

KARST, GROUNDWATER CONTAMINATION & PUBLIC HEALTH: MOVING BEYOND CASE STUDIES

January 27-30, 2016
San Juan, Puerto Rico

*TECHNICAL PROGRAM
Meeting Edits and Locations*



KWI Meeting Room Locations at the Condado Plaza Hilton

Day	Time	Session or Event	Location
Wednesday January 27th	4:00 pm	Registration opens	Outside Laguna 1
	6:30 pm -7:30 pm	Reception	Laguna 1
	7:30 pm – 9:30 pm	Opening remarks and keynote address	Laguna 1
Thursday January 28th	8:30 am – 11:40 am	Morning technical session	Laguna 1
	1:30 pm – 5:00 pm	Afternoon technical session	Laguna 1
	5:00 pm – 5:30 pm	Snap talks	Laguna 1
Friday January 29th	8:30 am – 11:45am	Morning technical session	Laguna 1 or 2
	1:00 pm – 4:00 pm	Afternoon technical session	Laguna 1 or 2
	4:00 pm – 7:00 pm	Poster session and reception	Laguna 1
Saturday January 30th	8:30 am – 12:45 pm	Morning technical session	Laguna 1
	Depart 2:00 pm Return ~ 5:00 pm	Local field trip	Buses will be outside the front door of hotel
	7:00 – 10:00 pm	Closing banquet and awards ceremony	Ocean Garden (Laguna 1 if bad weather)
Sunday January 31st	Depart 7:30 am		Buses will be outside the front door of hotel

Wednesday January 27, 2016 – Evening session 6:30 pm – 9:30 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Opening Session	
Moderator: Jack Hess	
6:30 pm	Opening Reception (Guests welcome)
7:30 pm	Welcoming Session
	Welcome by President of the Karst Waters Institute Janet S. Herman University of Virginia
	Welcome by Conference Chair Dorothy J. Vesper West Virginia University
	Welcome by Local Host Ingrid Y. Padilla University of Puerto Rico-Mayagüez
	Welcome by National Institutes of Health-National Institute of Environmental Health Sciences Heather Henry National Institute of Environmental Health Sciences
8:15 pm	<u>Keynote Lecture:</u> The Puerto Rico test site for exploring contamination threats (PROTECT) and the intersection of karst and public health science José F. Cordero ¹ and Akram Alshawabkeh ² ¹ University of Georgia; ² Northeastern University

Thursday January 28, 2016 – Morning session 8:30 am – 11:40am

<i>Start time</i>	<i>Title, Author, Affiliation</i>
8:30 am	Orientation to the day's presentations Technical Program Committee
Current state of knowledge in karst contaminant transport <p style="text-align: right;">Moderator: Dorothy Vesper Assistants: Amy Brown and Vilda Rivera</p>	
8:40 am	Keynote Lecture: Contaminant transport in karst aquifers: Systematics and mechanisms? William B. White The Pennsylvania State University
9:10 am	Keynote Lecture: Fate, transport, and exposure of emerging and legacy contaminants in karst systems: State of knowledge and uncertainty Ingrid Y. Padilla ¹ , William B. White ² , and Dorothy J. Vesper ³ ¹ University of Puerto Rico-Mayagüez; ² The Pennsylvania State University; ³ West Virginia University
Contaminants and tools for investigating contaminant transport <p style="text-align: right;">Moderator: Ellen Herman Assistants: Amy Brown and Vilda Rivera</p>	
:9:40 am	Microbial contamination in karst: From monitoring to process comprehension Michael Sinreich Swiss Federal Office for the Environment
10:00 am	Coffee Break
10:20 am	Comparative study of specific groundwater vulnerability of a karst aquifer in Central Florida Philip E. van Beynen ¹ , Michael Niedzielski ² , Elzbieta Bialkowska-Jelinska ¹ , and Kamal Alsharif ¹ ¹ University of South Florida; ² University of North Dakota
10:40 am	Mobility of <i>Escherichia coli</i> compared to traditional groundwater tracers within karst terrains Ashley Bandy ¹ , Alan Fryar ¹ , Kim Cook ² , Jason Polk ³ , Kegan McClanahan ³ , and Stephen Macko ⁴ ¹ University of Kentucky; ² U.S. Department of Agriculture-Agricultural Research Service; ³ Western Kentucky University; ⁴ University of Virginia
11:00 am	Selected micropollutants as indicators in a karst catchment Johannes Zirlewagen ¹ , Ferry Schiperski ¹ , Olav Hillebrand ² , Karsten Nödler ³ , Tobias Licha ² , and Traugott Scheytt ¹ ¹ Technische Universität Berlin; ² University of Göttingen; ³ Water Technology Center Karlsruhe
11:20 am	Lunch on your own

