The GSA Annual Meeting is only few days away! Thanks to all of your abstract submissions and the amazing work of the session chairs, the Hydrogeology Division is sponsoring or cosponsoring 388 abstracts in 78 oral and poster sessions on a wide variety of topics from Agrohydrology to Energy and Hydrology and beyond. Download the mobile app (GSA2018) or utilize the web app (https://gsa.confex.com/gsa/2018AM/meetingapp.cgi). Be sure to add in all of our Hydrogeology Division Events to your meeting schedule.

We sincerely invite you to stop by the Hydrogeology Division Booth (#836) for more information regarding events, involvement in the division, and conversations with fellow hydrogeologists. Information about Division events can also be found on page 5 of this newsletter. Students are especially encouraged to come by the booth for information about our student-focused events, including the Career and Networking Event and the Student Reception. See you all in Indianapolis!

Yu-Feng Forrest Lin
Hydrogeology Division Technical Program Chair

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Chair’s Corner

Stephen Van der Hoven, Chair
GSA Hydrogeology Division

This newsletter should hit your inbox a week or so before the annual meeting in Indy. Thanks to all the field trip and session chairs for helping to organize another robust program of technical sessions and field trips with hydrogeologic themes. The Hydrogeology Division also has a slate of non-technical events during the annual meeting. If you arrive in Indy on Sat., stop by our table at the GSA Icebreaker (5-7 in the 500 Ballroom). Also stop by and see us throughout the meeting at Booth #836 in the Exhibit Hall if you’d like more information on Division sponsored events or if you’d like to become more involved in the Division.

There will be plenty of great science being discussed with oral and poster technical sessions throughout the meeting. The Division is sponsoring 31 technical sessions that were expertly organized by Joint Technical Program Committee Chair Yu-Feng Lin and Co-Chair Randy Stotler. The Division also hosts 2 special lectures. The Darcy Lecture will be given on Mon. 4-5, where Dr. Masaki Hayashi will speak on “Alpine Hydrogeology: The Critical Role of Groundwater in Sourcing the Headwaters of the World”. The Birdsall-Dreiss Lecture will be given on Tue. at 4:30-5:30 where Dr. David Boutt will speak on “Water and Lithium - The nexus of hydrogeosciences and green energy in the transition from fossil fuels”.

The Division sponsors 2 main events for students during the annual meeting. The Career and Networking Event will be held on Tuesday from 2:30-4:30. This is an informal, roundtable event where students can talk with professionals working in the private sector and for government, academia, and non-profit organizations. Thanks to Cara Peterman and Kallina Dunkle for organizing this event.

The other main event is the Student Reception which will be held on Tue. Nov. 6 from 5:30-8:00. This is an informal gathering of students and professionals with a game show where students compete for donated prizes. If you would like to donate (textbooks, software, lab analyses voucher…), please drop your donation by the Hydrogeology Division booth (#836). And thanks to Tara Root for coordinating this event.

I’d also like to thank Andrea Brookfield for her many years of service as the editor of this newsletter. Andrea is “retiring” as newsletter editor to join the Division Management Board. In related news, we are looking for the next newsletter editor, so please contact me if you or anyone you know is interested.

This my last Chair’s Corner as I pass the Chair on to Bill Cunningham at the end of the annual meeting. However, the Hydrogeology Division is my professional home and I will continue to serve the Division particularly with respect to mentoring the next generation of hydrogeologists.

Steve
Ge 2018 O.E. Meinzer Award Recipient

The O.E. Meinzer Award will be presented to Dr. Shemin Ge with the Department of Geological Sciences at the University of Colorado-Boulder during the Division luncheon at the Indianapolis GSA meeting. Shemin received her Ph.D. from the John Hopkins University. Before she joined the University of Colorado-Boulder she worked with the hydrogeology consulting firm S.S. Papadopulos and Associates. Her research focuses on the interactions between pore-pressure and rock-deformation. She is a Fellow of GSA and was the Birdsall-Dreiss lecturer in 2016.

