



IAH COMMISSION ON MANAGING AQUIFER RECHARGE

Co-chairs: Peter Dillon, Weiping Wang and
Enrique Fernández-Escalante



Web sites:

English: www.iah.org/recharge

Spanish: www.dina-mar.es/

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



Joint International Workshop

EU FP7 MARSOL and EU HORIZON 2020 FREEWAT projects and EU EIP MAR Solutions -
Managed Aquifer Recharge Strategies and Actions (AG128)

Pisa - April 21st 2015



Scuola Superiore
Sant'Anna



TEASISTEMI
ENERGY AND ENVIRONMENT TECHNOLOGIES



MAR Commission

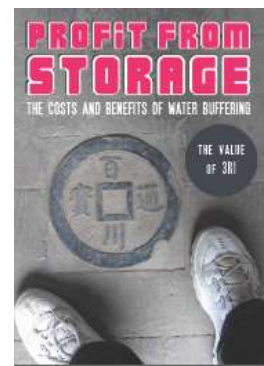


Commission on Managing Aquifer Recharge:

Objectives

www.iah.org/recharge

- **The Commission promotes the securing and expanding of water resources** and improving water quality in ways that are appropriate, environmentally sustainable, technically viable, economic and socially desirable.
- **It encourages research, development and adoption of improved practices** for management of aquifer recharge and improving knowledge, skills and capabilities of practitioners, water resources managers and regulators.
- **The Commission facilitates international exchange of information between members** (e.g. via a web page and an email list), by disseminating results of research and practical experience (e.g. via conferences and workshops), raising awareness of MAR among IAH members, related professions and the community, and its members undertaking projects and activities identified in plenaries as important.
- **Aligns with UNESCO IHP-VIII (2014-2021), Water security: responses to local, regional, and global challenges”, strategic plan, *Focal Area 2.2 - Addressing strategies for management of aquifers recharge***





WORKING GROUPS

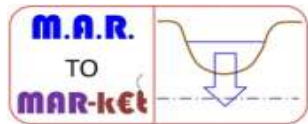
1. Producing a monograph on clogging and its management – Russell Martin
www.iah.org/recharge/clogging.htm
2. improved policies governance of MAR– Sharon Megdal
http://www.mdpi.com/journal/water/special_issues/MAR
3. identifying the economics of MAR – Andrew Ross
4. MAR for Development – Yan Zheng
5. Adaption to climate change – Bridget Scanlon
- 6. Communications and awareness raising on MAR (MAR to MAR-ket) – Enrique F. Escalante & Teresa Leitão**





POSSIBLE NEW WORKING GROUPS

- Inventory on MAR
- Book chapter - 40 years progress in MAR research
- Land management to enhance recharge
- Validation of fate of pathogens in aquifers
- North Mexico AR group enhancement facilities
- **SAT-MAR / MAR-SAT EXPERTS GROUP??**
- ... ???



AGROINDUSTRY: ACTIVITIES DIRECTED AT "END USERS"



MARSOL INFORMATIVE WORKSHOPS AT SANTIUSTE BASIN AND CARRACILLO DISTRICT



MANAGED AQUIFER RECHARGE
IN SANTIUSTE BASIN AQUIFER
MAR4FARM WORKSHOP



Ermo, Ayto. de Santuste de San Juan Euzkidea (Segovia)
Wednesday, October 28th, 2014. 17 h. Free entrance
Activity to involve groundwater users.



This initiative is financed by the framework of FP7 (2007-2013) (MARRSOL) (2014-2020) (Demonstrating Managed Aquifer Recharge as a Solution to Water Scarcity and Drought (DRA)) with the support of the European Commission, Spanish Ministry for the environment, Energy and Climate Change (MITECO) and the support of the Government of the Basque Country, the Government of Castile and León, and the Government of the Basque Country.



MARSOL INFORMATIVE WORKSHOPS AT SANTIUSTE BASIN AND CARRACILLO DISTRICT



MANAGED AQUIFER RECHARGE
IN CARRACILLO DISTRICT AQUIFER
MAR4FARM WORKSHOP



Centro cultural "Las Fuentes Viejas", C/ Alta, nº 21-23, Gomezzarain (Segovia)
Thursday, 20th October 2015, 10 h. Free entrance.
Activity to involve groundwater users.



This initiative is financed by the framework of FP7 (2007-2013) (MARRSOL) (2014-2020) (Demonstrating Managed Aquifer Recharge as a Solution to Water Scarcity and Drought (DRA)) with the support of the European Commission, Spanish Ministry for the environment, Energy and Climate Change (MITECO) and the support of the Government of the Basque Country, the Government of Castile and León, and the Government of the Basque Country.