Thursday January 28, 2016 – Afternoon session 1:30 pm – 6:00 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
1:30 pm	Summary of morning talks & discussion Technical Program Committee
Contaminants and tools for investigating contaminant transport (continued) <i>Moderators: William White and William Jones</i> <i>Assistants: Norma Torres and Jonathan Toro</i>	
1:50 pm	Relationship between organic micropollutants and hydro-sedimentary processes at a karst spring in southwest Germany Ferry Schiperski ¹ , Johannes Zirlewagen ¹ , Olav Hillebrand ² , Karsten Nödler ^{2,3} , Tobias Licha ² , and Traugott Scheytt ¹ ¹ Technische Universität Berlin; ² University of Göttingen; ³ Water Technology Center Karlsruhe
2:10 pm	Integrated strategy to guide microbial quality management at alpine karst water resources: Part I – Hydrogeological investigations to elucidate fecal pollution dynamics Hermann Stadler ¹ , Regina Sommer ² , Wolfgang Zerobin ³ , and Andreas H. Farnleitner ⁴ ¹ Joanneum Research; ² Medical University of Vienna; ³ Vienna Water; ⁴ Technische Universität Wien
2:30 pm	Integrated strategy to guide microbial quality management at alpine karst water resources: Part II – Towards fecal hazard characterization and risk management Andreas H. Farnleitner ¹ , Regina Sommer ² , Georg Reischer ¹ , Alexander Kirschner ² , Wolfgang Zerobin ³ , and Hermann Stadler ⁴ ¹ Technische Universität Wien; ² Medical University of Vienna; ³ Vienna Water; ⁴ Joanneum Research
2:50 pm	Trace metal accumulation and cycling in phreatic karst conduits Amy L. Brown , Jonathan B. Martin, George Kamenov, and Elizabeth Screatton University of Florida
3:10 pm	Coffee break
3:30 pm	Natural and enhanced bioremediation of contaminants in karst aquifers Thomas Byl ^{1,2} , Michael Bradley ¹ , and Roger Painter ² ¹ U.S. Geological Survey-Water Science Center; ² Tennessee State University
3:50 pm	Development of the electrochemical technologies for remediation of contaminated groundwater Ljiljana Rajic , Noushin Fallahpour, Roya Nazari, and Akram Alshawabkeh Northeastern University
4:10 pm	Investigating and remediating contaminated karst aquifers Malcolm S. Field ¹ and Neven Kresic ² ¹ U.S. Environmental Protection Agency; ² Amec Foster Wheeler Americas
4:30 pm	Discussion and day summation Technical Program Committee
5:00 pm	Snap Talks <i>Moderator: Ellen Herman</i> <i>Assistant: Norma Torres</i>
6:00 pm	Dinner on your own

