# NEWS &information

IAH - THE WORLD-WIDE GROUNDWATER ORGANISATION

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

## MAY 2022

**Also in this issue:**



Spurred by the focus on groundwater for this year's World Water Day, Tanzanian journalist Mohammed Hammie asked IAH to support the use of community radio to inform people in villages about the importance of protecting groundwater.

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### APPLIED HYDROGEOLOGY AWARD - NOMINATIONS CALL

We are pleased to call for nominations for the 2022 'Applied Hydrogeology Award'.

Who has made an outstanding contribution to the application of hydrogeology, supporting international development efforts?

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### IAH AT THE 9TH WORLD WATER FORUM, DAKAR

There was a strong IAH presence at the 9th World Water Forum held in Dakar between 20th and 26th March 2022, where our representatives participated actively in discussions at several high level and ordinary thematic sessions on groundwater.

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**INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS**

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@iahgroundwater @iahgroundwater

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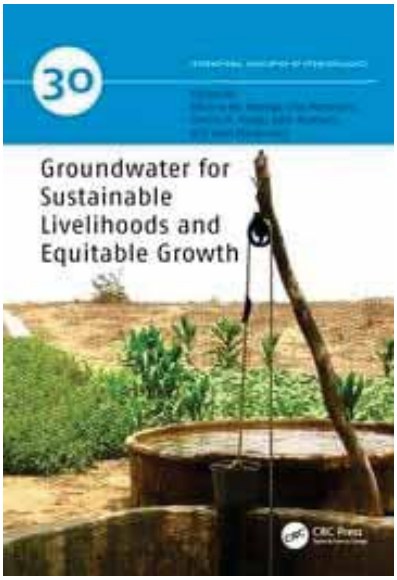
**MAY 2022**

# NEW FROM THE IAH BOOK SERIES

## Groundwater for Sustainable Livelihoods and Equitable Growth

edited by Viviana Re, Rodrigo Lilla Manzione, Tamiru A. Abiye, Aditi Mukherji, Alan MacDonald




This book presents a collection of nineteen situation reports from diverse human and physical settings within the overall theme of groundwater and sustainable livelihoods. It forms part of the mission of the IAH-Burdon Groundwater Network for International Development to create a groundwater knowledge base that will contribute to sustainable groundwater management and development in low-income countries. The book is the very last book in the IAH Blue Book Series, International Contributions to Hydrogeology, and it forms number 30 of that series.

The situation reports examine how groundwater can ensure long-term and equitable benefits to improve both rural and urban livelihoods. The studies underpin the importance of strengthening the interactions between science, policy and practice to develop groundwater systems, promote good groundwater governance and encourage transdisciplinary approaches. These strengths need to integrate both the social and physical dimensions of any development project.

There are two key ingredients to success: engagement between water users and managers, and openly sharing all available information and data. This book is an important contribution to this philosophy and provides examples in which groundwater has helped to reduce poverty, increase resilience to climate and environmental change, and contribute towards equitable growth. The studies reported here are all important because each of them demonstrates the impact that sustainable groundwater development can have on households, communities, and consequently on whole regions. The examples are taken from a variety of regions within Africa, and also from Brazil, India, Pakistan, Laos, Myanmar and Indonesia and provide a broad spectrum of groundwater-based issues and prospective solutions that have benefitted communities and society as a whole.

The book is presented to a high standard and is supported by graphics and photographs which are in full colour. Groundwater for Sustainable Livelihoods and Equitable Growth has been written both for practitioners and managers working within government and NGOs as well as for teachers and their students.

ISBN 9780367903862

HARDBACK £140.00 (30% OFF HARDBACK PRICE FOR IAH MEMBERS)

https://www.routledge.com/Groundwater-for-Sustainable-Livelihoods-and-Equitable-Growth/Re-Manzione-Abiye-Mukherji-MacDonald/p/book/9780367903862

View other titles available: https://iah.org/iah-book-series

We continue to live in challenging and troubling times, with war in Europe, ongoing conflicts and instability in other parts of the world and the Covid pandemic still with us. We hope that you, your families, friends and colleagues are safe and that 2022 can yet provide a time when there can be peace and hope for all. Our support continues for all IAH members to work peacefully towards furthering the understanding, wise use and protection of groundwater resources throughout the world.

Our colleagues in Wuhan, China are working hard on the arrangements for this year's IAH 'World Groundwater Congress'. Abstracts are requested and early bird registration is open till 20 May. The Organising Committee will keep us informed of requirements for managing covid for the Congress.

IAH members have been involved in activities across the world in celebration of UN World Water Day: 'Groundwater - making the invisible visible'. Activities are continuing throughout this 'year for groundwater' – conferences, webinars, radio programmes, videos, books, strategic papers, news release, stories, Tshirts, art and culinary competitions, field trips, academic papers. We are grateful too, to our Groundwater Quality Commission and other IAH members for contributing to the impressive World Water Development Report.

There are too many events to mention individually but we have a new interactive world map on the way that will tell you more about all of IAH's activities. In the meantime, thank you to all our members for raising the profile of groundwater.

Our new Strategic Overview Series paper on 'Poverty Reduction and Groundwater' is now available and supports the theme of this year's Congress. We have also published the final title in our International Contributions to Hydrogeology, on Groundwater for Sustainable Livelihoods and Equitable Growth.

And finally, we hope that you will want to continue membership of IAH – your Association – and renew your subscription, if you haven't already done so. If you no longer wish to be a member, do let us know and perhaps tell us how we can make membership more attractive.

*Ian, Kellie, Sue, Sharon*

IAH SECRETARIAT

# IN THIS ISSUE



## 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. 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 knicholson@iah.org for further details.

# MEDIA FOCUS

## A selection of groundwater related features from around the world

### AUSTRALIA: GROUNDWATER JUSTICE IS JUSTICE FOR ALL

If groundwater could speak, what would it say about water justice? The First Peoples of the Kimberley's Martuwarra (Fitzroy River) are advocating for transformative changes that will bring justice to people and water – especially groundwater. Australia must make the invisible visible and explicitly recognise how groundwater, rivers, and people are connected.
https://www.policyforum.net/groundwater-justice-is-justice-for-all/

### EUROPE'S GROUNDWATER — A KEY RESOURCE UNDER PRESSURE

Groundwater supplies 65% of drinking water and 25% of water for agricultural irrigation in the 27 EU Member States. Across the EU 24% of groundwater is of poor chemical status and 9% of poor quantitative status. Groundwater is under pressure from pollution and abstraction related to population growth and increasing water demand in a changing climate. Implementation of policies needs to be accelerated to protect groundwater.
https://www.eea.europa.eu/publications/europes-groundwater

### SUSTAINABLE GROUNDWATER USE COULD BE ANSWER TO AFRICA'S WATER ISSUES

Tapping into groundwater can help communities in Africa diversify their water supply and strengthen their drought defenses. Researchers tracked long-term water storage gains and losses across Africa's 13 major aquifers and found opportunities for sustainably withdrawing groundwater across much of the continent.
https://phys.org/news/2022-03-sustainable-groundwater-africa-issues.html

### SRI LANKA: GREAT RISK OF GROUNDWATER DEPLETION DUE TO OVER-EXTRACTION

There is a risk of groundwater depletion in the future due to unrestricted groundwater extraction, a National Audit Office report, titled 'Evaluating the Legal Mechanism and Its Functionality of Ground Water Management in Sri Lanka' has said. There is also a risk of increasing contamination of groundwater due to the use of agrochemicals and various other activities.
https://island.lk/national-audit-office-finds-great-risk-of-groundwater-depletion-due-to-overextraction/

### BHUTAN: ABSTRACTION OF GROUNDWATER IN MOUNTAINOUS REGIONS

Groundwater abstraction using boreholes is a very common sight while traveling through Assam to Phuentsholing and Samdrup Jongkhar. Groundwater may be an alternative water source for meeting increasing water demand for domestic supply and agriculture in Bhutan. However, there is limited information on the status of groundwater reserves in mountainous regions like Bhutan. A scientific approach towards establishing baseline information on groundwater resources in Bhutan is proposed.
https://kuenselonline.com/abstraction-of-groundwater-in-mountainous-regions/

### SWITZERLAND: EXCESS FUNGICIDE RESIDUES COULD 'IMPAIR GROUNDWATER FOR YEARS'

Residues of chlorothalonil, an agricultural fungicide banned in Switzerland because of its carcinogenic risks, are still too high in the groundwater from which most drinking water is obtained.
https://www.swissinfo.ch/eng/excess-fungicide-residues-could–impair-groundwater-for-years-/47313718

### HOPE FOR PRESENT-DAY MARTIAN GROUNDWATER DRIES UP

Liquid water previously detected under Mars' ice-covered south pole is probably just a dusty mirage, according to a new study of the red planet led by researchers at The University of Texas at Austin.
https://phys.org/news/2022-01-present-day-martian-groundwater-dries.html

### 'WE ARE AFRAID': ERIN BROCKOVICH POLLUTANT LINKED TO GLOBAL ELECTRIC CAR BOOM

An investigation into nickel mining and the electric vehicle industry has found evidence that a source of drinking water close to one of Indonesia's largest nickel mines is contaminated with unsafe levels of hexavalent chromium (Cr6), the cancer-causing chemical more widely known for its role in the Erin Brockovich story and film.
https://www.theguardian.com/global-development/2022/feb/19/we-are-afraid-erin-brockovich-pollutant-linked-to-global-electric-car-boom

