



# NEWS AND INFORMATION

## International Association of Hydrogeologists

The international groundwater organisation

Since 1956 a world-wide forum on the management of groundwater for the benefit of mankind and the environment

# A congress to remember IAH and ALHSUD in Mar del Plata



Over 400 delegates attended the 32nd Congress of IAH/6th Congress of ALHSUD in Mar del Plata, Argentina in October 2002. A large proportion of them are shown here at a fine hacienda, which was the venue for the lunch stop during the congress field excursion. Pictures and reports in the following pages.

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To join IAH please use the on-line service on our web site, download our membership form or contact the IAH office

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Twenty-seven years since the last IAH Congress in Latin America (Porto Alegre, Brazil in 1975) and twenty-five years after the first UN water conference held in Mar del Plata in 1977, IAH held a very successful joint congress in the same Argentine city with the Asociación Latinoamericana de Hidrología Subterránea para el Desarrollo (ALHSUD).

Although the two Associations have collaborated well over the years, this was the first time a joint congress had been held. One measure of the success is the agreement that the next IAH Congress, in Mexico in 2004, should also be a joint venture



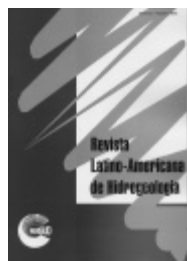
*Emilia Bocanegra,  
Chairman of the Mar del  
Plata Congress  
Organising Committee*

The Congress, held from 21st to 25th October, was superbly organised and is a tribute to the exceptional work, under difficult circumstances because of the disruption caused by the financial situation in Argentina, of Emilia Bocanegra, Chairman of the Organising Committee. Emilia, who is also IAH Vice President for Latin America and the Caribbean, had the support of an excellent organising team who are all to be congratulated on their success.



The title of the Congress was Groundwater and Human Development, a theme that was explored through plenary lectures, parallel sessions, poster sessions and workshops throughout the week. The pre-printed congress volume gives abstracts or extended abstracts of all the papers and these are

also included on a CD-ROM that is available from the congress organisers. Post-published outputs will be thematic volumes in the IAH book series and in journals. In addition, during the congress, ALHSUD issued the second volume of their annual publication *Revista Latino-Americana de Hidrología* (details from [inter@ufpr.br](mailto:inter@ufpr.br)).



The IAH Council met on 20th October, the second Council meeting during 2002. Attending for the first time were representatives of Peru and Portugal, two new IAH Chapters formed during the year. Representatives of the recently formed Asociación Colombiana de Hidrogeólogos, recognised as the IAH National Chapter in Colombia, were also present at the Congress. The principal item at the Council meeting was the adoption of the recommendations from the Special Council meeting held in Stâna de Vale in May 2002 (see page 8).

Five of the keynote papers presented at plenary sessions at the congress are published on the CD-ROM:

- Groundwater and Human Development, Ramón Llamas;
- Transboundary aquifer resources: groundwater shared by nations, Shammy Puri;
- A vision of groundwater resources in Latin America, Mario A. Hernández;
- Downstream of downtown - Urban wastewater as groundwater recharge, Stephen Foster;
- Coastal aquifers as important natural hydrogeological structures, Emilio Custodio.

Workshops held at the Congress included:

- Isotope methods for evaluation of aquifer vulnerability and sustainability;
- Transboundary aquifers;
- Nationwide networks for the monitoring of groundwater;
- Natural arsenic in groundwater. Experiences around the world;
- Coastal aquifers;
- Hydrogeology of large plains.

#### Opposite:

##### *Faces at the IAH Council meeting (clockwise)*

*Jorge Tovar (Peru) and Antonio Chambel (Portugal), representatives of the two newly formed chapters present at the Council meeting.*

*Xavier Sanchez-Vila (President of the IAH Spanish Group) and Nathan Burke (representative of the Irish National Group). These two national groups have been collaborating on reviewing the role and priorities of the IAH Burdon Fund and gave a joint progress report.*

*Alice Aureli, programme specialist with responsibility for groundwater projects at the International Hydrological Programme of UNESCO.*

*Bob Schneider, one of the Managing Editors of Hydrogeology Journal, giving a report to Council.*

*Ray Evans who stood down as President of the Australian National Chapter of IAH at the International Congress organised by the Chapter in Darwin in May 2002.*

# Mar del Plata, Argentina October 2002





At the Annual General Meeting of the Association, held on 22nd October, the President's Award for 2002 was awarded to Andrew Skinner (above), Secretary General of IAH since 1989, in recognition of both his contribution to groundwater management in the UK and the work he has done to foster the growth and influence of the Association on groundwater issues worldwide.