In support of Shemin’s Meinzer Award, seven works were cited (see inset). These works fundamentally advanced our understanding of groundwater’s role in inducing earthquakes. As detailed by her citationist, Dr. Jonathan Godt, the first two publications “inserts hydrogeology in the discussion of earthquake triggering, challenging geophysicists to expand their perspectives beyond traditional solid mechanics.” The remaining five works detail her role in understanding the role of wastewater injection in induced seismicity, including further advances in the physics of pore pressure generation and diffusion from injection.

Her research has generated much public interest, and she demonstrated her ability to communicate complex science through public media, including numerous radio and newspaper outlets. Given her vital contributions illustrated by the seven works cited here, Shemin Ge is this year’s recipient of the Hydrogeology Division’s O.E. Meinzer Award.

Papers Cited For The Meinzer


Halihan Receives the 2018 George Maxey Distinguished Service Award

Dr. Todd Halihan

The 2018 George Burke Maxey Distinguished Service Award is presented to Dr. Todd Halihan, Professor of Geology at the Pickens School of Geology at Oklahoma State University. Todd received a BS in physics from Monmouth College, an MS in geology from the University of Missouri, and a PhD from the University of Texas. He spent 12 months with CSIRO in Australia during his PhD. In addition to his position at OSU, Todd is also Chief Technical Officer at Aestus LLC, which uses hydrogeophysics for subsurface characterization and assessing sustainable water supplies. Todd is also a professional driller in the state of Oklahoma and a PADI divemaster (Professional Association of Diving Instructors).

Todd has been involved in GSA and the division since he was a student when he hosted and fundraised for GSA’s first International/Internet Symposium at the 1998 Annual Meeting in Toronto. He is a Fellow of the GSA and was Hydrogeology Division Chair in 2012-2013. He was the South-Central Section Chair in 2014 and chaired the 49th South-Central meeting in 2015. Those who attend the Hydrogeology Division’s student reception at GSA annual meetings recognize Todd as the emcee, developing and running the trivia contest for many years.

Todd’s service work extends beyond GSA. He has also served as Secretary Treasurer for the US National Chapter of the International Association of Hydrogeologists and has been associate editor for Ground Water. At OSU Todd received the 2015 Karin & Robert J. Sternberg Award for Excellence in Advancement of the Land Grant Mission of Oklahoma State University, the 2009 Inventor Recognition Award, and the 2006 Sterling L. (Bud) Burks Award for Outstanding Staff Environmental Research.

Todd’s research focuses on characterizing complicated hydrogeology in fracture, karstic or contaminated sites using physical hydrogeologic methods and electrical geophysical techniques to solve fluid flow and transport problems. With the onset of seismic activity in Oklahoma associated with injection of saline waters and flow back fluids, Todd has become the representative for the scientific community and has been cited nationwide on these issues.

In light of these past and continued contributions to the Division, the Hydrogeology Division is pleased to present Dr. Todd Halihan with the 2017 George Burke Maxey Distinguished Service Award.

Want to know what’s going on within the Division? Then visit our website at:
<http://community.geosociety.org/hydrodivision>
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
Jasechko is the 2018 Recipient of the Kohout Early Career Award

Dr. Scott Jasechko

The 2018 Kohout Early Career Award is presented to Dr. Scott Jasechko, Assistant Professor in the Bren School of Environmental Science and Management at the University of California at Santa Barbara. Scott completed his Masters at the University of Waterloo, and received his PhD from the University of New Mexico. After his PhD he spent three years at the University of Calgary as faculty before joining UCSB in 2017.

Scott’s recent research include a trio of papers in Nature Geoscience evaluating the ‘ages’ of fresh water in rivers and aquifers around the world. This work demonstrated that approximately one third of global river waters are ‘young’ (water that takes less than a few months to reach the river), while global aquifers are dominated by ‘fossil waters’ (water recharged before the current Holocene epoch began). His follow-on research explores the abundance and depth of groundwater wells around the world, providing a glimpse into the ways that humans rely upon and impact Earth’s groundwater reserves.

