



International Association of Hydrogeologists U.S. National Chapter Newsletter

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7TH INTERNATIONAL SYMPOSIUM ON LAND SUBSIDENCE: SISOLS 2005: Oct. 23-28, Shanghai, PR China.
INTERNATIONAL GROUNDWATER CONFERENCE, INDIA - January 4-6, 2006: Dindigul, Tamilnadu, India

GROUNDWATER RESOURCES ASSOCIATION OF CALIFORNIA

- Vicki Kretsinger

IAH Allied Activities with the GRA of California

Meetings include:

- 13TH SYMPOSIUM ON GROUNDWATER CONTAMINANTS – INVESTIGATION AND REMEDIATION OF DRY CLEANER SITES - November, 2004: Orange County, California
- ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEMS SEMINAR - January 26, 2005
- INDOOR AIR AND VAPOR INTRUSION - May 2005
- CALIFORNIA GROUNDWATER MANAGEMENT WORKSHOP – Spring 2005 and Fall 2005
- EMERGING CONTAMINANTS - Summer 2005
- OVERDRAFT AND SAFE YIELD SEMINAR – Fall 2005
- 25TH BIENNIAL GROUNDWATER CONFERENCE & 14TH ANNUAL GROUNDWATER RESOURCES ASSOCIATION MEETING
October 25-26, 2005, Sacramento Convention Center, Sacramento, CA
- DNAPL AND SOURCE ZONE REMEDIATION - November 2005

California Groundwater Management: Handbook

NGWA-AGWSE INFORMATION

- Vicki Kretsinger

NGWA ANNUAL EXPO – December 12-14, 2004, Las Vegas, NV
FIRST ANNUAL GROUNDWATER SUMMIT: GROUNDWATER IN DEVELOPING COUNTRIES: APPROPRIATE TECHNOLOGY,
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Editor's Note

Welcome to the Fall, 2004 newsletter of the US Chapter of IAH, and many thanks to all those who have contributed material for it. With each issue, more people seem to be contributing more substantive and varied items – thank you!

At the end of this year, the current US national committee (Lenny Konikow, John Harsh, Yoram Eckstein, and myself) steps down after its four-year tenure. You should already have received ballots for the election of the new committee to start January 1, 2005: candidates are Jack Sharp (Chair), Todd Halihan (Secretary-Treasurer), and Victor Heilweil, Noel Krothe, Mike Wireman and myself (directors). The deadline was October 29, so you should already have mailed/e-mailed your ballots to Lenny Konikow – if this newsletter gets out by then, and you haven't, please do so! To help with continuity into the new session, Lenny will serve on the committee as Past-Chairman, and I am willing to continue as a director and to help out as newsletter editor.

Being Secretary-Treasurer over the past four years has been a fair amount of work, but a very satisfying experience. I have enjoyed working with John, Yoram, and Lenny on the committee, and getting to know many of you, at least a little, mainly through e-mail. It is quite remarkable how recently and rapidly e-mail has become an integral part of our professional lives! Previous Secretaries of IAH/US had to struggle with slow, expensive snail-mail letter post. Over the past four years, our membership has become about 97% e-mail accessible and I have been able to handle enquiries, interact with members and the committee, update information with IAH headquarters in the UK, and request and collect newsletter items all virtually instantaneously. Nevertheless - if you have any difficulty with the size or format of the newsletter and require a direct-text-only copy, please let me know. And as always, let me know if you change your e-mail or mailing address. Thanks, and I look forward to serving US/IAH again.

-- Colin Booth

MESSAGE FROM THE CHAIRMAN

I just returned from the 33rd IAH Congress held in Zacatecas, Mexico. This joint meeting with ALHSUD (the Latin-American Association of Groundwater for Development) was attended by more than 400 participants from about 50 different countries. It was truly an international gathering, and there were many opportunities to meet and talk with professional colleagues from around the world. The Mexican Chapter of IAH did an excellent job in organizing the Congress and in selecting a wonderful venue: Zacatecas is truly a beautiful city with friendly people and many cultural highlights. The meeting included a number of keynote talks and other special sessions that focused on both recent developments in hydrogeological science, groundwater management, and regional aquifer studies with respect to both quantity and quality of groundwater. Several talks focused on scaling issues and on the use of isotopes to help understand groundwater flow systems. I want to especially thank Joel Carrillo, Chairman of the Organizing Committee, for his efforts in convening this Congress and for the kind hospitality of the hosts.

At the IAH Congress, I represented the U.S. Chapter at the Council Meeting on Oct. 10, and I reported on our activities and progress (*see photo, courtesy of Ken Howard*). One of the issues discussed during the Council meeting was the need for IAH to slightly increase its membership dues next year (by an amount of 3 Euros).



Unfortunately for U.S. members, this small dues increase combined with the unfavorable decline of the dollar relative to the Euro during the past year will translate into an increase of about \$9 or \$10 for us. Future IAH meetings were also discussed. The next IAH Congress is planned for Beijing, China, in October 2006. It is not too early to begin making plans to attend this Congress. Other IAH Conferences planned during 2005 include ones in New Zealand (Nov. 2005), Alicante, Spain (Data and Modeling for Integrated Management, Oct. 2005), and Belgrade, Serbia and Montenegro (Environmental

Problems in Karst, Sept. 2005). During 2006, in addition to the 34th Congress, a colloquium honoring the 150th anniversary of the publication of Darcy's law will be held in Dijon, France (May 29-June 4, 2006). More details will be posted on the IAH web site. During the Congress there were also planning meetings for the 4th World Water Forum to be held in Mexico in March 2006.

At the General Membership meeting during the Congress, it was announced that Stephen Foster will be the next President of IAH, and our own Jack Sharp will be the next Treasurer. Congratulations to both of them. Photo at right (*courtesy of Ken Howard*) shows Emilio Custodio, Stephen Foster, and Andrew Skinner leading the General Membership meeting on Thursday, Oct. 14.