By decision of the General Assembly Ramón Llamas (pictured right), President of IAH 1984-1989 and Aldo Rebouças, first President of ALHSUD, were elected honorary members of IAH.



The congress was notable too for its social events. The "groundwater band" of Argentine hydrogeologists, pictured above, were ever ready to entertain and the tango performances were also well to the fore, both in a special congress tango show at the fine Mar del Plata Colon Theatre and also at the closing congress dinner.

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## Management of aquifer recharge for sustainability

This was the theme of the 4th International Symposium on Artificial Recharge (ISAR4) held in Adelaide, 22-26 September 2002. Two hundred people attended from 27 countries, with 100 from Australia and large contingents from The Netherlands, Germany, USA and India, where intentional recharge enhancement is widely practiced.

John Williams, chief of CSIRO Land and Water, opened the conference with an exposé of Australian water issues and highlighted the importance of integrated management of surface water and groundwater resources. A keynote paper by Bill Mills (former General Manager of Orange County Water District, in California) gave a 25 year history of the operation of a highly constrained water supply in an arid area. This involves infiltration of Santa Ana River

water (mostly treated effluent) from ponds and injection of water reclaimed in Water Factory 21 into lines of wells in the coastal aquifer to prevent saline intrusion to the city's drinking water supply wells. Takashi Asano, Stockholm Water Prize Winner in 2001, gave an invited paper on health risk management of groundwater recharge with reclaimed water, using three trace organic compounds to exemplify the issues in assessing risks.

In addition to the 50 oral papers, 50 poster papers were presented, covering the themes above and additional themes such as agricultural practices and recharge, injection well and pond and bank filtration issues and solutions, regional issues and recharge site selection, and recharge enhancement in fractured rock aquifers.

Pieter Stuyfzand of KIWA of The Netherlands won the Herman Bouwer Award for best paper for his paper on quantification of hydrogeochemical impact and sustainability of artificial recharge systems. This was one of many papers that reflect an improved understanding of processes occurring within the mixing zone. Efforts are emerging to integrate physical, chemical and biological knowledge to improve predictions on water quality evolution and clogging processes.

The conference failed to draw out papers on community involvements and information or on policy and regulatory aspects (such as ownership of recharge water), nor was there serious consideration of any impacts of recharge on downstream environmental flows. However, one success of the conference was in cross-pollinating advances in process understanding between groups working in pond infiltration, bank filtration and well injection.

Preceding the congress was a UNESCO-IAH workshop on evaluating the performance of recharge enhancement projects in arid and semi-arid areas. Fifty hydrogeologists from 20 countries attended. During a session of the IAH-MAR Commission Deputy Chair, Ian Gale (BGS, UK) gave a demonstration of an on-line searchable list of references on the IAH-MAR web page ([www.iah.org/recharge](http://www.iah.org/recharge)) and launched the UNESCO-IAH brochure 'Managing Aquifer Recharge'. You can join an e-mail list for the Commission on the web page.

The next symposium (ISAR5) will be held in June 2005 in Berlin and current research on water quality changes during bank filtration in Berlin will be a feature of the conference.

The papers from the Adelaide meeting are a valuable, up-to-date reference source on management of aquifer recharge (see page 10 for details).

## International karst community assemble in Malaga

During 17-19 September 2002 the International Symposium on "Karst and Environment" was held in Nerja (Málaga), Spain. The symposium was organised by the Nerja Cave Foundation and the University of Malaga, in collaboration with the UNESCO-International Geological Correlation Programme and the IAH-Karst Commission. Some 120 participants attended, drawn from 4 continents and 15 countries. More than 70 articles, reviewed and accepted by the Symposium Scientific Committee, have been published as a book entitled "Karst and Environment", edited by Francisco Carrasco, Juan-Jose Durán & Bartolomeo Andreo, which can be obtained from the Nerja Cave Foundation ([cuevanerja@vnet.es](mailto:cuevanerja@vnet.es)).

The symposium aroused considerable international scientific interest, and was a success because of the relevance of the topics debated and the wide experience of the participants attending. It was divided into four sessions on the following topics: Karst and Water, Man and Karst, Natural Heritage of Karst Ecosystems, and Paleoenvironmental Studies in Karst.

