

IAH Commission on Management of Aquifer Recharge Annual Report 2005

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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."

Major Activities in 2005:

- ISMAR5, Berlin, 12-16 June
- IAH-MAR 4th Plenary, Berlin, 13 June
- UNESCO-IAH Workshop – Berlin (11 June),
- UNESCO-IAEA-IAH Workshop – Lahore (25 April – 2 May)
- GEF-UNESCO Workshop on MAR, New Delhi (19 – 22 September)
- IAEA Review of projects in Jordan, Syria and Yemen
- 2006 MAR Calendar – IAH Netherlands National Committee
- Guidance on MAR – UNESCO Booklet by Ian Gale, BGS
- Research projects
- Web site including grey literature data base
- Email list
- ISMAR6, Phoenix, 28 Oct-2 Nov 2007 Call for Papers
- Summary

The highlight of 2005 was the **5th Intl Symp on Management of Aquifer Recharge (ISMAR5), Berlin, 12-16 June**. The local organizing committee chaired by Francis Luck, Manager of the Berlin Water Competence Centre, a joint venture of Veolia Water and Berliner Wasser Bietribe, with Scientific committee oversight by Prof Asaf Pekdeger, (Berlin Free University) and major inputs by Prof Martin Jekel (Berlin Technical University) and Dr Birgit Fritz (WCC) and a very able committee. The conference attracted nearly 300 attendees from more than 20 countries, and about 60 oral papers and 80 poster papers were presented. The scientific base for sustainable MAR continues to grow, the applications for MAR in water conservation, recycling and environment protection are expanding supported by this new knowledge, and operational experience in a diversity of projects from bank filtration, pond infiltration, soil aquifer treatment, and well injection is also growing and projects are being more

comprehensively monitored and reported. Proceedings are to be published by UNESCO shortly. An IAH-MAR Plenary Session at ISMAR5 was well attended and some new initiatives emerged (see report on IAH-MAR web site: www.iah.org/recharge).

Veolia Water hosted a one-day UNESCO-IAH workshop on Application of MAR in Developing Countries -Benefits, Problems and Solutions. A summary is posted on the IAH-MAR web site.

A UNESCO-IAEA-IAH workshop on MAR was held in Lahore (Pakistan) (25 April – 2 May 2005) to continue the series from Alexandria (Egypt), Yazd (Iran), and Ho Chi Minh City (Vietnam). One of the aims of this sequence is to develop an inventory of prospective regional demonstration projects, and organizations that will form regional training hubs in appropriate siting, design, construction and management of MAR. This provides a base from which to plan implementation of this demonstration and training program.

The Strategic Technical Advice and Planning (STAP) Committee of the Global Environmental Facility (GEF) together with UNESCO Convened a Workshop on MAR, New Delhi (19 – 22 September 2005) to explore the possibilities for MAR to contribute to GEF's existing Focal Themes including soil and water conservation, biodiversity, coastal salinity management, and trans-boundary resource governance. The workshop found that MAR had a significant and catalytic role to play in addressing these issues. STAP is expected to facilitate a greater understanding of MAR and its role in catchments within GEFs procedures for setting project priorities. (see summary report on www.iah.org/recharge)

IAEA Review of projects in Jordan, Syria and Yemen was conducted in September 2005 to provide advice to local investigators on site selection, operation and monitoring of MAR. This is part of an IAEA project to assess the feasibility of, and identify criteria for applying MAR in selected sites and to promote the use of isotopic and geochemical techniques to execute such investigations. A training course and workshop involving participants from the 7 countries involved will be held in Damascus in February 2006.

2006 MARS Calendar – IAH Netherlands National Committee has again been very active in promoting sustainable MAR. In 2005 it combined with UNESCO to produce a highly innovative 2006 calendar with photographs of MAR projects from around the world. The calendar also doubles as an enduring resource booklet with information on these projects. This follows from the NNC's published proceedings of the conference "Recharge Enhancement and Subsurface Water Storage", 18-19 December 2002 in the Netherlands, edited by Albert Tuinhof and Jan Piet Heederik. Both of these publications can be downloaded from the IAH-MAR website at www.iah.org/recharge.

Guidance on MAR – UNESCO Booklet by Ian Gale, BGS

This is the second and final brochure developed out of discussions that started at IAH XXX congress in Cape Town, Dec 2000, which has come to fruition through the perseverance of Ian Gale and with the support of UNESCO and BGS. Drawing on experience from around the world, this booklet discusses issues relating to MAR, illustrated with a variety of case studies. The booklet can be downloaded (1380 kB) from www.iah.org/recharge, or copies can be obtained from a.lipponen@unesco.org.

ASCE/EWRI Artificial Recharge Standards Committee, Chaired by Ivan Johnson, the founder of the IAH Working Group on MAR from which this commission grew, has advised that the name of that working group has changed its name to Management of Aquifer Recharge Standards Committee, giving better alignment with IAH-MAR.

