by the person submitting the nomination (up to 300 words);
- A letter of recommendation by any other supporter (up to 300 words);
- A brief career history of the candidate (up to 300 words);
- A list of projects the candidate has carried out, including aims, region and period of time;
- A list of projects (planned or accepted), patents, publications or equivalent information.

And finally, if you had just 1 minute to persuade the panel why your nominee deserves the award, tell us what you would say, using not more than 100 words!

Your proposal must be in total be no longer than 5 pages of text in a single pdf-file. This should preferably be in English. Although we are happy to accept nominations in other languages such as Spanish, French, German, Chinese or Arabic, the judging will be based on an English version. It should reach the IAH Secretariat by e-mail (info@iah.org) before July 1st 2023. We look forward to receiving nominations from all our IAH Regions, to reflect the work of applied hydrogeologists across the world.

Previous winners



Ritchie Morris



Paul Bauman



Maria Stella Lizarazo Rojas



Thanks, Kellie!!

After 15 years as our Executive Assistant, Kellie Nicholson has decided it's time to leave the IAH Secretariat. When I joined the Association as Executive Manager in 2008, one of my first tasks was to recruit someone to work with me after Christine Watson retired. Christine helped to prepare a job description for the new person, and I was glad she was willing to sit with me to carry out the interviews.

We both agreed that of the five candidates interviewed, Kellie was easily the best. Kellie soon settled into the post (alongside well-established Sharon and Sue and novice me), taking on all aspects of the task with enthusiasm and good humour. One of the first big tasks was the organisation and reporting of the IAH Forward Look meeting in Reading. She quickly became an effective member of the Secretariat team. Me being a very cautious man with money (especially other peoples'), Kellie was often the one reminding us all of our obligations as a scientific association and charity to keep augmenting the services for our members.

Among the many jobs that she can look back on with pride was developing IAH's new website. I could not have seen that through without her support and insights. Some of our better ideas came from discussions in the car journeys to our regular meetings with the developers. She was not shy of giving her own ideas for things we might do, and if an email from Kellie started "I've been thinking....", I knew a strong coffee and quick walk around our back garden would be required, but many good initiatives came this way.

From this...



... to more of this.

The job of course had its frustrations. In pre-covid times, working at home was less common than now, and lack of direct contact and exchange of ideas was often one of these. Although definitely part time, the tasks were not uniformly distributed, with peaks associated with newsletters, annual reporting and accounting deadlines, council and executive meetings, always willingly met by Kellie, despite sometimes family constraints which she kept in the background.

Hydrogeologists as scientists occasionally caused some frustration to Kellie, but she was very tolerant of us as a species, and her appreciation of groundwater grew over the years. Another of the successes she can feel proud of is the IAH Early Career Network. Its start-up and growth of course depended on the energy and enthusiasm of those IAH members involved, but Kellie was instrumental in maintaining responsive and enabling support from the Secretariat.

So, in summary, we as an Association should be very grateful to Kellie for all her efforts on our behalf over these 15 years. Although she has not decided what to do next, we should wish her well for the future, whatever that brings. Thanks again, Kellie.

John Chilton



Spot Kellie performing with her samba band colleagues!



In memoriam

It is with sadness that we mark the passing of a number of our colleagues in the recent months.

Professor Emeritus José Martins

Carvalho (1943-2023) was a Professor of the Instituto Superior de Engenharia do Porto (ISEP), Geobiobec Researcher, and EuroGeologist (EurGeol), an outstanding professional known in all the Portuguese groundwater related communities, active member of several scientific and professional associations, in Portugal and internationally and recipient of the Medal of Merit by the European Federation of Geologists (EFG). The international journal *Environmental Earth Sciences* (Springer) dedicated a Thematic Issue: Sustainability and Water Resources (volume 73, number 6, March 2015), honouring Professor Carvalho.