### GROUNDWATER — NOT ICE SHEETS — IS THE LARGEST SOURCE OF WATER ON LAND AND MOST OF IT IS ANCIENT

Outside of the world's oceans, groundwater is one of the largest stores of water on Earth. While it might appear that the planet is covered in vast lakes and river systems, they make up only 0.01 per cent of the Earth's water. In fact, we now know there is 100 times as much groundwater on this planet as there is freshwater on its surface.
https://theconversation.com/groundwater-not-ice-sheets-is-the-largest-source-of-water-on-land-and-most-of-it-is-ancient-174031

### IN UNDERGROUND WATERWAYS, AN ENDANGERED ECOSYSTEM

Groundwater — held in caves, pores, and cracks — is actually the world's largest unfrozen freshwater habitat, containing more water than all lakes and rivers combined. And where there is water, there is life. Often blind, pale, and adapted to live in near starvation, these groundwater-dwelling animals — known as stygofauna — are poorly understood and difficult to study.
https://undark.org/2022/02/07/in-underground-waterways-an-endangered-ecosystem/

### EXPLAINER: WALL OF ICE AT FUKUSHIMA'S CRIPPLED NUCLEAR PLANT

The operator of Japan's crippled Fukushima nuclear power plant said this month that two storage tanks had leaked about four tonnes of coolant solution used to create an ice wall that prevented groundwater from seeping in.
https://www.reuters.com/world/asia-pacific/wall-ice-fukushimas-crippled-nuclear-plant-2022-01-25/

**Presentation of David K. Kreamer, IAH President, in the opening ceremony of UNESCO's ISARM conference 2021, "Transboundary Aquifers: Challenges and the way forward", December 6-9, 2021**

# IF EARTH HAS A PULSE...

If earth has a hidden underground pulse, that pulse is groundwater. This concealed lifeblood of the planet flows through unseen veins, filling the voids of economic development, the fractures and dissolution cavities of international distrust, and supplying life-giving sustenance from the fringes of its capillaries. It has fueled the fountains of many industries and is the circulatory system that underlies our agricultural fields.

This pulse of the planet is not only the baseflow of our rivers, it also provides a steadily gaining stream of support for our dreams of abundance. Subterranean water carries a most vital nutrient for our ecosystems. Where groundwater bursts forth in our springs and wetlands, it inspires art, music, and literature, recharging the human spirit. Springs are a place where the artesian meets the artisan.

This underground fluid moves through unseen intervals and interstices in tortuous ways, mimicking our sometimes complicated and circuitous human efforts to establish policies for the sensible use and protection of groundwater. Through conflict, corruption, and Covid, we have seen losing streams of financial investment, evaporation of donors, and failures of porous regulatory plans. Groundwater's potential is not limited to a diastolic piezometric surface, it is limited only by our imagination. Groundwater, in its mysterious and clandestine pathways, is mined, measured, and modeled within the finite elements of our specific human capacity to see the unseen.

This hidden underground pulse helps fill the deep well of our aspirations - our aspirations of who we want to be as a society and of what we want to leave for our children. And with rising global temperatures, the pulse of groundwater beats through the onslaught of climate change, beyond a shadow of a drought.

It sequesters our carbon footprint and directs the migratory footsteps of thirsty refugees that desperately seek it out in drylands.

But like a fugitive, groundwater steals across borders unchecked, ignoring border guards and ethnic differences. It follows its own gradient, disregarding hydraulic talking heads, and avoiding the radius of influence projected by politicians. It is constrained only by hydraulic conductivity, and by our own limited resourcefulness and ingenuity.

We are here at this conference to address this underground pulse of the earth, this hidden lifeblood of humanity and ecosystems, and the aquifers through which it flows. We are here not only to simply address the mechanics of the arterial flow through water-bearing geologic strata that straddle political boundaries. We are here for a more wholistic, inclusive view. We are here to consider the multitude of ideas and perspectives that inform realistic, cooperative management that ensures equity and human dignity.

The challenge of ensuring sustainable transboundary groundwater transcends academic disciplines. It considers

evolving climate, incongruent governmental systems, and different ethnicities and religions. Ensuring sustainable transboundary groundwater takes into account diverse political ambitions, many distinctive cultures, and dissimilar personal values. The challenge includes coping with seemingly unlimited population growth. The writer Edward Abbey said, "Growth for the sake of growth is the ideology of the cancer cell", - this population strain on the exploitation of aquifers is very real. However, for all our disparate disciplines and society's sometimes contradictory goals, we have unifying themes in sharing groundwater – themes that bind us together.

Sustainable management of transboundary aquifers can lay a foundation for peace and the alleviation of suffering. We are here to consider strategies that promote informed, long-term, adaptive agreements to preserve society and ecosystems for generations. We are here to create the logic and bases for creating transboundary treaties and accords to bring nations and regions together to share this precious, unseen, and under-appreciated resource.

How communities deal with transboundary aquifers can hold the key to conflict or compromise, to evidence-based management or maladministration. We are here at this conference not only to just take the pulse of hidden, underground groundwater on its silent pilgrimage, but to develop tangible ways to ensure its judicious use and protection.

The thousands of members of the International Association of Hydrogeologists in over 130 countries applaud your efforts in this conference, and urge you all to become signatories of the Sao Paulo – Brussels Groundwater Declaration which promotes the value and vulnerability of groundwater – groundwater the silent heartbeat and pulse of the earth.

DAVID KREAMER

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# WATCH AND LISTEN

We're pleased to confirm that a number of the keynote presentations from last year's congress in Belgium were recorded. Two are now available to listen to (transcripts also available), namely:


Jef Caers – Large-scale non-stationary geostatistical modelling in surface and subsurface hydrology

Listen/read: https://bit.ly/3DJ2wTG

David Kreamer - Groundwater in the field: Challenges, opportunities and possible solutions

Listen/read: https://bit.ly/3JO1KqW

Look out for further updates!

SECRETARIAT

IAH NEWS

# IAH EXECUTIVE UPDATE

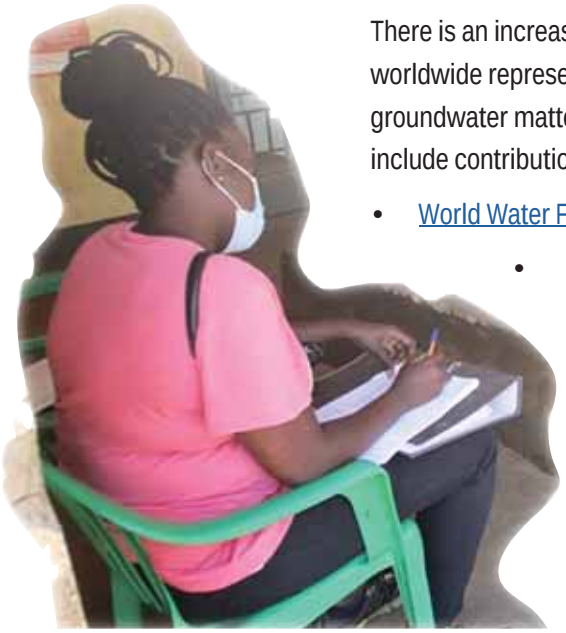
The IAH Executive Committee met online in February, with an agenda dominated by preparations for World Water Day and 'A Year for Groundwater'. Fortunately – and despite the covid pandemic and ongoing economic uncertainties across the world – our finances remain sound. As a result, IAH can look to support activities related to WWD2022 and also longer term aims for the next strategic plan, including:

- international congresses that IAH is running or is significantly involved in
- national chapter meetings on World Water Day and throughout the year, incorporating the theme 'making the invisible visible'
- publications, with a new IAH book, Strategic Overview Series papers, a topical collection of essays by Commissions and Networks for Hydrogeology Journal, and other publications by National Chapters
- podcasts, videos and outreach initiatives to attract attention beyond IAH

From the early reviews of responses from the IAH members' survey for the strategic plan it is already apparent that our approach on EDI (Equity, Diversity, Inclusion) should be developed further. For example, other organisations now include justice. Other key items for future consideration and resources will be member benefits, sponsorship, publications and how we do congresses.

The Executive congratulated the Belgian Organising Committee for the highly successful Brussels Congress. Members of the Executive are now working with the China Organising Committee to ensure that this too can be a success. They are also keeping an eye on preparations for the congresses in South Africa and Switzerland, and for proposals beyond these.

The Secretariat reported that, in accordance with recommendations from the UK authorities, they had checked whether members in specified countries were subject to sanctions. No IAH members fall into this category.



There is an increasing demand for IAH to contribute to international policy initiatives as the worldwide representative of hydrogeologists and hydrogeology, and to be the key global voice on groundwater matters. Recent and forthcoming activities by members of the Executive and Council include contributions to:

- World Water Forum, Dakar
- European Commission's Zero Pollution platform
- World Water Week (SIWI, August) including collaboration with the World Bank, IGRAC, GEF IW:Learn, IUCN and FAO, and potentially with the Ministry of Foreign Affairs of the Republic of Slovenia
- Preparations ahead of the UN 2023 Water Conference, including meetings with UN Water, the Groundwater Summit (December), UNECE, UNESCAP, UN-SDGs (early 2023)

- Support for groundwater in the UN Climate Change Conference (COP27)

It was noted that National Chapters and Commissions and Networks also participate widely in national and international debates, and the Executive Committee agreed that this contribution should increase and would grow in importance.

IAN DAVEY, SECRETARIAT

# HAPPY BIRTHDAY HYDROGEOLOGY JOURNAL!

This year, as well as World Water Day focussing on groundwater, we have another good reason to celebrate - the 30th anniversary of Hydrogeology Journal (HJ)!

