

International Association of Hydrogeologists Commission on Managing Aquifer Recharge



**International Association
of Hydrogeologists**
the World-wide Groundwater Organisation

**IAH Commission on
Managing Aquifer Recharge**

IAH-MAR REPORT OF ACTIVITIES 2023

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Sister Websites:

Spanish: <https://dinamar.tragsa.es>

Chinese: <http://china-mar.ujn.edu.cn/>



Report of activities by IAH-MAR co-chairs and commission members in 2023

Events

- **11th International Symposium on Managed Aquifer Recharge (ISMAR11), 11-15 April 2022, Long Beach, California, USA. Results.**

Materials produced by the organizers, and by IAH-MAR co-chairs:

- ISMAR 11 draft program <https://recharge.iah.org/files/2022/08/ISMAR-Draft-Program.pdf>
- ISMAR-11-onsite-guide https://recharge.iah.org/files/2022/08/ISMAR-11-onsite-guide_c.pdf
- ISMAR 11 abstract book (160 pg)
<https://recharge.iah.org/files/2022/09/ISMAR11-abstracts-book.pdf>
- ISMAR 11 presentations and videos (external link)
<https://www.grac.org/ismar-speaker-presentations/>
- P-ISMAR 11 mini-book (external link to DINAMAR, IAH-MAR's sister site)
<https://dinamar.tragsa.es/file.axd?file=/PDFS/P-ISMAR-11.pdf>
- ISMAR-11 field trips <https://recharge.iah.org/files/2022/08/ISMAR-11-Field-Trips2.pdf>

Available in the MAR Commission website:

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

- **NGWA MAR conference. Managed Aquifer Recharge: Unleashing Resiliency, Protecting Groundwater Quality**
 - April 24-25, 2023, San Antonio, Texas. <https://www.ngwa.org/what-is-groundwater/groundwater-issues/managed-aquifer-recharge>
 - Some organizers take part in the IAH-MAR commission list
- **UNESCO-IWRA conference: Emerging Pollutants: Protecting Water Quality for the Health of People and the Environment. 2023 January 17th – 19th.**
 - More info and results: <https://iwraonlineconference.org/>
 - Results: Some of the recordings are already on line:
<https://iwraonlineconference.org/recordings-23/>
 - Some MAR presentations were interspersed in sessions 2 and 4, Emerging pollutants and Groundwater:
<https://iwraonlineconference.org/recordings-23/>
- **Second International Conference on “Water Resources Management and Sustainability: Solutions for Arid Regions”, 26-28 February 2024, Dubai, United Arab Emirates**
 - Some IAH MAR members have participated.
- **VII Congreso colombiano de hidrogeología. Medellín, Colombia, 20 to 24 March 2023**



- Dr. Niels Hartog (KWR) has imparted a first day course: Sustainable water supply using managed aquifer recharge (MAR): potential, performance and pitfalls.
- **MAR in the IWRA's World Water Congress**
 - On September 11st, during the IWRA world water conference, took place a specific session on MAR: Managed Aquifer Recharge: A Proven Technology to Improve Water Security. From 15 to 16:30, local time.
 - More info: <https://www.worldwatercongress.com>
- **Geofluid Piacenza (Italy). Special MAR sessions. 2023 September 14th and 15th**
- **Workshop on MAR scheme design and operation according to DM 100/2016 (regulation for licensing MAR schemes in Italy)**
 - 60 participants took part in a workshop on MAR design and operation according to the Italian regulation DM 100/2016.
 - Download the presentations: [presentations 1.zip](#)
- **50th IAH congress. Cape Town, South Africa. September 18th to 22th**
 - "Groundwater: A Matter of Scale"
 - Specific session on MAR. 16 abstracts received:
 - https://recharge.iah.org/files/2023/10/50IAH-MAR-Abstracts_CapeTown2023.pdf
- **International RBF Conference, Dresden, 16-18 October 2023**
 - Bank filtration / riverbank filtration (BF/RBF) is an element of managed aquifer recharge and has been used by riverside communities for many decades as a natural water treatment process...
 - www.htw-dresden.de/rbfconf
- **AGU Fall 2023 meeting. Dec. 11 – 15, 2023. San Francisco**
 - Session H040. Climate proofing our water supply through upscaling managed aquifer recharge.