MARSOL Workshop
Technical Solutions for Managed Aquifer Recharge

MAR4FARM



Wednesday, March 11th 2015 10h
Centro cultural "Las Fuentes Viejas", C/ Alta, nº 21-23, Gomezzarain (Segovia)
Activity to involve groundwater users.



This initiative is financed by the framework of FP7 (2007-2013) (MARRSOL) (2014-2020) (Demonstrating Managed Aquifer Recharge as a Solution to Water Scarcity and Drought (DRA)) with the support of the European Commission, Spanish Ministry for the environment, Energy and Climate Change (MITECO) and the support of the Government of the Basque Country, the Government of Castile and León, and the Government of the Basque Country.



MANAGED AQUIFER RECHARGE SOLUTIONS

TECHNICAL SOLUTIONS FOR
MANAGED AQUIFER RECHARGE

MARENALES

SPANISH TRAINING WORKSHOP
2015 MARCH

PASSIVE INTERMITTENT

GrupoTragsa



9th International Symposium on Managed Aquifer Recharge

SOLUTIONS TO SUSTAINABLE WATER MANAGEMENT SUBJECT TO SCARCITY AND CLIMATE CHANGE

Mexico City, spring 2016

Organizations

National Autonomous University of Mexico
Engineering Institute
Water network
National Water Commission
Mexico Valley Basin Water Agency
Water System of Mexico City

ISMAR9 will include the following

Pre-conference activities and workshops
Plenary session with key note lectures
Technical and poster sessions
Round table discussions
Technical tours
Post-conference excursions
Social program

Theme and topic

Integrated water management and strategies
MAR methods and strategies
Regulations/Governance/Economics
Modeling
Geochemistry in MAR
Health Aspects (Removal and fate of microorganisms and organic compounds)
Monitoring and management
MAR as a key to adapt to Climate Change
MAR and water reuse
MAR in developing country
MAR and blueprint
MAR to Market

Sponsors

Degremont Technologies
CH2MHILL

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9th International Symposium on Managed Aquifer Recharge

Mexico City, Mexico

Venue to be Determined

The Engineering Institute of the National Autonomous University of Mexico (UNAM), will hold the 9th International Symposium on Managed Aquifer Recharge (ISMAR 9) in México City, Mexico in the Summer of the year 2016.

Organizations:

- National Water Commission
- National Autonomous University of Mexico:
- Engineering Institute
- Water network
- Geology Institute
- Engineering Faculty
- Geophysics Institute
- Water System of Mexico City (SACM)
- Federal Commission of Electricity (CFE)
- Mexico Valley Water Board (OCAVM)

ISMAR9 will include the following:

- Pre-conference activities and workshops
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- Post-conference excursions
- Social program

Local attractions include:

- Subsidence features
- National museums
- Pyramids
- Active volcanoes
- New state-of-the-art treatment plant
- Local culture
- Social program

Sponsors:

- Degremont Technologies
- CH2MHILL

ISMAR 9
MEXICO



CONAGUA
COMISIÓN NACIONAL DEL AGUA



INSTITUTO DE INGENIERÍA
UNAM



CONAGUA
COMISIÓN NACIONAL DEL AGUA





International Symposia on MAR

1. 1988 Anaheim California, USA (ASCE)
2. 1994 Orlando, Florida, USA (ASCE)
3. 1998 Amsterdam, Netherlands (IAH, ASCE & UNESCO)
4. 2002 Adelaide, Australia “
5. 2005 Berlin, Germany “
6. 2007 Phoenix, Arizona, USA “
7. 2010 Abu Dhabi, UAE “
8. **2013 Beijing, P.R. China** “
9. **2016 Mexico City, Mexico** “
10. **2019 ?????????? .. ****



have you considered hosting ISMAR??