As you know, the U.S. National Chapter is in the midst of electing new officers for the next 4-year term. We have had a reasonably good return of ballots so far, and I encourage those of you who have not yet voted, to please submit your ballot. Because of growth in the chapter membership, we have decided to expand the size of the Executive Committee. My term of office ends in December, and as I look back, I am pleased with the increased membership and vitality of the U.S. Chapter of IAH during this time. It was a pleasure to serve the organization and have the chance to make new friends and collaborate with colleagues. We have built or continued strong alliances with GSA, California Groundwater Resources Association, AGI, and American Ground Water Trust. If you have suggestions for additional alliances, please let us know. I will stay on the Executive Committee as Past-Chair, and I am pleased that Colin Booth will also remain a member of the Executive Committee and provide guidance to the incoming Secretary-Treasurer. Colin also has kindly agreed to continue as Editor of the Newsletter for a period of time, and we appreciate that. On behalf of IAH/USNC, I want to extend my personal gratitude to John Harsh and Yoram Eckstein, who will be rotating off of the Executive Committee. They have provided many years of valuable service and insight to the U.S. National Chapter and to IAH. The official results of the election will be announced in early November, but it is clear that the U.S. National Chapter will be in good hands for the next four years.

The U.S. National Chapter is helping to organize three special sessions at the 2004 Annual GSA Meeting in Denver (Nov. 7-10): “Sustainable Management of Water Resources” (Tuesday, Nov. 9, organized by Bridget Scanlon and Marios Sophocleus), “The Future of Hydrogeology” (Sunday, Nov. 7, organized by Cliff Voss), and “Groundwater Depletion and Overexploitation in the Denver Basin Bedrock Aquifers” (Sunday, Nov. 7, organized by John Moore and Peter Barkmann). The session on “The Future of Hydrogeology” also represents the topic of the next (Feb. 2005) theme issue of *Hydrogeology Journal*. Our thanks to these IAH members who have made an extra effort to foster scientific communication and increase IAH visibility. IAH/USNC will also hold a brief business meeting in Denver during the GSA meeting (**see below*). The overall hydrogeology program at this year’s GSA meeting is once again very strong, and I hope we can also contribute to next year’s GSA program as well. In that vein, we are soliciting ideas from our members for session topics to convene at the 2005 Annual Meeting or Regional Meetings. If you are willing to convene such a session, please contact one of the Executive Committee members. I hope to see you in Denver.

-- Lenny Konikow

**** Tuesday, November 9, 5:30 pm outside Room 207 (after the Darcy Lecture and just before the GSA Hydrogeology Division student reception). All members are welcome.***

REPORTS

Hydrologic Collaboration Contributes to Peace Process

By Anna Lenox

The Multilateral Working Group on Water Resources was formed in 1992 as part of the Middle East Peace Process. It established the Public Awareness and Water Conservation (PA&WC) Project in 1996. The Project is managed by the United States. The first activity completed by the regional participants was the design and preparation of a video intended for youth that highlights the importance of water issues from a Regional perspective.

The second major activity of the PA&WC Project, WaterCare, was preparation of a Student Resource Book, a Teacher's Guide, and complementary website focused on water conservation issues that are regional in concept, scope, and content. The materials, prepared jointly by educational writers from each of the regional participants (Israelis, Jordanians, and Palestinians), were written for students between 12 and 15 years of age. The major topics addressed by the materials include water resources, water use, water pollution and life/health, water management for conservation, and water care for the future, all from a regional perspective. The materials have been successfully introduced into pilot schools.

Regional graphics design specialists worked together with writers to produce a beautifully illustrated, scientific text book, entitled *Water*, which describes regional water resources from a scientific perspective while focusing on shared resources and joint responsibility. The book recognizes that humans, like other living creatures, require water to survive. The writers have focused on learning together and on translating the words of peace treaties into a language of action. The publication concentrates on the population's shared water resources and upon the necessity for mutual support in conserving and protecting the resource. The book can be viewed at <http://www.watercare.org/>

The website continues to develop and is composed of materials provided by all regional participants. The Teacher's Guide was prepared by each participating party to meet national educational and local cultural requirements.

A third activity has begun. RainCatcher, a rain-harvesting project, will provide students in pilot schools a chance to "learn by doing." Rain harvesting is the process of collecting and storing rainfall for later use. The project will increase awareness of rain harvesting as an important component in water conservation and offer a unique opportunity for regional collaboration on water conservation issues.

The Intifada and continuing unrest within the region have done little to dampen the enthusiasm of the participating parties. Determination, creativity, and the need to protect and conserve limited water resources have brought focus and determination to the activity. The PA&WC project is led by U.S. Geological Survey scientists, supported by the U.S. Department of State, and implemented by Israeli, Jordanian, and Palestinian teachers, scientists, writers, and children.

--Anna Lenox

Hydrogeologic Study of the Alta Piura Basin in Northern Peru

By Victor Heilweil

The Alta Piura ground-water system, near the Pacific Coast of northern Peru, is one of seven ongoing regional ground-water studies funded by the International Atomic Energy Association's (IAEA) Isotope Hydrology Section. As part of the IAEA technical assistance program, I recently spent a week in Piura, learning about the ground-water system and assisting with the development of a conceptual model of ground-water flow.



Well in the Alta Piura study area being used for drinking water.

The primary aquifer in the Alta Piura basin consists of unconsolidated alluvial and fluvial sediments, juxtaposed between metamorphic and igneous rocks (foothills of the Andes) to the northeast and eolian sands and silts to the southwest. On the edge of the Sechura Desert, the lower part of the basin receives less than 200 mm of precipitation annually. However, much more rainfall occurs both during El Niño years and in the upper parts of the basin, where altitudes exceed 3,000 meters. The combination of a severe

multiple-year drought and extensive irrigation has recently resulted in extended periods when the Piura River, once perennial, goes dry. Thus, the duelling forces of nature and recent increase in extractions have shown the limits of this precious resource, leaving little water for natural ecosystems. Also, the vulnerability of this unconfined aquifer to surface contamination from both human waste and agricultural chemicals is indicated by locally high concentrations of nitrates in groundwater - up to 70 mg/L.



Woman transporting drinking water back to her home in the Alta Piura study area.

