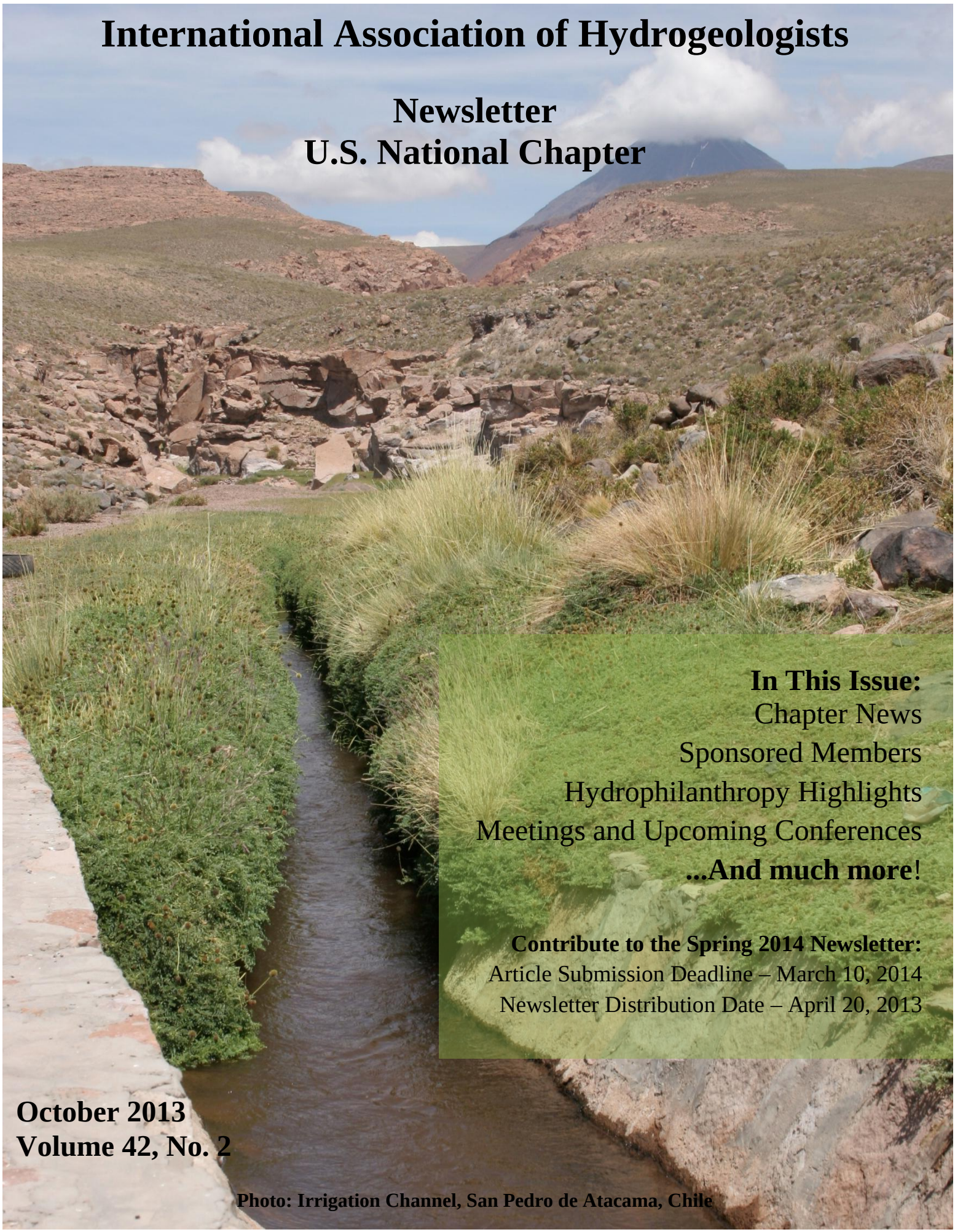
International Association of Hydrogeologists

Newsletter
U.S. National Chapter



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Contribute to the Spring 2014 Newsletter:
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International Association of Hydrogeologists
U.S. National Chapter
Fall 2013 Newsletter

Editor: Suzanne Pierce

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IAH/US NATIONAL CHAPTER: EXECUTIVE COMMITTEE 2012-2015

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A Note From The Chair

I wrote this note as the 2013 IAH Congress in Perth was underway. Travelling through Australia en route to the congress, I observed some of the climatic extremes of this vast continent, similar to the U.S. While visiting the Blue Mountains near the east (Pacific Ocean) coast, wildfires nearby were burning out of control due to abnormally dry conditions for early spring. Flying to Perth on the west coast and travelling south through the Boranup Forest of the Leeuwin-Naturaliste National Park, the landscape was inundated and rivers were at flood stage, caused by an abnormally wet September. Like much of the U.S., Australia rarely experiences "normal" or "average" climatic conditions, but rather jumps back and forth between extremes. As Craig Simmons pointed out in his keynote address at the beginning of the Congress, hydrogeologists in Australia are subject to a vicious cycle of (1) multi-year drought, followed by (2) public concern and generous funding for groundwater studies, then (3) rains and flooding, resulting in public apathy and budget cuts to groundwater investigations. Such a scenario makes it extremely challenging for conducting long-term data collection and scientific investigations. Yet water shortages associated with the recent (2002-2009) drought are still fresh in peoples' memories and the country is aggressively pursuing water conservation, desalinization, and managed aquifer recharge schemes. Such approaches are particularly important to Perth and its surrounding communities, which rely primarily on groundwater.

In this issue of the US National Chapter (USNC) Newsletter, we are highlighting each of the IAH Commissions: Regional Groundwater Flow, Groundwater and Climate Change, Groundwater Outreach, Karst Hydrogeology, Mineral and Thermal Waters, and Managing Aquifer Recharge. This illustrates the broad scope of IAH activities. Any US members interested in getting involved in these commissions can contact the individual commission chairs through the International Secretariat website: http://www.iah.org/about_commissions.asp. This issue also includes biographies of some of the Developing Country (DC) members currently being sponsored by our chapter; many other DC members are being sponsored by individual USNC members – please contact Devin Galloway (Membership liaison) if you are interested in such an opportunity. The newsletter also includes interesting articles on Deep Groundwater, Transboundary Aquifers, Vulnerability of Public Supply Wells, upcoming meeting announcements, some hydrogeology-related Non-Profit Organizations'activities, along with Member News and Notes. If you have anything of interest, particularly pertaining to international hydrogeology news and events, please consider submitting articles for our upcoming Spring 2014 newsletter.

We would like to invite anyone planning on attending the 2013 Geological Society of America conference in Denver, Colorado, to participate in our next US National Chapter meeting. The meeting will be on Sunday, October 27th from 5-6 pm in the Limestone Room of the Hyatt Regency at the Colorado Convention Center. Please let me know if you plan to attend.

Vic Heilweil
IAH-USNC Chair
heilweil@usgs.gov

A Note from the Vice President for North America

- Dave Kreamer

The IAH Council met in Reading, England, this past June, and in several days of meetings discussed many things pertinent to the future of IAH. A fundamental, strategic initiative called the "Look Forward," which was initiated several years ago, was discussed. Good progress is being made on this initiative. International membership is on the rise, and the financial condition of IAH is in good order. We discussed the possibility of creating webinar series, to which our members could contribute their expertise and experience. Other topics included upgrades of the IAH website, upgrading our booths and advertising at conferences, "twinning" of national chapters with other international chapters, publications (including our journals and books), and reducing student dues and providing introductory offers to IAH members. Other things discussed by the Council were a recommendation for the 2015 IAH Congress (Italy). The 2013 Congress was in Perth Australia, the 2014 will be in Morocco, and recently approved by the Council, the 2015 Congress will be in Rome Italy and the 2016 Congress will be in Cartagena de Indias, Colombia in 2016. If you have any questions, please contact me. I hope to see you all in Morocco next year!

June meeting in Reading. Back: Nick Robins, Kellie Nicholso,; Michael Rivett, David Kreamer, Sue Duncan, John Chilton, Callist Tindimugaya, Bruce Misstear, Viviana Re, Shammy Puri, Luiz Amore; Middle: Sharon Warden, Willi Struckmeier, Teodora Szocs; Front: Antonio Chambel, Ken Howard, Mohamed Aboufirras

Treasurer's Report – *Vicki Kretsinger Grabert*

2013 U.S. National Chapter (USNC) Memberships

As of September 2013, we had 290 paid USNC members, along with 25 honorary members and19 sponsored members. This is approximately the same as last year at this time. In addition, individual members in the USNC are sponsoring 11 developing country memberships and the USNC is sponsoring 5 developing country and 3 student members this year.

2013 USNC Financial Status

Regarding our general funds, we currently have about $15,000 in our JPMorgan Chase checking account and about $31,500 in our Vanguard Mutual Fund Account (Total Stock Market Index Fund). Separately, we have about $16,400 in our Endowment Fund, split evenly between two Vanguard Funds

(STAR and Extended Market Index). Our goal is to add additional contributions and let these funds grow to $20,000 before utilizing earnings for funding our endowment goals.

Please consider making a year-end donation to the Endowment Fund to help the USNC reach our $20,000 goal. Donations can be made to the IAH USNC; send checks to Vicki Kretsinger Grabert, USNC Treasurer, 500 First Street, Woodland, CA, 95695.