Free access books and info repository on MAR



[http://www.dina-mar.es/post/2014/04/30/Libros-sobre-la-tecnica-MAR-\(repositorio\)-MAR-books-repository.aspx](http://www.dina-mar.es/post/2014/04/30/Libros-sobre-la-tecnica-MAR-(repositorio)-MAR-books-repository.aspx)

LINKS:

- Igrac [International Groundwater Resources Assessment Centre - Igrac, www.un-igrac.org/](http://www.un-igrac.org/)
- PTEA as a dissemination member in the new action group <http://www.plataformaagua.org/>
- <http://www.dessin-project.eu>
- <http://demeau-fp7.eu/results>
- UNESCO - International Hydrological Programme <http://www.unesco.org/new/en/natural-sciences/environment/water/ihp/>
- CSIRO Land and Water <http://www.clw.csiro.au/research/urban/reuse/>
- China MAR: <http://china-mar.ujn.edu.cn/>
- Aquifer storage and recovery <http://www.asforum.com/>
- <http://www.iwmi.cgiar.org/> specially for Asia.
- South Africa's Artificial Recharge Information Centre. <http://www.artificialrecharge.co.za/>
- Activities in emergent countries <http://www.bebuffered.com/>

BOOKS

- **No.4 – Management of aquifer recharge / discharge processes and aquifer equilibrium states**
- http://typo3.fao.org/fileadmin/user_upload/groundwatergovernance/docs/Thematic_papers/GWG_Thematic_Paper_4.pdf
- **No.5 - Groundwater Policy and Governance**
- http://www.groundwatergovernance.org/fileadmin/user_upload/groundwatergovernance/docs/Thematic_papers/GWG_ThematicPaper5_APr2013_web.pdf
- **Rechargeable sustainability. The key is the storage" / "Sostenibilidad recargable. La llave en el almacén"**
- <http://www.dina-mar.es/post/2012/08/31/NUEVO-DINA-MAR-Publicacion-e2809cSostenibilidad-recargable-La-llave-en-el-almacene2809d-disponible-en-Internet.aspx>
- **DINA-MAR final book (in Spanish):** <http://www.dina-mar.es/post/2013/01/02/DINA-MAR-Publicacion-final-del-proyecto-c2a1Inminente!.aspx>
- **Clogging monograph (released last October) and opened to new contributions.** <http://recharge.iah.org/recharge/clogging.htm>
- **Strategies for MAR in semi-arid areas, Spanish:** http://recharge.iah.org/recharge/downloads/MAR_Strategies_spanish.pdf
- **P-ISMAR series: Posters from the last five International symposium on Managed Aquifer Recharge (P-ISMAR):**
- [http://www.dina-mar.es/post/2013/11/27/P-ISMAR-serie-Titulo-5-P-ISMAR-8-\(descarga-gratuita-del-Ebook-Free-download\).aspx](http://www.dina-mar.es/post/2013/11/27/P-ISMAR-serie-Titulo-5-P-ISMAR-8-(descarga-gratuita-del-Ebook-Free-download).aspx)
- <http://www.dina-mar.es/post/2013/01/01/P-ISMAR-BOOKS-TITULO-4-P-ISMAR-7.aspx>
- **ISMAR 7 proceedings book. Achieving Groundwater Supply Sustainability & Reliability Through Managed Aquifer Recharge**
- <http://www.dina-mar.es/pdf/ismar7-proceedingsbook.pdf>
- **ISMAR 6 proceedings book** http://recharge.iah.org/recharge/downloads/AquiferRecharge_ISMAR6.pdf & **ISMAR 5 proceedings book.**
- <http://recharge.iah.org/recharge/infoNNC.html>
- <http://recharge.iah.org/recharge/reports.htm>
- <http://www.artificialrecharge.co.za/06implementation.html>
- <http://www.artificialrecharge.co.za/11needtoknow.html>

VIDEOS

- http://www.dina-mar.es/videos/DINA-MAR_MOVIE.WMV / <http://www.artificialrecharge.co.za/13videos.html> ...

Updated 2015 April 8th

S3.3 Aquifer recharge assessment and storage management: quantity and quality issues *(coordinated by IAH Commission on Managing Aquifer Recharge)*

Convenor: Peter Dillon (CSIRO, Australia)

Co-convenor: Rudy Rossetto (Scuola Superiore S. Anna, Pisa, Italy)

Historically aquifers have sustained human water needs during droughts and in recent times techniques to enhance recharge and improve groundwater quality have been developed. Managed aquifer recharge (MAR) with all types of waters, in a variety of aquifers, using a range of methods is efficiently increasing the resilience of some future water supplies. MAR accompanied by monitoring, laboratory and modelling studies is also pushing the boundaries of knowledge of groundwater biogeochemical and hydrodynamic processes, that affect for example; fate of viruses in aquifers, metal mobilisation, clogging, and recoverability of banked water. Telling field applications and research papers are sought.