Water quality improvements during ASR – This AWWARF research report of 286 pages with 2 CDs, published in 2005 covers reduction in pathogens, disinfection byproducts, selected endocrine disruptors, and starts to give insights on redox processes in aquifers responsible for the rates of biodegradation or inactivation observed. Three different models, including a screening tool for predicting quality of recovered water are presented and applied to several sites. The final report is available for purchase from <http://www.awwarf.org/research/TopicsAndProjects/projectSnapshot.aspx?pn=2618>

Two EC research projects on MAR are currently active: RECLAIM WATER, led by Thomas Melin and Thomas Wintgens, University of Aachen focus is on water reclamation via subsurface storage, and involves 17 project teams in more than 6 countries. More information is available from www.reclaim-water.org. Another EC project, Gabardine, led by Prof. Martin Sauter from University of Göttingen (Martin.Sauter@geo.uni-goettingen.de) involves documenting artificial recharge projects.

Two U.S. MAR research projects are also underway. AWWA Research Foundation is developing a document entitled “Design, Operation and Maintenance Considerations for Sustainable Underground Storage Facilities.” This addresses surface recharge and well recharge science, technology and practice, and is being “ground-truthed” through investigations at 21 sites. The effort includes development of an inventory of MAR sites in the U.S. and also in other countries. David Pyne/ASR Systems is leading a team that includes Dr Herman Bouwer and Carollo Engineers among others. Also, the WateReuse Foundation is completing a project entitled “Reclaimed Water Aquifer Storage Recovery,” addressing the fate and attenuation of 102 constituents of wastewater origin during subsurface storage and recovery of reclaimed water from ASR wells, as determined from samples collected at four sites. Analyses include nutrients, metals, disinfection byproducts, radioactive and microbiological parameters, and numerous microconstituents such as EDCs, PCPPs, PhACs. Carollo Engineers leads the project team.

During 2005 Ilka Neumann (BGS, UK) who had been a mainstay with Ian Gale in maintaining and updating the IAH-MAR web page, www.iah.org/recharge left UK for sunny Australia and IAH-MAR wishes to record our thanks to her for her work over four years. Sam Jones (BGS) has taken up this role. There are more than 500 abstracts on the web-searchable reference data base. Currently these are all in English, but abstracts in Spanish will also be welcome. The number of subscribers on the IAH-MAR email list has increased slightly to 210. We gratefully acknowledge Glenys Jackson (CGS/Flinders Uni, Aus) for managing the list since its inception as she hands over the responsibility to Karen Schilling.

A MAR workshop in New Delhi associated with the International Groundwater Conference, Feb 06 has been cancelled, but it is hoped that a workshop can be run in India in due course. Plans are underway for a workshop within the IAH 34th Congress in Beijing, in October 2006, where the next Plenary of IAH-MAR will be held.

Plans for **ISMAR6, Phoenix, Arizona 28 Oct to 2 Nov 2007** are well advanced and a **first circular and call for abstracts** with a web submission facility has just been issued (www.ismar2007.org) and also linked to the IAH-MAR web site.

Thanks to Doug Bartlett (Chairman Organizing Committee), Herman Bouwer and committee for organizing this event which will merge with the 13th Arizona Hydrological Society's Artificial Recharge Symposium and, as with last two conferences in this series, co-hosted by IAH-MAR and EWRI/ASCE. Highlights will include workshops, field trips to innovative aquifer recharge projects, technical and poster sessions, an IAH-MAR plenary, and optional sightseeing tours to places such as Las Vegas and the Grand Canyon. This will be a brilliant conference, relevant to the needs of developing and developed countries.

FUTURE DIRECTIONS: While we are active and supported primarily by UNESCO, progress towards our aims is restricted by resources particularly for publications and training programs and progress is opportunistic. Consequently this has been faster in developed countries than in developing countries where the needs are greater but resources are less. Having a shared plan has been useful in focusing efforts from a range of organizations and IAH-MAR has a major role to play in assisting UNESCO with IHP 6, especially in arid and semi-arid regions. However it is time to reassess the original work plan established in April 2002 and establish a framework by which the revised plan can be completed, for example by identifying resources to see the establishment of the regional network of demonstration projects and training hubs. Clearly MAR needs to be an integral part of groundwater and catchment management, to achieve its unifying and catalytic role in integrated natural resource management, urban planning, water and wastewater systems planning and management, salinity abatement and biodiversity conservation. Expectations need to be realistic as to what can and can not be achieved by volunteers and the need for better hydrogeological information will continue to be on the critical path for effective implementation. Better informed communities, better regulations and improved triple bottom line performance assessment will rely on sound information effectively disseminated through well-trained people at regional and local levels. This Commission's task has only just begun.