Scott’s citationist, Dr. M. Bayani Cardenas, notes that in addition to his scientific achievements, that “Scott is one of my favorite collaborators. You cannot help but be inspired when you talk to him. His energy, drive and passion are contagious. His character is something to be modeled.”

In light of Scott’s impressive research and publication record the Hydrogeology Division is proud to present Dr. Scott Jasechko with the 2018 Kohout Early Career Award.

We hope to see you at all the Division events at the 2018 Annual Meeting in Indianapolis!

Darcy Distinguished Lecture
Monday, November 5, 2018
4:00 - 5:00pm
Indiana Convention Center
Sagamore Ballroom 6

Luncheon, Awards & Business Meeting
*Ticket Required*
Tuesday, November 6, 2018
11:30am - 2:30pm
Indiana Convention Center
Sagamore Ballroom 6

Careers and Networking Event
Tuesday, November 6, 2018
2:30pm - 4:30 pm
Indiana Convention Center
Sagamore Ballroom 4

Birdsall Dreiss Lecture
Tuesday, November 6, 2018
4:30 - 5:30pm
Indiana Convention Center
Sagamore Ballroom 6

Student Reception
Tuesday, November 6, 2018
5:30 - 8:00pm
Indiana Convention Center
Sagamore Ballroom 4
Dr. Laura Crossey is a professor in the Department of Earth & Planetary Sciences at the University of New Mexico. She received her Bachelor's degree in geology at Colorado College (1977) and Master's degree at Washington University in St Louis (1979). Her master's thesis was on the trace element geochemistry of basalts from the Rio Grande rift as part of the Terrestrial Basaltic Volcanism project in the 1970's (advisor Dr. Larry Haskin). She earned her Ph.D. from the University of Wyoming (Laramie, Wyoming, USA) in 1985 on the Origin and Role of Organics During Burial Diagenesis under the direction of Dr. Ronald C. Surdam. She joined the faculty at UNM in 1986 (first woman tenured, first woman full professor, first woman Chair). Her research group explores applications of low-temperature geochemistry to problems in hydrochemistry, diagenesis, geomicrobiology, and geothermal processes. Her research approach combines field examination of modern environments (water, gas, geomicrobial materials and sediments) with laboratory analysis as well as core and outcrop study to evaluate paleohydrology, spring sustainability and reservoir/aquifer characteristics. Related activities include geoscience outreach, K-12 outreach, and science education research as well as programs to increase the participation of under-represented groups in science. She is a Co-Investigator on the NSF-funded statewide New Mexico Alliance for Participation. Her research on carbonic springs has taken her to the Great Artesian basin of Australia, the Western Desert of Egypt, and the Tibetan Plateau. Laura has served the hydrogeologic and broader geoscience communities on proposal and academic program review panels and volunteer boards. A list of her publications may be found on her public Google Scholar profile. She has been a member of GSA since 1997 and a Fellow since 2012. She was awarded Lifetime Membership to the New Mexico Geological Society on the basis of her service. She has served as President and past-President of the Sedimentary Geology Division, convened many topical sessions at GSA national meetings, and served as Technical Program Chair for the Rocky Mountain Division. She has served as Associate Editor for GSA Bulletin, Geochimica et Cosmochimica Acta and Applied Geochemistry, and was editor of SEPM Special Publications. She and her husband Karl Karlstrom were awarded an Outstanding Achievement Award by the American Institute of Professional Geologists in 2015 for designing and building the Trail of Time, a geoscience exhibition at the Grand Canyon (funded by the National Science Foundation, and recognized as Best Wayside Exhibit by the National Association for Interpretation in 2011).

Institutions can schedule a visit by completing the request form here. Crossey will present one lecture on one of the topics described below. She is also happy to present brown bags or visit with faculty, staff and/or students on topics such as Inclusion and Diversity in STEM.