In addition to the difficulties often encountered in regional ground-water studies in the U.S., such as defining hydrologic boundaries, properties, and flows, the Alta Piura study faces an additional set of challenges common to many developing nations. One important difference is the lack of available information on well-completion depths, lithologic logs, and quantities of well withdrawals. Unlike state requirements in the U.S., private, industrial, and municipal well owners in Peru are not required to report this information. Since most of the pumps in the Alta Piura basin are diesel, well discharge cannot even be estimated with electrical power records. Other data deficiencies include historical water-level information, continuous stream discharge and differential (seepage) measurements, irrigation diversions, and long-term

precipitation measurements. This makes it difficult for the study team to accurately determine a detailed ground-water budget (water balance) and to evaluate long-term changes in ground-water storage.

Nonetheless, data acquisition and interpretation efforts during the current study include water-level data, aquifer testing, surface geophysics, along with the hydrochemical and isotopic analysis of precipitation, surface-water, and ground water. Combining this information with GIS techniques and ground-water flow modelling, the study team has been able to identify important hydrogeologic structures, boundary conditions, ground-water flow directions, recharge areas, rough water-budget estimates, and areas of recent surface contamination, resulting in a better understanding of the ground-water system. It has also raised local awareness of and interest in ground-water / surface-water interaction and the need for protecting both ground-water and ecological resources. While the study will be completed by the end of the year, it is hopefully only the first of several quantitative regional ground-water investigations in northern Peru.

--Victor Heilweil

International Conference and Exhibition on Groundwater in Ethiopia **By Pat Tucci**

Over 70 percent of Ethiopia's drinking water comes from groundwater sources, and the situation is similar in a number of other African countries. Yet, groundwater management is not adequately developed in Ethiopia. To address these issues, an international conference and exhibition on groundwater in Ethiopia was held May 25-27, 2004 at the UNECA Conference Center in Addis Ababa, Ethiopia. The organizing partners for the conference included UNICEF, the Economic Commission for Africa, UN Water Africa, the Ethiopian Ministry of Water Resources, the Geological Survey of Ethiopia, and others. The conference objectives were to:

- Share ideas, experiences, new developments, and practices for groundwater management among sector practitioners;
- Highlight the importance of groundwater in socio-economic development to governments, the general public, the private sector, External Support Agencies, NGO's;
- Identify, address and discuss the problems associated with sustainable groundwater management;
- Familiarize all concerned stakeholders on latest technologies & products;
- Promote the formation of coordination mechanisms for groundwater management at national, regional & global levels; and
- Promote future information exchange and continued discussions on groundwater management, through among others, networking and utilizing the opportunities of the remarkable advances in digital and communications technology.

The Conference addressed several thematic issues including:

- Assessment, inventory and mapping of groundwater resource potentials and development activities in Ethiopia;
- Networking and information exchange on new groundwater development technologies and best practices;
- Sustainable groundwater management and preparedness to respond to regional droughts;
- Implementation and monitoring guidelines and standards for the development of groundwater resources;
- Environmental and socioeconomic considerations in developing groundwater resources vis-à-vis increasing access to water supply;
- Institutional and legal aspects of groundwater management and administration;
- Participatory management of groundwater resources in Ethiopia;
- The economics of groundwater development and management;
- Capacity building in groundwater development and management.

The conference was well-attended, with about 700 registered participants. Twenty-nine exhibitors, including private companies and NGO's, were featured in the exhibition area. Although the focus of the conference was Ethiopia, representatives from several African and other countries also attended. Several of these countries presented talks on their experiences with groundwater.

More than 70 presentations were made over the first two days of the conference. Among the topics of note addressed during the conference were the need for a national groundwater assessment and a supporting groundwater database for Ethiopia, the high cost of drilling wells relative to more developed countries, the large failure rate for the drilling of water wells, and meeting of Millennium Development Goals. On the final day of the conference, group discussions were held on issues dealing with enabling environments, stakeholders, technology, socio-economics, and capacity building. Additionally, discussions were held on the formation of an African groundwater association. The final topic of the conference was the presentation of the “Addis Ababa Declaration on Groundwater”.

A conference proceedings volume is planned, but is not yet available. Additional information on the conference can be found at <http://www.uneca.org/groundwater/>.

IAH ACTIVITIES

IAH President’s Award: Stephen Foster



At the IAH General Membership meeting held on Oct. 14 in Zacatecas, Dr. Stephen Foster of the United Kingdom was presented with the prestigious President’s Award for 2004 by IAH President Emilio Custodio. The award is given for outstanding contributions to hydrogeology. Stephen is also the incoming IAH President.

(Photo courtesy of Ken Howard.)

--Lenny Konikow

Education Days in Hydrogeology Serbia & Montenegro, May-June 2004

During the period May 31st – June 4th, 2004, the first Education Days in Hydrogeology were presented by the IAH Education and Training Commission and NIS-Naftagas (Oil&Gas Industry of Serbia). **Dr. John Moore**, (Chairman of IAH Education and Training Commission, and Past President of the IAH), presented courses on: Groundwater Fundamentals (Primer); Sanitary Surveys; Protecting Springs and Wells from Contamination; History of Hydrogeology; Field Hydrogeology Methods; and Groundwater Mining in the Denver Colorado Basin Bedrock Aquifers. **Dr. David Hyndman** (Associate Professor, Department of Geosciences, Michigan State University, and 2002 NGWA Darcy Distinguished Lecturer), presented courses on: Groundwater – Surface Water Interaction; Simulating the impacts of seasonal recharge on the geochemistry of a jet fuel plume in Michigan; Efficient Large-Scale Bioremediation in a Heterogeneous Aquifer: The Schoolcraft Bioaugmentation Experiment; and Evaluating the impact of land uses on water and solute budgets at the scale of regional watersheds using measurements and models. Two panel discussions were also held: Karst Hydrogeology (contamination, development, etc.); and Groundwater and the Environment, including a case study from Serbia (CD presentation).

This was the first activity of the IAH Education and Training Commission organized independently of the IAH meetings and was held in NIS-Naftagas Headquarters, Novi Sad, Serbia and Montenegro. To further the vision of NIS-Naftagas to become an important education center in the region and to broaden cooperation with colleagues from the country and around the world, registration was made free and the lecturers came to Serbia and presented their lectures without any honoraria. Sanja Dragašević and Snežana Komatina from the Geophysical Institute organized the event, at which there were 30 participants from Naftagas and 32 from 18 other institutions from Serbia and Montenegro.

