

# The Hydrogeologist

Newsletter of the  
GSA Hydrogeology Division

Summer 2013  
Issue No. 79

## 125th Anniversary Annual Meeting & Expo

27-30 October 2013 • Denver, Colorado USA



This year marks the 125<sup>th</sup> Anniversary of the Geological Society of America, and this year's meeting in Denver from October 27-30 promises to be a great time to celebrate the science, the Society and the Hydrogeology Division. The proposed topical sessions for the 2013 Fall Meeting demonstrate the strength and vibrancy of the GSA, and the continued growth of the Hydrogeology Division. The Hydrogeology Division is proud to sponsor, co-sponsor or be listed as a relevant discipline in 53 technical sessions covering everything from hydraulic fracking to ecohydrology and from innovative teaching to international development. In addition, the discipline is also sponsoring 1 Pardee session titled "125 Anniversary Pardee Symposium: 125 Years of Exploration and Geoscience with GSA and the National Geographic Society: Celebrating the Rich History of Geoscientist Explorers Who Have Broadened Our Horizons and Knowledge of Our World" and 1 special session titled "GSA 125th Anniversary Books: I, The Web of Geological Sciences: Advances, Impacts, and Interactions; II, The Impact of Geological Sciences on Society: Authors Present Summaries of Their

Articles". See the list of sessions on Page 3. The abstract deadline is August 6<sup>th</sup>.

The Hydrogeology Division will also co-sponsor a workshop titled 'Navigating NSF' at this meeting. Time and place TBD. Details are available on page 8.

The Hydrogeology Division has several special events occurring over the course of the meeting. These include:

- Monday afternoon 5:00-6:00 PM: Darcy lecture by David Rudolph
- Tuesday lunch: Hydrogeology Division Award Ceremony and Luncheon followed by Division business meeting
- Tuesday 4:30-5:30 PM: Birdsall-Dreiss lecture by Dani Or, with the student reception to follow.

We hope to see you in Denver!

*Bill Sanford and Eliot Atekwana*  
Joint Technical Program Representatives 

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# Chair's Corner...



**Todd Halihan, Chair  
GSA Hydrogeology  
Division**

As chair of the Division, I hope you all had successful springs at the sectional meetings. There are some great things happening in Denver for this year's annual meeting that I wanted to convey. This issue highlights a function that was created for this anniversary meeting.

As part of the 125<sup>th</sup> anniversary of GSA, the Hydrogeology Division is hosting a dinner to celebrate the contributions of the

members of the division. We will be hosting the dinner on Saturday night, Oct 26<sup>th</sup> in Denver at The Broker Restaurant (821 17th Street, between Champa and Stout).

The dinner will celebrate the legends of our field with former division chairs and award winners joining us for food and variable density fluids (with associated contaminants). You can register for the dinner when you register for the meeting, or if you are just coming for the dinner without attending the full meeting, you can register for that with GSA as well. If we have space, we should be able to get you in the door the night of the party as well....if we have space.

The dinner will start around 7 p.m. after the GSA Icebreaker Reception at the convention center. We will try to figure out a few things about our history as part of the dinner, as well as having a couple of things to keep us entertained.

Please consider inviting any hydro legends that you would like to see at this event. If you have that spare Henry Darcy costume in your closet, feel free to wear it for the event (or not).

Warm Regards,

Todd



## The Hydrogeologist

The Hydrogeologist is a publication of the Hydrogeology Division of the Geological Society of America. It is issued twice a year, to communicate news of interest to members of the Hydrogeology Division. During 1998, the publication moved from paper-based to electronic media. The electronic version may be accessed at: <http://gsahydro.fiu.edu>. Members of the Hydrogeology Division who have electronic mail will receive notification of all new issues. Other members will continue to receive paper copies.

Contributions are material are most welcome, and should be directed to the Editor. Submission as a Word or WordPerfect document is most expedient. **The deadline for the Fall issue is September 15, 2013.**

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## Technical Sessions sponsored or co-sponsored by the Hydrogeology Division and those listing Hydrogeology as a discipline

### **Pardee Symposium:** (<http://community.geosociety.org/2013AnnualMeeting/Sessions/Keynote>)

P1. 125 Anniversary Pardee Symposium: 125 Years of Exploration and Geoscience with GSA and the National Geographic Society: Celebrating the Rich History of Geoscientist Explorers Who Have Broadened Our Horizons and Knowledge of Our World

### **Special Session:** (<http://community.geosociety.org/2013AnnualMeeting/Sessions/Special>)

Special Session: GSA 125th Anniversary Books: I, The Web of Geological Sciences: Advances, Impacts, and Interactions; II, The Impact of Geological Sciences on Society: Authors Present Summaries of Their Articles

