

EPA Symposium on Groundwater-Borne Infectious Disease, Etiologic Agents and Indicators

Carnegie Institution of Washington
1530 P St., NW
Washington, DC

December 2 – December 4, 2008

Tuesday, December 2, 2008

Groundwater Epidemiology

- 8:30 – 8:35 a.m. **Welcome**
Audrey Levine, U.S. Environmental Protection Agency (EPA), Office of Research and Development (ORD)
- 8:35 – 8:40 a.m. **Introduction**
Pam Barr, EPA, Office of Water
- 8:40 – 9:10 a.m. **High-Throughput High-Volume Virus Testing of Drinking Water: Protocols and Issues**
Susan K. Spencer, Marshfield Clinic Research Foundation, Marshfield, WI
- 9:10 – 9:30 a.m. **Discussion on “New” Virus Methods (e.g., glass wool, NanoCeram filter, hollow-fiber ultrafiltration, etc.)**
- 9:30 – 10:30 a.m. **Community-Wide Intervention With UV Disinfection for Estimating Risk of Viral Illness From Groundwater Consumption**
Mark A. Borchardt, Marshfield Clinic Research Foundation, Marshfield, WI
- 10:30 – 11:00 a.m. **Discussion on Epidemiology Studies (e.g., the influence of “blinding” in intervention studies, cost and severity of illness, population immunity, etc.)**
- 11:00 – 11:45 a.m. **Risk Assessment of Acute Illness From Virus Intrusions Into Distribution Systems**
Frank Loge and Elisabetta Lambertini, University of California at Davis, Davis, CA
- 11:45 – 12:00 p.m. **Discussion on Recontamination of Distribution Systems (e.g., implications for the forthcoming TCR/Distribution System Rule)**
- 12:00 – 1:00 p.m. **Lunch (on your own)**
- 1:00 – 1:15 p.m. **Discussion of the WAHTER Study Results (e.g., societal implications)**

- 1:15 – 2:00 p.m. **The Epidemiology and Microbial Risk Assessment (EMIRA) Study, 1998-1999, France**
Pierre Le Cann, France School of Public Health, Rennes, France
- 2:00 – 2:15 p.m. **Discussion on EMIRA (e.g., French public health policy as the result of the EMIRA study)**
- 2:15 – 3:00 p.m. **Seven-Year Longitudinal Study at Walkerton Ontario — The Walkerton Health Study**
William Clark, University of Western Ontario, Ontario, Canada
- 3:00 – 3:30 p.m. **Discussion on Walkerton (e.g., outbreak cost of illness for acute phase versus chronic sequelae disease, serendipitous findings?)**
- 3:30 – 4:00 p.m. **A Population-Based Study of Health Outcomes in American Indian Communities Using Groundwater**
Yvonne Yuen, Public Health Fellow at EPA
- 4:00 – 4:30 p.m. **Characterization and Modeling of Pathogen Risks in Groundwater of First Nations Communities**
Asit Mazumder, University of Victoria, British Columbia, Canada
- 4:30 – 5:00 p.m. **Discussion on First Nation, AmerIndian, Ontario, Wisconsin, and French Alpine Groundwater Infectious Disease Epidemiology (e.g., evaluation of current results, extrapolation to other locales, future prospects, etc.)**
- 5:00 – 7:00 p.m. **Dinner (on your own)**
- 7:00 – 10:00 p.m. **Discussion Forum Followed by Presentation**
Location: DoubleTree Hotel, 1515 Rhode Island Avenue, NW, in the Terrace Ballroom (2 blocks south) (refreshments provided)
- Does Arsenic Mitigation in Bangladesh Raise Exposure to Microbial and Viral Pathogens?**
Alex van Geen, Columbia University, New York, NY, and Brian Mailloux, Barnard College, New York, NY

Wednesday, December 3, 2008

Infectious Disease Transmission and Occurrence Models

- 8:30 – 9:00 a.m. **The Potential Implications of Person-to-Person Transmission of Viral Infection to EPA's Groundwater Rule**
Jeff Soller, Soller Environmental, Berkeley, CA
- 9:00 – 9:15 a.m. **Discussion on Population Dynamic Infectious Disease Transmission Models (e.g., dynamic model results compared with microbial risk assessment results)**

- 9:15 – 9:45 a.m. **Enteric Virus and Fecal Indicator Occurrence in Groundwater Sources of Public Drinking Water**
Mike Messner, EPA, Office of Water
- 9:45 – 10:00 a.m. **Discussion on Statistical Models (e.g., how to turn microbial occurrence data into information)**
- 10:00 – 10:30 a.m. **Microscopical Indicators Used for Warning of Contamination in Drinking Water (two case studies of outbreaks)**
Andrea Torok, National Institute for Environmental Health, Budapest, Hungary
- 10:30 – 11:00 a.m. **Noroviruses in Groundwater: Outbreak Investigations and Risk Characterization**
Kellogg Schwab, The Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD
- 11:00 – 11:15 a.m. **Discussion on Norovirus (e.g., secondary transmission after drinking water exposure)**