In the session on Karst and Water a large number of communications were presented and grouped into three sub-sessions: one on Investigations of Karst Aquifers, one on Hydrodynamic Characterisation of Karst Aquifers and the other on Karst Groundwater Protection. The activities also included the annual meeting of the IAH-Karst Commission (<http://www.karst-hydrogeology.de/iah-karst.html>), the annual meeting of the UNESCO-Project IGCP 448 "Correlation of Karst Ecosystems" (<http://www.gxnu.edu.cn/KDL>) and the annual meeting of the UNESCO-Project IGCP-448 Spanish Working Group (<http://www.hidrogeo.uma.es>)



*The UNESCO-IGCP Karst Correlation Working Group with IAH guests Stephen Foster and Heinz Hotzl 'prepare for battle' in the form of a special visit to the non-public areas of the Nerja caves.*

# Groundwater in the world water debate



## Johannesburg Summit 2002

During the Rio "Earth Summit" in 1992, water and sanitation did not emerge as one of the critical issues for the world's attention but the focus has changed since then. At the "Rio+10" summit in Johannesburg water and sanitation issues were much more visible. The focus of the attention on water was at the Water Dome. IAH collaborated with the South African Department of Water Affairs in providing a focus on groundwater through a popular publication "The Hidden Treasure - A diary of groundwater".

The European Union promoted a water initiative at the Water Dome:

[http://europa.eu.int/comm/environment/wssd/water\\_en.html](http://europa.eu.int/comm/environment/wssd/water_en.html) This initiative supported the UN Millennium Goal to halve the proportion of people lacking access to safe drinking water by 2015, together with a complementary target on sanitation but also stressed the need to ensure the health of aquatic ecosystems and balance the water needs of the environment with the water needs for economic development and agricultural purposes.

A report on the outcomes of the Johannesburg Summit can be found at:

[http://www.johannesburgsummit.org/html/documents/summit\\_docs/2009\\_keyoutcomes\\_commitments.doc](http://www.johannesburgsummit.org/html/documents/summit_docs/2009_keyoutcomes_commitments.doc)

### Key Outcomes of the Summit

- The Summit reaffirmed sustainable development as a central element of the international agenda and gave new impetus to global action to fight poverty and protect the environment;
- The understanding of sustainable development was broadened and strengthened as a result of the Summit, particularly the important linkages between poverty, the environment and the use of natural resources;
- Governments agreed to and reaffirmed a wide range of concrete commitments and targets for action to achieve more effective implementation of sustainable development objectives;
- Energy and sanitation issues were critical elements of the negotiations and outcomes to a greater degree than in previous international meetings on sustainable development;
- Fund for the eradication of poverty was a positive step forward;
- Africa and NEPAD were identified for special attention and support by the international

community to better focus efforts to address the development needs of Africa;

- The views of civil society were given prominence at the Summit in recognition of the key role of civil society in implementing the outcomes and in promoting partnership initiatives;
- The concept of partnerships between governments, business and civil society was given a large boost by the Summit and the Plan of Implementation.

### Water and Sanitation issues: International Goals from the Johannesburg Implementation Plan

- Halve, by the year 2015, the proportion of people without access to safe drinking water (this is a reaffirmation of one of the Millennium Development Goals agreed at the UN Millennium Declaration in September 2000 <http://www.developmentgoals.org>);
- Halve, by the year 2015, the proportion of people who do not have access to basic sanitation;
- Develop integrated water resources management and water efficiency plans by 2005.

### Commitments from the Johannesburg Summit - Water & Sanitation

- The United States announced \$970 million in investments over the next three years on water and sanitation projects.
- The European Union announced the "Water for Life" initiative that seeks to engage partners to meet goals for water and sanitation, primarily in Africa and Central Asia.
- The Asia Development Bank provided a \$5 million grant to UN Habitat and \$500 million in fast-track credit for the Water for Asian Cities Programme.
- The UN has received 21 other water and sanitation initiatives with at least \$20 million in extra resources.