**Birdsall Dreiss Lecture Abstracts**

1. **Chasing Helium: Mantle-to-Surface Connections to Water Quality and Geomicrobiology.**
   The discovery of oceanic black (and white) smokers revolutionized our understanding of mid-ocean ridges and led to the recognition of new organisms and ecosystems resulting from mixing of fluids. Continental smokers, defined here to include a broad range of carbonic springs, hot springs, and
## Hydrogeology Division Sponsored/Co-Sponsored Sessions

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<tr>
<th>Session Title</th>
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<tr>
<td>T93. Measuring and Modeling Fluxes across the Surface Water/Groundwater Interface I</td>
<td>SU</td>
<td>8:00 AM - 11:15 AM</td>
<td>Room 132</td>
</tr>
<tr>
<td>T102. Dye Tracing and Emerging Environmental Tracers in Hydrogeology</td>
<td>SU</td>
<td>8:00 AM - 11:45 AM</td>
<td>Room 133</td>
</tr>
<tr>
<td>D12. Hydrogeology (Posters)</td>
<td>SU</td>
<td>9:00 AM - 5:30 PM</td>
<td>Halls J-K</td>
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<tr>
<td>T47. Global Drinking Water and Public Health: Conditions, Contaminants, Concerns, and Strategies (Posters)</td>
<td>SU</td>
<td>9:00 AM - 5:30 PM</td>
<td>Halls J-K</td>
</tr>
<tr>
<td>T105. A Showcase of Undergraduate Research in Hydrogeology (Posters)</td>
<td>SU</td>
<td>9:00 AM - 5:30 PM</td>
<td>Halls J-K</td>
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<tr>
<td>T2. Cave and Karst Research in Indiana and Kentucky: A Tribute to Art Palmer, Peg Palmer, and Dick Powell</td>
<td>SU</td>
<td>1:30 PM – 5:10PM</td>
<td>Room 130-131</td>
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<tr>
<td>T14. Mining Wastes in the Tri-State Mining District of Kansas, Missouri, and Oklahoma: Advances in Characterization and Remediation</td>
<td>SU</td>
<td>1:30 PM - 5:00 PM</td>
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<tr>
<td>T57. Undergraduate Research Talks: The Next Step in Student Research Projects</td>
<td>SU</td>
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<tr>
<td>T93. Measuring and Modeling Fluxes across the Surface Water/Groundwater Interface II</td>
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<tr>
<td>T101. Advances in Data Discovery and Analysis for Hydrogeology</td>
<td>SU</td>
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<td>T3. Karst Hydrology and Hydrogeology</td>
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<tr>
<td>T13. Global Warning: Accelerating Rates of Change Forewarn of Catastrophic Impacts I</td>
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<td>T95. Climate Variability, Change, and Water Resources</td>
<td>MO</td>
<td>8:00 AM - 11:35 AM</td>
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<tr>
<td>T109. Hydrogeology and Energy</td>
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Hepburn Mineral Springs, Australia

This photo is from the Hepburn Mineral Springs Reserve near Hepburn Springs, Victoria, Australia. This reserve contains mineral springs that have been used for bathing and drinking since the late 1880s, and have been in continuous use since then. A bath house was established in the 1890s, and remained a popular tourist destination until after the Second World War. A resurgence in popularity in the springs in the 1980s led to an extensive renovation of the bath house.

The springs are the best known of the more than 100 mineral springs in Victoria’s Central Highlands that were first inventoried by the Geological Survey of Victoria in 1910. The reserve was created in 1968 to protect the springs from gold mining activities, and has since expanded.

Information sources:
Victorian Heritage Database:
vhd.heritagecouncil.vic.au

Sulphur Spring, Hepburn Mineral Springs, Australia
Photo credit: Ed Harvey
Robertson is the Recipient of 2018 IAH International Service Award

Dr. Wendy Robertson

By Andy Manning

Dr. Wendy Robertson of Central Michigan University has been selected to receive the 2018 International Association of Hydrogeologists U.S. Chapter's International Service Award. The Award recognizes the efforts of hydrogeologists based in the United States who have shown an outstanding commitment to assisting the international community with groundwater-related needs.