Pathogen Occurrence and Transport

- 11:15 – 11:45 a.m. ***Cryptosporidium* Infection and Onsite Wastewater Disposal Systems in the Arid Southwest**
Kristine Tollestrup, University of New Mexico, Albuquerque, NM
- 11:45 – 12:45 p.m. **Lunch (on your own)**
- 12:45 – 1:00 p.m. **Discussion on Bangladesh (e.g., untreated latrine sewage blocks microbial attachment and mobilizes arsenic?)**
- 1:00 – 1:30 p.m. **Challenges to Predicting Microbial Transport Distances in Porous Media Under the Simplest Environmental Conditions: Crawling Before We Walk**
William P. Johnson, University of Utah, Salt Lake City, UT
- 1:30 – 2:00 p.m. **Determination of Protection Zones for Dutch Groundwater Wells Against Virus Contamination—Uncertainty and Sensitivity Analysis**
Jack Schijven, RIVM, Bilthoven, The Netherlands
- 2:00 – 2:30 p.m. **Transport and Retention of Selected Bacterial Pathogens in Model Groundwater Environments**
Nathalie Tufenkji, McGill University, Montreal, Canada
- 2:30 – 3:00 p.m. **Microbial Groundwater Quality and Its Health Implications for Border-Strip and Spray Irrigated Dairy Farm Catchments in South Island, New Zealand**
Murray Close, Christchurch Science Center, Ilam, New Zealand

- 3:00 – 3:30 p.m. **Discussion on Coliphage and *E. Coli* Transport in Sand Aquifers Compared With Gravel Aquifers (e.g., enterovirus and *E. Coli* O157:H7 hazards)**
- 3:30 – 4:00 p.m. ***Arcobacter* spp., a Poorly Known Group of Bacteria Already Associated With Two Well-Water Outbreaks in the USA**
Maria Jose Figueras, Univ. Rov. Virg., Reus, Spain
- 4:00 – 4:30 p.m. **Groundwater Microbiological Quality in Canadian Drinking Water Municipal Wells**
Annie Locas, Institut national de la recherche scientifique, Quebec, Canada
- 4:30 – 5:00 p.m. **Discussion on Pathogen Occurrence (e.g., Is *E. Coli* a good pathogen indicator for groundwater?)**
- 5:00 – 7:00 p.m. **Dinner (on your own)**
- 7:00 – 10:00 p.m. **U.S. Geological Survey Pathogens in Groundwater Forum**
Location: DoubleTree Hotel, 1515 Rhode Island Avenue, NW, in the Terrace Ballroom (2 blocks south) (refreshments provided)
- Pathogen Transport in Karst Groundwater: An Overview of Research Advances**
Barbara Mahler, U.S. Geological Survey, Austin, TX
- Groundwater Quality Impacts in Two Large Karstic Spring Basins Using Microbiological Indicators**
Dale Griffiths, U.S. Geological Survey, Tallahassee, FL
- Subsurface Attenuation of Microorganisms Beneath Septic Tank Drainfields in the Woodville Karst Plain, Florida**
Brian Katz, U.S. Geological Survey, Tallahassee, FL
- Rapid Molecular Methods for Detection of Bacterial Contamination in Karst**
Bane Schill, U.S. Geological Survey, Kearneysville, WV
- Discussion**

Thursday, December 4, 2008

Pathogen Occurrence and Trans

- 8:30 – 9:00 a.m. **Viruses in U.S. Groundwater: Hydrogeological and Methodological Data Gaps**
Shay Fout, EPA, ORD
- 9:00 – 9:15 a.m. **Discussion on Virus Occurrence (e.g., Is Enterovirus occurrence more likely in karst and fractured bedrock aquifers?)**
- 9:15 – 9:45 a.m. **Determination of Enteric Pathogen Survival in Aquifers**

Simon Toze, Commonwealth Scientific and Industrial Research
Organisation (CSIRO), Wembley WA, Australia

- 9:45 – 10:00 a.m. **Discussion on the Use of Native Groundwater and Predation Effects on Enteric Virus Survival**
- 10:00 – 10:30 a.m. **Gastrointestinal Pathogens in Patients With AGI and Controls From Maryland, Connecticut, and Minnesota**
Jon Mark Hirshon, University of Maryland School of Medicine, Baltimore, MD
- 10:30 – 10:45 a.m. **Discussion on Emergency Room Data (e.g., how to assess sources of exposure?)**
- 10:45 – 11:15 a.m. **Virus Survival in Groundwater**
J. Scott Meschke, University of Washington, Seattle, WA
- 11:15 – 12:00 p.m. **Discussion on Inactivation and Groundwater Travel Times (e.g., Is a 1-year protection zone adequate?)**
- 12:00 p.m. **Adjourn**