<https://iah.org/news/professor-emeritus-jose-martins-carvalho-1943-1923>

Dr John Bredehoeft (1933-2023)

passed away on January 1, 2023 at the age of 89. was a pioneering quantitative hydrogeologist who consistently pushed the frontiers of groundwater science—both in terms of theoretical advances and practical applications. John's contributions were multifaceted and spanned numerous disciplines. His interests and advances linked groundwater hydrology and hydrogeology with geophysics, geochemistry, tectonics, petroleum engineering, economics, radioactive waste disposal, and numerical methods. John has more than 100 peer-reviewed publications covering his numerous scientific contributions.



<https://iah.org/news/john-bredehoeft-1933-2023>

Albino Medeiros (1959-2022) began his career in 1972 as an office helper in a prestigious well drilling company in Lisbon where he became acquainted with many aspects of practical hydrogeology and the importance of keeping and exploring documentation. He followed studies with the support of the company where he was highly esteemed to become a highly respected field and office geologist and hydrogeologist for the company. He later founded his own company in applied hydrogeology and engineering geology, and was an invited lecturer at the Nova University of Lisbon, being acclaimed by students and colleagues for his personal, pedagogic and scientific qualities.

<https://iah.org/news/albino-medeiros-1959-2022>

We report the sad news of the death of **Christine Watson (1943-2023)**, a stalwart of the IAH Secretariat's "backroom team" through the growth of the organisation in the 1990's, incorporation as a charitable company in 2000 and the management of *Hydrogeology Journal*. The picture shows Christine at the 2006 meeting of HJ editors, just ahead of her retirement. We send our sincere condolences to Christine's husband, Chris, and their family and friends.



<https://iah.org/news/christine-watson-1943-2023>





Commissions and Networks

No doubt many members of IAH Commissions and Networks will be at our Cape Town Congress. If you're intending to be there, tell the chairs of your Commission or Network, so that they can consider arranging a meeting of your group. Contact details for C&Ns can be found at <https://iah.org/groups/commissions-networks>

We're also proposing a Working Group meeting to discuss IAH outreach – come and join us!

Groundwater Quality Commission

The Groundwater Quality Commission has written the first paper in our new Technical Insight Series. The paper describes the chemistry and detection of PFAS in groundwater samples, their current water quality limits, and potential treatment options for PFAS polluted water. Find out more in the main article in this newsletter.

Commission on Karst Hydrogeology

The Chairs of the Karst Commission want to expand the group to broaden the exchange of ideas and share activities with audiences around the world. You can find their latest newsletter on the Karst Commission website at <https://karst.iah.org/kc-news>

Find out too about the Karst Commission Geotrip, which takes place from 22-27 May 2023 in Croatia and Slovenia, at <https://karst.iah.org/events-2>

You can become part of the Karst Commission at <https://karst.iah.org/how-to-join>

Hydrogeology 101 – Introduction to groundwater science and engineering

Karst Commission Member Neven Kresic has recently published this textbook, which is available online for free. Hydrogeology 101 introduces the basic concepts in groundwater science and engineering with 16 lectures on groundwater use, principles of groundwater flow, aquifers and aquitards, groundwater recharge and discharge including springs, groundwater chemistry, groundwater contamination and remediation, field investigations, groundwater in water supply, and guest lecture on groundwater drought in California by Alex Mikszewski. Download your copy at https://www.un-igrac.org/sites/default/files/resources/files/Kresic_Hydrogeology%20101_corrected.pdf

MAR Commission

Stay updated with the latest news on managed aquifer recharge collected in the MAR Commissions' monthly newsletters. You can find a full run down of news and information about MAR events held by the IAH Commission and sister organisations at <https://recharge.iah.org/newsletters>

Regional Groundwater Flow Commission

The Special Issue "Regional Groundwater Flow Concept and Its Potential for Interdisciplinary Application" has been proposed. Guest editors Judit Mádl-Szőnyi and Ádám Tóth have set up a brief survey to explore potential submissions for this special issue: <https://forms.gle/ZUoihcbnFNhjctWD9>. Deadline for manuscript submissions is 31 May 2023.

Socio-Hydrogeology Commission

IAH-SHG has a special session "The connectedness of groundwater and human systems", at Cape Town, under the main topic "The connectedness of groundwater and planetary sciences". Go to <https://iah2023.org.za/abstracts/> to submit your contribution.

