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The Virtual Environmental Microbiology Center – A Social Network for Enhanced Communication Between Water Researchers and Policy Makers

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Abstract

Effective communication within and between organizations involved in research and policy making activities is essential. Sharing information across organizational and geographic boundaries can also facilitate coordination and collaboration, promote a better understanding of technical and policy issues, and avoid duplication of effort. To enhance communication within the environmental microbiology community, the U.S. Environmental Protection Agency (EPA) is using the Agency's Environmental Science Connector (ESC) (<http://portal.epa.gov/ESC>), a web-based communication tool that can bring together people with diverse interests and expertise, to share information on a wide range of topics. It also provides a convenient means for EPA scientists to manage projects, interact with project collaborators through message boards, and participate in real-time web based seminars. The ESC is being used to bring the environmental microbiology community together to share information on a variety of topics. Using the ESC as a platform, a virtual seminar series has been launched to allow subject matter experts in the fields of environmental microbiology to openly discuss state-of-the-science research topics with network members, further fostering a sense of community and exchange of ideas. In addition, the ESC is providing a focal point for intra-governmental communication and collaboration on several specific research topics, including sample preparation for waterborne pathogen detection methods, the development of graywater guidance and microbial risk assessment.

Virtual Environmental Microbiology Seminar Series

The Virtual Environmental Microbiology Seminar Series allows for researchers within and outside of the Agency to present their research to the virtual community. Overarching topics related to environmental and public health microbiology such as sample concentration approaches, the application of molecular methods, microbial risk assessment, and microbial ecology have been presented by widely recognized researchers from across the world.

Presentations

- Interrogating Microbial Communities: New Approaches, New Challenges but New Insight *by Dr. James Tiedge*
- Dutch Water Supply Experience with Quantitative Microbial Risk Assessment *by Dr. Gertjan Medema*
- Pitfalls Associated with the Incorporation of Viability Testing in a qPCR Assay *by Dr. Betty Olson*
- Can Genomics and Microfluidics Enhance Water Safety? *by Dr. Syed Hashsham*
- Can Hollow-Fiber Ultrafiltration be Effective as a Universal Technique for Recovering Microbes from Water? *by Dr. Vince Hill*

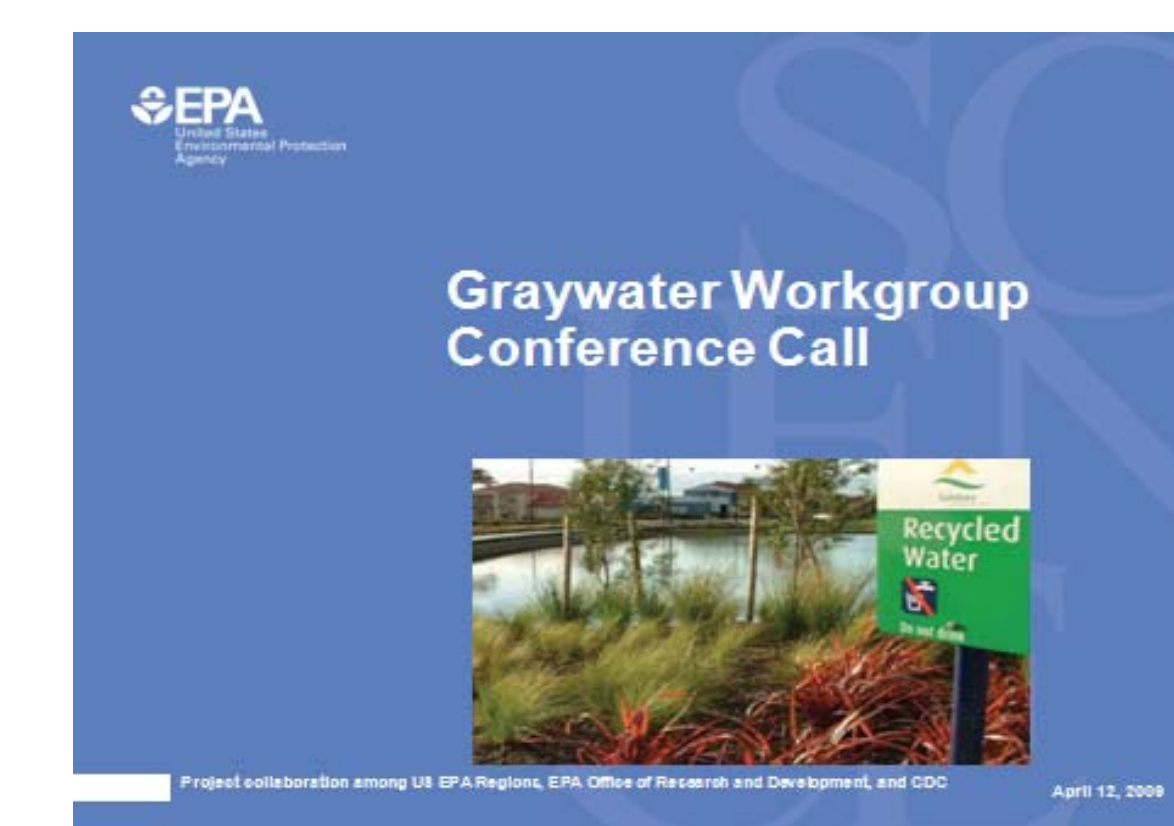


The locations above pinpoint the global reach of the Virtual Environmental Microbiology Seminar Series