### **Topical Sessions:** (<http://www.geosociety.org/meetings/2013/sessions/topical.asp>)

- T18. Critical Zone Evolution: Climate and Exhumation
- T32. The Co-Evolution of Soils and Landscapes in the Quaternary
- T34. Advances in Unsaturated Zone Geophysics
- T35. Bottoms Up! Shallow Water Table Influences on Vadose Zone Biogeochemistry and Ecohydrology
- T36. Impacts of Land-Use Change and Disturbances on Unsaturated-Zone Ecohydrology
- T37. Recent Advances in the Theory, Characterization, and Modeling of Unsaturated Zone Processes
- T38. Vadose Zone Flow and Transport in Natural or Engineered Systems Under Extreme Conditions
- T39. Anomalies, Surprises, Irregularities, and Contradictions in Variably-Saturated Subsurface Flow
- T40. Applications and Developments of Coupled Hydrologic Models
- T41. Contaminant Migration through the Groundwater–Surface-Water Interface: Processes, Impacts, and Implications for Remediation
- T42. Current Groundwater Challenges in the Rocky Mountain Region
- T43. Ecohydrological Impacts from Climate-Induced Changes in Land Cover and Vegetation in Mountain Environments
- T44. Environmental Arsenic: The Nexus of Natural Occurrences and Human Health
- T45. Envisioning a Digital Crust: A 3-D Data System of Crustal Material Properties in Support of Large-Scale Fluid-Flow Simulations in Earth System Modeling
- T46. Experimental Study and Numerical Simulation of Reactive Chemical Transport in Complex Subsurface Media
- T47. Founders or Leaders in Hydrogeology
- T48. Ground-Source Geothermal Energy Systems: A Significant Emerging Resource
- T49. Groundwater Extremes: Groundwater's Role in Drought, Floods, Depletion, Subsidence, Landslides, and Sea-Level Rise
- T50. Evolution of Hydrogeology 1976–2010
- T51. Hydrogeology, Pore Pressure, and Induced Seismicity
- T52. Innovative Teaching of Hydrogeology
- T53. Mountain Groundwater: Recent Advancements in the New Era of Climate Change and Resource Development
- T54. Remote Sensing of the Cryosphere—Building on the Legacy of Austin Post
- T55. Secondary Water Quality Effects of Natural and Enhanced Attenuation of Contaminants
- T56. Streams and Aquifers: Integrating the Physical and Chemical

Please see **Sessions** on Page 5

## Sessions from Page 3

- T57. Understanding Contaminant Fate and Transport in Unconsolidated Aquifers—A Session on the Occasion of 30 Years of Long-Term Research at the Cape Cod Toxic Substances Hydrology Field Site
- T58. 125 Years Underground: A Retrospective and Prospective of Cave and Karst Research
- T59. Assessing Hazards and Groundwater Contamination in Karst (Posters)
- T60. Caves as Deep Time Repositories of Geological, Biological, and Anthropological Information
- T61. Karst 2.0: Orogenies and Glaciers and Faulting—Oh My! The Impact of Changing Geologic Conditions on Existing Karst Terrane and the New Tools and Techniques We Have to Study It
- T62. The Epikarst as a Boundary and Critical Zone
- T63. Transport and Transformation of Non-Solute Materials in Karst Aquifers
- T74. Landslide Evolution: Long-Term Studies of Landslides and the Realities (or Surprises) They Reveal
- T82. Geosciences and International Development
- T83. Impact of Winter De-Icing Chemicals on Water Quality and the Environment
- T85. International Development and the Geosciences
- T96. Water-Quality Constraints on Groundwater Availability and Use—What Are the Trade-Offs or Costs to Society?
- T103. Fluids, Stress, and Episodicity in Subduction Settings: What We Need to Know
- T113. 16 Years of GeoCorps™—Geoscience Projects Impacting America's Public Lands and Natural Resources
- T141. Geologic Mapping—A Key to Successful Management of Water and Land Resources
- T142. Geologic Maps and Their Derivatives (Posters)
- T152. Celebrating the Scientific Contributions of Kirk Nordstrom—Part 1: Acid to Neutral Mine Drainage, Geochemistry of Iron and Sulfur, Sulfate Minerals, Natural Background, and Geochemical Modeling
- T153. Celebrating the Scientific Contributions of Kirk Nordstrom—Part 2: Geochemistry of Arsenic and Antimony, Microbial Biogeochemistry, Geothermal Systems, Radioactive Waste Disposal, and Geochemical Modeling
- T154. Coupling Colloid-Water Interfacial Geochemical Processes with Contaminant Transport: Micro Vehicles for Big Problems
- T162. Interdisciplinary Studies across the Critical Zone
- T165. Sigma Gamma Epsilon Undergraduate Research (Posters)
- T171. Disposal of Radioactive Waste: Promise, Progress, Pitfalls, and Path Forward
- T174. Societal Demand as a Driver for Geoscientific Research—What Happens after the Driver Walks Away? Yucca Mountain Geoscientists Report
- T175. From Desert to Delta: Geologic Research and Applications in Egypt in the First Decade of the 21st Century (Posters)
- T210. Structure and Evolution of Brittle Faults and Fault Rocks: Physical Properties, Geometry, and Geochemical Changes that Influence Water, Energy, and Mineral Resources
- T229. Past Climates of the Middle East From Proxy Records; Insights on Water Resources and Impacts on the People of the Region
- T250. A Comprehensive Look at Hydraulic Fracturing for Hydrocarbon Recovery and Other Purposes
- T255. Produced Waters: Characterization and Impacts of Subsurface Brine and Formation Water Associated with Hydrocarbon Production