National Chapters

With well over 50 national chapters, including recent additions in Ethiopia and Malaysia, IAH's global presence continues to develop. If you and your colleagues would like to establish a new chapter we'll be pleased to help out – contact us at info@iah.org.

We've already received annual reports for 2022 from many national chapters – thanks for all these. The extent of activity across in IAH chapters is quite remarkable and congratulations are due to all those involved. The reports included suggestions on how IAH can do better. More work is needed to help make funding available, on managing membership fees and demonstrating the benefits and value of being a member. At the last annual general meeting members agreed that a task group should be set up to review fees, which will take account of value for members. Chapters are invited to put forward a representative to participate in this review. Tell us who your representative will be at info@iah.org.

Reports from Chapters

Australia held several 'tech talks' across states during 2022 – from modelling local to continental scale, hydrogeological conceptualisation, geophysical and hydraulic testing methods, through to Kathmandu Valley Water Supply Management Board (Nepal) and social events. The Australasian Groundwater Conference takes place in November 2023, in collaboration with the New Zealand IAH Chapter and the New Zealand Hydrological Society.

In **Canada**, the IAH-CNC Regional Directors organised around 6 events and webinars in 2022, with another 3 organised by the Early Career Hydrogeologists Network (ECHN). In 2023 they plan to partner again with the Canadian Geotechnical Society for an annual conference in Saskatoon, Saskatchewan in October <https://geosaskatoon2023.ca/>

China held their annual meeting in November 2022 on the theme of 'Groundwater, health and green development', with more than 500 participants. This followed the successful 2022 IAH Congress with China Geology University in Wuhan, where more than 400 experts from over 40 countries took part. Further seminars and an international cooperation on groundwater monitoring are planned in 2023.

Czechia has a small but enthusiastic national chapter that co-organises domestic seminars and conferences, usually with the Czech Association of Hydrogeologists (a national professional chamber).

India has successfully established an E-Newsletter and E-Journal, augmenting its many scientific and technical events. Already held this year in Nagpur was a Special Session of INC-IAH in association with 108th Indian Science Congress. Further plans for 2023 are the monthly 'Popular Lectures Series', a groundwater internship programme promoting development of field-related skills for younger members and the announcement of national awards.

Ireland held its Annual Conference in April in Tullamore, Co. Offaly on the topic of 'Groundwater and Planning'. They also have two training courses planned for 2023. Their annual field trip in autumn will be an in-person, 2-day event in Ireland.

How much water do you use each day?



Japan plans to co-host an international joint session with the Japanese Association Groundwater Hydrology (JAGH) later in the year. ECHN-Japan members will hold their regular online meeting with local and international students.

Kazakhstan's conference in November 2022, in Almaty, on 'Hydrogeological science and practice', commemorated the 100th anniversary of Academician Zh.S. Sydykov and the 90th anniversary since training of mining hydrogeologists began in Kazakhstan. It was organized jointly with Satbayev University's Institute Hydrogeology and Geoecology, with over 100 participants from seven countries. A proposal to develop scientific cooperation between hydrogeologists of Central Asia and others was adopted.

Korea participated in a side event at the UN 2023 Water Conference, in New York in March. There are plans for a KIGAM-JRI joint symposium sponsored by IAH Korea NC in Jeju, Korea. The chapter also hopes to support the Jeju Water World Forum, with UNESCO.

Namibia held the Ada Lovelace Day/Women in Geoscience Dinner in October 2022, in Windhoek, attended by 51 women in the field of geosciences and published the 'Women in Geoscience' magazine, with biographical sketches of women in the industry. Plans for this year include 'AQUAMen' event that recognises men in geosciences, groundwater talks and excursions – and of course, they aim to attend IAH's Cape Town Congress!

Norway has a chapter members' newsletter as well as webinars and conferences. Their main conference takes place in November with the suggested topic 'Laws and regulations'. They're also proposing to arrange short-courses in hydrogeology.

In **Poland**, a new board has been elected and will meet to outline their plan for the next 3 years. They will be able to build on the numerous co-hosted events celebrating the World Water Day in 2022.