Wendy is receiving the International Service Award in recognition of her tireless and selfless work over the past eight years with Well Aware, an international nonprofit organization that provides drinking water systems in areas of water scarcity. Wendy’s work as lead hydrogeologist has been instrumental in successfully providing clean and sustainable water systems for 52 communities and over 220,000 people in east Africa in great need. Her commitment, technical expertise, and willingness to work extensively on the ground directly with benefiting communities (taking numerous trips to east Africa) is a major reason why Well Aware boasts a 100% project success rate. This is truly exceptional in east Africa, where many water systems installed by nonprofits fail within a year of installation, and it could not be achieved without Wendy’s dedication of countless hours of careful planning, smart implementation, and persistent follow-up on projects. Amazingly, she has performed this work largely on her own time, while maintaining a full-time faculty position at Central Michigan University. As an Assistant Professor in the Department of Earth and Atmospheric Sciences at CMU, she further shares her passion for helping communities in desperate need of clean water by mentoring students involved with projects providing water to critical need areas.

The Award will be presented to Wendy during the Hydrogeology Division Luncheon and Awards Ceremony at the Geological Society of America Annual Meeting in Indianapolis, Indiana on Tuesday, November 6th. We hope you can join us there for the presentation.

Congratulations Wendy!

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 conference? An announcement of interest to the hydrological community? If so, why not publish it in The Hydrogeologist? Send your submission ideas to abrookfield@ku.edu

STUDENTS, WE WANT TO HEAR FROM YOU TOO!
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<td>T103. Springs: Groundwater-Influenced Ecosystems, Gaining Streams, and Wetlands (Posters)</td>
<td>MO</td>
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<td>MO</td>
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<td>T47. Global Drinking Water and Public Health: Conditions, Contaminants, Concerns, and Strategies</td>
<td>MO</td>
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<td>Room 238-239</td>
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<td>T96. Large Watershed to National Scale Data and Science for Water Management</td>
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<td>T103. Springs: Groundwater-Influenced Ecosystems, Gaining Streams, and Wetlands</td>
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<td>GSA Hydrogeology Division: Henry Darcy Distinguished Lecture</td>
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<tr>
<td>T94. Water Temperatures in Surface and Subsurface Hydrologic Systems: Controls, Applications, and Implications</td>
<td>TU</td>
<td>8:00 AM - 11:45 AM</td>
<td>Room 133</td>
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<tr>
<td>T98. Satellite Remote Sensing Applications in Hydrology and Geology</td>
<td>TU</td>
<td>8:00 AM - 11:45 AM</td>
<td>Room 132</td>
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<td>4:30 PM - 5:30 PM</td>
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<tr>
<td>T65. Recent Advances in Using Near-Surface Geophysics to Solve Geological Problems (Posters)</td>
<td>WE</td>
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<tr>
<td>T99. Five Decades of Impactful Ideas in Hydrogeology: Recognizing the Contributions of Frank Schwartz</td>
<td>WE</td>
<td>8:00 AM - 12:00 PM</td>
<td>Room 132</td>
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<tr>
<td>T107. Arsenic, Manganese, Chromium, and Other Geogenic Contaminants, Including Radionuclides in Hydrological Systems—Source, Biogeochemical Cycling, Toxicity, and Removal I</td>
<td>WE</td>
<td>8:00 AM - 11:45 AM</td>
<td>Room 133</td>
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<tr>
<td>T172. Critical Zone Science—Bio-Geo Interactions across Environmental Gradients and Time</td>
<td>WE</td>
<td>8:00 AM - 11:45 AM</td>
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<tr>
<td>T40. Machine-Learning and Artificial-Intelligence Applications in the Geosciences (Posters)</td>
<td>WE</td>
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<td>9:00 AM - 6:30 PM</td>
<td>Halls J-K</td>
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<tr>
<td>T6. Critical Zone Science in Karst and Carbonate Terrains</td>
<td>WE</td>
<td>1:30 PM - 5:00 PM</td>
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<tr>
<td>T65. Recent Advances in Using Near-Surface Geophysics to Solve Geological Problems</td>
<td>WE</td>
<td>1:30 PM - 5:00 PM</td>
<td>Room 235</td>
</tr>
<tr>
<td>T100. Applications and Advances in Groundwater Flow Modeling</td>
<td>WE</td>
<td>1:30 PM - 5:30 PM</td>
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<tr>
<td>T107. Arsenic, Manganese, Chromium, and Other Geogenic Contaminants, Including Radionuclides in Hydrological Systems—Source, Biogeochemical Cycling, Toxicity, and Removal II</td>
<td>WE</td>
<td>1:30 PM - 5:10 PM</td>
<td>Room 133</td>
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Welcome to the Fall 2018 edition of The Hydrogeologist. This edition focuses on the upcoming 2018 GSA Annual Meeting in Indianapolis from November 4-7, including Division events, and Division sponsored topical sessions. This edition also includes information about all the 2018 awardees, including those for the O.E. Meinzer award, the George Burke Maxey Service Award, and the Kohout Early Career Award.