In this special year, the HJ Editors – Martin Appold, Jean-Christophe Comte, Jean-Michel Lemieux, Rui Ma, Maria-Theresia Schafmeister and Clifford Voss – decided to select ten articles as winners of the Editors' Choice designation instead of the usual five. These are articles that the editors especially liked for a variety of reasons and consider to be exceptional - outstanding science, innovative approach, potentially important conclusions, important methodology, interesting field area or phenomenon, unusual topic, political/social/governance/historical/philosophical interest, challenging arguments, and more. They were selected from around 140 unsolicited articles published in HJ in 2021.

Our thanks go to all of HJ's authors and also to those people who make HJ article publication possible by volunteering their time and energy - associate editors, manuscript reviewers, and our abstract translation managers and their teams of helpers.

Find out more at HJ's 2021 Editors' Choice articles.

IAN DAVEY, SECRETARIAT

# POVERTY REDUCTION AND GROUNDWATER

We are delighted to release a further title in the IAH Strategic Overview Series (IAH-SOS), which draws the attention of a broader audience in the water and development sectors to the critical importance of groundwater for poverty reduction in developing countries. Download the paper via the link below.

Translations of the paper will soon be available in Chinese, French, Hindi, Portuguese and Spanish. We are grateful to IAH members who volunteered to help with these translations - Ashok Kumar, Felipe Avilés, Nouha Samlani, Antonio Chambel, Faten Jarraya-Horriche, Yamin Deng Yijun Yang, Yanxin Wang.


https://iah.org/education/professionals/strategic-overview-series

GROUNDWATER: **MAKING THE INVISIBLE, VISIBLE**

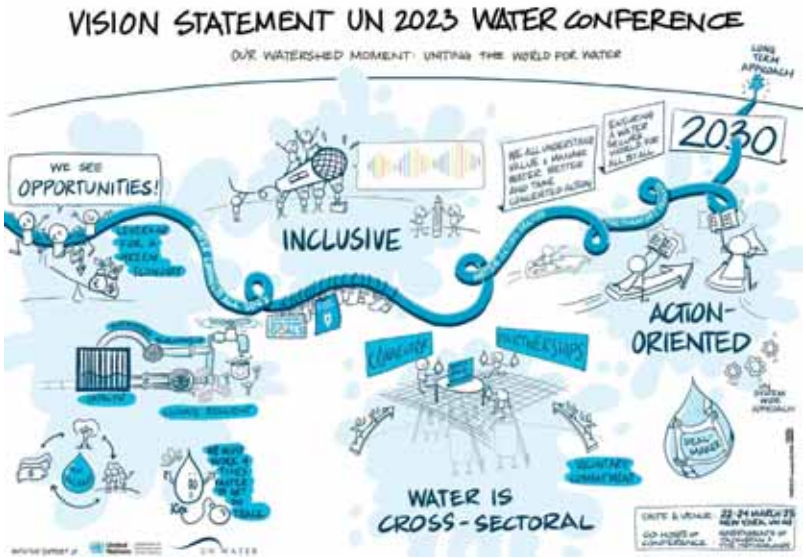
# WORLD WATER DAY
## AND A YEAR FOR GROUNDWATER

World Water Day 2022, on 22 March, focused on groundwater and its importance in solving the water crisis and achieving SDG 6: 'Water and sanitation for all by 2030.'

In this 'year for groundwater' IAH is highlighting the need to ensure wise use and protection of groundwater resources. As you can see from the many examples in this edition of our newsletter, IAH, its groups and members have been involved in events and activities to commemorate World Water Day 2022 and to bring groundwater to the attention of people across the world. In our news release, distributed worldwide, we urge people to think about how much water they use and where it really comes from, and to consider what we all can do to protect this vital resource https://iah.org/news/world-water-day-2022-groundwater-making-the-invisible-visible).


Several moments in the UN calendar in 2022 are dedicated to groundwater:

- The World Water Development Report (UN WWDR) on groundwater was launched on 22 March 2022 at the 9th World Water Forum in Senegal. This is part of an annual series: https://www.unwater.org/publication_categories/world-water-development-report/
- World Toilet Day on 19 November 2022 will complement World Water Day, focusing on the relationship between groundwater, sanitation and hygiene.
- The UN-Water Summit on Groundwater on 7-8 December 2022, with the support of IAH, will bring together scientists, policy makers and practitioners to raise the attention of groundwater at the highest international level. It will set out the findings from all the major water-related events during the year in a comprehensive groundwater message for the UN Water Conference 2023.





@iahgroundwater


## Key messages

IAH also has many more activities that will take place in the coming months, many of which can be seen on our events listing - https://iah.org/events.

- We are targeting a global audience - the general public, as well as experts – with information designed for the wider community and not just technical professionals.
- Groundwater is invisible but its impact is visible everywhere – we are explaining what groundwater is, where it is stored and its critical relationship to human society and healthy ecosystems.
- Groundwater is vital for water and sanitation systems, agriculture, industry, ecosystems and climate change adaptation. Groundwater needs to be reflected in sustainable development policymaking.
- Groundwater is critically important but not fully recognized. We need to see urgent action on groundwater to meet SDG 6 and adapt to the impacts of climate change.

You can more find information on the IAH website and also on the WWD 2022 website: https://www.worldwaterday.org/share-2022.

I'd also like to add my personal thanks to award-winning international journalist Lois Rogers for advising on the IAH WWD 2022 news release.

IAN DAVEY

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# Groundwater, Key to the Sustainable Development Goals, May 2022, Paris

Building on introductory webinars coordinated by IAH-CFH, UNESCO-IHP, and FWP and contributing to the 8th and 9th phases of UNESCO-IHP, the conference will examine the relationships between water-related SDG targets, their stakeholders and groundwater.

It aims to establish recommendations for a range of stakeholders – basin authorities, funding agencies, NGOs, civil society, farmers, water and sanitation companies, industries, planners, groundwater specialists – to ensure the integration of groundwater resources into the SDGs.

http://www.gw-sdg2022.fr/index.php/en/

# IAH at the 9th World Water Forum in Dakar, Senegal

There was a strong IAH presence at the 9th World Water Forum held in Dakar between 20th and 26th March 2022. IAH was represented among others by Dr Seifu Kebede Gurmessa (IAH SSA VP); Professor Cheikh Bécaye Gaye, IAH member, Chair section SFAI, Vice-chair Académie Nationale des Sciences et Techniques du Sénégal; and Prof Professor Moshood Tijani, IAH member, Professor of Hydrogeology and Environmental Geology, University of Ibadan, Ibadan - Nigeria, African Minister's Council on Water.

They participated actively in discussions at several high level and ordinary thematic sessions on groundwater where they were able to present IAH's role as a leading international society for the science and practice of hydrogeology and support for scientists, engineers, water managers and other professionals working in the field of groundwater. Sessions attended included:

- The High Level Panel on UNESCO Intergovernmental Hydrological Programme (UNESCO-IHP) - International Making the invisible visible: groundwater a response for resilience and sustainability
- The High Level Panel on OMVG, OMVS, GENEVA International - The exchange between transboundary aquifers on three continents
- Promoting sustainable development by improving knowledge and governance of transboundary groundwater resources
- Science and innovation for enhancing governance and management of transboundary aquifers and IWRM
- IGRAC (Global Groundwater Centre of UNESCO) The Netherlands Making invisible visible: Groundwater Catalogue for informed policy development and management interventions (1045, 22/03)

By reference to the works of IAH commissions, networks and working groups on specific topics, to the world-wide contribution of our national chapters, our Strategic Overview Series and 'Hydrogeology Journal', they highlighted IAH's continuing support for the programs and goals of the United Nations, and the wise use and protection of groundwater. Cheikh's keynote presentation on "Trans-disciplinary pathways to sustainable and equitable access to water and sanitation" highlighted the importance of groundwater in sustaining water supply and sanitation for low-income people in peri-urban areas of sub Saharan Africa and the key role of hydrogeologists in understanding the processes of water pollution.

The IAH representatives held informal discussions with a range of stakeholders at the Forum - students, NGOs, UN Agencies, Government, and Finance Institutions - to reinforce the message of the importance of making the invisible visible.

The Forum concluded with a commitment to include groundwater in its future agenda/fora and with the Dakar Declaration calling upon the international community to

- Guarantee the right to water and sanitation for all
- Ensure availability of the resources and Resilience
- Ensure adequate funding
- Ensure inclusive water governance
- Enhance cooperation

SEIFU KEBEDE GURMESSA

IAH VICE PRESIDENT, SUB SAHARAN AFRICA

https://www.worldwaterforum.org/en

Senegalese members of IAH at WWF

## Cyprus: Groundwater resources, protection and management, in our ever-changing environment

The 12th International Hydrogeological Conference, took place on 20-22 March 2022, in Lefkosia, Cyprus. Current knowledge was presented and good practice was considered on managing the increasing pressures and challenges on groundwater resources, protection and management, in our ever-changing environment, driven by climate change. Participants were able to review development and management of groundwater resources in the Troodos area and the UNESCO World Geopark.

# Community radio – groundwater in Tanzania

Mohammed Hammie is a Tanzanian journalist who is passionate about the right to clean water and sanitation. He specializes in community empowerment, telling stories about the human right to access clean drinking water, particularly in rural areas. In Tanzania's rural communities that means access to groundwater. As Mohammed says, "We all rely on groundwater in some way and groundwater relies on us to protect it. It is not only the duty of groundwater professionals to protect this valuable resource for future generations - it is the duty of all of us."