# Ada, Oklahoma



Congratulations to Bill Sanford of Colorado State University who was the first to identify the pianist in the Where in the World photo from our previous edition as the 2012 Birdsall Dreiss lecturer Jay Famiglietti. This photo was taken at East Central University in Ada, Oklahoma prior to the Birdsall Dreiss lecture. Ada's water is supplied by the largest spring in the state, and was the destination of a pre-lecture field trip. From the City of Ada's website ([www.adaok.com](http://www.adaok.com)):

"The City of Ada is also known locally as the "City of Pure Spring Water" – because that's exactly what it is. Ada's water supply originates from the Arbuckle-Simpson Aquifer, an underground reservoir of pristine-quality water. The Arbuckle-Simpson Aquifer is located in south central Oklahoma (south of Ada) and occupies more than 500 square miles of underground terrain. The

water gravity flows approximately 11 miles north into the city's water treatment plant, where it is tested for alkalinity, hardness, bacteria, and pH levels. A little bit of chlorine and fluoride are added to ensure safe consumption"

Now, to answer those questions regarding WHY Jay was photographed playing the piano on his lecture tour, there were AV issues involved in the evening lecture, and while technicians worked to sort out the issues Jay took it upon himself to entertain the crowd by playing the piano that was also in the room.



Do you have an interesting idea for a short scientific article? Perhaps an opinion on a new policy or technique? Any exciting news in your professional life? Upcoming conferece? An announcement of interest to the hydrological community? If so, why not publish it in The Hydrogeologist? Send your submission ideas to [andrea@kgs.ku.edu](mailto:andrea@kgs.ku.edu)

**STUDENTS, WE WANT TO HEAR FROM YOU TOO!**

# Where in the World?

This edition's photo is yet another obscure submission from our current chair, Todd Halihan. The hint provided is: this photo is from the home office of a former chair of the division who likes to sample these three piezometers by moving the display cabinet. The other forty wells in the yard are more accessible, but harder to sample in the rain. If you would like a further hint, the boot on the manikin in the picture is from World War II. Submit your guesses to [andrea@kgs.ku.edu](mailto:andrea@kgs.ku.edu)

Are you tired of obscure Where in the World photos from our Chair? Then submit your own to [andrea@kgs.ku.edu](mailto:andrea@kgs.ku.edu)



Want to know what's going on within the GSA Hydrogeology Division?

Then visit our website at <<http://gsahydro.fiu.edu>>

OR

Join the GSA Hydrogeology Division [facebook](#) group

to catch up on the latest events or find out how you can become more involved with our activities

# Useful at the Well Site: Permethrin

By: Todd Halihan



Well it is tick and chigger season (as well as a good time for field work), so the equipment recommendation for this issue is Permethrin. If you are not familiar with it, it is an alternative to using DEET for dealing with those fun critters that like to join us in the field. I'll let you know right now that I'm not a toxicologist or even an amateur biologist, so lots of those questions should go to someone else.

Permethrin is used to treat your field clothes and boots prior to going someplace that has lots of fun critters like mosquitoes, ticks and chiggers. If you are further north, add black flies and other fun things. The most common approach is to use DEET, which if you bring computers or other electronics to the field, you quickly find is not just a repellent, but a plastic solvent as well. The advantage of permethrin is that it doesn't repel our multilegged friends in the field, it just kills them.