### Partnerships for sustainable development

Partnerships in sustainable development are seen to be an important outcome of the World Summit on Sustainable Development. They supplement the commitments agreed to by Governments through the inter-governmental process. The 228 partnerships that have been agreed and posted on the WSSD website, address all the critical areas of sustainable development in all regions of the world. For further information on these partnerships, also known as Type II partnerships, please visit:

[http://www.johannesburgsummit.org/html/sustainable\\_dev/type2\\_part.html](http://www.johannesburgsummit.org/html/sustainable_dev/type2_part.html)

The full list of partnerships relating to freshwater can be found at:

[http://www.johannesburgsummit.org/html/sustainable\\_dev/p2\\_protecting\\_freshwater.html](http://www.johannesburgsummit.org/html/sustainable_dev/p2_protecting_freshwater.html)

IAH is a lead organisation for one of these partnerships on Transboundary aquifer resource management (ISARM):



### World Water Forum

In March 2003 the focus of the World Water Debate moves to Japan and the 3rd World Water Forum. The Japanese Organising Committee promise that this meeting will not be a platform for presenting technical papers, defining theoretical concepts or discussing research design. Instead the forum will invite participants to share their experience with proven actions and best practice - supported by sound research, science and theory - that have facilitated sustainable solutions to water problems. A priority will be to promote dialogue and interaction between the numerous stakeholders. The forum is spread across three sites in Kyoto, Shiga and Osaka and is divided into a number of thematic sessions.

IAH working with a number of agencies of the UN system, UNESCO, FAO, World Bank and IAEA, together with a number of organisations, notably the Marcelino Botín Foundation of Spain and the Japanese Association for Environmental Hydrology, have succeeded in getting a two day session devoted entirely to groundwater, to be held in Osaka. This will be the first time in a world water meeting that groundwater has had such a high profile. A programme is devised that will address the challenges in a practical way and engage the wide

ranging audience, specialist and non-specialist, expected at the Forum.

The Forum will close with a Ministerial Conference to which the groundwater theme session will contribute its key messages. It is expected that the Forum will give a further impetus to sustainable water development programmes around the world in which IAH wishes to see groundwater play its rightful part. It will be important to integrate our messages with those of other specialists working on world water resource development and management. IAH Council agreed at its meeting in Mar del Plata (page 8) to work better at integrating the work of its commissions and other experts to provide a policy and technical framework to advocate better understanding and management of groundwater.

### Groundwater Resources of the World

IAH, through BGR Hannover, has been leading a project on behalf of UNESCO and the World Water Assessment Programme to prepare a Groundwater Map of the World (WHYMAP - World Hydrogeological Map). The full project will be completed in 2003 but at the Mar del Plata Congress, project leader Willi Struckmeier launched the first product from the programme, a 1:25,000,000 map classifying world groundwater resources into three categories:

- Major groundwater basins with highly productive aquifers;
- Areas with complex structures including some important aquifers;
- Areas with generally poor aquifers, locally overlain by shallow and river bed aquifers.

The pilot map can be viewed on the IAH web site ([www.iah.org/WHYMAP](http://www.iah.org/WHYMAP)) or downloaded as a low

resolution map as a PDF file (95KB)



Thumbnail of the UNESCO/IAH/CGMW/BGR World Hydrogeological Map

### **Council endorses priority actions for IAH**

IAH Council, meeting in Mar del Plata in October 2002, endorsed the report of priority actions proposed by the IAH Special Council meeting held in Stâna de Vale, Romania in May 2002. Here are the main conclusions of the report, which can be found in full with appendices at:

<http://www.iah.org/News/2002/028.html>

### **Influencing policy**

Continue active collaboration with UNESCO in the IHP VI programme, coordinate and strengthen input into the World Water Assessment Programme and build effective partnerships with World Bank (GWMate), UNESCO, FAO, IAEA and other international agencies, with the objective of promoting a better understanding of the role of groundwater in the World Water Forum and other international water policy initiatives.

Create a Global Groundwater Policy Forum of senior IAH members from the existing commissions and other experts with groundwater policy experience, to sustain influence on global groundwater issues going forward from the 3rd World Water Forum and provide expert advice and analysis on international groundwater issues from hydrogeological, legal, economic and social standpoints.

### **Increasing resources**

Give priority to the promotion of membership through national chapters to meet the business plan objective of 5000 members. Priority targets are high income countries, especially the USA, corporate members and students.

Develop programmes to seek sponsorship from a wider range of potential funders than we have previously tackled.

### **Support to developing countries**

Strengthen the sponsored membership scheme by encouraging donations from members and non-members.

Review the priorities and method of working of the Burdon Commission for Developing Countries and the use of the Burdon Fund.

### **New and priority programmes**

- Transboundary aquifer water resource management;
- Urban groundwater;
- Groundwater and poverty alleviation;
- Improving understanding and better characterisation of groundwater systems through WHYMAP (World Hydrogeological Map) and the International Groundwater Resource Assessment Centre initiative of UNESCO and WMO;
- New commission on groundwater dependent ecosystems;
- New commission on coastal aquifer management.