In Tanzania local media plays a crucial role in delivering credible and helpful information to people and gives communities a voice to communicate their concerns to local authorities. Using community radio makes it possible to reach big audiences. Mohammed broadcasts a radio programme in Tanzania, Sauti Yangu, which means 'My Voice' in Swahili. Through Sauti Yangu he aims to help communities understand more about their sources of water and to engage with the government, to deal with the big challenges of water supply in rural areas. He travels to rural communities to talk with people who as a daily reality have to walk long distances to fetch water from wells, ponds and springs.

Spurred by the focus on groundwater for this year's World Water Day, Mohammed asked IAH to support this use of community radio to inform people in villages about the importance of protecting groundwater. In some cases activities across the community can over-use or pollute the local groundwater resource and Mohammed believes that, "If people in the community can have a better understanding, they will all know how to look after their precious source of water".

We agreed – and Mohammed set about the arrangements for a series of radio programmes. He spoke initially with Seifu Kebede in South Africa and originally from Ethiopia, our Vice President for Sub-Saharan Africa. He also held technical discussions with Professor Japhet Kashaigili from Sokoine University of Agriculture (SUA) in Morogoro, in the eastern Tanzania. Prof. Kashaigili said, "When the community is not

involved or they decide not to participate in protecting the groundwater, even if you try to force this you will not succeed – or if you do succeed this will cause hurt."

The first phase of the radio programmes was aired at Pambazuko Fm based in Ifakara district, Morogoro region. This radio station reaches more than 800,000 listeners in the area of Kilosa, Malinyi, and Kilombero district. Jonas Simoni Matthew, a chairman of Mnyune village in Kibedia ward, Gairo district, Morogoro, said, "I am glad to be informed about groundwater issues. This education is good, and it has really benefited me today. And I promise my fellow citizens, I also give them this education so that they know there is groundwater that needs to be protected and efforts must be made."

In the next phases, the radio stations involved broadcast to 1.5 million people in Mtwara region, 2.5 million in Tanga region and 500,000 listeners in the south of Zanzibar island. In fact, broadcasts can reach many more people in neighbouring areas beyond this target coverage.

Prof Kashaigili believes that local radio can play a big role in raising awareness about what must be done and to enhance community participation in protecting groundwater resources. This perhaps can be the best way to inspire citizens to participate in the conservation of this vital resource in all parts of the world.

You can find out more about Mohammed Hammie and his work at https://mediainnovationnetwork.org/2021/10/14/meet-the-tanzanian-journalist-passionate-about-the-right-to-clean-water-and-sanitation/

## Back to school in Nigeria

Elomgreenie and Yali Network Ondo State, Nigeria, made the invisible visible at a school in Akure, Ondo State, Nigeria, on World Water Day. The event was also featured in The Hope Newspaper, which publishes news about Ondo State. It was reported that sinking too many boreholes in a community can attract severe consequences and Chief Greenie, Elomgreenie Organisation, Kayode Ojelola warned that proper awareness was needed for preserving groundwater. "We misuse water because we see it in excess and this is wrong". Also speaking was the Deputy Coordinator, Young African Leaders Initiative, YALI Ondo State, Mr Ibukunoluwa Akinlade. Together they advised government at all levels to have policies that will preserve groundwater and provide a single source of water in each community.

## Making groundwater visible in Afghanistan

Climate change and some anthropogenic activities have reduced the quantity and the quality of groundwater throughout Afghanistan. As highlighted on the World Water Day website (https://www.worldwaterday.org/stories-2021/story/making-groundwater-visible-afghanistan), hydrogeology in Afghanistan is being recognized as a tool for peace and development. Under the auspices of IAPG (International Association for Promoting Geoethics) and IAH (International Association of Hydrogeologists), our members in Afghanistan held a highly successful webinar dedicated to "Making Groundwater Visible in Afghanistan" to mark World Water Day 2022. Our colleagues have also submitted papers to the International Conference on GW and Sustainable Goals (Paris, May) where IAH Vice President for West and Central Europe, Manuel Abrunhosa, will make the presentations on their behalf.

## Groundwater: protecting tomorrow's resources

Led by former IAH President Stephen Foster, IWA's Groundwater Group held a webinar that focussed on groundwater for human water-supply. Presenters discussed linkages with the 2030 Agenda and the Sustainable Development Goals (SDGs), especially SDG6 – Water and Sanitation, the benefits and challenges of incorporating groundwater into the water supply, and the importance of "protecting tomorrow's groundwater resource" for future generations. Denmark, where drinking water comes entirely from groundwater, was highlighted as a leading example of sustainable use and protection of groundwater. The webinar marked a step on the 'Road to Copenhagen' and the IWA World Water Congress & Exhibition (11-15 September 2022, Copenhagen).

# A Public Library of Educational Videos for Groundwater Learning

A new, non-profit, web-based platform was launched in January 2022 to help bridge the knowledge gap between groundwater experts and the millions of people across the world who need to make daily decisions to sustain access to clean water for drinking and agriculture.

GroundwaterU is a free public library catalogue of educational videos related to all things groundwater – from science and engineering to law and policy – and for all interests and learning levels. It was set up by Andrew Cohen, a consultant and Adjunct Professor of Contaminant Hydrogeology at the New Jersey Institute of Technology.

Andrew is supported by volunteers in building the library content. Links to videos and summaries are submitted for review using a simple form, which helps make participation easy. Written summaries of the video content include key conceptual and technical elements and the multimedia content, such as animations, illustrations, and lectures on specific topics that are embedded in much longer videos.

An extensive database of keywords enables visitors to unearth specific content that is otherwise invisible to internet search engines. The summaries on GroundwaterU are instantly translated into 100+ languages with the aid of a dropdown menu.

Andrew notes that, "Fortunately, there are many experienced groundwater practitioners, teachers, and organizations that have created high-quality educational videos containing multimedia and that are available to the public for free via YouTube, Vimeo, or on organization-specific websites."

In other cases, there are high-quality, multimedia presentations used in classrooms and conferences, but which have not been posted to the internet in video format. These creative works can be saved as video files, curated, and included in the GroundwaterU library at no cost.

A key goal is for GroundwaterU to become a comprehensive catalogue of high-quality educational videos related to groundwater, with content from around the globe and in multiple languages. It aims to help professionals easily share their knowledge and creativity with the world. The educational concept for GroundwaterU corresponds with the aims that IAH has for education – and following our survey on our future strategic plan we are working on how we can develop this further, taking on board the suggestions made by IAH members. Members are invited to contact us – and Andrew at GroundwaterU directly – about how IAH can contribute to this innovative initiative.

Contact info@groundwateru.org and info@iah.org

You can find out more about GroundwaterU at https://groundwateru.org/

# WATCH AND LISTEN

Catch up on webinars that have involved IAH members and groups during this 'year for groundwater'!

SECRETARIAT

## Groundwater: Mediterranean and Semi-Arid Regions


With population growth, rapid urbanization, higher living standards, water pollution, and changing climate, pressure on groundwater is becoming a universal challenge, with the crisis more serious in arid and semi-arid areas.

This series of webinars is tackling major topics in groundwater science from salt water intrusion in coastal aquifers to managed aquifer recharge, climate change impacts on groundwater and governance. The talks intend to increase groundwater visibility and call for a collective action for its protection. Webinars have included:

- Groundwater Education by John Cherry and Faten Jarraya-Horriche
- Socio-Hydrogeology and Transdisciplinary Sciences by Viviana Re and Oliver Higgins
- Problems and solutions with Aquifer Storage Recovery in Lebanon by Pieter J. Stuyfzand and Catalin Stefan
- The Impacts of Climate Change and Drought on Groundwater: Examples of Management Strategies

You can find out more at https://www.aub.edu.lb/hydroGeo_doummar/Pages/events.aspx including links to the webinar recordings.

## Jo.in Hydrocafe


Jo.in Hydrocafe is continuing its series of webinars presented by up-coming hydrogeologists. Its aim is to encourage early career researchers to show and share their work, increasing the visibility and impact of their contribution to Science. The spread of new research methodologies or their application, will not just transfer new knowledge, but also will motivate and give new ideas to everyone that accesses this platform.

You can watch the recordings here: www.youtube.com/c/JoinHydrocafe. Look out on social media for upcoming dates.

# Free **Congress Registrations**

We are offering free online registrations for members for our congress in China. 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'.

## China 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/49th_draw

Terms and conditions: Prize draw closes 11.00pm BST on Monday 15th August 2022. Entry is open to current IAH members only (2022 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 be also be announced in the December 2022 edition of "News and Information".

## Application for IAH funding: China congress registration

IAH is able to provide registrations to existing IAH members who may otherwise have difficulty in securing funding to participate in the Wuhan 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:

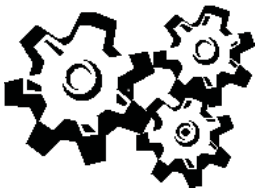
https://www.surveymonkey.co.uk/r/49th_cs

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 15th August 2022. Eligibility is limited to curent IAH members only (2022 dues paid, or on sponsorship programme). Winners will also be announced in the December 2022 edition of "News and Information".

SECRETARIAT

## Mentoring Scheme



Thank you to all those who submitted forms for our mentoring scheme in recent months. As this newsletter is being drafted we are reviewing all applications received and are contacting those who registered. We are grateful for everyone's patience and support for the programme.

We hope to reopen the scheme later in the year for new applications. We'd also love to receive updates/progress from former and existing participants on the scheme - do get in touch with your feedback and comments - email info@iah.org.

