

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

January 27-30, 2016
San Juan, Puerto Rico

TECHNICAL PROGRAM



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

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

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Opening Session	
6:30 pm	Opening Reception
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	<i>Keynote Lecture:</i> The Puerto Rico testsite for exploring contamination threats (PROTECT) and the intersection of karst and public health science José F. Cordero¹ and Akram Alshawabkeh² ¹ University of Georgia; ² Northeastern University

KARST, GROUNDWATER CONTAMINATION & PUBLIC HEALTH: MOVING BEYOND CASE STUDIES
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	
8:40 am	Keynote Lecture: Contaminant transport in karst aquifers: Systematics and mechanisms? William B. White The Pennsylvania State University
9:10am	Keynote Lecture: Fate, transport, and exposure of emerging and legacy contaminants in karst systems: State of knowledge and uncertainty Ingrid Y. Padilla¹, William B. White², and Dorothy J. Vesper³ ¹ University of Puerto Rico-Mayagüez; ² The Pennsylvania State University; ³ West Virginia University
Contaminants and tools for investigating contaminant transport	
9:40 am	Quantification of wastewater infiltration and transport processes in karst aquifers Martin Sauter, Sebastian Schmidt, Olav Hillebrand, Karsten Nödler, and Tobias Licha Georg-August-Universität Göttingen
10:00 am	Coffee Break
10:20 am	Microbial contamination in karst: From monitoring to process comprehension Michael Sinreich Swiss Federal Office for the Environment
10:40 am	Comparative study of specific groundwater vulnerability of a karst aquifer in Central Florida Philip E. van Beynen¹, Michael Niedzielski², Elzbieta Bialkowska-Jelinska¹, and Kamal Alsharif¹ ¹ University of South Florida; ² University of North Dakota
11:00 am	Mobility of <i>Escherichia coli</i> compared to traditional groundwater tracers within karst terrains Ashley Bandy¹, Alan Fryar¹, Kim Cook², Jason Polk³, Kegan McClanahan³, and Stephen Macko⁴ ¹ University of Kentucky; ² U.S. Department of Agriculture-Agricultural Research Service; ³ Western Kentucky University; ⁴ University of Virginia
11:20 am	Selected micropollutants as indicators in a karst catchment Johannes Zirlewagen¹, Ferry Schippers¹, Olav Hillebrand², Karsten Nödler³, Tobias Licha², and Traugott Scheytt¹ ¹ Technische Universität Berlin; ² University of Göttingen; ³ Water Technology Center Karlsruhe
11:40 am	Lunch on your own

KARST, GROUNDWATER CONTAMINATION & PUBLIC HEALTH: MOVING BEYOND CASE STUDIES
Thursday January 28, 2016 – Afternoon session 1:30 pm – 6:00 pm

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Contaminants and tools for investigating contaminant transport (continued)	
1:30 pm	Summary of morning talks & discussion Technical Program Committee
1:50 pm	Relationship between organic micropollutants and hydro-sedimentary processes at a karst spring in southwest Germany Ferry Schipperski¹ , 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 Stadler¹ , Regina Sommer ² , Wolfgang Zerobin ³ , and Andreas H. Farnleitner ⁴ ¹ Joanneum Research; ² MedicalUniversity 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. Farnleitner¹ , Regina Sommer ² , Georg Reischer ¹ , Alexander Kirschner ² , Wolfgang Zerobin ³ , and Hermann Stadler ⁴ ¹ Technische Universität Wien; ² MedicalUniversity 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 Sreaton 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-WaterScienceCenter; ² TennesseeStateUniversity
3:50 pm	Development of the electrochemical technologies for remediation of contaminated groundwater LjiljanaRajic , NoushinFallahpour, Roya Nazari, and AkramAlshawabkeh Northeastern University
4:10 pm	Investigating and remediating contaminated karst aquifers Malcolm S. Field¹ 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
7:00pm	Dinner on your own