Serbia's 16th symposium on hydrogeology in September 2022 attracted 120 participants and there are 90 articles by authors from seven countries in the Proceedings. The chapter honoured the 125th anniversary of Serbian hydrogeology, dating from 1897 when the book 'Groundwater – aquifers, springs, wells, thermal and mineral springs' was published by Svetolik Radovanovi. The project, 'MIKAS – Most Important Karst Aquifer's Springs', was established with IAH's Karst Commission. Committee elections are planned in 2023 so there will no doubt be a full programme of events developed by the chapter.



Ada Lovelace Day / Women in Geoscience Dinner in October 2022, in Windhoek, Namibia



New Members



A warm welcome to the following new members, who joined our Association in the period 26 October 2022 to 29 March 2023

ALGERIA

Ibtissem DJAAFRI
Ahmed FILLALI
ABDALLAH SALHI

ARGENTINA

Martin CASTELLARO

AUSTRALIA

Maya AL DILATI
Dean BUCHANAN
Matthew CAMERON
Anita CHASELING
Grant COZENS
Manuel DIAZ
Liam DUNCAN
Andre DUSZYNSKI
Rachael FLETCHER
Mark FLINTOFT
Sam GOLDSMITH
Matt GOODE
Nataly GUEVARA
Paul HEDLEY
Julia HEIDE
Michael HUTCHINSON
Gerhard JACOBS
Sian KENNARE
Reza KESHAVERZI
Dominica LOONG
Steve MCCORMICK
Mal MCGIVERN
Rebecca MCGRECHAN
Adrian MCKAY
Sean MORAN
Greer NADENBOUSCH
Rebecca NIXON
Yousef NOWROZI
Hakan PARKER
Mandana SHAYGAN
Amin SHOKROLLAHI
Wade SOMERVILLE
Catherine STAFFORD
Christian STEYN
Rhiannon STOCKDALE
Nahidi STOCKS
Matthew TAYLOR
Saeed TORKZABAN
Brent USHER
Anna WATT
Emma WHITE

BANGLADESH

Md Mahmudul HASSAN

BELGIUM

Mohamed BOUEZMARNI
Dries GOORTS
Stijn HUYGHE
Alexia LEYSSENS
Mateusz ZAWADZKI

BOTSWANA

Keoratile TOTENG

BRAZIL

Eduardo Sávio PASSOS
RODRIGUES MARTINS

CAMEROON

Bertil NLEND

CANADA

Lea ANTESZ
MD ABDULLAH ASAD
Abigail BARAN
Rahim BARZEGAR
Steven BERG
Steven BERG
Sandra BIRKS
Rossana BORELLI
Norbert BOTCA
Carlo CILIA
Reid DAUPHINEE
Ndèye Marie DIOP
Albanie DOUGLAS
Rebeca ESPINOSA CORTES
Marc-Alexandre FILLION
Cole FISCHER
Jacqueline GORMAN
Sarah GRIFFITH
Erick GUERTIN
Jennifer HANCOX
Jordi HELSEN
Alexia HEROUX
Maluki KANYENZE
Ceilidh MACKIE
Margaret MCLENNON
Alex NOTT
Jennifer PRETORIUS
Liam PRICE
Sarah RASCHELLA
Yongyung RYUH
Nathalie SAHAKYAN
Michael SCHRIVER

Kathryn SMITH
Reginald SOMERA
Rachel SUN
Peter THOMPSON
Chani WELCH
Audrey WOO
Alan WOODFORD
Tingxian ZHANG

CAPE VERDE

Michael FREDERICO

CHILE, PEOPLE'S REPUBLIC

Gonzalo AURÍA PEREZ
Etienne BRESCIANI
M^a Francisca CLEMO GARCÍA
Aurora Carolina HIDALGO
MARAMBIO
Sergio IRIARTE
Nadia Antonieta MANRIQUEZ
MICHEA
Camila Elena MARAMBIO
PIZARRO
Julia Esmeralda MAZO
MAQUES
Maximiliano Alonso MOLINA
GALLARDO
Gustavo MORAGA
Katherine PINOCHET
Giselle Gabriela PLACENCIA
MARÍN
Ramón QUIROZ
Eugenio Eduardo ROJAS
CONTRERAS
Bárbara Salomé RUIZ
VELÁSQUEZ
Pedro Nicolás SIMUNOVIC
DALANNAIS
Camila Estefanía ZAPATA
FIERRO