Courses, lectures and webinars

- **5 International Summer School on Managed Aquifer Recharge, MARISS, from 3 July to 14 July 2023**
 - 3 July to 14 July 2023. Organised by IAH-MAR members. More info: <https://www.htw-dresden.de/en/university/faculties/civil-engineering/studies/subject-areas/water-sciences/research/planned-research-topics>
- **The 21st Century Water Quality Challenges for Managed Aquifer Recharge**
 - Speaker: Yan Zheng, PhD. 18 Jan 2023
 - View the recorded webinar: <https://wrrc.arizona.edu/events/brown-bag/wrrc-brown-bag-webinar-21st-century-water-quality-challenges-managed-aquifer>
- **Presentations on MAR from the professor Custodio (in Spanish)**
 - Cycle of conferences organized by the University of Chihuahua



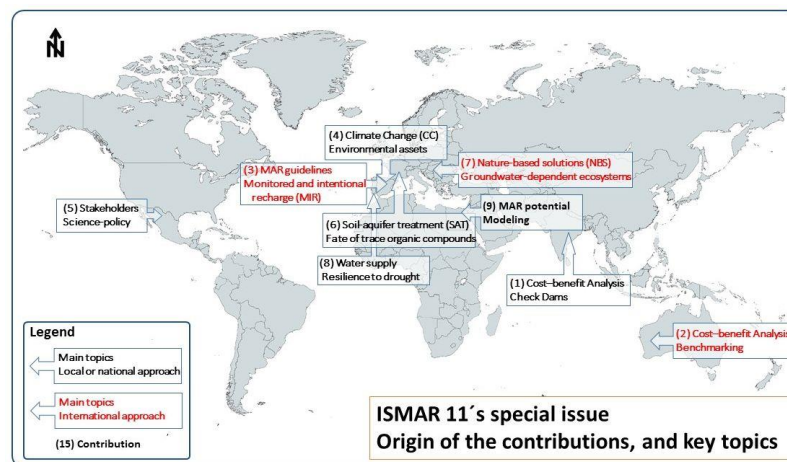
- Múltiples aspectos de las acciones de recarga artificial de acuíferos.
https://youtu.be/wQ_Cdfv_ciM
- **IAH Colombian chapter organizes a mini-conference on MAR**
 - On May 21st took place a short conference organized by the IAH Colombian Chapter. Niels Hartog and Enrique Fernández Escalante presented two slots on MAR, exploring possibilities for future actions in the country.
- **IAH Chile chapter organizes a brief presentation on MAR (in Spanish)**
 - Recarga de Acuíferos Gestionada (RAG)", dictada por Claudio Vergara. Miércoles 14 de junio a las 19:00 horas (Santiago, Chile).
 - Chilean chapter: <https://www.aih-cl.cl/>
- **Risorse idriche e siccità del 29/06/2023 a Torino (In Italian). Water resource scarcity in times of climate crisis: issues, experiences and proposals for mitigation action**
 - <https://www.geologiapiemonte.it/apc/apc-news/articolo/la-scarsita-della-risorsa-idrica-in-periodi-di-crisi-climatica>
 - Access to the presentations:
 - https://drive.google.com/file/d/1Dqwa3_bTxmD0EDgSrc1ph5PmL6fXoRGY/view
 - At least three speakers from IAH-MAR
- **Wetlands as Nature Based Solutions (in Spanish)**
 - 09 de junio se celebró el Webinar: "Humedales como soluciones basadas en la naturaleza".
 - El evento contó con 863 profesionales inscritos procedentes de España, Portugal y América Latina. Hubo ponencias específicas sobre MAR. At least one from a MAR commission member.
 - Acceso a la grabación: <https://www.youtube.com/watch?v=7H-StNKcJ68>
- **Webinar recarga artificial de acuíferos**
 - July 12nd. UNAM, México (in Spanish). Latin-MAR WG.
- **FIRO-MAR workshop.**
 - July 20th. UC San Diego. At least two IAH-MAR members among the speakers
 - <https://www.youtube.com/watch?v=aIS4P3IA-4M>
- **Integrating Surface Water Management and Managed Aquifer Recharge: Case Study from a USACE-OCWD Partnership**
 - Recorded webinar access (requires inscription):
 - <https://www.gwpc.org/event/webinar-integrating-surface-water-management-and-managed-aquifer-recharge-case-study-from-a-usace-ocwd-partnership/>
- **CIS Madrid workshop and Plenary (October 9-11)**
 - The Common Implementation Strategy (CIS) group have shared among experts the draft of the imminent Managed Aquifer Recharge (MAR) guidelines document for Europe. The IAH MAR Commission co-chairs and other members have provided some inputs, and the CIS group are considering them.