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https://iah.org/education/professionals/mentoring

## Check your records!

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 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.

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https://iah.org/members/edit-details

## ?! Beware of scam emails !?

We have again received reports of attempts to defraud members of IAH by scam email. Such attempts can include apparent requests from an IAH colleague for financial assistance based on a supposed emergency situation far from home. Unfortunately, these activities can take advantage of the global goodwill of IAH in making contact information publicly available on the website and on chapter, commission and network sites. These activities are sadly becoming commonplace.

Often it is clear that these emails have come from fake addresses, but sometimes the emails can look very convincing. Please be careful when dealing with any emails that might be suspicious. Ask yourselves, 'Would this person contact me in this way about this matter?' If you receive any suspicious emails of this sort please reject them as spam. Often the generating email address is via gmail, which you can report to Google here: https://support.google.com/mail/contact/abuse?hl=en. We also encourage you to report suspicious emails to the authorities in your country so that they can help fight international cyber crime.

SECRETARIAT

# Ask a **Member**...

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

This issue Monica Guzman from Bolivia has kindly volunteered to contribute. Currently Monica teaches and is studying for her PhD concurrently but as you will read she's also been Hydrogeological Head of the Department of Water Resources in Santa Cruz.

### Tell us about yourself....

My name is Monica Guzman, and I was born in a small city called Sucre, located in the valleys of Bolivia. I have a bachelor's in Civil Engineering (specializing in hydraulics), however I did my thesis in hydrology, which is unusual for a civil engineer. I chose hydrology because it took me out of my comfort zone. Up to that point in my life, I had focused on physics. Then I started learning in-depth statistical analysis. In fact, I had a tough time in the beginning, but thankfully it became easier with time. After finishing my bachelor's, I applied for a scholarship funded by the Canadian International Development Agency (CIDA) and co-organized in a partnership between the University of Calgary (Canada) and the San Francisco Xavier University (Bolivia). Via this process, I entered the master's program in hydrogeology.

I have to say that what caught my attention about this program, was really that it challenged me to step out of my comfort zone once again, and the fact that groundwater is currently a particularly neglected area of study in Bolivia. It was a huge challenge for me primarily because at that time my field of study was "invisible", and basic questions like" In what direction does groundwater move?", "Or the possible flow velocity?" were being asked. It seemed impossible to answer just by going to the site and observing. So, in my opinion, you might feel very intimidated at first in respect to what you may find in the subsoil, especially if you have an engineering background.

Immediately after my graduation, I applied for a hydrogeology position in the Departamental Government of Santa Cruz. Although initially the work was essentially technical, oriented to the resolution of conflicts for water, two years later, I was promoted to Hydrogeological Head of the Department of Water Resources. That being said, it was not as good as it sounded, especially if you happen to be a 27 year old hydrogeologist working in a city with a significant amount of economic development, which of course, also depended 100% on groundwater. I began to receive the most complex and urgent water-conflicts "cases" which of course demanded technical and negotiation skills, and this received a lot of attention as well. Consequently, there was very little room for error; I had to mature professionally as fast as I could. After 3 more years of practicing hydrogeology strongly connected with solving day-to-day problems, I started working in the academy.

Right now, I teach in the Department of Civil Engineering, concurrently working on my Ph.D. in the Department of Hydrology and Hydraulic Engineering of the Free University of Brussels. I must say that the research I am doing has been the meeting point of all the things I've learned and practiced because I am modeling the recharge groundwater rates under post-fires scenarios in the Amazon. For this, I have used my hydrologist background, of course, my hydrogeologist one, and also my engineering practice background.

### Why did you join IAH?

By the time I finished my master's thesis and the second phase of the program "Water

***"look for problems in places where it is evident that people involved need answers because that implies that there will be a stronger motivation, support, commitment, and that leads to the achievement of objectives and farther contributes to the construction of a career as extraordinary as hydrogeology"***

management in Bolivia" was nearing its end, the first Bolivian Congress of Hydrogeology was organized. This congress brought together groundwater professionals from all over the country. I think the atmosphere generated by the congress, specifically getting to know professionals who are dealing with similar hydrogeological problems with the same limitations, made us find that sense of community and want to be an active part of it. So right there, many of us joined the IAH.

Since then, in addition to the annual high-level congresses and the Hydrogeology Journal, which I have appreciated because they were science-centered, I think that the sense of community promoted by the IAH has added significant value into my career. For example, in 2021 I was in San Marcos, Texas, and I wrote to my dear friend and mentor Jeff Green, who lives in Minnesota, who in turn kindly wrote to other hydrogeologists he knows to find someone in town that I could network with. Ultimately, Benjamin Schwartz from the Edwards Aquifer Research and Data Center (Texas State University), was available to show me the low-pressure springs with such a detailed explanation. These experiences are very enriching, and that's just one example, I've traveled to countries where I've met people, who have given me a chance for technical, scientific collaborations, friendships, just because we are the same international team of professionals who study groundwater, and professional associations make it possible, from the most global ones like IAH, to more local groups or chapters; and I feel very grateful for that.

What would you say have been your career highlights (so far), successes, etc?, Any career "low points", or experiences you have learned from, that you are willing to share with others? Particular challenges?

Personally I think that conducting a project on hydrogeology in my country is very challenging and constitutes an outstanding achievement! I think that way because I have gone through many constraints like excessive bureaucracy, unclear regulations about groundwater issues and sexism at certain points. However, somehow we go through it and were able to create conclusions based on our research. Our conclusions giving some guidelines as to the application of the results found, feels like a success for me. I have to say that in that way I develop my resilience capability, that together with the passion I feel for my work, that is what takes me forward.

To give some examples, in 2013, we wanted to understand the groundwater dynamics in the shallow aquifer underlying a landfill, and therefore what would happen in the following years under different leaking scenarios; we performed flow simulations linked to the landfill operation, based on the outputs we proposed some guidelines to protect the most vulnerable areas to pollution. One year later the groundwater monitoring network in the area was enhanced, to keep producing hydrogeological data, that to update the simulations and continue to improve its operation. A few years later another monitoring network was implemented under the same criteria but this time in the new landfill of the city, I wasn't involved on the improvements, but I know of them since I took my students to do fieldwork there and I am pleased with what has been achieved.

To provide one more examples, in 2016, we wanted to delineate the main groundwater recharge areas and validate the recharge mechanisms of the alluvial fan that supplies Santa Cruz de la Sierra city and the entire metropolitan area. This was quite challenging because the hydrogeological information was scarce and dispersed, and some of it was inaccessible; however, we had a hydrogeochemical database, so we used that with stable isotopes analysis, and the results allowed us to propose strategies to preserve areas like Urubo, a city overlying on one of the most hydrogeological meaningful recharge areas of the Santa Cruz metropolitan aquifer. Some of these strategies have

been implemented. To carry out this project, we collaborated with Prof. Ricardo Hirata, who was my professor. The last time I saw him was at the IAH Malaga congress, just before giving my presentation, I was a little nervous and he encouraged me, as usual. I realize that as I write the answers to this interview, more names of wonderful people I know come to my mind.

### What have been the biggest changes you've seen over your career?

Regarding the practice of hydrogeology in Bolivia connected to water management, I haven't seen as many changes as I would like. From my point of view a significant limitation has been that lost efforts invested on improving the groundwater preservation/protection have been individual, i.e. (a particular sector, an institution, a university, etc.), who have proposed and sometimes implemented actions for strengthening the groundwater management in Bolivia. That is the goal, but not necessarily the way because in practice some of these attempts have unfortunately not succeeded; in fact, some unfortunate cases have generated the opposite effect, and that's because as a country, we haven't agreed on how to take these steps and integrate them. To illustrate this, I don't think the solution that leads us to promote integrated groundwater management is specifically the implementation of laws and regulations that bring groundwater to the same level as surface water; or the increase of scientific production in the field of hydrogeology, or the inclusion of our object of study (groundwater) within educational programs. We have to do it all, everything matters, and all is interconnected. To move forward it is necessary try to cover it all in a gradual but integrated way; and that is the moment in which an earth science shares the responsibility with a social science because groundwater management is real teamwork.

There are some examples of past attempts, one of them happened in 2016 when "Municipal Law of Protection and Conservation of water" was promoted to deal with the indiscriminate drilling of wells. I think we all agree that legislation is a crucial piece to achieve groundwater protection. However, when it was the moment to regulate and apply this law it wasn't possible. It was noted that there wasn't enough information to apply the restrictions proposed. I mean, how do you prohibit drilling in certain areas without updated water balances at aquifer level? or how do you update your water balances without a piezometric monitoring network? Or without a reasonable number of hydrogeology companies to deal with the lack of information for implementing these regulations in the short term? Promoting these types of laws without considering how to make them work can be more damaging because you are forced to take it back and, in that way, you lose credibility. People will be attentive to the instructions; they will notice it which could be a constraint for future attempts. If you add the unfortunate coincidence that in the same year another government dependency was closing the groundwater quality monitoring network in the same region because of budget issues, people are not going to get a positive impression. On the other hand, of course, there are also many success stories on groundwater management in Bolivian aquifers, whose insights must constitute an essential part of water governance. Education is a crucial component as well, and there is so much to do too; I admire the work done by The Groundwater Project, I have known David Bethune since I was studying my master's, and his vocation to help others is impressive. This kind of initiative deserves to be replicated in countries like ours.