Workshop on Modeling of Groundwater Contamination and Remediation Belgrade, Serbia and Montenegro, Nov. 29 – Dec. 1, 2004

Dr. Neven Kresic of Malcolm Pirnie, Inc., (member of the US chapter of IAH) will be teaching a workshop entitled "Modeling of Groundwater Contamination and Remediation" at the University of Belgrade, late this Fall. The workshop is organized by the University's Institute of Hydrogeology and co-sponsored by the Serbia and Montenegro Chapter of IAH. As part of the ongoing EU's Bologna Declaration reorganization of the higher education in Serbia and Montenegro, the Institute of Hydrogeology is establishing multidisciplinary international graduate studies in "Aquifer Management and Restoration" with active participation of the IAH National Chapter. The workshop is part of the promotion for this new academic program.

ANNOUNCEMENTS

The Ann Campana Judge Foundation

The Ann Campana Judge Foundation honors the life and memory of Ann Campana Judge, murdered by terrorists when they crashed American Airlines flight 77 into the Pentagon on September 11, 2001. The Ann Campana Judge Foundation was created to promote, undertake, support and fund philanthropic projects in and relating to developing countries, especially those projects focused on water, health, and sanitation. The ACJF will conduct projects on its own, but also makes grants to individuals and other non-profit organizations. Philanthropic projects of the following types will be supported by the ACJF: (1) community water supply development, especially those projects emphasizing relief, training and self-sufficiency; (2) community sanitation and health; (3) community-level economic self-sufficiency; and (4) those projects in the aforementioned areas that emphasize student involvement. Visit www.acjfoundation.org for more information. All donations are tax-deductible to the fullest extent of the law.



ACJF Board Vice Chair Loring Green instructs Epera Indian men in Panama on the finer points of drilling wells. Green and ACJF President Michael Campana developed and conducted this project while with Lifewater International. They raised the money, purchased the equipment, and trained the Epera how to drill and complete wells and install pumps. The ACJF is committed to similar projects that emphasize self-sufficiency.

The ACJF has already funded five projects--located in Ecuador, Peru, Kenya, Haiti, and Nicaragua. Details on these projects are on the WWW site. The ACJF's second RFP (Request For Proposals) will be posted shortly. At the present time, the ACJF funds projects only in response to RFPs.

--Michael Campana & Lenny Konikow

Proposed United States-Mexico Transboundary Aquifer Assessment Act

The proposed Senate Bill represents an effort by Senator Jeff Bingaman of New Mexico to address the lack of consensus between the U.S. and Mexico on the source and availability of future water supplies along the border. The Bill proposes to establish a binational scientific program to comprehensively assess the region's transboundary aquifers and to establish the scientific foundation for national, state and local officials to address pressing water resource challenges in the region. The bill directs the Secretary of the U.S. Department of the Interior to implement this program in cooperation with the border-states in the United States, other appropriate entities, including affected Indian tribes, and, to the "maximum extent practicable," with appropriate Mexican entities and organizations at the federal and local levels. It authorizes the Secretary of the Interior to cooperate with the States on the border with

Mexico in conducting a hydrogeologic characterization, mapping, and modeling program for priority transboundary aquifers, and for other purposes. In its present form, the Bill would authorize \$50 million to be appropriated for fiscal years 2005 through 2014. The Bill passed a vote in the U.S. Senate on 15 September 2004, and on 17 September 2004, was referred to the U.S. House of Representatives Committee on Resources.

--Gabriel Eckstein

Earth Observation System

In August, Bush administration officials Mike Leavitt of the Environmental Protection Agency and Vice Admiral Conrad Lautenbacher of Dept. of Commerce met with members of the media to discuss the Global Earth Observation System, a network of satellites and land- and ocean-based sensors that will be developed in coordination with 40 other countries. As reported in an AGI news release, Leavitt and Lautenbacher pointed out the many benefits of the system, including monitoring climatic changes in polar regions, reducing damage from hazards such as hurricanes and forest fires, and monitoring private-sector environmental problems such as agricultural runoff. The officials said that the greatest challenges to the development of the system and coordination of the data of different agencies will be bureaucratic, not technological. The National Ocean and Atmospheric Administration currently spends about \$800 million a year to manage its satellite data, and the officials could not give an estimate of how much extra the additional equipment and data processing required for the project will cost. A plan for network construction will be released in February 2005. For more information about the Global Earth Observation System, visit <http://www.epa.gov/geoss/>.

--L. Konikow

EPA Fellowship Opportunities

The U.S. Environmental Protection Agency (EPA) Science to Achieve Results (STAR) program offers graduate fellowships for master's and doctoral level students in environmentally related fields of study, according to an AGI announcement. EPA has announced that the next deadline for receipt of pre-applications is **Nov. 23, 2004**. Subject to the availability of funding, the agency plans to award approximately 100 new fellowships by July 21, 2005. The fellowship program provides up to \$37,000 per year of support. For more information, visit http://es.epa.gov/ncer/rfa/2004/2005_star_grad_fellow.html.

Additionally, EPA plans to award 20 fellowships to master's or doctoral students in environmentally related fields through its Greater Research Opportunities (GRO) program. The pre-application deadline for the fellowships is also Nov. 23, 2004. For additional information visit http://es.epa.gov/ncer/rfa/2004/2005_gro_grad_fellow.html.

Finally, EPA's GRO program also plans to award 15 new undergraduate research fellowships for bachelor level students in environmentally related fields of study. Undergraduate fellowships provide students support for their junior and senior years as well as for a summer internship at an EPA facility. The undergraduate fellowships provide up to \$17,000 per year in support and up to \$7,500 to support the summer intern experience. For additional information, please visit http://es.epa.gov/ncer/rfa/2004/2005_gro_undergrad_fellow.html.