Friday January 29, 2016 – Morning session 8:30 am – 11:50am

<i>Start time</i>	<i>Title, Author, Affiliation</i>
8:30 am	Orientation to the day's presentations Technical Program Committee
Exposure concentrations and human health Moderator: Janet Herman Assistants: Mohammad Shokri and Ashley Bandy	
8:40 am	Factors influencing the occurrence and the fate of <i>E.coli</i> population in karst hydrosystem Fabienne Petit¹ , Thierry Berthe ¹ , Erick Denamur ² , Olivier Clermont ² , Nicolas Massei ¹ , Jean-Paul Dupont ¹ , Philip C. Bennett ³ , Manon Michaud ¹ , and Gautier Chaix ¹ ¹ Normandie Université; ² Université Paris Diderot; ³ University of Texas
9:00 am	Using enteric pathogens to assess sources of fecal contamination in the Silurian dolomite aquifer: Preliminary results Maureen A. Muldoon¹ , Mark A. Borchardt ² , Susan K. Spencer ² , Laura Hubbard ³ , and Randall J. Hunt ³ ¹ University of Wisconsin-Oshkosh; ² U.S. Department of Agriculture-Agricultural Research Service; ³ U.S. Geological Survey-Wisconsin Water Science Center
9:20 am	Potential exposure of emerging contaminants in karst groundwater through tapwater sources Norma I. Torres , Ingrid Y. Padilla, and Vilda L. Rivera University of Puerto Rico-Mayagüez
9:40 am	Environmental exposures among pregnant women in the northern karst region of Puerto Rico John Meeker University of Michigan
10:00 am	Coffee Break
10:20 am	Keynote Lecture: Cholera and climate: The Haiti experience Rita R. Colwell University of Maryland
11:20 am	Discussion – Integrating geology and human health Technical Program Committee
11:50 am	Lunch on your own

Friday January 29, 2016 – Afternoon session 1:00 pm – 7:00 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
1:00 pm	Summary of morning talks & discussion Technical Program Committee
Exposure concentrations and human health (continued) <i>Moderators: Ljiljana Rajic and Ingrid Padilla</i> <i>Assistants: Felix Santiago and Jonathan Toro</i>	
1:10 pm	Keynote Lecture: Beyond case reports: Placing karst in context in public health response to groundwater contamination Marian Rutigliano U.S. Environmental Protection Agency
1:40 pm	Spatiotemporal assessment of CVOC contamination in karst groundwater sources and exposure at tap water point of use Vilda L. Rivera , Ingrid Y. Padilla, and Norma I. Torres University of Puerto Rico-Mayagüez
2:00 pm	Social determinants of contaminant exposure and maternal and child health in the northern karst of Puerto Rico Nancy Cardona ¹ , Carmen M. Vélez Vega ¹ , José Cordero ² , Colleen Murphy ¹ , Carlos Vergara ¹ , John Meeker ³ , Akram Alshawabkeh ⁴ , and Liza Anzalota ¹ ¹ University of Puerto Rico-Medical Sciences Campus; ² University of Georgia; ³ University of Michigan; ⁴ Northeastern University
2:20 pm	Phytoforensics: Using plants as biosentinels of in-home exposure pathways Joel G. Burken Missouri University of Science and Technology
2:40 pm	Coffee break
3:00 pm	Moving beyond case studies: Research examples from mountaintop removal coal mining Michael Hendryx Indiana University
3:20 pm	Frameworks for protecting public health in the context of surface water recreation: Implications for karst research Samuel Dorevitch University of Illinois-Chicago
3:40 pm	Discussion and day summation Technical Program Committee
4:00 pm	Poster session & reception (Guests welcome) <i>Moderator: Noelma Galiano</i> <i>Assistants: Vilda Rivera and Ashley Bandy</i>
7:00pm	Dinner on your own

Saturday January 30, 2016 – Morning session 8:30 am – 12:45 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
8:30 am	Orientation to the day's presentations, poster discussion Technical Program Committee
Orientation to the geology and hydrology of Puerto Rico <i>Moderator: William White</i> <i>Assistants: Felix Santiago and Mohammad Shokri</i>	
9:00 am	Keynote Lecture: The karst regions of Puerto Rico Thomas Miller University of Puerto Rico-Mayagüez
10:00 am	Coffee break
Regulatory issues in karst water resources <i>Moderator: Marian Rutigliano</i> <i>Assistants: Felix Santiago and Mohammad Shokri</i>	
10:20 am	Protecting the karstic corner: A challenge to Minnesota's drinking water James L. Berglund ¹ , Justin L. Blum ² , and Emily Berquist ² ¹ Temple University; ² Minnesota Department of Health
10:40 am	Karst – Fitting regulatory square pegs into round holes Jesse J. Richardson, Jr. West Virginia University
11:00 am	On the implementation of environmental indices in karst Marianna Mazzei ¹ and Mario Parise ² ¹ Salento University; ² National Research Council-Research Institute for Hydrogeological Protection
11:20 am	Addressing hazardous materials releases in karst terrains Geary M. Schindel Edwards Aquifer Authority
San Juan Bay Estuary System & communities <i>Moderator: Dorothy Vesper</i> <i>Assistants: Jonathan Toro and Mohammad Shokri</i>	
11:40 am	Introduction to the San Juan Bay Estuary System Ingrid Padilla University of Puerto Rico-Mayagüez
11:45 am	Introduction to the San Juan Bay Estuary System – Representatives from the Martin Peña Communities will talk about the challenges confronting those who live along the tidal channel ENLACE.org
12:45 pm	Lunch on your own