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

An essential part of my work and indeed of my life is the time I dedicate to teaching in the civil engineering department of the Catholic University of Santa Cruz, the hometown of my mother and mine for almost eight years; so, the tips I share below are a bit general and certainly apply also to young hydrogeologists who are about to start their career:

1. Never stop learning, especially when we have so many online resources at our disposal, from complete online courses and specific tutorials to technical/scientific forums with professionals open to exchanging knowledge on particular topics. The tools we use to practice hydrogeology are continuously updated and diversified, so stay motivated and connected!

2. Be kind to yourself; sometimes, it is essential to recognize that although every one of us has received the same instruction in a particular post-graduate program; in practice, we will deal with different problems in different study sites, which will be instrumented (or not) on other ways too. Read a lot, be open and creative, because the literature also shows many unconventional ways to get the outputs you require; do not forget that there is also a lot of merit in the ability to do as best as you can with little, as long as you find the balance between technical rigor and the solution you are looking for.

3. Do not underestimate surface water; this one is more specific to hydrogeologists. We usually demand groundwater be at the same level of importance as surface water in water management decisions, mainly because it has been dismissed many times. But many times in practice, we make a similar mistake, and we underestimate surface hydrology. From a modeling point of view, in practice, we have to deal with hydraulic conductivity and recharge rates, both highly sensitive inputs; and therefore, we can find infinite combinations of both that fits our assumptions and the calibration process; so improving our recharge estimations from hydrology water balance models can be pretty helpful. In the end, everything is connected, and that should be our philosophy. In my case, I am not allowed to forget this piece of advice since my father, sister, and many good friends, like Jaime Villena, are successful Bolivian hydrologists who inspire me too.

What do you think those starting out should do to gain good experience?

I think that the first opportunity to gain experience is through our theses; something very interesting happened to me when I was searching my topic and study site. I was convinced that I wanted to work in the lowlands of Bolivia, specifically in Santa Cruz de la Sierra City, not only because it is a city of significant development but because it strongly depends on groundwater, so the balance between economic development and sustainable water use was starting to reflect some problems.

I had an interview with the most significant water cooperative in the city, I was very excited by the idea of working with a cooperative that has the challenge of providing water to a city of more than 1.5 million inhabitants, and it seems the ideal place to put groundwater modeling into practice; however, at the time the coordinator of the master's program, Brendan Mulligan, was also in Santa Cruz and suggested to visit the city landfill to explore if there were any options to research with them; the Head of that institution received us, and I remember every detail of that meeting; especially for what he said, and I quote him: "We have these groundwater heads measurements, this chemical analysis that shows us that we are accomplishing the regulations, some tendencies from our monitoring network, but what does this mean? What's going on below our landfill? How long will these conditions be maintained? What can we do to maintain or improve them?". Those few intelligent questions that needed to be answered challenged me, I have to say that at that time, I knew very little about landfills, but until that point, I had never felt so motivated to start a research project because I felt I was in the right place

and at the right time to help; and at the end of the day, that's what hydrogeology is for, help answer difficult questions about water that lead to better decision-making. So my advice is to look for problems in places where it is evident that people involved need answers because that implies that there will be a stronger motivation, support, commitment, and that leads to the achievement of objectives and farther contributes to the construction of a career as extraordinary as hydrogeology.

### Your future plans? Aspirations?

At the moment, we have high expectations of what we are doing, and this is because we are dealing with a latent problem in the forests of the Bolivian Chiquitania. In my country, we have a common practice called "chaqueos" with is the land conversion by burning. This practice has the purpose of getting rid of the natural land-cover to make it suitable for agriculture and livestock; unfortunately, many times, the authorizations involved don't consider the impact that this generates on resources such as water, and still, if these practices are not carried out correctly, they can cause wildfires affecting large areas, where communities that depend on springs (essentially groundwater) are settled. Water scarcity is also a common factor among them.

This complex situation motivated us to investigate the connection between these two problems using models. We started four years ago in the municipality of San José de Chiquitos; starting was quite challenging since the lack of hydrogeological information required additional fieldwork, and the wildfire occurrences often limited the entrance to the site. However, we are concluding this study, and we plan to continue five more years in other municipalities. The final goal is to generate enough technical and scientific information about the water security risks involved and open this issue for discussion with all the stakeholders to find better ways to deal with it. We know this project is ambitious, and I am part of a very competent team, which has brought together local and international researchers with the same objective, starting with my promoter Marijke Huysmans who is one of the most talented researchers and leaders I have ever met, her master's students, my colleagues from the Department of Hydrology of the VUB, my Bolivian students, all of them with a strong commitment. I am convinced that this is how changes happen.

MONICA GUZMAN

Read more interviews: https://iah.org/education/professionals/sources-of-experience

## APPLIED HYDROGEOLOGY AWARD: CALL FOR NOMINATIONS

### Who has made an outstanding contribution to the application of hydrogeology, supporting international development efforts?

We are pleased to call for nominations for the 2022 '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 49th IAH Congress in Wuhan, China.

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 (translation will be arranged by IAH's Secretariat). It should reach the IAH Secretariat by e-mail (info@iah.org) before Monday 4th July 2022. We look forward to receiving nominations from all our IAH Regions, to reflect the work of applied hydrogeologists across the world.

SECRETARIAT

# New **Members**

A warm welcome to the following new members, who joined our Association in the period 20 October 2021 - 9 March 2022

### AFGHANISTAN
Asadullah FARAMAND
Hussain Ali JAWADI

### ALGERIA
Malek ABDESSELAM

### AUSTRALIA
Chris AITKEN
Tobiah AMERY
Michael ARCHER
Zoe BAXTER
Alexander BAYER
Tim BLAKE
Brendan BORG
Bill BULL
Travis CATTLIN
Ned CLAYTON
Hayden CLELLAND
Caroline COOP
Rodrigo CORREA
Claire CORTHIER
Ryan DAVIES
Jordan DE BOER
Andrei DIMAANO
Rijwana ESHA
Isaac GRAVES
Robert GRIMSEY
Hannah GROVES
James HANCOCK
Mary HARANG
Rama HERAWAN
Nick JERVIS-BARDY
Leon LEACH
Greg LEVMINE
Jude LEWIS
Keith LEWIS
Emma LEWIS
Benjamin LUND
Casey MADDEN
Sanjeeva MANAMPERI
Barry MANN
Daniel MARTENS
Stephanie MCCOLL
Andrew MCCONACHY
Keegan MCGUFFIE
Kyle MCLAREN
GEORGE MUNROE
Vevanya NAIDOO
Henry NOAKES
Melissa NORTH
Rusian NURIAKHMETOV
Vanessa O'KEEFE
Joshua OXLEY
Milos PAVLOVIC
Sladjana PAVLOVIC
Jorik POESSE
Joseph REIVERS
Rachael ROBERTS
Tim ROBSON
Paula ROJAS
Kate SELVARATNAM
Silvia SERRA
Jonathon SHUDRA
Guy STOCK
Manfred THIENENKAMP
Richard TOLL
Shaun TROON
Shane TROTT
James TUFF
Riefqy USMAN
Chantel WEIDENMANN
Richard WILLIAMSON

### BELGIUM
Abdoulie BAH
Linh NGUYEN

### BENIN
Francis OUSSOU

### BRAZIL
Sandra PACHECO
Ana KATIUSCIA WEBER

### CANADA
Erik ARDLEY
Stephen BARTLETT
Paul BAUMAN
Susanne BENZ
Terry CARTER
Niloofar FIROOZY
Scott GREEN
Joao KUPPER
Michael LAFLAMME
John MOSQUERA
Kathryn POOLEY
Tarek RASHWAN
Julia Valentina SOARES
Sofija STANIC
Rene THERRIEN
Stephanie WRIGHT
Jane YETTER

### CHILE
Eliana DÍAZ

### CHINA, PEOPLE'S REPUBLIC
Chuntang HOU
Yueqing XIE
Zaiyong ZHANG

### COLOMBIA
Vanessa PAREDES

### COTE D'IVOIRE
Omer Zephir DE LASME

### CROATIA
Dario PERKOVI

### DENMARK
Ane LABIANCA

### ETHIOPIA
BEHAILU BIRHANU WOLDE
Addisu DERESSA
Tolossa Dabi DINAGDE
Daniel HAGOS ARAYA

### FRANCE
Dorian BAILLE
Auguste BENOIT
Léa BUSSIERE
Gurpreet DASS
Sandra DECORMES
Mamadou DIATTARA
Gregory FAGERLUND
Clément FRAYSSE
Malo GINOUX
Pierre-Alain GUISIANO
Mathieu HAZECHNOUR
Eline JOBERT
Anne JOST
Stéphane LANNEZ
Gaspard MAGNINY
Hassan MAHAMAT
Cloé MAYEUR
Olivia MESPOULHE
Mathilde MONON
Laëtitia NATIVEL

Camille ROULLIN
Virginie SCHOEPF
Clara SERVIERE
Théo SOUMILLE
Catherine TRUFFERT
Urie-Luli ZOHORE

GERMANY
Dimitrios BASSUKAS
Hyekyeng JUNG
Linda SOLLER
Hesam SOLTAN MOHAMMADI
Thomas WALTER