--L. Konikow

Mercury Pollution

AGI reports that U.S. Environmental Protection Agency (EPA) officials announced on Aug. 24 that mercury contamination in the nation's waters has reached an all-time high. This conclusion was based on the fact that the number of fish advisories issued between 2002 and 2003 has increased by roughly 6 percent in lakes and 35 percent in rivers. EPA Administrator Mike Leavitt attributed these statistics to the rise in assessment of the nation's waters through monitoring and fish sampling. He also stated that human-made mercury emissions are decreasing, with power plant emissions dropping 45 percent between 1990 and 1999. Rising levels, he explained, are partly due to pollution from other countries, specifically in Asia, which accounted for 53 percent of global mercury emissions in 1995. Leavitt also acknowledged the wide variety of testing and warning programs administered throughout the

states. Washington and Montana, for example, are the first states to issue statewide advisories of mercury contamination, rather than posting warnings for specific sites.

The increase in advisory warnings has spurred significant economic consequences. The seafood industry is concerned that mercury warnings will deter consumers from taking advantage of the health benefits offered by consuming fish. Several states, including Minnesota, Wisconsin, Ohio, and Michigan, have significant stakes in the recreational fishing industry and have been worried that increased mercury pollution will continue to threaten jobs and cost the state millions of dollars in lost revenue. In response to the increase in mercury contamination, the Bush administration has focused on two options. The first, an across-the-board cap on mercury emissions favored by environmentalists, would set limits for each pollution source, as dictated by the "maximum achievable control technology" standards. The administration prefers the second choice, which is a cap-and-trade program that would enable industries to trade pollution credits under a national emissions standard. For more information about mercury, visit <http://www.agiweb.org/gap/legis108/mercury.html> .

--L. Konikow

MTBE Vapors Threaten Environment

AGI reports an announcement from U.S. Environmental Protection Agency (EPA) officials that vapor from the gasoline additive MTBE also poses a threat to groundwater supplies. Recent efforts have focused on monitoring and preventing liquid leaks in underground tanks, but have largely neglected the threat of vapor leaks, possibly undermining recent efforts to improve liquid leak detection and prevention. The warning came during a groundwater contamination conference in Maryland, which has experienced significant MTBE contamination in the last month. Maryland Gov. Bob Ehrlich (R) has proposed new rules to prevent leaks in roughly 13,000 underground fuel storage tanks across the state, where more than 200 wells have been found containing MTBE. Eight of these wells had MTBE concentrations 1,300 times higher than acceptable levels, causing widespread concern of water contamination throughout the state. For more information about MTBE and its role in the controversy over passing a national energy policy, visit <http://www.agiweb.org/gap/legis108/energy.html> .

--L. Konikow

Yucca Mountain: Two Steps Forward, Three Steps Back Also Likely

A recent AGI press release states that, as previously planned, the Department of Energy (DOE) expects to submit a license application by December to the Nuclear Regulatory Commission (NRC) seeking approval for Yucca Mountain. This announcement came despite a court ruling in July challenging the validity of the 10,000-year safety limit for the release of radiation set by the Environmental Protection Agency (EPA). The court decision requires DOE to adjust the application to meet safety standards recommended by the National Academy of Sciences. According to the Nevada Agency for Nuclear Projects, the state plans to use the courts to block NRC from accepting the application.

Controversy over NRC's testing standards of nuclear waste shipping casks flared up in August. NRC insists that its method of crashing the 150-ton containers at 75 miles per hour into a train and engulfing them in flames is adequate to determine the durability of the casks. Nevada officials are dissatisfied with the method, arguing that it is more of a demonstration than a scientific test. The safety of nuclear waste transportation is an important issue to Nevada, as the Bush Administration still plans to ship radioactive material to Yucca Mountain. For more information about Yucca Mountain, visit <http://www.agiweb.org/gap/legis108/yucca.html>.

--L. Konikow

PUBLICATIONS, SOFTWARE & WEBSITES

WHYMAP “Groundwater Resources of the World”

The WHYMAP (Worldwide Hydrogeological Mapping and Assessment Programme) project has released a special edition map of “Groundwater Resources of the World” at a scale of 1:50,000,000, which was distributed at the International Geological Congress in August 2004. While at the IAH Congress in Zacatecas, senior author Willi Struckmeier, of BGR (Germany’s Federal Institute for Geosciences and Natural Resources), kindly provided me with a limited number of complimentary copies (printed on both sides of a 20 by 35-inch sheet). I will be happy to mail a copy to you if you request one by e-mail (lkonikow@usgs.gov), as long as my limited supply lasts. Otherwise, copies can be downloaded from BGR’s WHYMAP Web page at:

http://www.bgr.de/b1hydro/index.html?/b1hydro/fachbeitraege/a200401/e_whymap.htm

--L. Konikow

Water Cycle Diagram

The U.S. Geological Survey has just released a new Web site about “The Water Cycle.” The URL for “The Water Cycle” is: <http://ga.water.usgs.gov/edu/watercycle.html> This USGS site offers a comprehensive discussion of the water cycle. It features a superb diagram by a USGS graphic artist; the diagram is available in **36 languages**. There is also an in-depth Web page for each of the 15 topics on the diagram, along with a single-page summary of the water cycle. The water cycle is about the most searched-for term about water.

”The Water Cycle” is an independent module of the existing Water Science for Schools site (<http://ga.water.usgs.gov/edu/index.html>). Water Science for Schools is also available in a Spanish language version.

--L. Konikow

Global Overview from IGRAC

The International Groundwater Resources Assessment Centre (IGRAC) has recently announced the release of an enhanced version of Global Overview, which gives a world-wide overview of selected groundwater-related attributes. In the enhanced version of the software the attributes are aggregated both per country and per groundwater region. Furthermore, the new version enables a search for comparable groundwater situations and a convenient connection with about 460 references used for estimation of attribute values.

The Global Overview contains a world map of countries and a set of aggregated groundwater-related attributes for each of the countries. The second Global Overview view is based on world map of groundwater regions (also provided with a corresponding attribute set). The map of groundwater regions and a description of the regions are also available in a pdf form from the download link on the IGRAC web page (<http://www.igrac.nl/>).