Improving Our Understanding of Deep Groundwater

- Mike Wireman, Bill Alley, and Andy Manning

There is growing interest in understanding groundwater beneath the typical depths of today's withdrawals for water supply. Oil and gas development in tight sands and shales, carbon sequestration, underground injection of waste fluids, locating geologic repositories for nuclear waste, and geothermal energy all require an increasing knowledge about deep groundwater. As availability of water for human and ecological needs becomes more critical, deeper groundwater also will become a more realistic potential future water supply. Currently not enough is known about the hydrogeology of deep groundwater resources because of their limited use and the relatively high cost and technical challenges to characterize and develop them. (Alley et al., 2013)

Injection of waste fluids associated with oil and gas development, mining, and industrial processes into deep formations has been a common practice in the US and Western Europe for decades. The recent increase in development of oil and gas from deeper, tighter formations and an increase in in-situ uranium mining have resulted in a significant increase in the volume of waste fluids injected into deep formations.

Suitable investigation methods and tools for characterizing deep groundwater resources are still limited and in need of further development. Acquisition of hydraulic data in deep flow systems is expensive and requires different field testing strategies and methods than used to characterize shallow groundwater used for water supplies.

Recent research in Western Europe indicates that groundwater may flow and circulate at great depths (Rybach, 1997; Smithson et al., 2000). Using geothermal data, Ryback (2009) estimated appreciable groundwater flow velocities at depths of 5-7 km. Stober and Bucher (2005) reported unexpectedly high hydraulic conductivities of 1e-7 to 1e-6 meters per second at a depth of 4000 meters based on a pump test performed in a pilot hole in western Germany. They concluded that fracture pore space at that depth is saturated and highly connected. These and other recent research results are helping to establish new paradigms regarding deep groundwater flow. In light of these new paradigms, current regulations governing deep groundwater resources may need to be re-evaluated. (Hebig, 2012, Davies, et al, 2012).

To improve the knowledge and capabilities of hydrogeologists to address these emerging issues, the National Ground Water Association, with support from the Ground Water Research and Education Foundation of the Ground Water Protection Council, is planning a 2-day conference on deep groundwater to be held in connection with the Ground Water Summit in Denver, CO in May 2014. The USNC and the Canadian National Chapter of IAH are having initial discussions about sponsoring a one-day meeting on deep groundwater to be held with the Geological Society of America Meeting in Vancouver in October 2014.

References

Alley, W.M., Bair, E.S., Wireman, M., 2013, "Deep" groundwater, Groundwater early view, doi:10.1111/gwat.12098.

Davies, R.J., Simon, M., Moss, J., Hustoff, S., Newport, L., 2012, Hydraulic fractures: How far can they go?, Marine and Petroleum Geology, April, 2012.

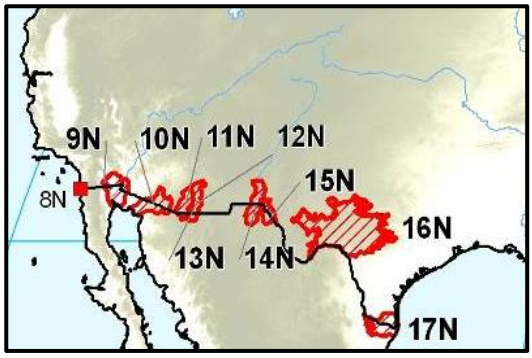
Hebig, K. H., 2012, Review: Deep groundwater research with focus on Germany, Hydrogeology Journal 20: 227-243.

Rybach, L., 1997, Deep groundwater circulation in Hercynian basement, Environmental Geology 32 (2): 137-141.

Smithson, S. B., Wenzel, F., Ganchin, Y.V., Morozov, I.B., 2000, Seismic results at Kola and KTB deep scientific boreholes: velocities reflections, fluids and crustal composition, Tectonophysics 329 (1-4): 301-317.

Stober, I., Bucher, K., 2005, The upper continental crust, an aquifer and its fluid: hydraulic and chemical data from 4 km depth in fractured crystalline basement rocks at the KTB test site, Geofluids 5 (1): 8.

Rethinking Transboundary Groundwater Resources Management: A Local Approach along the Mexico-U.S. Border – *Gabriel Eckstein*



Map suggesting the presence of 10 transboundary aquifers or aquifer systems along the Mexico-U.S. border (designated as 8N through 17N; the names of the aquifers can be found on the full map, accessible at: http://www.un-igrac.org/publications/286.

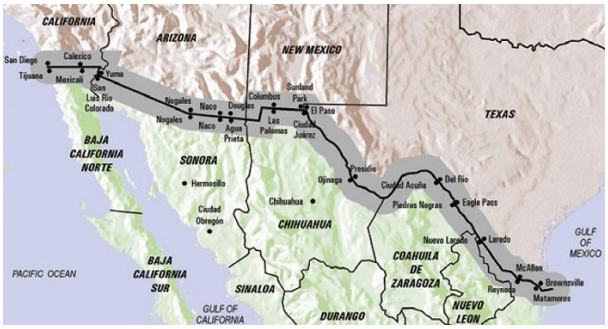
The nearly 2,000 mile-long border between Mexico and the United States is hot and dry. Few rivers cross this arid expanse. Yet, despite the lack of visible, life-sustaining water, the region is thriving. The reason for this progress is ground water, more specifically, transboundary aquifers. As many as twenty aquifers straddle the Mexico-U.S. border, many of which serve as the primary or sole source of fresh water for the border's communities and unique ecosystems.

Despite the importance of these aquifers, neither Mexico nor the United States seems inclined to pursue a border-wide pact to coordinate the management of these critical resources. As a result, these aquifers are being overexploited on both frontiers as populations and industries pump with little regard for sustainability or cross-border consequences. Moreover, these subsurface reservoirs are being fouled by untreated wastes, agricultural and industrial by-products, and other sources of pollution. Imminently unsustainable, the situation portends a grim future for the region.

If both federal governments are unwilling to take decisive steps, what else can be done? Are there alternatives to a formal, comprehensive, border-wide regime that would address the complexity and multitude of issues related to the various transboundary aquifers on the border?

In a recently published article, I advocate for an alternative approach, one that sidesteps the respective federal authorities and places the burden of pursuing cross-border cooperation on the communities that so depend on these critical fresh water resources. Essentially, I propose that subnational entities at the local and regional level pursue cooperation over transboundary aquifers in the form of informal, locally-specific, cross-border arrangements.

While this tactic challenges the national governments' traditional monopoly over international relations, especially as they relate to transboundary natural resources, there is good reason to believe that such an approach could achieve what Mexico City and Washington, DC have failed (or declined) to do – create effective collaborative schemes for the mutual and sustainable management of the region's transboundary aquifers.



Map of Mexico-US border shows six Mexican states and four US states, along with sister cities, courtesy of USEPA: http://www.epa.gov/region9/annualreport/07/images/mexico-us-border.jpg

Local decision-makers are typically better informed about local and regional cross-border concerns than federal bureaucrats, especially on issues related to the management of local fresh water resources. Moreover, local authorities are better able to reflect the values and preferences of those most likely to be affected by a water accord with a neighboring country, which, for a local border community, is merely a short drive away. Critically, local decision-making is likely to be more sustainable, as well as responsive and adaptable to changing climatic and economic circumstances and improved knowledge, given that the local communities and their children will have to live with their decision far into the future.

In addition, a local approach to the management of transboundary aquifers makes hydrologic sense. No two aquifers are alike; each functions as a complex and unique hydrological system. Moreover, no two aquifers are perceived equally by overlaying communities, especially where those communities are highly dependent on the resources to meet their daily freshwater needs. Hence, aquifers traversing the Mexico-U.S. border cannot be managed effectively through a single, comprehensive, border-wide regime.

As a legal matter, while the constitutions of both nations recognize the national governments as the sole authorities empowered to deal with foreign representatives on a formal basis, the goal here is the development and implementation of informal or quasi-formal, locally-specific, cross-border arrangements. These can be implemented through a memorandum of understanding, or more structured contracts for goods or services. While the former would be immune to constitutional scrutiny due to their unofficial, unenforceable, and non-binding nature, the latter would be immune to the extent that the respective legislatures have not preempted such activities.

Given the state of the economy, drug wars, and other challenges, ground water on the Mexico-U.S. border is not a priority of the Mexican and American governments. Unfortunately, that prioritization is jeopardizing the long-term viability and habitability of the border area. The two federal governments, though, are not indispensable for developing sustainable and coordinated ground water relations on the border. Through informal locally-specific, cross-border arrangements, frontier communities can achieve viable cross-border pacts that will ensure the water futures of their people, economies, and environment. This essay is based on an article by the same title, published in the Georgetown International Environmental Law Review, Vol. 25(1), 2013, available at: http://ssrn.com/abstract=2254081.