### **Publication and outreach**

Maintain Hydrogeology Journal and the Balkema book series as primary publications.

Expand as soon as resources are available the publication programme, including use of electronic media, to provide technical and best practice advice publications and thereby meet the wider needs of our membership and potential members.

Support groundwater policy awareness by publications in formats accessible to policy and decision makers.

### **Co-operation between IAH and ALHSUD**

During the Mar del Plata Congress, a joint meeting between members of the Councils of IAH (Emilio Custodio, Andrew Skinner, Stephen Foster and Emilia Bocanegra) and ALHSUD (Mario Hernández, Joel Carrillo, Carlos Molano, Lourdes Rocha, Jorge Montaña) reaffirmed a continuing co-operation between the two organisations. The more important elements of this cooperation are:

- IAH and ALHSUD will jointly encourage the creation of national groups in Latin America. They will also encourage and organise joint workshops;
- ALHSUD will offer membership to IAH members at a discount rate;
- There will be an exchange of topical information through IAH News and Information and Novedades de ALHSUD;
- Both organisations will organise joint working meetings at Congresses;
- There will be co-operation in the distribution of Journals in Spanish and Portuguese.



Presidents of the two Associations - Emilio Custodio (IAH) and Mario Hernández (ALHSUD)

At the ALHSUD General Meeting the following executive board was elected for the period 2002-2006: President: Mario Hernández (Argentina), Vice Presidents: Joel Carrillo (Mexico), Ernani Da Rosa F (Brasil), Carlos Molana (Colombia), Liubow González (Chile), Secretariat: Jorge Montaña (Uruguay), Pablo Dacoud (Uruguay).

### Fees for 2003

As already announced IAH fees will increase for 2003 for high-income countries from €60 to €62 in line with inflation. There will be no increase for low-income countries or students where the fee will remain €30. However a few countries now recognised as middle-income countries, which includes the EU accession states, will have a fee rise to €35. Also this year members will be receiving personal membership cards for the first time. They include details of how to access the new members-only section of the IAH web site where the new on-line membership directory is to be mounted.

### National Chapter News

The Grupo **Português** da Associação Internacional de Hidrogeólogos (AIH-GP) is now well advanced in the formal registration with the competent Portuguese authorities. The inaugural officers are: Fernando Peixinho de Cristo (President); António Alberto Chambel Gonçalves Pedro (Vice-President); Maria Teresa Condesso Melo (Secretary/Treasurer). The AIH-GP contact is Maria Teresa Condesso Melo, ([aih-gp@geo.ua.pt](mailto:aih-gp@geo.ua.pt)).

The Asociación de Hidrogeólogos del **Perú** is now recognised as the IAH National Chapter in that country. The inaugural executive committee is Jorge Tovar (President), Juan Sayán (Vice President) Daniel Sanchez (Secretary) and Jaime Uchuya (Treasurer). The AHP contact is Jorge Tovar ([jtovar@tre.com.pe](mailto:jtovar@tre.com.pe)).

Congratulations to our professional colleagues in **Colombia** on the formation of the Asociación Colombiana de Hidrogeólogos, which is now recognised as the National Chapter of IAH in Colombia. The President of ACH is Professor Alberto Lobo-Guerrero ([ablg@andinet.com](mailto:ablg@andinet.com)) and the Secretary is Elsa García ([elsagarcias@yahoo.com](mailto:elsagarcias@yahoo.com))

The **Chinese** National Committee for IAH held a meeting on November 14-15 2002 in Chongqing city. A new committee was elected as follows: Huang Zhixing (President), Dr. Han Zaisheng (Secretary) ([hzaisheng@mail.cgs.gov.cn](mailto:hzaisheng@mail.cgs.gov.cn)) and Zhang Fawang.

The **Greek** National Committee of IAH has a new board following elections earlier this year as follows: Georgios Soulios (President - [gsoulios@geo.auth.gr](mailto:gsoulios@geo.auth.gr)), Georgios Stournaras (Vice President), Leonard Tiniakos (General Secretary), Konstantinos Papadopoulos (Treasurer).

### Other News

The IAH Commission on Mineral and Thermal Waters, holding its Annual Meeting in Olimia Terme, Slovenia from September 14-21, elected a new Chairman - Dr Peter Kralj of Slovenia. The retiring chairman, Dr Jan Dowgiallo (Poland), has held the post for 14 years and was nominated Honorary Chairman of the Commission. IAH is grateful for the dedicated contribution of Jan Dowgiallo to the work of IAH and this Commission.

