

International Association of Hydrogeologists
COMMISSION ON MANAGEMENT OF AQUIFER RECHARGE
ANNUAL REPORT 2010

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Aims of Commission

IAH-MAR was established in January 2002 by the IAH Executive aiming “to expand water resources and improve water quality in ways that are appropriate, environmentally sustainable, technically viable, economical, and socially desirable. It will do this by encouraging development and adoption of improved practices for management of aquifer recharge. This will be achieved by increasing awareness of MAR among IAH members, related professions and the community, by facilitating 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 reference database), and by undertaking joint projects and activities identified as important by its members.”

Activities in 2010:

The highlights of 2010 for the Commission were the 7th Intl Symposium on Managed Aquifer Recharge held in Abu Dhabi and organising and participating in two events at Stockholm International Water Week with 3Rs Consortium and UNESCO to promote dialogue on safe affordable use of MAR for securing water supplies in developing countries, a prime objective of the MAR-NET network. With Commission Plenaries in Krakow and Abu Dhabi, a further MAR-NET workshop in Abu Dhabi and a series of publications arising from working groups of the Commission, continued communications via the email list, and three web sites in English, Spanish and Chinese, the Commission continues to provide value for IAH members and non-members alike, raising the profile of IAH as a major contributor to improved groundwater management and innovation.

1. ISMAR7 Symposium, Abu Dhabi, 9-13 October 2010

IAH Commission on MAR together with ASCE/EWRI and UNESCO coordinate a series of international symposia held approx every 3 years to showcase the advances in science and application of MAR and to foster communications amongst an active international fraternity of researchers and practitioners. In 2010 Abu Dhabi Environment Agency and Schlumberger Water Services hosted ISMAR7 in Abu Dhabi, UAE. Following the global financial crisis and being the first ISMAR to be held in the Middle East, there was a degree of nervousness about prospective attendance. However attendances continued to the increasing trend and more than 300 folk representing at least 24 countries including a good number from the Middle East not previously represented at ISMARs came together for an excellent cohort of papers. Schlumberger Water Services have mounted 67 auditorium and 47 poster papers on the web site for viewing and downloading at www.ismar7.org. You need to register to download papers, but registration is free and virtually instantaneous. The conference dinner was an Arabian Desert Dinner which was a hugely popular evening with an array of fun and unusual entertainment, including camel rides, aromatic hookah pipes and several fortune tellers under stars on a glorious desert night. The field trip to Liwa strategic groundwater reserve project demonstrated the high value of water security and the important role of MAR in storing desalinated seawater in aquifers as a strategic reserve for Abu Dhabi. Special thanks are due to Schlumberger organisers Traci Murray, Martin Draeger and Conference Chair, Rolf Herrmann, for their hard work in making the symposium a success. **ISMAR8 will be held in Beijing in 15-19 October 2013.**



ISMAR7 opening ceremony



Arabian desert dinner



Field trip to Liwa strategic groundwater reserve

2. Workshops and meetings

2.1. World Water Week 2010 - UNESCO with IAH were awarded a one hour seminar at the Stockholm International Water Week, 5 - 11 September 2010, to give exposure to MAR-NET. The session entitled "*Managed Aquifer Recharge for Safe Low Cost Drinking Water Supplies*" was held on September 8. The event consisted of talks by Sjef Ernes (Aqua for All, The Netherlands) on what is MAR and where could it best contribute to meeting UN MDG for drinking water supply; Peter Dillon (CSIRO, Aust) on guidelines for MAR and international application for safe water supplies; Boris David (Veolia Eau, France) on applications of MAR for water supply and the outcomes of research; and Dr N Varadaraj (Central Ground Water Board, India) on Indian experience with MAR. The session was chaired by Francesco Rizzo (UNESCO) and summed up by Willi Struckmeier, President IAH and BGR, Germany).

Also at Stockholm International Water Week was the 3Rs consortium, including members of IAH Netherlands Chapter who ran a 3 hour workshop on 5 September entitled '*Water Recharge, Retention and Reuse (3R): The untapped potential of 3R solutions to improve water quality and quantity.*' A common objective of both events was to better inform governments, development banks and NGOs about the viability and efficiency of managed aquifer recharge (MAR) for securing safe drinking water supplies with a view to understanding how to encourage appropriate investment in MAR. The 3R Workshop also covered other uses of recharged water such as irrigation, and complementary activities of water retention and reuse to increase storage.