CHINA

Zhilin GUO P.R.
Zhenjiao JIANG P.R.
Jinchao LI P.R.
Lei MA P.R.
Peipeng WU P.R.
Qiyang ZHANG P.R.

COLOMBIA

Jorge Luis ABRIL BENJUMEA

CONGO

Harmel OBAMI-ONDON

CONGO, DEMOCRATIC REPUBLIC

Serge KASHIMBO KALALA

DENMARK

Peter VAN DER KEUR
Michael VAN TIL

DJIBOUTI

Zakaria ZAMZAMI

ETHIOPIA

Taye ALEMAYEHU
Astatike BAHIRU
Abebaw Demelash FENTIE
Kefyalew GIRMA
Belay Molla SISAY
Belay TAFACHU
ZEMICHAEL YOSEF
Lulseged ZEMEDKUN
Faris RAMET

FRANCE

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Romain CHABANT
Rachel CHARBONNEL-
PILJEAN
Cécile COULON
Alexia CRISTOL
Chloé GAUDILLAT
Thomas HUGUET
Edouard JOUINES
Clara MOREIRA
Loïc PAQUIER
Chris PAYET
Jose Alejandro PEREZ PARDO
David RAMEL
Carl TIXIER
Romain ZELLMAYER

GERMANY

Akoanung Ayaba ABENDONG
Felix FAHRENBACH
Alfred POLLAK
Mikhail TSYPIN

GHANA

Ayuba BONKU
Jerry S KUMA
Ezeldin NOGARA

GUATEMALA

Jaime REQUENA FERNÁNDEZ

HUNGARY

József DEÁK
Julianna MEKKER
Soma OLAH
Zoltán VÁRI

INDIA

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Sanjog Kumar CHOUDHARY
RONAK CHUNDAWAT
Satyanarayana CHUNDURI
RINKU RANI DAS
Rushikesh Vijoy DAVANE
Rakesh DEWANGAN
Mayuri Sadashiv DONGARE
Vibhuti DONGARE
Ajay DWIWEDI
Apurva FULADI
Deepak Sahebrao GAWAI
Nitesh V. GOPNARAYAN
DAUD BANDENAWAJ
HIPPARAGI
Saroj HIRANWAL
GANESH NARAYAN IYER
Ayush KESHARWANI
MANISH KHATRI
Ravindra Sambhaji KODAG
Chevva KRISHNAIAH
Anjali KUSHWAHA
Suhail LONE
Hema MACHKAR
Saikat MAJUMDER
N C MONDAL
Neety NAYAR
Darshan NIKUMBH
Jyoti NIMJE
Jacob NOBLE
Ritu ORAON
Ishfaq Ahmad PALL
Amit PANDEY
Abhinav PANKAJ
Vaishali M PARAVE
Sagar PINAGE
Sayali PINOGE
Harendra PRASAD SINGH
C P PRIJU
Sumit S PUGAONKAR
Pritesh Shivaji RATHOD
Ashis ROY
Shubham C SALVI
S.RATHINA KUMAR

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 benefits such as Hydrogeology Journal, discounts and offers 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. We'd hate you to miss out. Check your records at: <https://iah.org/members/edit-details>

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Shubham Jagarnath SHINDE

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Viktor SPORYSHEV

MEXICO

Jesús Francisco FLORES

FÉLIX

Guadalupe IBARRA OLIVARES

MONGOLIA

Oyun DEMCHIG

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Tárcia NOVELA

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LIKANDO

Shoopala UUGULU

NETHERLANDS

Swagatam CHAKRABORTY

Pranisha POKHREL

Gloria SOLER

NEW ZEALAND

Ivan BERRA

Sian FRANCE

Logan MCLEAN

Leon PEMBERTON

Louise SOLTAU

NIGER

Cheffou Mairoukoundoum

RACHID

NIGERIA

Victoria AFOLABI

Okechukwu AGBASI

Ayodeji AINA

Omolade Tinuade AJIBOLA

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Nnaemeka UZOAMAKA

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NORWAY

Line HAUKANES

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PAKISTAN

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Raymond HESS

Eric HUMPHREY.