Saturday January 30, 2016 –Local field trip 2:00 pm – 5:00 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Field trip to community environmental project focused on San Juan Bay Estuary	
2:00 pm	Field trip to community environmental project departs
5:00 pm	Field trip returns to conference hotel

Saturday January 30, 2016 – Evening session 7:00 – 10:00 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Closing banquet and awards ceremony	
	Moderator: Janet Herman
7:00 pm	Closing banquet
8:00 pm	Concluding remarks by Conference Chair Dorothy J. Vesper West Virginia University
	Concluding remarks by Local Host Ingrid Y. Padilla University of Puerto Rico-Mayaguez
	Concluding remarks from Chair of the Board of Directors, KWI Jack Hess Geological Society of America Foundation
	Presentation of KWI Karst Award for 2016 by President, KWI Janet S. Herman University of Virginia
8:30 pm	<i>Award Lecture:</i> Puerto Rico's karst protection – Beyond the law and regulations Abel Vale Nieves Ciudadanos Del Karso

Posters – Friday January 29, 2016 – 4:00 pm – 7:00 pm **Moderator: Noelma Galiano**

<i>Poster #</i>	<i>Title, Author, Affiliation</i>
1	Cave characterization in the north coast karst belt zone of Puerto Rico Ángel A. Acosta-Colón University of Puerto Rico-Arecibo
2	Bassett's Cave Bermuda Maureen Handler and John Hoffelt Southern Environmental Technologies
3	Improving the karst groundwater catchment area isohyet map of Río Tanamá, Arecibo Puerto Rico, using a geographic information system software method Orializ Martínez Román and Thomas E. Miller University of Puerto Rico-Mayagüez
4	Development and testing of hydrogel beads as potential tracers of contaminant movement in karst aquifers Dorothy J. Vesper ¹ , Amanda F. Laskoskie ² , Habib Bravo-Ruiz ¹ , and Harry M. Edenborn ³ ¹ West Virginia University; ² Weston Solutions; ³ National Energy Technology Laboratory
5	Assessment of flow and transport properties in an intermediate karstified lab-scale physical model using hydraulic and tracer response analysis Jonathan Toro-Vázquez and Ingrid Y. Padilla University of Puerto Rico-Mayagüez
6	Clastic sediments in karst as a vehicle for contaminant transport: Lithofacies and transport mechanisms Rachel Bosch and William B. White The Pennsylvania State University
7	Delineation of a major karst spring basin with multiple input points, Roaring River, Tennessee Ryan Gardner , Evan Hart, Steve Anderson, Sid Jones, Chuck Sutherland, and Joseph Asante Tennessee Technological University
8	Water tracing tests and public health in karst areas William K. Jones Karst Waters Institute
9	Quantitative dye studies to evaluate the spill response system for Mammoth Cave National Park JeTara Brown ¹ , Rickard Toomey, III ² , and Lonnie Sharpe, Jr. ¹ ¹ Tennessee State University; ² Mammoth Cave National Park
10	Stormwater runoff characterization and treatment system efficiency analysis in Mammoth Cave National Park Hung-Wai Ho ¹ , David Solomon ¹ , and Rick Toomey ² ¹ Tennessee State University; ² Mammoth Cave National Park
11	Anthropogenic nutrient loading on an epigenic karst aquifer in Southeastern Kentucky Gilles V. Tagne and Lee J. Florea Ball State University
12	Current state of metal toxicity and remediation in the Tri-State Mining District, USA Aaron W. Johnson ¹ , Douglas R. Gouzie ² , Melida Gutierrez ² , and L. Rex Mcaliley ¹ ¹ Northwest Missouri State University; ² Missouri State University