- During the Madrid workshop and Plenary (October 9-11) some of these topics were discussed:
- **2023 Flood-MAR Forum on Nov. 7-8**
 - The California Department of Water Resources and others have organized a new flood-MAR forum participating IAH-MAR members.
 - <https://www.linkedin.com/feed/update/urn:li:activity:7119708113724731392/>
- **River Basin Management Plan (RBMP) workshop. Malta.**
 - During November 21-22 has taken place a workshop of the RBMP in Malta Island, organized by the Energy and Water Agency (EWA).
 - The project integrates different lines of action taking part in most of the RBM plans, including MAR, and many other IWRM actions. There is an important focus on the sea.

Publications

- **Special issue on MAR: “Managed Aquifer Recharge, A Key to Sustainability”**
 - Guests Editors: Enrique Fernandez Escalante, Catalin Stefan, Christopher J. Brown, June Mirecki
 - 10 papers published at MDPI Journal “Water” (ISSN 2073-4441), IF 3.53
https://www.mdpi.com/journal/water/special_issues/Aquifer_Recharge



- **Managed Aquifer Recharge in Mining: A Review**
 - Managed aquifer recharge (MAR) has been gaining adoption within the mining industry for managing surplus water volumes and reducing the groundwater impacts of dewatering. This paper reviews MAR for mining and includes an inventory of 27 mines using or considering MAR for current or future operations... Some IAH MAR members have participated.
 - <https://ngwa.onlinelibrary.wiley.com/doi/10.1111/gwat.13311>
- **Recarga de Acuíferos Gestionada (in Spanish, summary in English)**



- Some IAH MAR members have participated in the production of the publication:
https://www.researchgate.net/publication/371286762_Libro_Recarga_de_Acuiferos_Gestionada#fullTextFileContent
- **MAR in California. Release of three MAR handbooks**
 - Recent post gathering five interesting links to MAR in California, three of them are recent publications. As a novelty, to mention that aquifers are considered "natural infrastructures".
 - <https://www.aguasresiduales.info/revista/noticias/manuales-y-articulos-para-la-recarga-planificada-d-6quX2>
- **Agricultural managed aquifer recharge (Ag-MAR) - a method for sustainable groundwater management.**
 - Reported by IAH-MAR members:
<https://doi.org/10.1080/10643389.2022.2050160>

Other relevant publications

- **AGI. Managed Aquifer Recharge in California. Four examples of managed groundwater replenishment across the state.**
 - Under the 2014 Sustainable Groundwater Management Act, California now requires comprehensive groundwater management throughout the entire state...
 - Read more...
<https://www.americangeosciences.org/geoscience-currents/managed-aquifer-recharge-california>
- **Contribution in a new IAH Series: Technical Insight Papers**
 - IAH MAR members have proposed IAH Executive a new Technical Insight Paper about Co-Managed Aquifer Recharge (expecting resolution yet).
- **MARSoluT Policy Brief. Essentials on Managed Aquifer Recharge for policy makers and water managers**
 - Access and download: <https://dinamar.tragsa.es/post/marsolut-policy-brief-essentials-on-managed-aquifer-recharge-for-policy-makers-and-water-managers-in-english>
- **Earth journal special issue including MAR papers**
 - Earth journal has just released their special issue with some MAR-related articles.
 - Download: <https://www.mdpi.com/2673-4834/4/3>
- **No58 Serie comunicacional CRHIAM recarga de aguas subterráneas (Chile, in Spanish)**
 - Download:
https://www.crhiam.cl/wp-content/uploads/2023/11/No58_Serie-comunicacional-CRHIAM-recarga-de-aguas-subterraneas.pdf