GHANA
Prodeo Agbotui AGBOTUI
Emmanuel Kofi BOATENG

GUAM
Maria Jhonnie VILLAREAL

HONDURAS
Hector ORDONEZ

HUNGARY
Abel MARKO

INDIA
Pritha BAGCHI
Joydeep BANERJEE
Devkaran BHANDARI
Rajat S. CHATTERJEE
John Devadas DAKEY
Renuka DAS
Saini DEEPAK
Siddhant EKKA
PRACHI GUPTA
Gayatri JOSHI
Prerna JOSHI
Rakhi JOSHI
Archana KARMA
Sushil KUMAR
Yogesh KUMAR
Ankit KUMAR HOTA
Prasanjit MAJI
Asha NAG
Avinash NAG
Tushar NAIK
Akriti PANCHBUDHE
Dageshwar PRASAD DEWANGAN
Jainendra Kumar RAI
HARI RAMAVATH
Jharna SAHU
Lekhnarayan SAHU
Upma SHARMA
Savita SINGH
Raveena TOPPO
BHAVANA UMRIKAR
Mukesh VASANT SAKHARE
Gaurav VERMA
Soumya VERMA
SP VIKRAMAN

INDONESIA
Azwar MUHAMMAD
Naufal REVANDA
Wahyudin WAHYUDIN

IRAN
Majid ALTAFI DADGAR
Zahra KAYHOMAYOON
Morteza MOZAFARI
Saeideh SAMANI
Mehdi ZAREI

IRAQ
Alyaa OLEIWI

IRELAND
Pat BARRETT
Patrick COCHRAN
Seán CONNELL
Adrian TANNER
Suzanne TYNAN
Joy WAMAGATA

ISRAEL
Alex FURMAN

ITALY
Alessandro GUGLIELMETTO
Antonio LUCCHIARI
Elisa MEDDI
Alessandro PARISI
Paola PETRONE
Davide RENGHI
Michele SALVIONI
Luis Miguel SANTILLAN QUIROGA
Federico TROMBONI

KAZAKHSTAN
Azamat ISKALIYEV

KENYA
Agnes MBUGUA
Florence TANUI

KOREA, REPUBLIC OF
Hanna CHOI
Su Yeon KANG
Kyung-Seok KO
Hyeonju LEE
Jaemin LEE
Jeong-Han LEE
Dongkyu PARK
Hoyoon RYU
Mun-Ju SHIN

MALAYSIA
Mohamad Anuri GHAZALI
Mohd Rozi UMOR

MEXICO
RUBÉN CHÁVEZ
CÉSAR MICHEL HERNÁNDEZ GARCÍA

# A warm welcome to more new **members**

who joined our Association in the period 20 October 2021 - 9 March 2022

MONGOLIA
Enkhbayar BYAMBADORJ

NETHERLANDS
Siska DE VREEZE
Christina FRAZER
Abebe KETEMA
Julio Isaac MONTENEGRO
Loeki VOS

NEW ZEALAND
Catriona GRANT

NORWAY
Malin HASSUM
Thomas SCHEIBER
Robbert VAN DE VEN

PERU
Rogger MAYTA

PHILIPPINES
Jayson Gabriel PINZA

POLAND
Jakub WCISŁO

PORTUGAL
Maria Teresa ALBUQUERQUE
Saulo VIEIRA DA SILVA FILHO

RUSSIA
Nikolay MIKHALCHUK

SERBIA
Ivana CVEJIC

SOUTH AFRICA
Dylan BLAKE
Simmone DU PLESSIS
Cedrick KABANGU
Kes MURRAY
Michael Richard PYBURN
Nico VAN ZYL
Cindy VIVIERS

SPAIN
Juan CAPELO MEDINA
Margalida COMAS
José David COMINO MARTÍNEZ
Christian MONTORO
Antonio Lope MORALES GONZÁLE
María POLL RAMIREZ
Jordi PUJADAS
Esperanza REANO
Diego SAMPIETRO
Mercedes VÉLEZ NICOLÁS

SWEDEN
Fredrik MOSSMARK

SWITZERLAND
Raoul COLLENTEUR

TUNISIA
Hayet CHIHI

UGANDA
Kamusiime BROSOM
Annette MULO
Jordan Samuel MWAVU

UNITED KINGDOM
Khaled ALGHAFLI
Lourds ANTHONYPILLAI
Lucy CARRUTHERS
Richard HOLTHAM
Michael KENRICK
Romain LEBORGNE
Juan Fer RIVERA VELASQUEZ
Sonja SINGH
Harris TARNANAS
Andre VAN COLLER
Georgia WILLIAMS

UNITED STATES OF AMERICA
Cecia BICKNELL
Issam BOU JAOUDE
Dakoda DICKEY
Allan FOSTER
Thomas HANNA
Christine HATCH
Joseph KANNEY
Guy MEANS
Bryant MOUNTJOY
Calib OPHOVEN
James ROMAN
An Ho TAYLOR
Peter WAMPLER

URAGUAY
Lucía SAMANIEGO

## THE STORY OF AQUA - A TALE ABOUT THE WATER CYCLE

Join 'Aqua', a water drop in the ocean that suddenly finds herself evaporating high into the sky and falling down as a raindrop, and eventually swimming through the rocks and soil to the water table far below. This short story explains the water cycle and introduces children - and others - to a host of tiny, watery characters. Our thanks go to David Seccombe for sharing this with us.

This is the story of Aqua and her exciting journey cycling through the water environment ....

One day Aqua was swimming in the warm sea currents off England, when all of a sudden she was lifted into the air. Oh how excited was Aqua to play with lots of new friends bouncing around the clouds and overlooking the beautiful countryside. Below she could see rivers, lakes, wetlands and lots of happy farmers spreading water over their crops.

When there were too many friends for Aqua, a door opened and down she poured to the ground. What a thrilling ride it was to land in a river! When Aqua looked around she could only see a few of her friends. "What happened to them?", she thought, and was sad for a moment. Then she met some new friends called Parr, Elver and the Cray twins with their big nasty claws, but all waved and were happy to see Aqua. Then Aqua bounced into a wall and was instantly cascading down a beautiful weir into a nice wide river. All of a sudden there was a swoosh and King Fisher was diving, dipping and laughing at the fish scuttling around the clear water. While swimming towards the sea she met the stern Effy who said "You must return with more friends to make sure the river is healthy and happy and your friends, Parr and Elver and the Crays can breathe in the healthy waters". After a little time Aqua was back out to sea, swimming in the warm waters off England.

Again, Aqua was lifted into the air and met some more friends bouncing around the clouds. "This is so exciting", she thought. When she fell to the ground this time she landed on some soil with a splash. "Ouch!", she said and was thinking what would happen next as she did not have a river to swim in. Then came a voice from below the soil which said to Aqua, "I am Vaydos come quickly with all your other friends and join us below". So Aqua went down past all the grains of soil and rock and met up with Vaydos, who told her not to be frightened as a treat was in store for her. In an interstitial moment Aqua found that as she went lower, she was getting cleaner and more beautiful. When at last she came to a watery table she saw that all her friends from the cloud were also the prettiest things she had ever seen.

"Where am I?", said Aqua. Then a voice said, "I am Flo and you are indeed very lucky. You have joined a large movement that protects all those lovely rivers, lakes and wetlands you saw from the clouds". "Wow!", said Aqua, "that is impressive". But then Aqua said she met up with Effy who said that she protects the rivers. Flo laughed and said that Effy needs us to support her rivers, otherwise she would not last for the duration of a summer. While Aqua and Flo swam through the rocks she learnt more about this wonderful underground movement called groundwater. She heard about King Creta who was much depleted about the lack of water in his beautiful streams and was heard crying in his bed. "Why is there not enough water?", gasped Aqua. Flo said sadly that people may love water but they do not love groundwater, as they have taken us for granted for too long. "Oh dear", said Aqua and then felt like a circle of depression was around her. While thinking about other things she bumped into a shrimp call Stygo. Aqua said that she had heard that Stygo bites, but he just laughed and said, "No, I just like swimming around and I'm very friendly!".

While travelling, Flo told her about the wetlands and lakes they support and the clean water for drinking. "People drink us?", cried Aqua. "Yes", said Flo and then Aqua thought that would be yucky and a terrible waste. After a wonderful time swimming together Aqua could hear a noise coming from above. A bit scared, Aqua asked Flo what the noise was. "That is a river and it is now your turn to help Effy keep the rivers healthy." Feeling hyporheic Aqua sprang through the river bed and met her friends Parr, Elver and the Cray twins. Well, Aqua could not stop talking about her wonderful adventures with Vaydos and Flo, and the wonderful stories about the importance of groundwater. Aqua was very proud as she passed by Effy, knowing that she and her friends were keeping the rivers healthy.

When Aqua was swimming back to sea she could not wait to tell all her friends about Vaydos, Flo and the important work they do for the water environment. Aqua hoped that she would again be lifted up again and be part of the groundwater movement.

# CHAPTER NEWS

There has been a great response from our national chapters to World Water Day 2022 and this 'year of groundwater'. Chapters have taken up the challenge to reach out beyond IAH and a few of the many examples that have taken place across the world are shown below. And as you can see from the list of events on the IAH website (see https://iah.org/events) there are many more events on the way that IAH is running or assisting with. Other activities in the pipeline include videos, radio programmes, podcasts and books.

Do tell us about anything that your chapter is doing. We'll be promoting everything on a new interactive world map soon – watch this space!

We now have more than 50 national chapters across the world, with Malaysia being the latest one to hold an inaugural meeting. Recently we've had enquiries from Afghanistan, Cote d'Ivoire, Zimbabwe and Ethiopia. As part of the development of our new strategic plan, we want to provide more support to chapters and to help the establishment of new chapters. Our national chapters are also strengthened by the increasing number of corporate supporters in the countries where they are present. Currently we have 73 corporate members and sponsors, which are based in 31 countries but also active across several others.