--Michael E. Campana

New Publication on Evaporite Karst Now Available

Oklahoma Geological Survey has just published a major compilation on Evaporite Karst (EK) in the United States. OGS Circular 109 contains 33 papers by researchers from all parts of the country. “Evaporite Karst and Engineering/Environmental Problems in the United States,” edited by Kenneth S. Johnson and James T. Neal, was published in cooperation with the U.S. Geological Survey and the National Cave and Karst Research Institute—National Park Service. The 353-page book contains 3 or more papers in each of the following 7 chapters:

Introductory and General Papers; Oklahoma; Kansas; Texas and New Mexico; Wyoming and South Dakota; Colorado, Utah, and Arizona; and Eastern United States. All the areas and concepts described in the book are important examples of EK, and they provide valuable information for all workers dealing with EK or carbonate karst in the USA or elsewhere in the world.

To order a copy of Circular 109, please contact: Oklahoma Geological Survey, Publication Sales Office, 2020 Industrial Blvd., Norman, OK 73069; ph. 405/360-2886, fax 405/366-2882, email ogssales@ou.edu The price is \$20.00, plus 20% (\$4.00) per copy for shipping within the United States; that's a total cost of \$24.00 per copy in the USA. Contact the OGS sales offices for international shipping costs, including Canada and Mexico. All payments must be U.S. money orders or checks (in U.S. currency), drawn on a U.S. bank. Contact Publication Sales Office with questions about payment.

--K.S. Johnson

CONFERENCE NOTICES

For announcements by IAH, please go to the IAH website, www.iah.org
For announcements of conferences and meetings being presented by California GRA, see the GRA section below.

Geological Society of America Annual Meeting November 7-10, 2004: Denver, Colorado.

See: www.geosociety.org

For IAH-related information, see Message from the Chairman above.

Straddling the Divide: Water Supply Planning in the Lake Michigan Region February 15-16, 2005, Chicago, Illinois: Holiday Inn - Merchandise Mart.

As the areas surrounding Lake Michigan continue to grow, so does the potential for water supply shortages. Local governments in this region need to integrate water supply considerations into local and regional planning processes. *Straddling the Divide* will strive to enhance the understanding of policy makers and the technical community through invited talks in two tracks:

- Policy Track: Geared towards municipalities, counties and regional planning agencies. Emphasis on water supply planning and decision making for communities not receiving Lake Michigan water or using both Lake Michigan and other water sources.
- Technical Track: Geared towards scientific and engineering professionals. Emphasis on how science and engineering can support regional-scale management of water resources.

The conference is being jointly organized by the Northeastern Illinois Planning Commission and the Illinois State Water Survey, with financial support from the Joyce Foundation. For more information please go to: <http://www.nipc.org/environment/slmrWSC/conferences/> or contact Doug Walker (217 333-1724) ddwalker@uiuc.edu

7th International Conference on Acid Deposition

June 12-17, 2005: Prague, Czech Republic

Contact: ACID RAIN 2005, Conference Secretariat,

INFO.COM Ltd., Krokova 2, 12800 Prague 2, Czech Republic

Phone: +420 241 412 518 Fax: +420 241 408 222

E-mail: infocom@infocom.cz

Website: <http://www.acidrain2005.cz/>

-- Pavel Kram, Czech Geological Survey

International Mine Water Association: : Ninth Congress

September 5-9, 2005: Oviedo, Spain

Details pending: (www.imwa.info).

ALSO: IMWA Symposium at SME/ICARD/ASSMR Conference, March 23-30, 2006: St. Louis, Missouri

Evaporite Karst (EK):

special session, Sixth International Conference on Geomorphology

September 7-11, 2005, Zaragoza, Spain.

A special session on evaporite karst (EK) will be held as part of the **Sixth International Conference on Geomorphology** that will be held at Zaragoza (Spain) in September 7-11, 2005. Abstracts on any topic related to karst in evaporite rocks and sediments will be welcome (geomorphology, geology, hydrogeology, speleogenesis, minerals, paleokarst, dissolution subsidence, environmental problems, etc.). Many excellent 1- to 5-day-long field trips are offered before, during, and after the conference. Some of them are focused on EK processes and problems. The Second Circular is now available at: <http://wzar.unizar.es/actos/SEG>. Instructions for the submission of abstracts are in the Second Circular. The deadline for abstract submission is **March 1, 2005**.

There are plans to publish the EK papers in an international journal. The EK special session is being organized by Francisco Gutiérrez (University of Zaragoza, Spain) <fgutier@unizar.es> and Kenneth Johnson (Oklahoma Geological Survey, USA) <ksjohnson@ou.edu>.

-- Francisco Gutiérrez & Kenneth Johnson

7th Hellenic Hydrogeology Conference & 2nd Open Workshop on the

Hydrogeology of Fissured Rocks

October 5-6, 2005: Athens, Greece.

The Hellenic Committee of Hydrogeology, the official representative in Greece of the International Association of Hydrogeologists-IAH, will host the 7th Hellenic Hydrogeology Conference, in Athens, from October 5-6, 2005. The primary goal of the congress is the presentation of recent advances in Hydrogeology with an emphasis on the Hydrogeology of Fissured Rocks (Discontinuous Media). The 2nd Workshop on the Hydrogeology of Fissured Rocks will take place within the frame of the Congress, and event. It is organized by the Middle and East Mediterranean Working Group of Fissured Rocks, Hydrogeology Commission of IAH. A pre and post conference field trips will take place from October 3-4 in Evia, October 3-9 in Tinos Island

Further information is available at web site: www.iah-hellas.geol.uoa.gr

**SISOLS: 2005: 7th International Symposium on Land Subsidence
October 23-28, 2005: Shanghai, P.R. China,**

UNESCO, the Center for Land Subsidence of the China Geological Survey, and the Municipal Government of Shanghai, China, jointly invite you to attend SISOLS 2005. The symposium provides a forum to scientists from all over the world to discuss problems related to land subsidence, to present technological innovations and achievements, and to exchange ideas, information, and results. It will give the opportunity to discuss a sustainable approach to land subsidence, intended to seek a compromise between the use of natural resources and mitigating negative subsidence effects caused by their exploitation. Issues will also include distinguishing naturally occurring subsidence from anthropogenic causes of subsidence, predicting potential hot spots, in particular those located in coastal and low-lying flat areas, and transforming scientific information into intelligent policy management and environmental control.