We hope to see you in Indianapolis. As usual, if you have any comments or article ideas please pass them on to me at abrookfield@ku.edu.
fumaroles that vent mantle-derived fluids in continental settings, exhibit many of the same processes of heat and mass transfer and ecosystem niche differentiation. The application of noble gas geochemistry (specifically helium isotope (3He/4He) analyses) indicates widespread mantle degassing in perhaps unexpected tectonic locales: including the western U.S.A., Great Artesian basin of Australia, Western Desert of Egypt, and the Tibetan Plateau. Our work shows that variations in the mantle helium component measured in groundwaters correlate best with low seismic-velocity domains in the upper mantle and with abrupt lateral contrasts in mantle velocity rather than crustal parameters such as strain rate, proximity to volcanoes, crustal velocity, or composition. Microbial community analyses applied to several of these areas indicate that these springs can host novel microorganisms. Our work yielded the first published occurrence of chemolithoautotrophic Zetaproteobacteria in a continental setting. These observations lead to two linked hypotheses. 1) that mantle-derived volatiles transit through conduits in extending continental lithosphere preferentially above and at the edges of mantle low velocity domains. 2) Elevated concentrations of CO2 and other constituents ultimately derived from mantle volatiles drive water–rock interactions and heterogeneous fluid mixing that help structure diverse and distinctive microbial communities. This recognition of the small volume but chemically potent “lower world” contributions to groundwater systems has implications for topics as diverse as tectonics, fluid conduits, water quality, and microbial ecosystems.

2. Hydrochemistry and Geoscience Education at Grand Canyon and Beyond: Who Knew Groundwater Hydrology Could Be So Complicated?

Springs and associated riparian environments provide critical habitats for both aquatic and terrestrial wildlife in the Grand Canyon region. Springs also provide drinking water for Grand Canyon National Park (GCNP). Grand Canyon springs are fed by world-class karst aquifer systems (both shallow and deep) on the Colorado Plateau, but increasing pressure on groundwater resources from climate change, mining and other development activities pose major challenges to resource managers. The shallow and deep karst systems of the region interact in ways that are revealed by recent studies. General hydrologic models for the Colorado Plateau aquifers highlight the importance of recharge areas (‘springsheds’) for water supply.

Ongoing work by several groups is helping to understand these complex relationships using multiple tracer methods. A robust monitoring and geochemical sampling program can provide data for understanding the sustainability of spring-fed water supplies for anthropogenic use. Our ongoing geochemical studies of spring waters (including dissolved gases) have identified the importance of mantle-derived volatiles and CO2 that contribute dissolved salts and other products of water-rock interactions at depth to the regional aquifer systems. Faults are important conduits for fluid transport and mixing and hence impart a tectonic influence on water quality. The result is a multi-porosity system resulting from variable ages and mixing of meteoric recharge, karst system transport, matrix sandstone transport, fault connectivity, and endogenic inputs. Quantitative forecasting of the effects of climate change on water quality depends on our understanding of these deep inputs (diminishing surface flows affecting recharge rates), as well as aquifer recharge flowpaths and quantities. Results from Grand Canyon and other spring-supported stream systems in the western U.S. indicate the need for development of hydrologic baselines that recognize these complexities. This can be accomplished through use of both natural and artificial tracers to unravel mixing and environmental sensors to monitor real time changes. These investments are needed to inform water management decisions that address societal and ecosystem needs.
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