Vulnerability of Public-Supply Wells to Contamination - *Lenny Konikow*

About one-third of the U.S. population gets its drinking water from public-supply wells. A new USGS report identifies key factors that help determine the vulnerability of public-supply wells to contamination, providing insight into which contaminants in an aquifer might reach a well and when, how, and at what concentration they might arrive. This new report, “Factors affecting public-supply-well vulnerability to contamination: understanding observed water quality and anticipating future water quality”, by Sandra M. Eberts, Mary Ann Thomas, and Martha L. Jagucki, explores factors affecting public-supply-well vulnerability to contamination in ten study areas across the nation. The study areas include Modesto, CA Woodbury, CT; near Tampa, FL; York, NE; near Carson City and Sparks, NV; Glassboro, NJ; Albuquerque, NM; Dayton, OH; San Antonio, TX; and Salt Lake City, UT.

The study found that conditions in some aquifers enable contaminants to remain in the groundwater longer or travel more rapidly to wells than conditions in other aquifers. Direct pathways, such as fractures in rock aquifers or wellbores of non-pumping wells, frequently affect groundwater and contaminant movement, making it difficult to identify which areas at land surface are the most important to protect from contamination. An unexpected finding is that human-induced changes in recharge and groundwater flow caused by irrigation and high-volume pumping for public supply changed aquifer geochemical conditions in numerous study areas. Changes in geochemical conditions often release naturally occurring drinking-water contaminants such as arsenic and uranium into the groundwater, increasing concentrations in public-supply wells. The report is available through the US Geological Survey.

IAH Commission Updates

The following descriptions include brief mission statements and recent activities of the six IAH Commissions. For further information or to get involved, please contact the individual Commission chairmen, whose email addresses are listed at: http://iah.org/groups/commissions-networks.

Regional Groundwater Flow Commission – *Judit Mádl-Szőnyi and József Tóth*

The Regional Groundwater Flow Commission (RGFC) of the International Association of Hydrogeologists (IAH) was launched in November, 2011. The mission of the Commission is to internationally foster the education, research and practical application of the concept of gravity driven regional groundwater flow. Although the theory was proposed half a century ago, it is not yet well-recognized and is underused in practice relative to its potential. The Commission endeavors to demonstrate the relevance and practical utility of basin-scale flow systems in problems related to regional water resources, ore deposits and petroleum accumulations, geotechnics, geothermics, landscape architecture, environment protection, soil and groundwater salinization and amelioration, forestry and agriculture, land use planning and management, and satellite hydrogeology.

RGFC strives to gather a powerful, effective and truly international group of actively engaged participants. At present more than 150 hydrogeologists have indicated active interest in the work of the Commission. One of its most important activities is to organize international symposiums on the subject in different parts of the world. The first such formal activity was a Technical Session on Regional Groundwater Flow at the 39th Congress of IAH in Niagara Falls, Canada, September 2012. Conveners of the session were J. Mádl-Szõnyi (Hungary), J Carrillo Riviera (Mexico) with contribution of J. Tóth (Canada). Twenty-seven oral presentations were made, with attendance generally over 60 (with 6 invited speakers: O. Batelaan; L. Barbour; J. Gomez; X-W, Jiang; J. Tóth; C. Voss) and several posters shown. A successful kick-off party of the RGFC also was held on the congress' first day.

On June 21-23, 2013, the "International Symposium on Regional Groundwater Flow: Theory, Application and Future Development" was held in Xi'an, China. The symposium was mainly organized by China Geological Survey with the RGFC. Around 120 hydrogeologists attended the symposium. Thirty-three invited speakers (J. Tóth; G. Engelen, W. Zijl, J. Mádl-Szõnyi, J. Carrillo Riviera, etc.) from 11 countries gave oral presentations. There was also a post-symposium field trip to the Ordos Basin in Northwest China.

The most recent meeting of the RGFC was held in Budapest, Hungary, in conjunction with the "International Symposium on Hierarchical Flow Systems in Karst Regions" on September 3-7, 2013. The objective of this symposium was to introduce the concept of gravitational groundwater flow systems in the thinking and practice of the karst community. The symposium was held in honor of the author of the theory of basinal groundwater flow, Professor József Tóth, in celebration of his 80th birthday.

Groundwater and Climate Change Commission - *Richard Taylor*

The mission of Comission on Groundwater and Climate Change (CGCC) is to improve understanding of both the relationship between groundwater and climate change, and the role of groundwater in adaptation to climate variability and change. The CGCC, working closely with the UNESCO-IHP GRAPHIC Programme, aims to: (1) facilitate the dissemination of knowledge and exchanges of experiences related to groundwater and climate change through the organization of conferences, lectures and meetings as well as the preparation of books, journal articles and popular articles; and (2) to coordinate research activities and knowledge dissemination pertaining to groundwater and climate change with allied global initiatives (e.g. UNESCO-IHP IGRAC, IPCC AR5, GEWEX, GWSP) including the IAH Commission on Managed Aquifer Recharge. The current CGCC Co-Chairs are Professor Jianyao Chen (Sun-Yat Sen University, China), Professor Bridget Scanlon (University of Texas, USA), and Professor Richard Taylor (University College London, UK). The IAH-CGCC recently completed a critical review of the relationship between groundwater and climate change that was published earlier this year in Nature Climate Change (Vol. 3, 322–329). For further information or to get involved, please register online at www.gwclim.org.

Groundwater Outreach Commission - *Andrew Stone*

World-wide, ignorance and misunderstanding of groundwater are major barriers to effective water resources management. Groundwater professionals need to be advocates for sensible water policy to ensure that water allocation, resource protection and land-use decisions are based on hydrologic reality. Science-based knowledge that is effectively communicated can support the dual objectives of sustainably maximizing the use of groundwater for economic, social and environmental benefit while protecting against overdevelopment and water quality degradation.IAH members should be prepared to share their expertise and be powerful advocates who provide information, create awareness and support education initiatives that promote the important economic and environmental role of groundwater. Targets for groundwater advocacy are policy makers, end-users, resource managers, organizations concerned with economic development, and citizen organizations involved with resource & habitat sustainability.

A major objective of the commission is to assist IAH members and National Committees with effective communication strategies to assist with outreach. IAH "branded" groundwater information in non-technical format can help members to target their expertise among policy makers, end-users and resource managers. Promoting the integration of groundwater science and water resource information in schools and among teachers is an additional Commission objective.The commission chairman is Andrew Stone (American Ground Water Trust) with Suzanne Pierce (UT Austin) and Tim Parker (Parker Groundwater) as active US members. The next commission activity in the US is the annual training program for teachers from Latin America that will take place in San Antonio, TX in November with Andrew Stone and Suzanne Pierce as part of the presentation team. Corporate support for this event from the companies of IAH members will be much appreciated.

Over the next few months, the commission plans to develop IAH-branded groundwater information for distribution via the IAH website. Three groundwater PowerPoint presentations are already prepared and under review. The purpose of the materials is to explain groundwater science in non-technical terms and provide IAH members with "ammunition" that can help explain the importance of groundwater to communities and decision-makers. We are aware that there are thousands of agencies and utilities that have published information on groundwater topics, but the commission believes that the best long-term interests of IAH will be served by having its own branded materials. Once developed and approved, these can be made available world-wide in different language versions. Products identified as useful to help communication could include a series of one-page groundwater topics in pdf, a library of PowerPoint presentations, short videos that explain generically aspects of groundwater science, etc. With a few more volunteers we can work out priorities and allocate tasks. We are looking for permission from existing authors/ agencies to make use (with full acknowledgement) of specific prioritized topic areas. With limited editing and additional material we can then reproduce existing content, images and graphics as downloadable (pdf) documents that can be made available to IAH members as IAH-branded materials.

Mineral and Thermal Waters Commission - *Jim LaMoreaux*

In the second half of the 20th century, many countries have increasingly utilized mineral and thermal waters with the main purpose being for medicinal (balneological) purposes. As a consequence, hydrogeological methods have rapidly developed for exploration, exploitation and protection of such waters. International cooperation in the form of know-how and exchange of experience became essential. Although there were opposing political blocks in the world at that time, development of such cooperation was made possible by the IAH, founded in 1956. The proposal to establish a new IAH commission was prepared by a group of interested hydrogeologists mainly from Central and Eastern European countries. It was accepted promptly by IAH and the new Mineral and Thermal Waters Commission (MTWC) was set up on 24 August 1968.

In the first period of MTWC's existence (1970 - 1985), meetings were held mostly on the occasion of large hydrogeological conferences and congresses organized by IAH. Since 1986, Commission meetings have been organized separately from congresses with meetings hosted by MTWC members in their respective countries. Meetings routinely consist of a week-long field trip with formal presentations by members during the course of the week. Thermal and mineral water springs and bottled water plants are visited in a particular region with tours and lectures on the scientific and medicinal aspects of the waters presented by representatives of the facilities. Publications of particular Commission members are numerous and may be found in many national and international publications. An annotated bibliography consisting of about 1500 references has been compiled by Dr. Hussein Idris, members interested in accessing the bibliography should contact Dr. Idris.

A number of proposed projects have been initiated and are in various phases of completion. The methodology of establishing mineral and thermal water (MTW) maps has been developed and requires application in broad practice; the international glossary on MTW exploration, exploitation and protection has been prepared in draft form and requires updating prior to being published as a book; the international comparative analysis of regulations concerning MTW has been proposed and requires establishment of a committee to follow up on the project. A MTWC website has been established and is updated regularly. It may be accessed at http://www.cmtw.c0.pl/. MTWC working groups, thus, have several challenging projects in the works.