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

Friday January 29, 2016 – Morning session 8:30 am – 11:45am

<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	
8:40 am	Factors influencing the occurrence and the fate of <i>E.coli</i> population in karst hydrosystem Fabienne Petit ¹ , 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. Muldoon ¹ , 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-WisconsinWaterScienceCenter
9:20 am	Potential exposure of emerging contaminants in karst groundwater through tapwater sources Norma I. Torres 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

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

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

<i>Start time</i>	<i>Title, Author, Affiliation</i>
Exposure concentrations and human health (continued)	
1:00 pm	Summary of morning talks & discussion Technical Program Committee
1:10 pm	<u>Keynote Lecture:</u> Beyond case reports: Placing karst in context in public health response to groundwater contamination Marian Rutigliano U.S. Environmental Protection Agency
1:40pm	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 MissouriUniversity 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 IndianaUniversity
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
7:00pm	Dinner on your own

KARST, GROUNDWATER CONTAMINATION & PUBLIC HEALTH: MOVING BEYOND CASE STUDIES
Saturday January 30, 2016 – Morning session 8:30 am – noon

<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	
9:00 am	<u>Keynote Lecture:</u> The karst regions of Puerto Rico Thomas Miller University of Puerto Rico-Mayagüez
10:00 am	Coffee break
Regulatory issues in karst water resources	
10:20 am	Protecting the karstic corner: A challenge to Minnesota's drinking water James L. Berglund¹ , 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 Parise² 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
11:40 am	Discussion and technical program summation Technical Program Committee
Noon	Lunch on your own

Saturday January 30, 2016 – Afternoon session 1:00 pm – 5:00 pm

<i>Start time</i>	
Field trip to community environmental project focused on San Juan Bay Estuary	
1:00 pm	Introduction to the San Juan Bay Estuary System
2:00 pm	Field trip to community environmental project departs
5:00 pm	Field trip returns to conference hotel

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

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	
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	<u>Award Lecture:</u> Puerto Rico's karst protection – Beyond the law and regulations Abel Vale Nieves Ciudadanos Del Karso

KARST, GROUNDWATER CONTAMINATION & PUBLIC HEALTH: MOVING BEYOND CASE STUDIES
Posters – Friday January 29, 2016 – 4:00 pm – 7:00 pm

<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 OrializMartínezRomán 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	Practical limitations of temperature tracer experiments in karst systems Josue Rodriguez and Matthew D. Covington University of Arkansas
10	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

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<i>Poster #</i>	<i>Title, Author, Affiliation</i>
11	Stormwater runoff characterization and treatment system efficiency analysis in Mammoth Cave National Park Hung-Wai Ho¹ , David Solomon ¹ , and Rick Toomey ² ¹ Tennessee State University; ² Mammoth Cave National Park
12	Anthropogenic nutrient loading on an epigenic karst aquifer in Southeastern Kentucky Gilles V. Tagne and Lee J. Florea Ball State University
13	Current state of metal toxicity and remediation in the Tri-State Mining District, USA Aaron W. Johnson ¹ , Douglas R. Gouzie² , Melida Gutierrez ² , and L. Rex Mcaliley ¹ ¹ Northwest Missouri State University; ² Missouri State University
14	Where is the greatest potential for superficial contamination in the North Coast Limestone aquifer of Puerto Rico? Ronald T. Richards¹ , Anastacio Emiliano ¹ , and Rafael Méndez-Tejeda ² ¹ Universidad del Turabo; ² University of Puerto Rico-Carolina
15	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
16	Cave monitoring results from Cueva Larga, Puerto Rico Rolf Vieten¹ , 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
17	Cave conduits as receptacles of trash and septic tank contamination of karst in Puerto Rico Thomas Miller University of Puerto Rico-Mayagüez
18	Hydrologic analysis of a poplar-based phytoremediation system Felix L. Santiago Collazo¹ , Alan J. Rabideau ² , and Beynan Ransom ² ¹ University of Puerto Rico-Mayagüez; ² State University of New York at Buffalo
19	Tennessee cave life relational geodatabase Chuck Sutherland Tennessee Technological University