Ing Alberto Arias Paz has been elected as the new president of the Asociación Geohidrológica Mexicana, which works in partnership with the IAH Mexican National Chapter.

IAH has accepted an invitation to join the international steering committee of the Dialogue on Water and Climate ([www.waterandclimate.org](http://www.waterandclimate.org)), which was launched at the Bonn Freshwater Conference in December 2001. It seeks to raise awareness of climate and weather associated vulnerability in the context of sustainable water management. The IAH contact is Albert Tuinhof ([a.tuinhof@royalhaskoning.com](mailto:a.tuinhof@royalhaskoning.com))

The IAH/UNESCO project as part of the IHP programme on a Groundwater Contamination Inventory - a methodological guide has now reported. The report is available as a CD-ROM (available from UNESCO offices) edited by Alexander Zaporozec (USA)

For an overview of issues relating to protection of groundwaters used for public supply in Europe the report of a UNECE workshop, to which a number of IAH members contributed, is a useful series of source documents and can be found at: [www.unece.org/env/water/meetings/groundwater01.htm](http://www.unece.org/env/water/meetings/groundwater01.htm)

## New publications

**Llamas, M.R./Custodio, E.: Intensive Use of Groundwater - Challenges and Opportunities** 2002, 25 cm, 484 pp., ISBN: 90 5809 390 5 EUR 149,00/\$149,00. Published by Balkema.  
<http://balkema.ima.nl>

The main aim of this book is to contribute to more transparent, objective and unbiased information on the pros and cons of intensive groundwater development, based on the experiences of many countries in past decades. One group of authors present the positive and negative aspects of intensive use in general. A second group of papers provides overviews of significant regions of the world where there is intensive use of the groundwater resource.

The book is written by authors from different countries and disciplines. The scope is not only to present the conventional hydrogeological aspects of the issue, but more importantly, the ecological, legal, institutional, economic, and social challenges and opportunities of such intensive groundwater use. It should be clear that different scientists, experts and stakeholders may interpret a given situation very differently. Perceptions also change through time, and possible solutions are not unique and may often involve trade-offs and accommodation to local circumstances, established policies and politics. Nevertheless, it is intended to propose actions in order to assure a sustainable groundwater development. It is expected that this book may constitute a step-forward to help clarify the importance of groundwater and its far-reaching implications. The conclusions were debated at the SINEX conference in Valencia in December 2002.

**Dillon, P.J. (ed): Management of Aquifer Recharge for Sustainability - Proceedings of the 4th International Symposium on Artificial Recharge of Groundwater, Adelaide, 22-26 September 2002** 2002, 25 cm, 567 pp., ISBN: 90 5809 527 4 EUR 149,00/\$149,00 less 60% discount to IAH members. Published by Balkema <http://balkema.ima.nl>

One hundred papers from 20 countries cover the latest research and current state of the art on a widening range of methods for recharge enhancement and groundwater quality protection and improvement. These include bank filtration, aquifer storage and recovery and soil aquifer treatment as well as rainwater harvesting and pond infiltration. The emphasis is on understanding subsurface process to improve siting, design and operation and facilitate use of stormwater and reclaimed water, particularly in water-scare areas.

**Thornton, S.F./Oswald, S.E. (eds): Groundwater Quality: Natural and Enhanced Restoration of Groundwater Pollution.** 2002, + xii pp.; ISBN 1-901502-86-4; price £82.50. Published by IAHS Press <http://www.cig.ensmp.fr/~iahs/>

There is increasing pressure on the world's groundwater resources in response to greater demand for potable water from the human population and on-going growth in industrial development. The consequences of this pressure are the increasing contamination of water supplies and the need to ensure that these supplies are improved and protected for continued exploitation. This is necessary to sustain current groundwater resources and to ensure their availability for future generations.

This places tremendous pressures on water supplies that are provided by groundwater, in terms of managing the available resource and protecting its quality. There remains a need to develop innovative and especially cost-effective methods to clean up polluted groundwater. It is now widely acknowledged that many engineered technologies available for groundwater remediation are costly and often impractical, particularly in urban settings or with complex industrial sites and pollution histories. A more practical philosophy to groundwater resource management and remediation is needed, within the concept of sustainable development.