For information about the symposium please visit <http://www.sigs.com.cn/sisols2005.htm>.

**International Groundwater Conference, India
January 4-6, 2006: Dindigul, Tamilnadu, India**

An International Groundwater Conference (IGC-2006) on “*Sustainable Development and Management of Groundwater Resources in Arid and Semi-Arid Regions, with Special Reference to Hard Rocks*” will be held at Dindigul, Tamilnadu, India, January 4-6, 2006. IGC-2006 is a follow-up to the earlier, successful IGC-2002, held at the same place in February, 2002. In that spirit, the organizers are planning this second conference with local support, and are hoping that foreign and Indian delegates will attend and enjoy meeting with rural farmer delegates, who are facing serious water problems. Themes of the conference include:

- Remote sensing techniques and GIS,
- Recent advances in geophysical and Geo-Engineering techniques,
- Innovative techniques in monitoring,
- Recharge process in Arid and Semi-Arid regions,
- Application of isotope techniques in hydrology,
- Artificial recharge methods including Aquifer Storage and Recovery (ASR),
- Impact of human activities, climate change, coal mining and urbanization on groundwater systems.
- Mapping of aquifer vulnerability,
- Characterization of fracture geometry and properties for understanding the flow mechanism in hard rocks with special reference to multi-scale parameters,
- Lake-aquifer interaction studies and conjunctive use of surface and groundwater.
- Groundwater Flow and Mass Transport modeling,
- Management of groundwater resources through scientific and community participation, with special reference to over-exploited regions in developing countries and the role of Non Government Organizations.

Abstracts (not exceeding 250 words) must be received by December 20, 2004 and can be sent by E-mail to the principal organizer, Dr. M. Thangarajan, Conference Coordinator at: mthangarajan@hotmail.com. (Emeritus Scientist, NGRI, Hyderabad-500007 (Ph: +91-(0)40 27175156),

GROUNDWATER RESOURCES ASSOCIATION OF CALIFORNIA ACTIVITIES, MEETINGS AND INFORMATION

By Vicki Kretsinger, GRA Director

IAH Allied Activities with the GRA of California

The Groundwater Resources Association (GRA) recently passed the 1,000-member mark with 1040 members. Through the efforts of many long-time, dedicated volunteers, and the added support of GRA's Executive Director, Kathy Snelson, and her staff, GRA enjoys offering its members excellent programs. GRA is pleased that there has also been a successful alliance with IAH since 2001. The alliance has included the GRA/IAH Joint membership program with 129 participants and numerous programs for which IAH has been a cooperating organization. IAH/USNC co-sponsored (or is co-sponsoring through the end of the year) the following 2004 GRA events:

- PCE and Dry Cleaners Symposium, February 18, 2004;
 - Low Yield Aquifer Testing and Analysis Workshop, April 26/27 2004;
 - 11th Symposium in the Series on Groundwater Contaminants – Perchlorate in California's Groundwater, August 4, 2004;
 - 13th Annual GRA Meeting and Conference: Managing Aquifers for Sustainability – Protection, Restoration, Replenishment and Water Reuse, September 23-24, 2004;
 - 12th Symposium in the Series on Groundwater Contaminants – Arsenic in Groundwater: Impacts on a Critical Resource, October 18-19, 2004;
- and coming soon:
- **13th Symposium in the Series on Groundwater Contaminants – Investigation and Remediation of Dry Cleaner Sites, November 10, 2004; Orange County, California.**

GRA is also organizing other events for 2005, including several for which IAH also plans to be co-sponsor. IAH members are welcome to express their interest in assisting with the planning of these events or participating as a session organizer or presenter by e-mailing GRA's Executive Director, Kathy Snelson, at executive_director@grac.org. The events, with the general topic noted and the anticipated time frame that the event will be offered, include:

- Environmental Information Management Systems Seminar – January 26, 2005;
- Indoor Air and Vapor Intrusion – May 2005;
- California Groundwater Management Workshop – Spring and also Fall 2005;
- Emerging Contaminants – Summer 2005;
- Overdraft and Safe Yield Seminar– Fall 2005;
- 25th Biennial Groundwater Conference & 14th Annual Groundwater Resources Association Meeting, October 25-26, 2005, Sacramento Convention Center, Sacramento, CA; and
- DNAPL and Source Zone Remediation – November 2005.

Learn more about GRA, or the programs in which IAH is participating with GRA as a cooperator, on the GRA web site at <http://www.grac.org>.

California Groundwater Management Handbook

The second edition of the *California Groundwater Management* handbook, a reference book and guidance manual published by the Groundwater Resources Association (GRA), is scheduled to be released in mid December 2004. Handbook chapters include a systematic guide on preparing groundwater management plans and local wellhead protection programs, as well as reference material on California hydrogeology and groundwater quality. The handbook also provides an extensive discussion of the political, institutional, legal, and technical issues that are part of the groundwater management process. The approximately 300-page handbook is intended to be used as: 1) a

reference for public officials who need a fundamental understanding of groundwater issues as they determine policies for the comprehensive management of water resources, and 2) general guidelines for the hands-on development of groundwater management plans. The regular handbook cost is \$35 for GRA members and \$45 for non members. For more information about the handbook, visit the GRA web site -- www.grac.org

Vicki Kretsinger

NGWA-AGWSE INFORMATION –

By Vicki Kretsinger, AGWSE Chair

NGWA Expo: December 2004, Las Vegas, Nevada IAH Co-Sponsors International Ground Water Availability Meeting

NGWA's 2004 Expo includes many informative events, including eight Interest Group offerings that take place December 12-14. The Interest Group venue features presentations designed to encourage participants to engage in dialogue about many science, regulatory, public, political, and social issues. These mini-conference sessions direct presentations and discussions at current issues of importance. This year, the Ground Water Availability Interest Group sessions embrace an internationally relevant theme, "Pragmatic Pathways to Sustainable Water Resources in Water-Scarce Regions." The Special Interest Group sessions, to be conducted by the Association of Ground Water Scientists and Engineers, a division of NGWA, address the following subjects:

- . Ground Water Availability
- . Ground Water Modeling
- . Geothermal Energy
- . Internet Ground Water Data
- . Horizontal Wells
- . Microbial Ground Water Quality
- . Regulators (water well construction)
- . Wellhead Protection.