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<i>Poster #</i>	<i>Title, Author, Affiliation</i>
13	Where is the greatest potential for superficial contamination in the North Coast Limestone aquifer of Puerto Rico? Ronald T. Richards ¹ , Anastacio Emiliano ¹ , and Rafael Méndez-Tejeda ² ¹ Universidad del Turabo; ² University of Puerto Rico-Carolina
14	Recharge and water-quality controls for a karst aquifer in central Texas Brian A. Smith and Brian B. Hunt Barton Springs/Edwards Aquifer Conservation District
15	Cave monitoring results from Cueva Larga, Puerto Rico Rolf Vieten ¹ , Amos Winter ¹ , Thomas Miller ¹ , Andrea Schroeder-Ritzrau ² , Sophie Winterhalder ² , and Christoph Spötl ³ ¹ University of Puerto Rico-Mayagüez; ² University of Heidelberg; ³ Leopold-Franzens-Universität Innsbruck
16	Cave conduits as receptacles of trash and septic tank contamination of karst in Puerto Rico Thomas Miller University of Puerto Rico-Mayagüez
17	Hydrologic analysis of a poplar-based phytoremediation system Felix L. Santiago Collazo ¹ , Alan J. Rabideau ² , and Beynan Ransom ² ¹ University of Puerto Rico-Mayagüez; ² State University of New York at Buffalo
18	Tennessee cave life relational geodatabase Chuck Sutherland Tennessee Technological University
19	Surface and subsurface karstification of Cheshme-Ali karstic aquifer, NE Iran Mohammad Shokri West Virginia University
20	Human preceptions of anthropogenic impact on the aquifer recharge zone in Santa Isabel, Puerto Rico Betzaida Ortiz-Carrión University of Puerto Rico-Mayagüez

Field trips to the San Juan Bay Estuary & the Martin Peña Communities

These field trips are being led by Excursiones Eco, Inc. These are designed as small-group trips, so we have to split into the Boat Trip and the Community Trip with limited space on each. We have assigned the field trips based mostly on last names – you are free to trade amongst yourselves at the meeting if you have a strong preference for one trip or the other. Please inform Noelma of any changes so we can update the lists. Please also let Noelma know if you are not planning on going on this trip but are on the list. We apologize if you don't get your first choice – but they are both excellent.

Boat Trip	Community Trip
1 Acosta, Angel	1 Bishop, Aaron
2 Bandy, Ashley	2 Bishop, Holly
3 Berglund, Jim	3 Cardona, Nancy
4 Berquist, Emily	4 Herman, Janet
5 Bishop, Jennifer	5 Parise, Mario
6 Bishop, Mark	6 Petit, Fabienne
7 Bishop, Ryan	7 Richards, Ronald
8 Bosch, Rachael	8 Richarson, Jesse
9 Brown, Amy	9 Rivera, Vilda
10 Brown, JeTara	10 Rutigliano, Marian
11 Burken, Joel	11 Schindel, Geary
12 Byl, Tom	12 Schiperski, Ferry
13 Dorevitch, Sam	13 Sinreich, Michael
14 Farnleitner, Andreas	14 Sitler, Jeff
15 Field, Malcolm	15 Smith, Brian
16 Gardner, Ryan	16 Spong, Ronald
17 Handler, Maureen	17 Stadler, Herman
18 Hendryx, Michael	18 Sutherland, Chuck
19 Henry, Heather	19 Tagne, Gilles
20 Hess, Jack	20 Toran, Laura
21 Ho, Hung-Wai	21 Van, Phil
22 Hoffelt, John	22 Vele, Abel
23 Jones, Bill	23 Vieten, Rolf
24 Martinez, Orializ	24 White, Bet
25 Muldoon, Maureen	25 White, Will
26 Nilsson, Bertel	26 Zirlewagen, Johannes
27 Santiago, Felix	27
28 Torres, Norma (support)	
29 Toro, Jonathan (support)	
30 Vangas, Angeliz (support)	

Waiting list: Mohammad Shokri, Ingrid Padilla