Tell us about what your national chapter is doing at info@iah.org. The same email applies to those interested in forming a new national chapter.

SECRETARIAT

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

## Australia

### IAH art and culinary competition for schools launched


IAH Australia NC held a competition for schoolchildren to produce a piece of groundwater related artwork – a drawing, painting, collage, a photograph of a groundwater themed cake or a digital artwork – with prizes!

Meanwhile, Sarah Bourke, IAH VP for Australasia and the Pacific, was interviewed by RTR FM in Perth, where 50% of the city's drinking water comes from groundwater – listen in at https://rtrfm.com.au/story/dr-sarah-bourke-world-water-day/

http://www.iah.org.au



Find IAH groups

## Canada

### A cross-country check-up on Canada's groundwater

Members of IAH Canada National Chapter were part of a panel of leading hydrogeologists from across the country on World Water Day.

They explored the vast diversity of Canada's groundwater resources and the challenges facing one of this most critical, yet underappreciated natural resource, calling for sustainable management in a changing world.


http://www.iahcnc.ca/index.php

## China

### Magical Groundwater - Sustainable MAR Technology

The Shenzhen Women Scientists Association and SUSTech held a webinar at Chinese New Year: "The Mysterious Groundwater: Sustainable MAR Technology". Presented by Yan Zheng, co-Chair of IAH's Commission on Managing Aquifer Recharge, it was aimed at the general public and school children.

Find out more at https://www.bilibili.com/video/BV1pY411L7BK/?spm_id_from=333.788 (in Chinese).

## Georgia

### Meeting to celebrate World Water Day

A meeting to celebrate WWD2022 was organised at the Georgian Technical University by the Institute of Hydrogeology and Engineering Geology, the Faculty of Mining and Geology and Faculty of Civil Engineering, and the Georgian National Group of the International Association of Hydrogeologists. The event was opened by the Rector of the Georgian Technical University, Professor Davit Gurgenidze and covered by GTU Pulsi TV (see https://drive.google.com/file/d/1NNkop5tJcfO9LiCw-BttlWJFGYyRrL1W/view - in Georgian)

## Germany

### Das Unsichtbare sichtbar machen - Making the invisible visible!

To celebrate 'Weltwassertag', Professor Johannes Barth, of Friedrich-Alexander-Universität Erlangen-Nürnberg and President of the German Chapter of the IAH, Professor Matthias Fifka, also of FAU, were joined by Bavarian Minister for the Environment, Thorsten Glauber, to 'further the understanding of groundwater and promote IAH's mission!'

See https://www.fau.tv/clip/id/41094 for more (in German)

https://germany.iah.org/

## Italy

### Photo Contest 2022

In occasione del World Water Day 2022 del 22 marzo, IAH-Italia organizza un photo contest con l'obiettivo di valorizzare le acque sotterranee presenti nel territorio italiano. E i premi? Ci saranno! Venite a scoprirli!

http://www.iahitaly.it

## Norway

### Norwegian and global perspectives

For World Water Day Hydrogeologists of all ages gathered for inspiring lectures, and interesting perspectives on Norwegian and global groundwater challenges.

## Poland

### Celebrate World Water Day with us!

A popular science lecture was given by Dr. Monika Derkowska-Sitarz from the Wrocław University of Technology about what is most important, but invisible to the eyes! Dr. Magdalena Worsy-Kozak introduced everyone to the secrets of using groundwater as a source of critical raw materials.

https://www.youtube.com/watch?v=WyF8NaD9vDY&list=PLrerHiIrVUZi6NKq_4NsVO_ISn-1p12Rx&index=2

## South Korea

### Evolving roles of groundwater in addressing the new challenges

President Dave Kreamer, Korea and Asia Vice President, Yongje Kim, appeared on 'The Groundwater Talk Show', which was screened from Jeju, Korea (see https://www.youtube.com/watch?v=UBnX-K9C3rk). This was followed by a full-day conference organised by the Institute of Geoscience and Mineral Resources (KIGAM) and Jeju Research Institute (JRI).

## Spain

### A manifesto for groundwater

"On the occasion of World Water Day in 2022, dedicated to groundwater, the associations of hydrogeologists have joined the Manifesto for groundwater in Spain , with the aim of conveying to the public and their representatives the importance of this natural resource."

Find out more at https://www.aih-ge.org/wp-content/uploads/Manifiesto_dia_mundial_agua.pdf (in Spanish)

# São Paulo-Brussels Groundwater Declaration

Over a thousand people have already signed the São Paulo-Brussels Groundwater Declaration - please add your name. With your help, the International Association of Hydrogeologists and all its partners will use the Declaration to inspire the actions needed to further the understanding, wise use and protection of groundwater resources throughout the world.

Let's make the invisible visible! And like those who've already done so, share this - and your photos on social media - and ensure the messages contained reach those those who need to see it.

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.

Read/sign here: https://iah.org/gwdeclaration

## Groundwater Declaration inspires leaders

Marco Petitta, IAH Vice President for Science and Programme, reports that a proposal for a new law on water resource protection in Italy cites the São Paulo-Brussels Groundwater Declaration and notes that "this vital and strategic resource, which is by nature 'invisible', should be given greater importance and visibility to ensure its resilience and protection from overexploitation."

The proposal aims to modify existing Italian environmental law to reinforce the need to improve both the knowledge and the protection of groundwater resources. It also seeks to recognise the main aquifers tapped for drinking purposes as 'environmental sanctuaries' and to enhance their protection, not only by regulation but also highlighting their role to citizens and society.

The proposal has been made by Senator Ruggero Quarto, who is himself a geologist.

# 49th IAH Congress – China 2022

# GROUNDWATER SUSTAINABILITY AND POVERTY REDUCTION

Welcome

The theme of the 49th IAH Congress in September 2022 is "Groundwater Sustainability and Poverty Reduction". Poverty reduction is a top priority for most countries in the world. Unfortunately, most of the poor countries and regions have been faced with serious problems of water scarcity and contamination. It is the mission and ultimate responsibility of the international community of hydrogeologists to help the people get access to sustainable safe supply of fresh groundwater. With your active participation to share your ideas, experiences and knowledge, we believe this congress in China will be a great success. We are keeping a close watch on the precautions required for Covid and will keep you informed of developments.

KEY DATES

- 28 FEBRUARY: Call for abstracts
- 20 MAY: Early-bird registration
- 30 JUNE Abstract submission deadline

## CHINA ORGANISING COMMITTEE


China Congress website - http://www.iah2022.com

DIARY DATES & EVENTS

# 2022 - SELECTION

18-20 May – Paris, France
Groundwater, Key to the Sustainable Development Goals
This international conference will examine the overall relationships between water-related SDGs targets, their stakeholders and groundwater. It will enable sharing of knowledge, experiences, findings and good practices on GWR in sustainable development trajectories, to elaborate recommendations to ensure the best integration of groundwater resources into the SDGs. http://www.gw-sdg2022.fr/

22-25 June – Malaga, Spain
Eurokarst 2022
Eurokarst is the European bi-annual conference on the hydrogeology of karst and carbonate reservoirs. Organised by CEHIUMA and IGME in cooperation with universities of Neuchatel and Franche-Comte.
http://www.eurokarst.org/

26-30 June – Caserta, Italy
MinWat2020
3° International multidisciplinary conference on mineral and thermal waters. 3° International multidisciplinary conference on mineral and thermal waters (postponed from 2020). Organised by Organised by Commission on Mineral and Thermal Waters of IAH and IAH Italy. http://www.minwatitaly2020.org

23 August - 2 September – Stockholm, Sweden
World Water Week - Seeing the unseen: The value of water
he week will cover topics ranging from food security and health to agriculture, technology, biodiversity, and the climate crisis. Organised by SIWI. https://www.worldwaterweek.org/

11-15 September – Copenhagen, Denmark
IWA World Water Congress & Exhibition - Water for smart liveable cities
The IWA World Water Congress & Exhibition engages stakeholders and key contacts within the conventional water sector and beyond. With a strong representation and contribution from Nordic and Baltic Sea countries, the IWA Congress & Exhibition is a vital opportunity to learn about the Nordic water challenges and solutions, including participation in technical site visits. https://worldwatercongress.org/

12-15 September – Maastricht, the Netherlands
LuWQ2022 – 5th International Conference on LAND USE and WATER QUALITY: Agriculture and the Environment
LuWQ2022 is an interdisciplinary conference on the cutting edge of science, management and policy to minimise effects of agriculture and land use changes on the quality of groundwater and surface waters. Organised by Organised by RIVM National Institute for Public Health and the Environment, the Netherlands (principle organiser); Aarhus University (DCE and Department of Bioscience), Denmark; Geological Survey of Denmark and Greenland (GEUS); and Umweltbundesamt (UBA), German Environment Agency, Germany. IAH is Scientific Sponsor of the conference. https://www.luwq2022.nl/

18-23 September 2022 – Wuhan (hybrid conference) China
49th IAH Congress - Groundwater Sustainability and Poverty Reduction
Poverty reduction is a top priority for most countries in the world. Unfortunately, most of the poor countries and regions have been faced with serious problems of water scarcity and contamination. It is the mission and ultimate responsibility of the international community of hydrogeologists to help the people get access to sustainable safe supply of fresh groundwater. With your active participation to share your ideas, experiences and knowledge, we believe this congress in China will be a great success, and look forward to meeting you in in Wuhan! http://www.iah2022.com

https://iah.org/events
For a fuller list of conferences, events and meetings and to submit an event

Share knowledge and memories... @iahgroundwater #iahgroundwater