Others

- **IAH-MAR Commission, mandate 2021 – 2026**
 - Submission of report of activities for 2022 and renewal form (January)
 - Renewal granted by IAH Board until 2026
- **20th anniversary of the official starting point of MAR at Los Arenales aquifer. CyL, Spain**
 - Last March 11st has been the 20th anniversary for the first MAR system at Los Arenales aquifer, CyL, Spain. This date is when the Minister officially open the valve. The tests were conducted from a year before, and specific studies since 1999.
 - It has been working not stopping recharging for irrigation during this whole period. Technicians in charge proposed a toast, cheers!
- **Several new thesis on MAR defended, and new Doctors in the IAH-MAR family 😊**
 - José David Henao Casas. Thesis title: "managed aquifer recharge as a low-regret measure for climate change adaptation". <https://oa.upm.es/73999/>
 - Carina Eisfeld. "Removal of plant pathogenic bacteria during agricultural managed aquifer recharge to produce irrigation water and protect plant health"
 - Kathleen Elizabeth Standen Ph.D. thesis entitled "Managed Aquifer Recharge: An integrated water resource management solution for the Algarve, Portugal" took place last 21st of July 2023
 - Francesco Demichele. EWA Malta. https://www.linkedin.com/feed/update/urn:li:activity:7133072511700733954?utm_source=share&utm_medium=member_desktop
 - Esteban Caligaris. December the 1st 2023. Santa Anna Pisa. Hydroinformatics and Monitoring for investigating groundwater quality changes in Managed Aquifer Recharge
- **MAR and Water harvesting in Huaytara, Peru**
 - Video link: <https://www.facebook.com/arribaelagro/videos/siembra-y-cosecha-de-agua-en-huaytar%C3%A1/530797232018293/>
- **More information on MAR from Pakistan. Rooftop rain-harvesting for MAR**
 - YouTube video reported by an IAH-MAR member: <https://www.qwant.com/?client=opensearch&t=videos&q=MAR+from+Pakistan+.+Rooftop+rain-harvesting+for+MAR&o=0%3AJsEjgE6teak>
- **Local Actions are Key to Progress in Reaching Groundwater Sustainability**
 - Some may be asking after this extremely wet water year -- how is California progressing towards sustainable groundwater management and efforts to recharge groundwater basins?



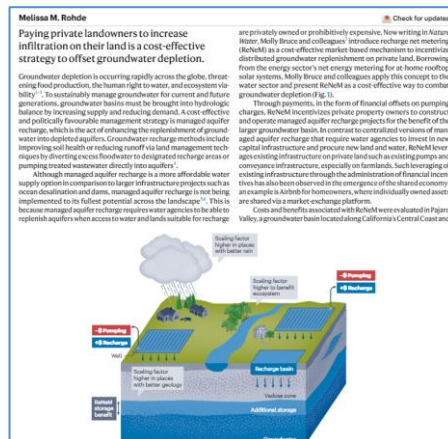
- Read more and download: <https://water.ca.gov/News/Blog/2023/July-23/Local-Actions-are-Key-to-Progress-in-Reaching-Groundwater-Sustainability>
- **Benchmark MAR in Europe. Survey. MARWAL project**
 - The Group of Hydrogeology & Environmental Geology at the University of Liège coordinates the MARWAL* project consisting of a feasibility study of managed aquifer recharge projects for the aquifers of the Walloon Region of Belgium. In this context, an online international survey was launched
 - English version: https://my.uliege.be/portail/go_xt.do?a=o%7C11004%7Ce%7C546928

Awards and appreciations

- GHS member Paula Rodríguez was awarded with the LLOBMAR project, which aims to apply managed aquifer recharge actions during episodes of torrential rain and flooding. <https://bit.ly/44Q80tg>

Other dissemination activities

- Publication of 8 newsletters (almost on monthly basis) with MAR-related activities: <https://recharge.iah.org/newsletters>
- IAH-MAR Commission on Twitter: <https://twitter.com/IAHMARCom>
- WhatsApp group on MAR: <https://chat.whatsapp.com/KL97KCIJTLI6XQIPMEKZaO> (the link is updated eventually)
- Various posts on personal LinkedIn pages of Commission's co-chairs



Note: The list above is only a selection, and it does not include the numerous activities resulted from different projects on managed aquifer recharge, such as project-related workshops, training courses, field trips etc.

For detailed reports see the series of newsletters of the IAH-MAR Commission: <https://recharge.iah.org/newsletters>.