An outcome of these events was a 5 page document, *Stockholm water week activities on managed aquifer recharge: Learnings and proposed response* found on www.iah.org/recharge. This document provides a framework for action under 8 topics; financial justification, technical viability, appropriate technology well-integrated, health assurance, longevity of benefits, capability building in government, awareness and capability building at user level, communications. Those elements of these that are best addressed by IAH-MAR are being incorporated in the case for a new MAR Commission/Network that will take over from the current one.

2.2 ISMAR7 MAR-NET Workshop, Abu Dhabi, 9 October 2010 - The workshop was attended by 38 people from 24 countries. Agenda and presentations for this workshop "Where is MAR the best option for securing drinking water supplies, and how?" are found at www.iah.org/recharge. At the conclusion of the workshop a summary of the findings from Stockholm were presented and discussed.

3. Plenaries

3.1. Plenary of IAH-MAR Commission held at IAH Congress, Krakow, Poland on 13 September 2010 - The plenary was attended by 19 people from 11 countries. A summary **presentation**, including a list of attendees and conclusions drawn from the meeting is on the Commission's web site.

3.2. Plenary of IAH-MAR Commission held at ISMAR7 on 11 October 2010 - The plenary was attended by 53 people from 26 countries. A summary **report** is available on the IAH-MAR web site.

4. IAH- MAR Websites

In 2010 the Spanish website (thanks to Enrique Fernandez-Escalante, TRAGSA, Madrid) and Chinese website (thanks to Weiping Wang, University of Jinan, China) were conspicuously linked to the English version site (maintained by Ian Gale and John Talbot at BGS, UK). The sister websites are found at:

www.iah.org/recharge <http://www.dina-mar.es/> <http://china-mar.ujn.edu.cn>

5. Email List

IAH Aust Chapter and Flinders University of South Australia have maintained this list, thanks to Joel Pillar, which has a stable number of 300 members in 33 countries. About 12 emails were sent during 2010 advising of new conferences, workshops, reports and opportunities. We hope non-members of IAH find this helpful and encourage you to join IAH and enjoy the full benefits of membership. The list can be joined from the web site (www.iah.org/recharge).

6. Progress of Working Groups (established at Plenary at ISMAR6, Phoenix 2007, and modified at ISMAR7, Abu Dhabi)

Six new work groups were initiated in Dec 2007; their objectives and progress are as follows;

6.1 Governance review –

6.1.1 An Australian Govt funded project result in a publication on policy framework for managed aquifer recharge in Jan 2011. This deals with water rights and allocation issues from a catchment and basin perspective

- Ward, J. and Dillon, P. (2011). Robust policy design for managed aquifer recharge. Waterlines Report Series No 38, January 2011, 28p. <http://www.nwc.gov.au/www/html/2986-waterlines-38.asp?intSiteID=1>

6.1.2 Health and Environment Requirements for MAR were established under the Australian MAR Guidelines which were web-published in July 2009 (see below) and in December 2010 a set of nine case study risk assessments following the MAR Guidelines was web-published.

- NRMCC, EPHC, NHMRC (2009). Australian Guidelines for Water Recycling, Managing Health and Environmental Risks, Volume 2C - Managed Aquifer Recharge. Natural Resource Management Ministerial Council, Environment Protection and Heritage Council National Health and Medical Research Council. Jul 2009, 237p. <http://www.ephc.gov.au/taxonomy/term/39>
- Page, D., Dillon, P., Vanderzalm, J., Bekele, E., Barry, K., Miotlinski, K. and Levett, K. (2010). Managed aquifer recharge case study risk assessments. CSIRO Water for a Healthy Country Flagship Report, Dec 2010, 144p. <http://www.clw.csiro.au/publications/waterforahealthycountry/2010/wfhc-MAR-case-study-risk-assessments.pdf>

6.1.3 ASCE/EWRI Standards Committee on Managed Aquifer Recharge is currently revising USA standard guidelines for MAR. For information: Chair is Ben Willardson: bwillard@ladpw.org

6.1.4 More work is needed on an international front in this field.

6.2. Document benefits and costs of MAR projects –

At IAH-MAR Plenary Abu Dhabi It was agreed that this would be pursued - Albert Tuinhof to coordinate. See David Pyne's paper at www.ismar7.org Several measures of effectiveness are; cost per unit capacity and levelised cost per cubic metre of water supplied (dpyne@asrsystems.ws). People with case studies of documented costs please contact Albert at albert.tuinhof@acaciawater.com

More work is needed on an international front on economics and externalities of MAR.