Karst Hydrogeology Commission – *Nico Goldscheider (content from IAH website)*

Hundreds of millions of people drink water from karst aquifers worldwide. At the same time, karst aquifers are particularly vulnerable to contamination, due to their specific characteristics, such as the presence of natural conduits, which allow water to flow rapidly over large distances. The Karst Hydrogeology Commission is a network of academicians, practicing hydrogeologists, and water resources professionals promoting a defensible scientific basis and professional practice for the sustainable management of karst water resources for multiple uses, including safe drinking water, agriculture and protection of ecosystems. The Commission fosters international and interdisciplinary research collaboration and exchange of ideas; communicates with other relevant organizations and associations dealing with water, ecology, environmental, karst and cave sciences; organizes conferences, thematic sessions and workshops on karst hydrogeology and water resources; prepares and disseminates publications, such as books and special issues of scientific journals, as well as technical guidelines and popular publications; and provides training and education. A separate article below describes the recent IAH Karst and Regional Groundwater Flow Commissions' Joint Conference in Budapest.

Managing Aquifer Recharge Commission - *Peter Dillon and Weiping Wang*

The Commission promotes the securing and expanding of water resources and improving water quality in ways that are appropriate, environmentally sustainable, technically viable, and economically and socially desirable. It encourages research, development and adoption of improved practices for management of aquifer recharge and improving knowledge, skills and capabilities of practitioners, water resources managers and regulators. The Commission facilitates exchange of information between members internationally (via the web page http://www.iah.org/recharge and an email list that can be joined from the web site), by disseminating results of research and practical experience (e.g., via conferences and workshops), raising awareness of Managed Aquifer Recharge (MAR) among IAH members, related professions and the community, and through its members undertaking projects and activities identified by plenary participants as important.

October 15-19, 2013 brings our 8th, approximately triennial, International Symposium on Managed Aquifer Recharge. This will be held in Beijing, and this first ISMAR in Asia has 6 workshops (majority from USA members) and about 80 oral papers and 40 poster papers, as well as a relevant local tour. Three journals will be publishing thematic editions of selected papers from this conference. At this symposium, a new MAR Commission monograph on clogging and its management will be launched. This is the culmination of the work of a band of 12 contributors led by Russell Martin, and brings to fruit an idea raised in Commission plenaries since 2007, and a number of contributions have come from members and Chair of the IAH US Chapter. USA has been a hotbed of activity in MAR innovation, through many utilities and water districts in need of reliable water supplies in an increasingly variable climate. They have been ably supported in the science, technology and policy domains by Arizona Hydrological Society and California Groundwater Resources Association, with many of the prime movers being IAH members and active contributors at national and international levels through IAH and this Commission. Sadly we also observe the recent passing of Herman Bouwer, a lifetime champion and international luminary of MAR, who pioneered MAR with recycled water. See article below.

Developing Country USNC-Sponsored Members

The IAH U.S. National Chapter sponsors student memberships and international hydrogeology professionals each year through general funds. The following are short descriptions of five of our USNC-sponsored Developing Country Members. The other three USNC-sponsored Bolivian members were introduced in the Spring 2013 Newsletter. Although not included here, individual USNC members also sponsor additional Developing Country members. If interested, please contact Devin Galloway, our Membership Coordinator.

Ana María Paulini Palacios de Silva – Peru

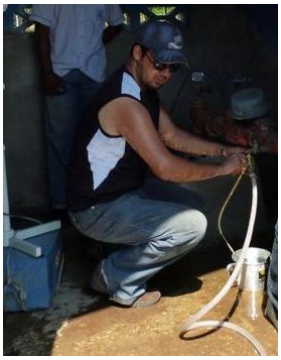
Ana María is currently a Professor of the Faculty of Engineering of the University of Piura, and member of the Hydrogeology Research Group of the Institute of Hydraulics, Hydrology and Sanitary Engineering of the same university. She has a degree in Civil Engineering and is currently completing a Master's Degree at the University of Piura (including studies in Hydrogeology from the Polytechnic University of Catalonia's Foundation for International Groundwater Hydrology) with a specialty in Water Resources. She played a leading role in a regional groundwater study of the Mancora Aquifer, located northeast of Peru, which is currently being overexploited due to increasing tourism in the area. This research was conducted with funding from the International Atomic Energy Agency and the Regional Government of Piura.

Ana María is interested in expanding her knowledge of hydrogeology, especially groundwater management in arid regions and utilization of this resource in a sustainable manner. The Hydrogeology Research Group is currently soliciting funds to begin an investigation of the aquifer beneath the city of Piura, which provides 50% of the water for the city. Groundwater from this aquifer has been exploited for more than 50 years through a series of production wells, yet has never been studied.

Rafael Matamoros – Costa Rica

Rafael is a geologist who graduated from the University of Costa Rica in 2007; he works for the Water Management Unit of the Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento (SENARA) in Costa Rica, where he has developed studies including the hydrogeological, hydrogeochemical and isotopic characterization of the Parrita Aquifer in the central Pacific Coast of Costa Rica, sponsored by the Instituto Costarricense de Acueductos y Alcantarillados (AyA), the University of Costa Rica, and the International Atomic Energy Agency.

Rafael is involved with activities related to research, management and protection of water resources. This includes analysis of applications for drilling water wells, and analysis of hydrogeological studies for residential and commercial development projects. He also advises commissions of inquiry and management of water resources in the Reventazón and Arenal-Tempisque river basins, where he has assisted in conducting hydrogeological studies for aquifer characterization and determination of drinking-water protection zones for springs used by populations living in these basins.



Also, Rafael responds to queries to SENARA from the judicial sector of the Costa Rican government concerning water resources issues for the resolution of legal disputes in environmental issues related to water. He provides advice to local governments on the issue of land use impacts on water resources, considering the subjects of hydrogeology, aquifers, vulnerability and groundwater recharge. He has participated in training courses and symposia on isotope hydrology research and management of water resources.

Abdul-Hammeed – Iraq

Dr. Hayder Mohammed Abdul-Hameed Al-Manshi, an Iraqi scholar who was awarded membership in IAH by the U.S. National Chapter, was selected as a Visiting Research Scholar at Hiroshima University in Japan. In the past year at the 243rd IDEC Asia Seminar/The 31st HiPeC In-House Seminar, he presented: " The 4-S Peace building in Iraq: Status, Scope, Strategies, Steps". His work involves the development of a well-planned strategy to increase peace building in Iraq. Some of his work has concentrated on the marshlands population which suffered from past religious discrimination and destruction of the marshes, and on the continuing challenges of illiteracy and poor economical conditions. Hayder has interests in how the people promote their knowledge and understanding of peace building, and the roles of women, children, education, and socioeconomic status associated with resource extraction in Bolivia.

Ludmilla Glonti – Georgia

Dr. Ludmila Glonti is a senior researcher in the Institute of Hydrogeology and Engineering Geology of Georgian Technical University. She has a Master's degree in Geophysics from Tbilisi State University, Department of Physics and a Ph. D. in Hydrogeology (earned in 2006). Ludmila has 30 years of experience in investigations of temperature conditions of Georgian groundwater systems. She participated in helium observations in South and West Georgia, calculating temperature distributions in oil-bearing strata beneath both the Black Sea water near Tbilisi. She also participated in projects of the Georgian Academy of Sciences and the Georgian National Science Foundation, investigating aquifer temperature parameters. Her publications focus on hydrothermal conditions of the Caucasus and Georgia. Ludmila is a member of the International Geothermal Association (IGA).

Badri Mkheidze – Georgia

Dr. Badri Mkheidze is head of the Hydrogeology Department in the Institute of Hydrogeology and Engineering Geology of Georgian Technical University. He has a Master's degree in Engineering-Geology and a Ph.D. in Hydrogeology (1973). He has 50 years of experience in groundwater, natural gas, and mineral/thermal-water research in Georgia. Currently Badri participates in groundwater investigations in the Greater Caucasus Southern Slope and Adjara-Trialeti mountain zone, including mineral water chemical evolution, and hydrothermal resources. He also participated in projects of the Georgian Academy of Sciences. He has published monographs and articles on fundamental investigations of Georgian hydrogeology, natural-gas resources, and mineral/thermal waters of Georgia.

Recent Meetings and Conferences

Joint Conference of the IAH Karst and Regional Groundwater Flow Commissions – *Chris Groves and Nevin Kresic*

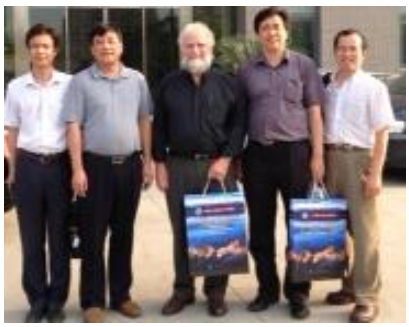
In early September 2013, members of the IAH Commissions on Karst and on Regional Groundwater Flow participated in the joint conference "International Conference on Hierarchical Flow Systems in Karst Regions" in Budapest, Hungary. The meeting was organized in honor of Professor József Tóth, a pioneer in the development of quantitative descriptions of regional groundwater flow, on his 80th birthday. This fine conference, hosted by Eötvös Loránd University, was proceeded by two one-day training workshops: MANKARST on the Hydrogeology and Management of Karst Groundwater Resources and REGFLOW, which introduced the concept of gravity-driven groundwater flow and its geological and environmental consequences. The courses were attended by some 70 students, about half from Hungary and the rest from throughout the world.