Restoration using monitored and enhanced natural attenuation has received significant attention over the last few years as a cost-effective, risk-based, low intensity technology for the in-situ treatment of contaminated land and groundwater. Much of this interest has been stimulated by the success in using natural attenuation to remediate petroleum hydrocarbon spills. However, the focus is now shifting towards developing an understanding of the natural attenuation of a wider range of contaminants that impact on groundwater. Important issues that need to be addressed are:

- Identifying contaminants for which natural attenuation is an unsuitable technology;
- Defining conditions under which natural attenuation is not likely to be effective;
- Developing suitable site investigation methods to reliably monitor natural attenuation processes;
- Extending and applying numerical modelling techniques to predict attenuation and risk reduction;

- Developing practical ways to enhance or increase natural attenuation.

The publication contains 88 peer-reviewed papers from the Q2001 International Conference on Groundwater Quality: Natural and Enhanced Restoration of Groundwater Pollution, held in Sheffield, UK, 18-21 June 2001. It continues the series established by the previous conferences, GQM'93 (held in Estonia in 1993), GQ'95 (held in the Czech Republic in 1995) and GQ'98 (held in Germany in 1998). The major objective of the conference was to provide an international forum to discuss the newest advances in research on natural and enhanced restoration of pollutants in soils and groundwater.

Particular focus was given to site characterization and remediation strategies using state-of-the-art techniques, field-scale demonstration of treatment technologies, fundamental understanding of natural attenuation processes in the subsurface and their application in remediation design, reactive barrier design and performance, and reactive transport modelling of natural attenuation processes.

**McLaughlan, R. G: Managing Water Well Deterioration.** 2002, 25 cm, 142 pp., ISBN: 90 5809 247X IAH International Contributions to Hydrogeology 22. EUR55,00/\$55,00 less 20% discount for IAH members. Published by Balkema  
<http://balkema.ima.nl>

Managing water well deterioration fills a need within the literature for an academically based informative text that incorporates practical advice. The focus on a problem-orientated approach to diagnosing well deterioration makes the book a useful practical handbook. It integrates concepts from hydrogeology, hydrochemistry and microbiology to give a thorough understanding of water well deterioration processes.

Scenarios have been developed to illustrate common causes of water well fouling. A feature of the book is the treatment of both corrosion and fouling issues in depth. Case studies are used to illustrate approaches to the diagnosis and remediation of well deterioration. These scientifically orientated perspectives on water well deterioration are embedded within a management framework to provide a comprehensive approach to dealing with these problems.

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# Conference Listing

Summary details of conferences with e-mail or web addresses are given below. For a fuller list of conferences and more details, including hot links to web sites visit [www.iah.org/conf/](http://www.iah.org/conf/)

## 2003

January 19-22, Albuquerque, New Mexico. Source Water Protection Symposium- New Tools and Techniques. Organised by the American Water Works Association. Web: <http://www.awwa.org/conferences/swp/>

January 20-23 Muscat, Oman. International Conference on Soil and groundwater Contamination and Clean-up in Arid Zones. Web: [www.squ.edu.om/agr/](http://www.squ.edu.om/agr/)

February 20-21, Phoenix, Arizona, USA. NGWA Southwest FOCUS conference - co-sponsored by IAH: Water Supply and Emerging Contaminants. Web: <http://www.ngwa.org/>

February 26-28 Dresden, Germany. International workshop on Diffuse Input of Chemicals into Soil & Groundwater - Assessment & Management. Web: [www.tu-dresden.de/fghhgw/workshop/index.htm](http://www.tu-dresden.de/fghhgw/workshop/index.htm)

March 11-14 Alicante, Spain. Technical congress on intrusion in coastal aquifers in Mediterranean countries. Web: [www.igme.es/internet/web\\_aguas/igme/tiac03](http://www.igme.es/internet/web_aguas/igme/tiac03)

March 30 - April 2, Merida, Yucatan, Mexico. Second International Conference on Salt Water Intrusion and Coastal Aquifer Monitoring, Modeling, and Management (SWICA-M\*3). Web: [www.igeofcu.unam.mx/swica2/](http://www.igeofcu.unam.mx/swica2/)

April 7-10, Montpellier, France. International Conference on Hydrology in the Mediterranean and Semi-arid Regions. Web: <http://www.mpl.ird.fr/montpellier2003/>

April 7-11 Denver, Colorado, U.S.A. International Workshop on Integrated Water Resource Management. Web: [www.usbr.gov/international/trn\\_integrated.htm](http://www.usbr.gov/international/trn_integrated.htm)

April 13-14 Birmingham, UK. Groundwater in Tomorrow's Europe - The Water Framework Directive. More information available shortly.