Thirty presenters, including some from Spain, China, Saudi Arabia, and Mexico, will discuss efforts to characterize natural water systems and their vulnerability to degradation; water-management principles to ensure sustainable water use; and the cultural socio-economic and political forces critical to decision-making processes. This two-day venue is sponsored by UNESCO and co-sponsored by the USGS and IAH. Presentations include domestic and international examples of proposed and ongoing efforts to ensure a sustainable future. An open-forum discussion follows the Ground Water Availability sessions to explore water resources management approaches and implementation strategies. The Ground Water Availability Interest Group venue also incorporates a Round Table discussion that plans to identify the necessary focus and action plans for the ground water elements of the major themes evolving for the Fourth World Water Forum (WWF4) in 2006. Details and presenters are posted on the web site at <http://www.ngwa.org/e/expo/0412126010.shtml#interest>.

For more information you may also contact Sandy Masters, 800-551-7379, ext. 502.

--Vicki Kretsinger

--Cliff Treyens, NGWA Public Awareness Director

USNC/IAH Co-Sponsors AGWSE Ground Water Summit Session April 17-25, 2005, San Antonio, Texas

A new AGWSE technical conference, the Ground Water Summit, will be launched in Spring 2005. The 2005 Summit, which takes place April 17-20 at the Hyatt Regency on the Riverwalk in San Antonio, Texas, will engage local, national, and international science partners in this new venue that facilitates the exchange and dissemination of technical information and new science developments, allows a means for discussing policy and regulatory issues pertaining to ground water, and promotes goodwill among ground water professionals worldwide. Highlights of the

2005 Summit include: professional development courses, Darcy Forum and debate, platform and poster presentations, NGWA Darcy and GSA Birdsall-Dreiss Lecturers, AGWSE Awards, field trips, student mentoring program, student project presentations, and student awards for platform and poster presentations.

The Summit includes 23 sessions with subject matter that ranges from more environmentally and emerging contaminant-focused topics to water resources systems analysis, management, and policy issues. Session co-sponsors include the USNC/IAH, the Geological Society of America's (GSA) Hydrogeology Division, the Groundwater Resources Association of California (GRA), and the Sustainability of Semi-Arid Hydrology and Riparian Areas (SAHRA). Additionally, field trip sponsors include the Edwards Aquifer Authority and the San Antonio Water System.

The USNC/IAH and GSA's Hydrogeology Division are co-sponsoring the "Ground Water Education – Field vs. Classroom" session. The session conveners, Richard Laton (Professor at California State University Fullerton), Alan Dutton (Associate Professor at the University of Texas at San Antonio), and Vicki Remenda (Associate Professor at Queens University Ontario, Canada), plan to discuss many questions, including: What encourages students to enter the geosciences? What educational training responds to society's future needs? What creates a teaching environment that fosters imagination, stimulates creative problem solving, and develops students' appreciation for earth science complexities? What strategies enhance the teaching and research environment to fully engage both students and faculty? The conveners invite submissions on strategies for engaging undergraduate students in both experiential activities and research-linked learning in hydrogeology and related earth sciences.

Michael E. Campana (Professor and Director of the Water Resources Program), Albert and Mary Jane Black (Professors of Hydrogeology Water Resources Program) will convene a session on "Ground Water in Developing Countries: Appropriate Technology, Sustainability, and Self-Sufficiency". This session will explore the role of ground water in alleviating water shortages in developing countries and will emphasize projects that are: sustainable; technologically appropriate; and consistent with the principles of integrated water resources management. Presenters will be from NGOs (non-governmental organizations); PVOs (private voluntary organizations); consulting firms; government agencies (e.g., Peace Corps, US Agency for International Development); and academia. Papers addressing some of the quality issues (e.g. arsenic, fluoride, nitrate, pesticides, pathogens) will also be sought. Again, those papers dealing with technologically appropriate solutions to quality problems will be most desirable. I would like to invite you to submit an abstract for this session. If you decide to submit an abstract, please also send a copy to Michael E. Campana Professor and Director, Water Resources Program Albert and Mary Jane Black Professor of Hydrogeology Water Resources Program SSCI-Economics Bldg. #57 MSC05 3110 1 University of New Mexico Albuquerque, NM 87131-0001 E-mail: aquadoc@unm.edu.

Call for Abstracts. Abstract instructions are posted on the NGWA website on the Ground Water Summit page at (<http://www.ngwa.org/e/conf/0504175095.shtml>). Abstracts will be received until midnight (EDT) **November 22, 2004.**

--Vicki Kretsinger

Other Member News & Comments

Bill Halliday:

In response to your call for anecdotes of international field work, I normally put myself unconditionally into the hands of local geologists (and once into the hands of an English-speaking taxi driver). They all know slightly irregular ways to accomplish field work in short order. In Egypt, a taxi driver passed me off as a Russian at a whole series of check points (nobody in Egypt seems to care about the safety of Russians but they seem to be VERY solicitous about Americans, no matter how much it delays the field work). Then at a resort in Ukraine restricted to Russians and Ukrainians, my hosts made me into a fellow Ukrainian. This was a practical matter; there wasn't any other place to stay within a half-day's drive. And in a remote part of Kamchatka soon after the breakup of the USSR, my Russian hosts declared me a tall Lithuanian to avoid trouble with overly suspicious villagers.

-- Bill Halliday

Lorne Everett:

Dr. Lorne G Everett (Chief Scientist and Senior Vice President for Shaw Environmental Inc., Santa Barbara, CA) chaired the World Pollution Panel meetings and presented the status report on World Groundwater Pollution to the World Federation of Scientists at the World Laboratory (founded in Geneva), Ettore Majorana Foundation and Center for Scientific Culture in Erice (Italy) on August 23, 2004. The meetings, which were a part of the Galileo Galilei celebrations (Four Hundred Years Since the Birth of Modern Science), were part of the 32nd session of the International Seminars on Planetary Emergencies.

- Lorne Everett

IAH/U.S. NATIONAL CHAPTER: EXECUTIVE COMMITTEE 2000-2004

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