In terms of hydrogeology, Budapest is well known for its wealth of thermal springs and flowing wells that issue from a deep and complex fault zone that underlies the city and the Danube River along which the city was established. An increasingly sophisticated understanding of the hydrogeology of this flow system has evolved through exploration, modeling and recently through innovative work with international partners using radiogenic isotopes as natural groundwater flow tracers. A number of presentations on research to understand the flow system, including its karstic components, were made by Hungarian scientists and their international partners, and this was coupled with a day-long field excursion to the Buda Thermal Karst System, Europe's largest thermal water system. Popular use of the city's springs as bathing spas goes back to at least the Roman period and reflects influences of the various cultures that have developed them, notably the Ottoman Turks who occupied the region in the 15th and 16th centuries. Purely in the interest of science, a large group of hydrogeologists from the conference investigated the Széchenyi spa one evening after the day's presentations (shown in the photo). Water there is mixed from a variety of groundwater sources, including a supply of 74-77˚C drawn from two 1,000+ meter-deep wells, to fill bathing pools at a range of pleasant temperatures from 26-38˚C.

A variety of sessions, along with business meetings and a joint plenary session of the two IAH Commissions over three days worked to enhance cross-fertilization of ideas across the conference's two themes. A nice feature was that a relatively large number of young scientists who participated in the conference and, indeed, the Karst Commission awarded a record number of Young Karst Researcher Awards to four young scientists, including the top award to Amélie Dausse of the University of Montpellier in France. A highlight of the conference was a gala dinner in honor of Professor Tóth, who was awarded the Order of Merit of the Republic of Hungary, the country's highest civilian honor. Thanks go to the conference's organizers and sponsors, with the effort led by Professors Judit Mádl-Szőnyi and Anita Erőss of Eötvös Loránd University. The conference website is http://www.karstflow2013.org where the program, including all abstracts, is available for download.

IAH Chinese National Chapter – *Jim LaMoreaux*

Dr. Jim LaMoreaux, PE LaMoreaux & Associates, and Dr. Zhou Wanfang (independent consultant) met with officers of the IAH Chinese National Chapter and participated in a lecture tour in China. The lecture tour was sponsored by the China University of Mining and Technology Beijing (CUMTB) in concert with the Institute of Hydrogeology and Environmental Geology, a research arm of the China Geological Survey located in Shijiazhuang (IHEG/CAGS), and the Quindao Institute of Marine Geology. The purpose of the lecture tour was to interact with Chinese scholars and students about topics in hydrogeology with an emphasis on karst and on how to write and publish scientific articles.



Meeting with the IAH Chinese National Chapter (from left to right): IAH Chinese National Committee (CNC) member Dr. Xiangquan Li, CNC Vice Chairman Dr. Zhang Zhaoji, IAH US National Committee Secretary Dr. Jim LaMoreaux, CNC Vice Chairman Dr. Qiang Wu, Dr. Zhou Wanfang

This is the beginning of a proposed series of lecture tours, with the next one planned for spring 2014. Lecture topics included History of Karst Hydrogeology and Groundwater Development, Sustainability of Water Resources in Karst Terrains, Writing a Scientific Article and Submitting it to the Right Journal, and Mine Water Disaster Prevention and Water Resources. Lecturers included Professor Qiang Wu, Director of CUMTB's Institute of Mine Water Prevention and Water Resources in addition to Drs. LaMoreaux and Wanfang.

The lecture tours will also be an opportunity to improve relations and cooperation between the IAH US National Chapter and the IAH Chinese National Chapter. Representatives of the universities and institutes visited are officers and members of the IAH Chinese National Chapter.

Dr. LaMoreaux, Secretary of the IAH US National Chapter, met with Vice Chairmen of the Chinese National Chapter, Professor Wu of CUMTB and Dr. Zhang Zhaoji, Vice Director of IHEG/CAGS. Other Chinese National Chapter members participating in the meetings were Drs. Xiangquan Li, Director of the Geological Hazards and Mine Environment Section of IHEG/CAGS, and Cheng Yanpei of IHEG/CAGS. Dr. Yanpei, who is heading up the Chinese National Chapter's bid to bring the IAH Congress to Shijiazhuang in 2016, solicited the IAH US National Chapter's support in this effort.

2013 IAH Congress, Perth, Western Australia - *Vic Heilweil*

The 2013 IAH Congress in Perth was well-attended (about 800 participants from over 40 countries), and included a nice balance of technical presentations, mid-congress tours, IAH Council and Commission meetings, early career hydrogeologist activities, and many opportunities for social networking. Our Australian hosts were exceptionally welcoming and gracious and the meeting provided many compelling reasons for a journey nearly half-way around the planet for many of us. US National Chapter members attending the congress also included Dave Kreamer, Jim Lamoreaux, Tim Parker, and Cliff Voss.

The plenary sessions included a mix of timely topics including Western Australia's drought-proofing water strategies (Sue Murphy of the Perth Water Corporation), international opportunities and challenges (Craig Simmons of the National Centre for Groundwater Research and Training (NCGRT), Adelaide), sustainable management (Wolfgang Kinzelbach of the Eidgenössische Technische Hochschule (ETH), Zurich), urbanization and groundwater (Stephen Foster, Global Water Partnership, Sweden), groundwater interaction with rivers (Peter Cook of Flinders University, Adelaide), public-supply well vulnerability to contamination (Dave Rudolph, University of Waterloo, Canada), managed aquifer recharge (Peter Dillon of the Commonwealth Scientific and Industrail Research Organisation (CSIRO), Adelaide), mine dewatering (Geoff Beale, Schlumberger, United Kingdom), China's Love Canal (Chunmiao Zheng, Peking University, China), and the numerical subjectivity of groundwater modeling (John Doherty, NCGRT, Adelaide). Topical Sessions included managing groundwater resources, hydrogeochemistry, surface water – groundwater interaction, advances in tools and techniques (isotopic, GIS, modeling), climate and groundwater, groundwater and resource extraction industries, the Broken Hills Managed Aquifer Recharge project, and advances in hydrogeologic characterization.

The Perth Congress brought to mind the mantra "think globally, act locally," Learning about hydrogeologic systems and groundwater challenges in distant lands (with a focus on the Australian experience) provided context

and relevance to our work here in the U.S. And the many opportunities for international/intercultural interaction were another aspect not readily encountered at our U.S.-based meetings such as NGWA, GSA, or AGU. Thus I would encourage all of our members to consider joining myself and other USNC board members at one of the upcoming IAH Congresses. The next meetings will be in Marrakesh, Morocco (2014); Rome, Italy (2015); and Cartagena, Columbia (2016).

At the Australian NCGRT Annual Dinner in Perth (from left to right): Vic Heilweil, Shammi Puri (IAH Secretary General), Dave Kreamer, and Ken Howard (IAH President)

USNC members attending the IAH 2013 Congress in Perth (from left to right): Maj-Lis and Cliff Voss, Jim and Nicole LaMoreaux, Vic Heilweil, and Dave Kreamer (Timothy Parker also attended, but is not in this photo)

Updates on Selected Non-Profit Organizations' Acitivities

Hydrogeologists are working and volunteering around the globe to assure that people and communities have safe, fresh, and secure water supplies. In the interest of assisting with awareness among the IAH membership in relation to hydrophilanthropy, the IAH US National Chapter has asked some organizations with ongoing programs to describe their efforts, mission, and presence. We hope that this information can help keep our members in tune with on-the-ground efforts to teach about and provide aide through expertise in groundwater science. We would welcome information from other organizations that may be known to our members. Please email Suzanne Pierce (sawpierce@gmail.com) to start the process for including another organization in the next newsletter. More importantly, we hope to help these highlighted organizations connect with our IAH-USNC members!

UniWater Success in Africa - *Laurra Olmsted*

On a recent trip to Kenya, Tanzania, and Nigeria, UniWater's Executive Director and Dr Mandana Meriano from the University of Toronto Scarborough were greeted with overwhelming enthusiasm by universities wishing to establish new Master of Science programs in Hydrogeology and Water Resources Management. Four universities

have embraced the prospect of starting these programs in September 2014. Each university will customize the program to make it their own program based on the local needs and specialties of faculty on staff. The four universities include the University of Nairobi (Kenya), South Eastern Kenya University, Sokoine University of Agriculture (Tanzania) and the University of Calabar (Nigeria). These programs will constitute the pilot phase of a Grand Challenges Canada - Stars in Global Health funded initiative. For further information, please contact Laurra Olmsted at uniwatered@gmail.com.