6.3. Publication of MAR materials in Spanish and Chinese;

Web materials are being prepared by Enrique Fernandez-Escalante, TRAGSA, Madrid) and Weiping Wang, University of Jinan as well as Ian Gale and John Talbot, BGS

6.4. MAR movie

Enrique Fernandez-Escalante has started to collate an inventory of DVDs, videos. He has also prepared books containing the poster papers from ISMAR4 to ISMAR7 (see www.iah.org/recharge). Information welcome from anyone on any videos of MAR projects or educational videos on MAR. Please contact Enrique: efernan6@tragsa.es

6.5. Clogging review

There had been no progress until Krakow when Russell Martin (AGT, Australia) offered to lead a group to consolidate new knowledge on clogging and unclogging of ASR wells and infiltration systems. Volunteers welcome with information and reports on rates of clogging and unclogging of wells and basins. Please contact Russell at: rmartin@agwt.com.au .

6.6. MAR demonstration and training network;

MAR-NET was established with the aim of developing demonstration projects and building capabilities to enable appropriate use of MAR to efficiently achieve UN Millennium Development Goal for Water Supply. MAR-NET a UNESCO-IAH Network to progress this was established in China and India in 2009 and a workshop was held in Abu Dhabi in Oct 2010. See above.

7. Other meetings

These are not run by IAH Commission on MAR, but the Commission has helped disseminate information on these events.

7.1 Conference: Southern California - Managing For Self Sufficiency - Water Resources Issues in California, 8 Feb 2010, Ontario CA USA. Association of Ground Water Agencies, American Ground Water Trust, Groundwater Resources Association of California (GRA) and California Groundwater Coalition (CGC) (lots on water banking)
http://www.agwt.org/events/2010/2010CAWater_Program.pdf

7.2 International 'Arid and Semi Arid Development through Water Augmentation' (ASADWA) Conference, 13-17 December 2010, Valparaiso, Chile

7.3 Managed Aquifer Recharge Symposium, 25-26 January, 2011, in Irvine, CA. Water Research Foundation (WaterRF), Orange County Water District and NWRI: Powerpoints and proceedings are at: <http://www.nwri-usa.org/rechargesymposium2011.htm>

8. Future Symposia

8.1 European Geosciences Union General Assembly 2011 Vienna, Austria, 3 - 8 April 2011
Session: 'Recent advances in spatial and temporal modelling of groundwater recharge'
Contact: Dr. Ulf Mohrlök, Karlsruhe, Germany: ulf.mohrlok@kit.edu

8.2 OzWater Conference, Adelaide, Australia. 9-11 May 2011, 'Water for Health: Towards Sustainable Practices' Workshop May 9th (2 hrs) on '*Indirect potable reuse of water via aquifers*'. IAH-MAR, AWA and IWA special interest groups on water recycling and reuse. <http://www.ozwater11.com.au/> Also a Satellite sites workshop 12-13 May on *Managed Aquifer Recharge and Stormwater Use Options*. contact: Peter.Dillon@csiro.au

8.3 IAHS Workshop HW02: Understanding and quantifying physical and geochemical processes during artificial recharge of groundwater. Convenor: Henning Prommer (Australia)
XXV IUGG General Assembly, Earth on the Edge: Science for a Sustainable Planet
28 June - 7 July 2011, Melbourne, Australia www.iugg2011.com/

8.4 NCGRT/CSIRO Workshop on MAR, 17-18 Oct 2011, Melbourne, Australia;
<http://www.groundwater.com.au/ncgrt/industrytraining/>

9. Future of Commission

The current Commission will be dissolved 30 June 2011, and it is intended to submit an expression of interest to IAH Executive to continue as a new Commission the next day. Those willing to be involved in the management of the new Commission please contact Ian Gale or Peter Dillon. There will be abundant opportunities for active engagement in new activities for those interested in advancing the science and practice of MAR.