Ilias MAHMUD

Kurt MCCOY

Isaiah MEZA

Aaron MOHAMMED

Rio MURSINNA

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Uganda

Patrick KATO

Juliet NALUBWAMA

Joseph OKULLO

United Kingdom

Arifin ARIFIN

Claudia BERTONI

Kelly CLINTON

Natalie KIEBOOM

Andrew LONGLEY

Joanne MCAULEY

Lindsay MCMILLAN

Jonny MELLS

Daniel SHOCKLEY

Michael SUMBLER

Charles Ile UMORU

David VAN WALT

William VENESS

Orchella VOFO TEYIMGUE

Vietnam

Tuc DANG VAN

Zimbabwe

Muchaneta MUNAMATI

Diary dates

15–19 May 2023
Virtual

EEGS / AEG 2023 Virtual Symposium on “Life of Mine – Maintaining Sustainability Through Geoscience”

The Role of Geoscience in Mine Site Regulation, Running, Rehabilitation, Re-purposing, Retirement, and Reclamation. Looks at environmental concerns and permitting, regulatory water and soil management, rehabilitation, re-purposing of historical mines (e.g., re-processing of mine wastes for critical minerals), closure and reclamation planning and implementation, and education toward future mining geoscience practice. Organised by AEG and EEGS.

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

25–27 May 2023
Trabzon Turkey

HYDRO'2023

Hydrogeology and water resources. Biannual National Symposium on Hydrogeology and Water Resources. Organised by Karadeniz Technical University and Turkish National Chapter HIDRODER.

ktuhidro2023@gmail.com

14–16 Jun 2023
Malta

Flowpath – National Meeting on Hydrogeology

The Italian Chapter of the International Association of Hydrogeologists (IAH) is pleased to invite you to the 6th Edition of FLOWPATH, the National Meeting on Hydrogeology. Following the tradition of the previous editions of FLOWPATH, the conference will be an opportunity for hydrogeologists and professionals to exchange ideas and discuss different issues on groundwater resources.

<https://www.iahitaly.it/news/flowpath/flowpath-malta-2023-first-announcement>

27 Aug – 1 Sep 2023
Stockholm, Sweden, and online

SIWI World Water Week

Innovation for water. Further details to follow. <https://www.worldwaterweek.org/>

17–22 Sep 2023
Cape Town, South Africa

IAH 50th Worldwide Groundwater Congress

In 2023, we come together as hydrogeologists at the southern point of Africa. The theme of the congress is Groundwater: A Matter of Scale. Research, modelling and consulting work is developing at discrete scales right through to regional scale work related to the critical zone and transboundary aquifers. Data starts at the molecular level and moves to “big data”. We up-scale data and we down-scale data. Datapoints become temporal data. And we govern at different scales of involvement.

<https://iah2023.org.za/>

24–27 Sep 2023
Marsa Alam Egypt

Living with Environmental Challenges in the Coastal Zones

Coastal zones around the world are under increasing threat of freshwater scarcity, due to both over-exploitation of groundwater resources and climatic changes. The rising demand for freshwater in coastal areas and small oceanic islands, combined with sea level rise and longer dry periods, could cause collapse situations, inducers of serious humanitarian crises. This session seeks to highlight the importance of coastal aquifers management in a context of climate change, considering the increasing demand due economic reasons, the over-exploration of water resources, especially in arid regions, and groundwater salinization processes. Organised by The Egyptian Society of Environmental Change.

<http://www.marsaalam2023.com>
torab.magdy@gmail.com

Go to <https://iah.org/events> for a fuller list of conferences, events and meetings and to submit an event

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