S3.4 Combating over-extraction: artificial recharge and aquifer engineering regulation

Convenor: Dave Kreamer (University of Nevada, Las Vegas, USA)

Managed Aquifer Recharge and engineering augmentation of groundwater supply have been important hydrogeological techniques for ameliorating the effects of groundwater withdrawal. Artificial recharge projects have, in many cases, successfully helped to provide sustainable groundwater use, improve water quality, combat saline water intrusion, block subsurface contaminant plumes, and restore the natural function of groundwater/ surface water interactions which are important human and ecological considerations. This session seeks to investigate the state-of-the-art techniques of managed aquifer recharge and engineering intervention, the varying legal and regulatory framework for implementing these systems, and examples with lessons learned from past attempts to manage aquifer replenishment.

S3.5-Managing Aquifer Recharge as a solution to water scarcity and drought in Mediterranean and MENA regions

Convenor: Ralf Klingbeil (United Nations ESCWA, Lebanon) (to be confirmed)

Co-convenor: Enrique Fernandez Escalante (TRAGSA – Spain)

Managed Aquifer Recharge (MAR) and Aquifer Storage and Recovery (ASR) can be suitable approaches for intermediate storage of water to overcome supply shortages in times of water scarcity and drought.

Joint International Workshop Pisa, 2015 April 21-23th

- *Creative interaction toward understanding critical issues and achieving **technical solutions** for integrated water management based on **MAR technique**, by means of **numerical modeling tools***

IAH email list

<http://recharge.iah.org/recharge/contacts.htm>

<https://listserver.flinders.edu.au/mailman/listinfo/iah-mar.listcgs>

International Association of Hydrogeologists
THE WORLDWIDE GROUNDWATER ORGANISATION

HOME SYNOPSIS WORKING GROUPS/PLENARIES CONFERENCES RESEARCH CONTACTS

Contacts (IAH email list)

Click here to access the IAH Email List. By clicking on this link you can join a large group of people with interests in recharge enhancement. We hope you will contribute ideas and news of interest to this scientific community, and benefit from the contributions of others to this email list.

Contact a Co-Chair

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Selected publications
Chipping Holograph

IAH-MAR.ListCGS -- International Association of Hydrologists - Managed Aquifer Recharge

About IAH-MAR.ListCGS English (USA) Home

Dear new subscriber,
Welcome to the IAH Working Group on Management of Aquifer Recharge (IAH-MAR) is a group of people with interests in recharge enhancement. We hope you will contribute ideas and news of interest to this scientific community, and benefit from the contributions of others to this email list.

If you are not a member of the International Association of Hydrogeologists you are encouraged to visit the IAH web page.. www.iah.org and see the benefits of conferences, publications, commissions, and other working groups that IAH provides.

MAR replaces the established terminology 'Artificial Recharge' for a number of reasons. One connotation of 'artificial' is that its not as good as the real thing (Would you give the love of your life artificial flowers?)

Secondly is there anything artificial about the water we recharge or the physical, chemical and biological processes affecting it? They are all natural. Even considering engineered recharge facilities, we don't call extraction from wells 'artificial discharge' to distinguish it from natural discharge.

Finally, with the community involved to an increasing degree in decision making in water resources management, it is important that subsurface water banking and water treatment are understood by the community to be working in harmony with nature. Our hope is that the new name will overcome some of the stigma associated with the old name, which has served for many decades, and allow us to play an increasingly positive role in water management in a more environmentally aware world.

Thanks to Ian Gale of the British Geological Survey, IAH-MAR is developing a web page and you will hear more about this in due course.

Peter Dillon

ISMAR 10, Draft guidelines

International Symposium on Managed Aquifer Recharge, candidature: Madrid, 2019 May.
preparatory meeting intended for *MARSOL Lisbon midterm workshop, Jun 2015*

ISMAR10, THEME AND TOPICS:

1. Integrated water management and strategies
2. MAR methods and strategies
3. Regulations/Governance/Economics
4. Modeling
5. Geochemistry in MAR
6. Health Aspects (Removal and fate of microorganisms and organic compounds)
7. Monitoring and management
8. MAR as a key to adapt to Climate Change
9. MAR and water reuse
10. MAR in developing countries
11. MAR and blueprint
12. MAR to Mark€t

ISMAR10 will include:

- Pre-conference activities and workshops
- Plenary session with key note lectures
- Technical and poster sessions
- Round table discussions
- Technical tours
- Post-conference excursions
- Social program

ONLY FOR PARTNERS (OUT OF IAH MAR COMMISSION)

**Thank you
Pisa, 2015 April 21th**