The BOOST Initiative – *Alan Fryar and Adam Milewski*

Across North Africa, the Middle East, South Asia, and East Asia, levels of development differ, but common problems include both inadequate access to fresh water and inadequate higher education. Water pollution is a challenge throughout the region, while absolute water scarcity is widespread outside Southeast Asia. Challenges in higher education include lack of opportunity for university graduates, lack of research productivity, and a mismatch between societal needs and university activities. To address both sets of problems, with the support of the U.S. Department of State, we have initiated the BOOST project (Building Opportunity Out of Science and Technology), which combines training in technical and professional skills for graduate students and recent graduates in hydrologic science. The BOOST Initiative focuses on enhancing capacity for hydrologic science from North Africa to Southeast Asia. We are collaborating with colleagues at the University of Kentucky, University of Georgia,Western Michigan University, and institutions in Morocco, Egypt, Turkey, and Indonesia. Activities began in spring 2012 (six participants each from Morocco and Egypt) and spring 2013 (seven participants from Turkey and ten from Indonesia). Students were selected from three or four universities in each country. English proficiency is emphasized and women make up at least half of each group. Most participants are geologists or engineers (geological, civil and environmental, or agricultural), but there are also two soil scientists and a geographer.

The program for each participant has been broadly similar. Technical ("hard") skills training began with a 2-month long-distance course in GIS, remote sensing, and hydrologic modeling (http://wrrs.uga.edu/moodle). As a capstone, there was a week-long, "hands-on" workshop at the University of Georgia, where students worked in teams with hydrologic and satellite remote sensing datasets to model watersheds in Morocco (2012) and Turkey (2013). During May and June, each participated in a week of field activities, including stream gauging, measurement of hydraulic heads in wells, and monitoring of water-quality parameters (e.g., temperature, pH, electrical conductivity, and alkalinity) in surface and ground waters. The 2012 participants traveled to San Angelo, Texas, to work in the semi-arid watershed of the Concho River. The 2013 participants conducted field activities in their home countries (around the Iznik Lake basin in western Turkey and near Bogor in west Java, Indonesia. The latter groups also assessed stream geomorphic parameters. Both cohorts interpreted field data with respect to landscape position, lithology, and land use.

Professional ("soft") skills training has focused on research conduct, communication, and professional opportunities. The first group of participants submitted abstracts for a poster session entitled "Building Capacity for Hydrologic Science in Water-Stressed Regions of the World," co-sponsored by IAH-USNC, at the 2012 Geological Society of America Annual Meeting. The second group of participants submitted abstracts for poster and oral sessions entitled "Building Capacity for Hydrologic Science in Africa and Asia" at the 2013 American Geophysical Union Fall Meeting. Participation in each professional meeting has been (or will be) a capstone to a 3-month long-distance course, in which students develop resumes and LinkedIn pages, complete a module on research ethics, give written and oral summaries of webinars (on career options for geoscientists and hydrologic topics), and discuss grant opportunities. Finally, each participant is expected to engage in at least 40 hours of outreach activities, such as peer mentoring at universities, presentations at local schools, or working with community groups on water-related issues.

The success of the BOOST project will depend not only on development of skills by the participants, but also on continued engagement and expansion. At the beginning and during the project, participants have been surveyed anonymously about their prior preparation, the value of various activities, and possible changes to the activities. Final surveys will be given after completion of outreach activities. We are developing a repository of on-line resources (http://arches.wrrs.uga.edu/) and network of BOOST alumni to sustain the program in multiple countries and provide guidance to future participants.

Egyptian and Moroccan participantsof the BOOST Initiative along floodwall at Vicksburg, Mississippi - left; Indonesian participants surveying stream transect near Bogor- right.

Sustainable Management of Small Wells in India - *Lenny Konikow*

The Food and Agriculture Organization of the United Nations (FAO) recently released a new report, "Smallholders and sustainable wells. A Retrospect: Participatory Groundwater Management in Andhra Pradesh (India)," by Samala Venkata Govardhan Das and Jacob Burke. As described on the UN Water Library web site, the study analyzes the lives of two successive Participatory Groundwater Management programs in Andhra Pradesh, India, which ran from the mid-1990s to 2010, and were centered around small wells, typically servicing a few families each. The programs ran in 660 villages across drought-prone districts of Andhra Pradesh, and by their culmination involved the participation of nearly 20,000 farmers as barefoot technicians. The core principles adopted by these programs were: demystifying hydrological science and technology for rural communities; enabling them to blend their local knowledge for sustainable management of their groundwater resources through a network of Farmer Water Schools and information kiosks, and an emphasis on reducing agricultural water demand through options such as reduction in the number of new wells that might lead to unsustainable over-extraction (voluntary self-regulation), changes in cropping pattern, efficient water use and soil moisture management. The programs also addressed the overarching issue of hydrological data scarcity, necessary to formulate better policies, by involving farmers in the collection and recording of such local data. As such, the study is also an excellent example of "Citizen Science." The report suggests that the success of these programs lay in the fact that they recognized information, education and social mobilization as key objectives of a participatory model and not subsidiary criteria. The report is available from a link on: http://www.zaragoza.es/ciudad/medioambiente/onu/en/detallePer_Onu?id=687

UN-Water Decade Programme – *content from U.N. Water Decade web pages contributed by Lenny Konikow*

Every year millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation, and hygiene. Water scarcity, poor water quality, and inadequate sanitation negatively impact food security, livelihood choices, and educational opportunities for poor families across the world. Water-related natural disasters such as floods, drought, tropical storms, and tsunamis exert a heavy toll in human life and suffering.

At the United Nations Millennium Summit in September 2000, the largest-ever gathering of world leaders adopted the Millennium Declaration; from the Declaration emerged the Millennium Development Goals, an integrated set of time-bound targets for extending the benefits of globalization to the world's poorest citizens. Among them was a target to cut in half the proportion of people without sustainable access to safe drinking water. Given the magnitude of the task, in December 2003, the United Nations General Assembly proclaimed the period 2005-2015 International Decade for Action 'Water for Life.' The decade officially started on World Water Day, March 22, 2005. The challenge of the International Decade is to focus attention on action-oriented activities and policies that ensure the long-term sustainable management of water resources, in terms of both quantity and quality, and include measures to improve sanitation. The United Nations, through its inter-agency coordination mechanism, UN-Water, is responsible for coordinating the 'Water for Life' Decade. Water cooperation at national and global levels is essential to achieve sustainable development and ensure that millions of people have access to this precious resource. More information, helpful fact sheets, and publications are available at:
http://www.un.org/waterforlifedecade/water_cooperation.shtml or http://www.un.org/waterforlifedecade/

Member News and Notes

Notice of Retirement from Yoram Eckstein

Well, friends - after 37 years on the faculty with Kent State University Geology Department, I have decided to retire as of May 31, 2013. It was a long haul... but about the last 37-years, perhaps at another time...For now, what is a retired professor, who is still holding in the vertical position and still has some active matter between his two ears, to do...? A rocking chair? ...naah! There are still things to do and places to go...

I am a happy recipient of a research/teaching grant from Fulbright Foundation to spend the academic year 2013-14 in ...Siberia. I know, that name is associated with a terrible history and freezing cold. But, in the year 2009, I went there for "a reconnaissance" and since developed close ties with the Geology Department at Tomsk Polytechnic University in the City of Tomsk, Russia. I know that the colleagues at the Department of Geology, where I will be teaching Applied Hydrogeology during fall-semester and Contaminant Hydrogeology during spring-semester, are preparing a warm welcome for me (with plenty of vodka).

Also, Tomsk is located a stone's throw from the Vasyugan Mire, the largest boreal wetland in the world. It will be fun to analyze the temporal changes in the chemical composition of water samples collected by my colleagues there during the last decade and correlate these changes with the geomorphological evolution of the area as recorded on Landsat images throughout the last 30 years (to see the effects – if any - of global warming there). The only drawback is that I'll miss the GSA Annual Meeting this year. Cheers, *Yoram Eckstein*

Announcing the Yoram Eckstein Scholarship Fund – *Gabriel Eckstein*

YES, he is finally retiring. After 37 years of provoking and pestering students toward his chosen profession, Professor Yoram Eckstein is finally hanging up his geologist's hammer (at least, as an academic at Kent State University). During his career, he mentored hundreds of students and supervised scores of Ph.D. and Masters students. His pending retirement truly marks the passing of an era for the KSU Department of Geology.

In recognition of my father's many years of commitment to students, his exacting and successful teaching style, and his overall contributions to the department and the profession, a number of us (I, myself, graduated with a geology degree from KSU in 1989) have created a scholarship in his name for students pursuing a degree in hydrogeology. Through this scholarship, we hope to continue his legacy of helping to produce rigorously educated and successful geologists and other professionals who now can be found throughout the world.

Accordingly, I would ask that you please forward this solicitation to anyone you believe may have known my father over the years and who might be willing to contribute to a scholarship in his name. We are inviting all of my father's students, colleagues, clients, and friends to contribute to this effort and help us to recognize his unique place in KSU Geology history, as well as aid for future graduates achieve their own success. Contributions can be made in any amount. And yes, they are tax deductible! Checks can be made out to Kent State Foundation, though, please make sure to write in the memo line: "Geology restricted fund in honor of Yoram Eckstein." Please mail checks to: Kent State University, Development & Foundation, 1061 Fraternity Circle, Kent, OH 44242-0001. For payment by credit card, please call Kat Sackett in the Foundation Office at 330-672-2452. Please remember to tell Kat that this is a "Geology restricted fund in honor of Yoram Eckstein."