The general approach with permethrin is to treat your clothes before you go into the field. I would recommend that a couple of sets of field

pants and long sleeve shirts as well as your field boots get hung with hangers on a ladder outside and treated. Some of the spray bottles get pretty clogged as they go, so they have come out with some pump versions instead. Once the stuff is dry it has a mild scent, but I still pack them in a bag separate from my other gear. Most of the manufacturers of permethrin talk about being effective after washing your gear, but my experience is that the effects are reduced after sending the stuff through the wash. If you are required to sit in the field to monitor equipment, the effectiveness of this treatment becomes obvious. Another plus, it doesn't melt your computer screen.

There are always toxicity questions about these things, and as I pointed out above, I'm not a toxicologist. What I have learned from discussions and a couple of web searches is that this stuff is bad for fish (so is DEET), so be careful if you are going to be doing stream work. It is also bad for cats, so don't bring fluffy to the field (dogs don't seem to mind). As far as your health, it is also used on humans for other uses, so it probably isn't much worse than spraying yourself with plastic solvent (DEET). The alternative is to enjoy Rocky Mountain Spotted Fever or a nice case of Lyme Disease.

Happy field work,

Todd



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## Navigating NSF: A workshop for researchers

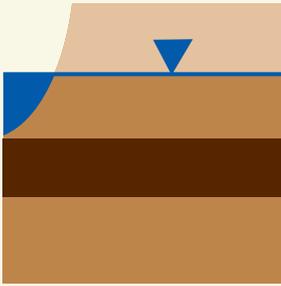
NSF Program Directors from the Division of Earth Sciences conduct this workshop, which is free and open to all GSA meeting attendees. It will be particularly helpful to early-career to mid-career participants, especially those thinking about applying for NSF funding for the first time or who are interested in new cross-disciplinary programs at NSF. Broken into 3 parts, the workshop welcomes you at any time throughout the duration. **Hour 1:** We will cover the basics of putting a proposal together, and this year will highlight the new changes to the GPG, particularly the changes

to the Broader Impact requirements. We cover data management, how to find the right program, etc.

**Hour 2:** We will introduce new opportunities and initiatives outside of the core funding programs, both within Earth Sciences and across the Foundation. Attendees have the opportunity to talk with the many Program Directors in attendance at the GSA meeting.

Time/Place: TBD





## 2014 Hydrogeology Division Officer Candidates

The 2014 officer elections are just around the corner. These elections will determine the upcoming Hydrogeology Division Officers. New this year will be a non-voting student member of the Management Board. Online voting will begin shortly, and paper ballots will be mailed to those who have requested them. The GSA will send an e-mail announcing the beginning of the elections, in addition to a link to the voting website. Here is a preview of the candidates for the 2014 Hydrogeology Division officers:

### Chair:

**Alan Fryar**, Ph.D. 1992, University of Alberta, is Associate Professor of Earth and Environmental Sciences at the University of Kentucky in Lexington, KY, where he has been since 1995. He teaches courses in hydrogeology, hydrology, and environmental geology. His research has encompassed recharge, flow, and chemistry in regional sedimentary aquifers; natural attenuation of contaminants; groundwater-surface water interactions; transport of sediments and bacteria in karst aquifers; water resources in developing countries; and the history of hydrology. He is a Fellow of GSA; a member of AGU, IAH, and NGWA; books editor of *Ground Water*; and former co-editor of *Environmental & Engineering Geoscience*. He served on the GSA Publications Committee (2002-06) and the Joint Technical Program Committee (2001-03), including leading the organization of the Hydrogeology Division technical program for the 2003 Annual Meeting. He has convened or co-convened nine technical sessions at GSA annual meetings and two sessions and a field trip at sectional meetings. He is currently the Hydrogeology Division's First Vice-Chair and chairs its Historical Committee.

**Statement of Interest:** I have been a member of the Hydrogeology Division since 1992. I am indebted to the senior colleagues who encouraged me to become active in the division: I have grown professionally and gotten to know wonderful people as a result. As a member of the division's management board, I have sought to (1) assist students and younger professionals, (2) maintain the GSA Annual Meeting as a venue for novel and relevant work in hydrogeology, and (3) broaden our reach internationally, especially in developing countries, where our expertise is sorely needed.

### 1st Vice Chair:

**Madeline Schreiber**, Ph.D. 1999, University of Wisconsin-Madison, is an Associate Professor of Geosciences at Virginia Tech in Blacksburg, VA. She teaches courses in introductory geology and hydrogeology and has authored or co-authored 43 peer-reviewed publications. She is a Fellow of the GSA, and a member of AGU, NGWA and AWG. She is an associate editor for *Ground Water* (2004-present). For the GSA Hydrogeology Division, she has been the Joint Technical Program Chair (2010-2011), and a member of the Meinzer Award (2005-2007) and Kohout Early Career Award (2011-present) committees. She is currently the Second Vice Chair (2012-2013) and as such, serves on the GSA Hydrogeology Division Management Board.