April 29-30 Tullamore, Co. Offaly, Ireland. 23rd Annual IAH Irish Group Groundwater Seminar. Groundwater - its stakeholders. E-mail [m.doak@epa.ie](mailto:m.doak@epa.ie)

May 19-23 Vienna, Austria. 40th Anniversary International Symposium on Isotope Hydrology and Integrated Water Resources Management. Web: <http://www.iaea.org/worldatom/meetings/2003/infcn104.shtml>

May 28-30, Salamanca, Mexico 1st International Workshop on Aquifer Vulnerability and Risk. Instituto de Hidrología de Llanuras. Web: <http://www.igeofcu.unam.mx/avr03>

June 23 -26, Faro, Portugal. Jornadas Hispano-lusas sobre Las Aguas Subterráneas en el sur de la Península Ibérica. Organiza: AIH-GE; AIH-GP, APRH. E-mail: [aprh@aprh.pt](mailto:aprh@aprh.pt)

June 29-July 2, New York City, USA. Watershed Management for Water Supply Systems. Web: <http://www.awra.org/meetings/NewYork2003/index2.html>

June 30-July 11, Sapporo, Japan. International Symposium on Methodologies for Risk Assessment of Waste Water Re-use on Groundwater Quality. Web: <http://www.jamstec.go.jp/jamstec-e/iugg/index.html>

July 30 - August 1, Medellín, Colombia. V Simposio Colombiano de Hidrogeología.

Web: <http://www.congresocolombianodegeologia.org>

September 3-5, Albacete, Spain. Envirwater 2003 - VI Inter-regional Conference on Environment - Water - Land and Water use Planning and Management.

Web: <http://crea.uclm.es/enviowater2003.php>

September, Esfahan, Iran. Third international symposium on water resources in karst and hard formations.

E-mail: [karstsympo2003@wrm.or.ir](mailto:karstsympo2003@wrm.or.ir)

September 15-19, Prague, Czech Republic. Conference on Groundwater in Fractured Rocks.

Web: <http://www.natur.cuni.cz/gwfr2003>

September 22-26, Bled, Slovenia. 1st International Conference on Groundwater in Geological Engineering.

Web: <http://www.drustvo-skiah.si> or

<http://www.pivo-union.si/ICGGE-2003/>

September 28 - October 1 Winnipeg, Canada. 4th CNC-IAH/CGS Conference.

Web: <http://home.cc.umanitoba.ca/~cgsman/cgs2003/>

September 30-October 3 Venice, Italy. International Conference on Remediation of Contaminated Sediments.

Web: [www.battelle.org/sedimentscon](http://www.battelle.org/sedimentscon)

October 5-9 Madrid, Spain The XIth World Congress on Water Resources - Water Resources Management in the 21st Century. Web: [www.cedex.es/iwracongress2003/](http://www.cedex.es/iwracongress2003/)

October 13-15 Stockholm, Sweden. International Conference on Coupled T-H-M-C Processes in Geosystems: Fundamentals, Modelling, Experiments and Applications (GEOPROC-2003). Web: [www.geoproc.org](http://www.geoproc.org)

October 14-22, Huangshan City (Tunxi), China. Conference on research basins and hydrologic planning.

Web: <http://www.gsf.de/OA/kong.htm>

October 22-25, Berkeley, CA, U.S.A. Second International Symposium on Underground Injection Science and Technology. Web: <http://www.lbl.gov/conferences/UIST>

## 2004

June 16-19 Sosnowiec, Poland. International conference on groundwater vulnerability assessment and mapping.

Web: <http://khgi.wnoz.us.edu.pl/vulnerability.htm>

August 20-28, Florence, Italy. 32nd International Geological Congress. Web: <http://www.32igc.org>

October 11-15, Mexico. XXXIII Congress of IAH Conference on Groundwater Flow Understanding: From Local to Regional Scale. Web: <http://www.igeograf.unam.mx/aih>

## 2005

September. Belgrade, Yugoslavia. International Conference on Environmental (Geoecological) Problems in Karst.

E-mail [jemcov@ptt.yu](mailto:jemcov@ptt.yu)

October, Barcelona, Spain. IAH Conference "From data gathering and groundwater modelling to integrated management" E-mail: [gerencia@cihs.org](mailto:gerencia@cihs.org)