Memorial for Robert "Bob" Schneider, 1921-2013 - *Charles Netheway*

(Reprinted from May 2013 USGS WRD Retirees newsletter)

Robert "Bob" Schneider, 91, passed away on March 9, 2013 in Springfield, VA. He was born on April 7, 1921 in New York City of parents who emigrated from the Ukraine and Latvia. The Schneiders lived near their tailor shop in Brooklyn, and Bob could walk to his studies at Brooklyn College where he also worked at the library. After Bob's B.S. from Brooklyn College in 1941, he became an engineering aide for the Geologic Division, USGS, in Alaska and Arkansas, then in Washington, D.C. working on maps. It was in Washington where he met his wife, Lore, in 1941. From Germany, she was a night student at GW University and a "Government Girl" for the Department of Interior in the daytime, one of those thousands of young women who moved to Washington at about the time of

World War II to get federal jobs where there was great demand. With arms full of text books, Lore was on the same bus as Bob on the way to work at Interior. Bob, being the gentleman, offered her his seat, and the courtship began. Bob served in the Army during World War II, 1944-1946. Bob and Lore married after the war, and they had celebrated their 66th anniversary before Bob's passing. In late 1946, Bob joined the USGS Water Resources Division (WRD) as a geologist for the Ground Water Branch in Memphis. He studied the geology of the Memphis area. Bob's first paper was published in 1947 in "Economic Geology," entitled "Ground-water conditions and problems in the upper Mississippi River embayment." Bob and E.M. Cushing wrote a paper in 1948 that would be cited many times in the future: "Geology and water-bearing properties of the '1,400-foot' sand in the Memphis area: USGS Cir. 33." In 1950 he transferred upriver to the Groundwater Branch in St. Paul, MN. Hal Langford remembers Bob when Hal was in the Regional Water Quality (QW) Office in Lincoln and Bob was the District Geologist of the Ground Water Branch in St. Paul. Among his many papers, he co-wrote USGS Circular 274 in 1953, "Water resources of the Minneapolis – St. Paul area (Preior, Schneider, and Durum)." In the later part of his Minnesota assignment, he became the ground-water district chief. Then, after 10 years in Minnesota, Bob moved to the USGS headquarters, in Arlington, VA. Bob and Lore had three children along the way, Valerie, Glen, and Marilyn. When Bob was sent to Brazil in 1960 for a few months, Lore asked for the assignments from the children's school, and everyone went to Rio. She home-schooled the children for much of the latter part of the 1960 school year, setting down the rule, "Homework before the beach." All had a great time. Bob traveled throughout Brazil, particularly in the Amazon River basin, and the USGS published his findings, "Status of Investigations and Development of Ground Water in Brazil." In 1962, Bob was detailed to Israel where he produced a paper, "USGS WSP 1608-F: Cenomanian-Turonian Aquifer of Central Israel – Its Development and Possible Use as a Storage Reservoir." Bob returned to Israel several times to give papers about his findings. Bob also had a brief detail to the U.K. In 1967-1971, Robert was the Chief, Office of Radiohydrology. Bob continued to write and edit for USGS until he retired in 1981 and as a rehired annuitant until 1985. After retirement, Bob worked for Environmental Strategies Corporation. He also served on the editorial boards of "Ground Water" (Groundwater Technology Division, NGWA) and "Hydrogeology Journal (HJ)," the official journal of the International Association of Hydrogeologists. Bob worked in support of Bill Wilson and Cliff Voss, Editors of HJ, to carry out re-Englishing of technically-strong articles where the authors' native language was not English, then became Managing Editor (2001-2005) after Bill stepped down. Bob loved to read and take long walks. In his later years he was interested in green issues and, according to his wife, he was "going green" and was active in the Greenspring Environment Club where the Schneiders lived. Bob is survived by his wife, Lore; their three children, Valerie, Glen, and Marilyn who live in MA, FL, and the Eastern Shore of VA, respectively; 3 grandchildren and 2 great-grandchildren; and one brother, Sherman. Bob was laid to rest at King David Memorial Gardens, National Memorial Park, Falls Church, Virginia.

Memorial for Herman Bouwer, 1927-2013

Comments by Ed Bouwer, John Hopkins University: "Herman Bouwer, one of the world's leading researchers in water management and groundwater, died on July 28 at age 86 of complications from Parkinson's Disease. He was a native of The Netherlands, where he survived World War II and the Nazi occupation. He received his MS from Wageningen University in drainage and irrigation in 1952, and his Ph.D. in 1955 from Cornell University in soil and water management. After five years in the Agricultural Engineering Department of Auburn University, Alabama, he joined the U.S. Water Conservation Laboratory, U.S. Department of Agriculture in Phoenix, Arizona where he worked for 42 years, the last 18 as Director. He retired in early 2002. He was best known for his work on artificial recharge of groundwater, especially with sewage effluent to get the benefits of soil-aquifer treatment (SAT) for water reuse, including potable use. Herman was also an adjunct faculty member of the University of Arizona, Tucson and Arizona State University, Tempe, where he taught ground water hydrology courses. He has authored more than 300 publications including 12 book chapters and the textbook Ground Water Hydrology. He served on several US National Academy of Sciences and National Research Council committees, consulted on numerous recharge projects, received an Organisation for Economic Co-operation and Development (OECD) Fellowship in

1964 for studying recharge in The Netherlands and Germany, and gave seminars and short courses on artificial recharge in the U.S., India, Jordan, Tunisia, and Morocco. In 2004, Herman received the Prince Sultan Bin Abdulaziz International Prize for Water for his work on underground water movement with emphasis on artificial recharge, water reuse, and surface and groundwater interactions. Outside of the lab, field projects, and the classroom, Herman's favorite avocations were tennis, swimming, and bicycle riding. Herman is survived by his wife, Agnes Bouwer, daughter Annette Flegenheimer of Chandler, AZ, two sons, Edward Bouwer of Baltimore, MD and Herman Bouwer of Portland, OR, and 5 grandchildren."

Comments by Peter Dillon, IAH Managing Aquifer Recharge Commission: "Herman was a giant in the field of managed aquifer recharge (called artificial recharge) through most of his career. He encouraged a scholarly view of hydraulic, chemical and biological processes and at the same time was very practical, as can be seen in his text book 'Ground Water Hydrology.' He was a great teacher and mentor and inspired many to study MAR. His eyes sparkled and his face lit up when he gave talks on artificial recharge, such was his joy in the subject and his passion for helping others learn. With David Pyne, he ran countless American Association of Civil Engineers (ASCE) training courses on Managed Aquifer Recharge (MAR). He was active in asking hard questions and encouraging people to dig deeper. He had a wonderful sense of humor. Back in 1994, Herman told me he had 'stopped buying green bananas' because he didn't know how long he had left. Later that day he thrashed me in tennis by slicing the ball to all parts of the court. I asked him about the beneficial nexus of groundwater and wastewater that he pioneered. He explained in simple terms 'the heart of recycling and sustainability are treatment and storage. Soil and aquifers, if you don't overload them, can do both.' He attended part of ISMAR6 in Phoenix in 2007, a joint meeting organized by Arizona Hydrological Society, and received a certificate of appreciation signed by the President of IAH. Herman humbly expressed satisfaction that the foundations for MAR that he had laid, along with his good colleagues Mario Lluria, and in USGS Ivan Johnson (since deceased Aug 2011), were sound and have supported ongoing growth in impact, geographic spread, knowledge, innovation and in the number of engineers and scientists involved in MAR. On behalf of the Commission on Managing Aquifer Recharge, we express our sympathy to Agnes and family. We share in your loss and we hope that the knowledge of the great admiration and gratitude felt around the world by Herman's colleagues and beneficiaries of his work and mentoring will be of some comfort. Herman has left a global and enduring imprint on his profession and his work underpins provision of safe water to many millions of people who otherwise would not have a supply."

Upcoming 2013 Meetings and Conference Notes - *Jim LaMoreaux and Vicki Kretsinger*

IAH ISMAR8 (International Symposium on Managed Aquifer Recharge), October 15-19, 2013, Beijing, China: Conference Organizers Peter Dillon and Weiping Wang, Co-Chairs, IAH Commission on Managing Aquifer Recharge, invite colleagues to gain a much broader understanding of MAR. During the symposium, on Thursday the 17th, there will be a plenary for the IAH Commission on Managing Aquifer Recharge. This will include information sharing, the long-anticipated release of the IAH publication on clogging and its management, an announcement on ISMAR9, and discussion about future directions for the Commission's activities. Please make your suggestions and indicate your interest in contributing time to these proposed Commission activities: (1) improved policy and governance of MAR; (2) synthesizing information on economics of MAR; (3) MAR-NET a network of demonstration projects and capability centers in developing countries; (4) financing of MAR operations in developing countries; (5) water banking for drought relief and emergency supplies. The organizers welcome all IAH participants and particularly members of the IAH Early Career Hydrogeologists Network. Pieter Stuyfzand (Free University of Amsterdam and KWR) and Jianlong Wang (Tsinghua University) will be keynote speakers. For those going to Beijing who have not yet registered for workshops, please let Jordy Yin, the conference organizer, know you will be attending. (www.ismar8.org email: jordyyin@163.com).