**Statement of Interest:** Since I joined as graduate student at UW-Madison, the Hydrogeology Division has been a supportive and welcoming place for hydrogeologists at all levels. I have been incredibly impressed at the breadth of hydrogeology topics covered at the annual and regional meetings, and would strive to continue that breadth as a member of the division's management board. The encouragement and mentoring of students are key strengths of the division, and I would work to further the strong tradition of student professional development.

# BULLETIN BOARD

## 125th Anniversary GSA Meeting Approaching Fast

Don't forget to submit your abstracts for the upcoming 125th Anniversary Meeting of GSA in Denver, CO. The online abstract deadline is Tuesday, August 6, 2013. Please visit the GSA Website <http://geosociety.org/meetings/2013/> to review the list of this year's sessions, submit an abstract, and register!

## NGWA Groundwater Expo and Annual Meeting

The NGWA Annual meeting, "A Sound Investment" is planned for December 3-6 in Nashville, TN. See the website for details: [groundwaterexpo.com](http://groundwaterexpo.com)

## AGU Fall Meeting Abstract Submissions Open

Abstracts for the AGU 2013 Fall Meeting (December 9-13) in San Francisco can now be submitted; deadline is August 6, 2013. See the website for details: <http://fallmeeting.agu.org/2013/>

## IAH 2014 - Groundwater: Challenges and Strategies

September 15-19, 2014  
Marrakech, Morocco

[www.iah2014.org](http://www.iah2014.org)

**PLACE YOUR  
ANNOUNCEMENT  
HERE**

## From the Editor....

Welcome to the Summer 2013 edition of The Hydrogeologist. This edition highlights many of the events that will occur during the Annual meeting in Denver. This year is a special one for GSA as it marks the 125th anniversary of the Society. Please be sure to join us in Denver to celebrate the Society and the Hydrogeology Division!

This summer will also bring new edition to my family. So, as I try to finish this newsletter before he/she arrives, I will say in advance that I appreciate your patience in awaiting any replies from me with regards to comments/questions/Where in the World submissions in the upcoming weeks. Regardless, please continue to forward any comments or article ideas to [andrea@kgs.ku.edu](mailto:andrea@kgs.ku.edu).

Andrea



# Hydrogeology Division Contacts

## **2013 Management Board**

**Chair:** Todd Halihan (todd.halihan@okstate.edu)

**First Vice-Chair:** Alan Fryar  
(alan.fryar@uky.edu)

**Second Vice-Chair:** Maddie Schreiber  
(mschreib@vt.edu)

**Secretary-Treasurer:** Eric Peterson  
(ewpeter@ilstu.edu)

**Past Chair:** Steve Ingebritsen  
(ingebrit@sbcglobal.net)

## **Standing Committees**

### **Technical Program Committee:**

Bill Sanford and Eliot Atekwana (2013 - Denver)

**Nominating Committee:** Scott Bair (Chair), Ed Harvey, Steve Ingebritsen

### **Meinzer Award Committee:**

Mary Jo Baedecker (Chair), Bayani Cardenas, Graham Fogg, Kamini Singha, David Leland Parkhurst

### **Birdsall-Dreiss Lecturer Committee:**

Jeffrey McDonnell (Chair), Jay Famiglietti, Dani Or

### **Distinguished Service Award Committee:**

Laura Lautz (Chair), Mary Anderson, Brian Katz

### **Kohout Early Career Award:** Steve Van der

Hoven (Chair), Scott Tyler, Shaul Hurwitz, Maddie Schreiber, Bayani Cardenas

## **Ad Hoc Committees**

### **Historical Committee:**

Alan Fryar (Chair)

### **Section Representatives:**

Cordilleran - Beth Weinman

Northeastern - Todd Rayne

North Central - Sue Swanson

South Central - Marcia Schulmeister

Rocky Mountain - Andrew Manning

Southeastern - Joe Donovan

### **Representatives to other Societies:**

American Geophysical Union - TBD

American Geological Institute - Dave Stephenson

National Ground Water Association - Bill Alley

International Assoc. of Hydrogeologists - Jack Sharp & Vicky Kretsinger

Society for Sedimentary Geology - Gary Weissman

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### **Web Administrator:** Mike Sukop

### **GSA Hydro. Division Liaison:** Janet Herman

Hydrogeology Division Website: <<http://gsahydro.fiu.edu>>

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