GSA Annual Meeting and 125th Anniversary Celebration, October 27-30, 2013, Denver, CO: The 2013 Geological Society of America Annual Meeting and Exposition will be held October 27-30 in Denver, Colorado. The theme will be "Celebrating 125 years of Advances in Geoscience". Over 8,000 attendees are expected. Plan to be a part of GSA's history. For more information, go to: http://www.geosociety.org/meetings/2013. ***The IAH-USNC will hold its Fall 2013 board meeting at this conference Sunday, October 27, 2013*** from 5-6 pm in the Limestone Room of the Hyatt Regency at the Colorado Convention Center.

The IAH-USNC is co-sponsoring the following 2013 GSA technical sessions:

1) Groundwater Extremes: Groundwater's role in drought, floods, depletion, subsidence, landslides, and sea level rise; Session Chairs - Cunningham, W.L., Sheets (rasheets@usgs.gov), R.A. and T.J. Burbey.

2) Mountain Groundwater: Recent Advancements in the New Era of Climate Change and Resource Development; Session Chairs - Andrew Manning (amanning@usgs.gov), Jonathan Caine, and Lyndsay Ball.

3) Environmental and Social Implications of Hydraulic-Fracturing Driven Oil and Gas Development: Toward a More Holistic Assessment; Session Chairs - Chris Potter, Avner Vengosh, Zack Bowen, Vic Heilweil, and Peter McMahon (pmcmahon@usgs.gov).

4) Vadose Zone Flow and Transport in Natural or Engineered Systems Under Extreme Conditions; Session Chairs - Fred Zhang (Fred.Zhang@pnnl.gov) and H. Liu, J Zhu.

5) A Comprehensive Look at Hydraulic Fracturing; Session Chairs - Neil Coleman (NCOLEMAN@pitt.edu) and Gerry Winter.

6) Anomalies, Surprises, Irregularities, and Contradictions in Variably-Saturated Subsurface Flow; Ben Mirus (bbmirus@usgs.gov), Brian Ebel, and John Nimmo.

7) Unsaturated Zone Geophysics; Session Chairs - John W. Lane (jwlane@usgs.gov) and Kamini Singha.

8) Recent Advancements in the Theory, Characterization, and Modeling of Unsaturated Zone Processes; Session Chairs - C. Amanda Garcia (cgarcia@usgs.gov), Michael H. Young, David Stonestrom, and John Nimmo.

In addition to the eight sessions listed above, the IAH US National Chapter is co-sponsoring a field trip titled "Rocky Mountain Unsaturated Zones-Exploring Fire-Earth-Sky Connections" (Session ID: 32374) on behalf of the Unsaturated Zone Interest Group (UZIG).

Pillars of Groundwater Innovation conference series, November 7-8, 2013, Phoenix, Arizona: NGWA is hosting the newly established Pillars of Groundwater Innovation conference series November 7th-8th in Phoenix, Arizona. Join the 2013 pillars of groundwater as four accomplished scientists and practitioners who have made significant contributions to hydrogeology - and continue to do so - present keynote speaches and moderate the corresponding sessions. This year, Mary P. Anderson, Fletcher Driscoll, Errol "Monte" Montgomery, and Shlomo P. Neuman will share their perspectives with others active in the groundwater industry. To find out more visit: https://ngwa.confex.com/ngwa/pgic/webprogram/

NGWA/GWPC Groundwater Summit, May 4-7, 2014, Denver, CO: Theme: "Ten Years of Moving Research to Solutions". Former IAH US National Chpater Chair Mike Wireman is Co-Chairman of the conference. Groundwater is a resource to be protected. It ignores political boundaries, transports contaminants, floods mines and construction sites, spins communities into an uproar, and can't be found when you need it. Model, explore, characterize, bank, inject, extract, treat and predict all your subsurface needs with everything groundwater at the 2014 NGWA/GWPC Summit. For more information contact customerservice@ngwa.org.

11th IWA International Conference on Hydroinformatics, August 17-21, 2014, City College of New York Campus, New York, NY: This biennial conference provides a venue for Hydro-Informatics Specialists around the globe to meet, discuss, and learn from each other. Abstracts submissions due October 25, 2013. Further information is available at the conference web-site: www.hic2014.org

IAH 41st Congress, Groundwater: Challenges and Strategies, September 15-19, 2014, Marrakech- Morocco: The Moroccan Committee of the International Association of Hydrogeologists (IAH-CM) is organizing the 41st International for the first time in the Middle East and North Africa (MENA) Region, one of the regions of the world that suffers severe water scarcity. This offers the opportunity to deal with topics such as extreme aridity and groundwater, non-renewable groundwater resources and major trans-boundary aquifers. It is of paramount importance to rethink groundwater policies and management in a more holistic and integrated vision, taking into account supply and demand, groundwater vulnerability and protection, mobilization of non-conventional water resources and ground water recharge. From this perspective, groundwater governance is a central issue. Setting up frameworks for good governance will not only help access groundwater in a more equitable and sustainable way, but set conditions for better cooperation (rather than conflict) at the local, national and even international levels. The Congress is aimed at scientists, researchers, students, engineers, water resources specialists, officials and government administrators, NGOs and all those interested in groundwater and environment. The Congress will offer the opportunity to exchange ideas, knowledge, experience, techniques and know-how in various aspects of groundwater. More information at: http://www.iah2014.org/

International Water Association World Water Congress: Shaping Our Water Future, September 21-26, 2014, Lisbon, Portugal: Contributions are expected that present global best practice, advances in fundamental science, innovative research, policy developments and solutions to challenges faced by water professionals worldwide. Presentations are encouraged that focus on the dynamic interactions between water and urbanization; water, food and energy; and water and climate change. More information at: http://www.iwa2014lisbon.org/the-event/why-attend/

Groundwater Resources Association of California (GRA) 2013-2014 Events: The USNC/IAH has been a cooperating organization for a number of GRA events. As members of a cooperating organization, IAH members enjoy GRA member rates to attend these events. IAH members are welcome to express their interest in assisting with the planning of 2014 events or participating as a session organizer or presenter by contacting GRA. 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 , or by telephone, 916-446-3626.

Upcoming GRA Conferences and 90 Minute GRA-Cast Series:

1. **Compounds of Emerging Concern in Groundwater:** This three-part series will focus on key groundwater contaminants and feature presentations on the technical and institutional challenges posed by the presence of these compounds in the environment. The series will conclude in January 2014 and will be followed by a one-and-a-half day GRA symposium on the topic on February 4-5, 2014 in Concord, CA. More details available on GRA's website, www.grac.org.
   - Thursday, October 3, 2013 (already occurred): focus on per- and polyfluorinated compounds including PFOA and PFOS.
   - Wednesday November 20, 2013: (i) Chromium; (ii) 1,2,3-TCP
   - Wednesday January 15, 2014: (i) 1,4-Dioxane; (ii) Urban runoff as a potential source of emerging contaminants
2. **Collaborative Leadership Workshop: Negotiating Relationships to Improve Water Resources Planning, November 4, 2013, Sheraton Grand Hotel, Sacramento, CA**. A workshop designed to provide attendees with the fundamentals for collaborative leadership and stakeholder involvement, a ***must*** for professionals working with the public and multiple stakeholder groups in today's complex natural resources management environment. More details at: http://www.grac.org/collaborativeleadership.asp
3. **Groundwater Issues and Water Management — Strategies Addressing the Challenges of Sustainability in California, March 4-5, 2014, Sacramento, CA**. A GRA Conference Organized in Cooperation with USCID, The U.S. Society for Irrigation and Drainage Professionals. Reliance on groundwater in the West in the last few decades is due largely to the expansion of permanent crops, more intensive irrigation practices, increased urban and environmental competition for water supplies, and reduced surface-water supplies due to drought and increasing regulatory restrictions. Coupled with overdraft, land subsidence and other ongoing issues associated with groundwater use heighten the concern over the long-term sustainability of the resource. GRA, in cooperation with the United States Committee on Irrigation and Drainage (USCID) and the U.S. Society for Irrigation and Drainage Professionals, is organizing a conference that provides a unique opportunity for attendees to access simultaneously the technical and policy challenges facing groundwater resources. We are soliciting papers and presentations that synthesize these issues in an important conference relevant to today's water management. More details and conference topics at: http://www.grac.org/giwm.asp
4. Other GRA Events Being Planned for GRACasts, approximately monthly Webinars
   - **MODFLOW** (October 16, 2013)
   - **Salt and Nutrient Management Plans Update** (Third in Series, October 23, 2013)
   - **Emerging Contaminants** (November 20, 2013; see above description)
   - **Site Closure** (Second in Series, December 18, 2013)
   - **Site Closure** (Third in Series, January 29, 2014)
   - **Emerging Contaminants** (January 15, 2014; see above description)
   - **Salt and Nutrient Management Plans Update** (Fourth in Series, February 19, 2014)

Books and Publications of Interest

Recently, IAH released a book on Groundwater Dependent Ecosystems that can be viewed at http://www.crcpress.com/product/isbn/9781138000339?utm_source=August+2013+Connections+Enewsletter&utm_campaign=August+Connections&utm_medium=email

Contributions Invited for the Spring 2014 Newsletter

Would you like to contribute to the Spring 2014 Newsletter? Please send proposed articles to the USNC IAH Newsletter editor, Suzanne Pierce, at the following email address: sawpierce@gmail.com.

Article Submission Deadline - March 10, 2014

Newsletter Distribution Date –April 20, 2014.