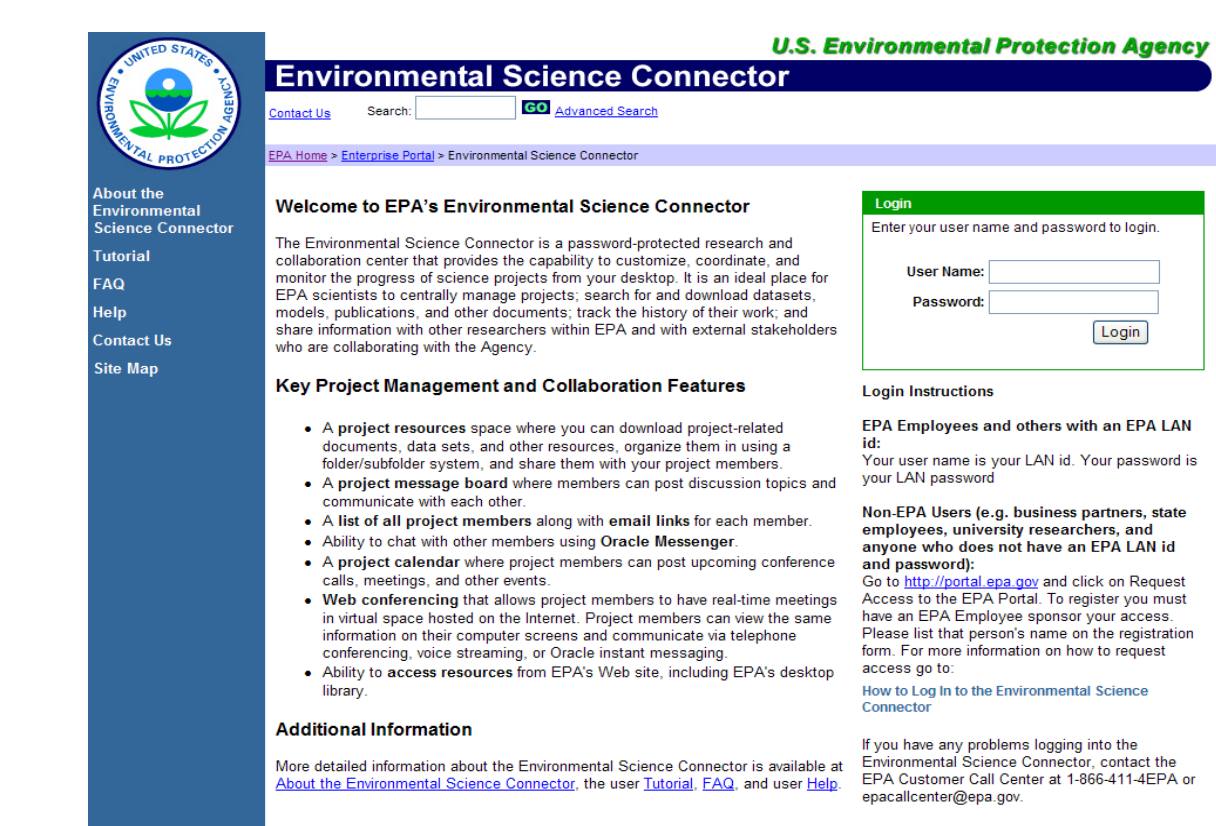
- Systems Biology (Integration of the Omics, Bioinformatics, and Biogeochemistry): The New Frontier for Environmental Biotechnology *by Dr. Terry Hazen*
- Research to Study Virulence of *Mycobacterium avium* Complex Bacteria from Drinking Water *by Dr. Larry Schlesinger*
- The Missing Carbon Link: Terrestrial Production Meets Aquatic Microbial Processes In Freshwater *by Dr. Peter Pollard*
- A Risk-Based Approach to Recycled Water Management: An Australian Perspective *by Dr. Michael Storey*
- Waterborne Cryptosporidium: Risks, Regulations and Challenges *by Dr. George Di Giovanni*
- Drinking Water Quality Regulation in England and Wales and the Role of the Drinking Water Inspectorate *by Mr. Shaun Jones*
- Modeling Pathogen Inputs to Drinking Water Reservoirs In Australia, the UK, and the USA *by Dr. Christobel Ferguson*
- *In-vitro* Microarray Chip Evaluation and Improvement: A Thermodynamic Approach *by Dr. Dan Tulpan*
- Functional Anatomy of a Bacterial Biofilm *by Dr. Roberto Kolter*
- New and Improved Methods to Detect Virus Pathogens and Indicators in Water *by Dr. Mark Sobsey*
- Monitoring Strategies for *E. coli* and Total Coliform Measurements in Drinking Waters *by Dr. Colin Fricker*
- Microbial Source Tracking: Problem or Promise? *by Dr. Valerie Harwood*
- How Quantitative is Quantitative? Using qPCR to Track Genetic Markers of *Bacteroidales* Along with Pathogens *by Dr. Stefan Wuertz*
- Comparison of Traditional, Rapid, and Novel Measurements of Microbial Water Quality Using Ambient Marine Samples *by Dr. John Griffith*
- The Value of Quantitation When Applying Host-Associated Microbial Source Tracking Markers to Environmental Samples *by Dr. Don Stoeckel*
- Derivation and Use of a New Discrete Growth Probability Distribution of Microbes in Environmental Samples and Associated Dose-Response Function *by Dr. James Englehardt* in June 2009

Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.

Focal Points



The Graywater Workgroup is a collaborative effort by EPA Region 4, EPA Office of Research and Development, and the Centers for Disease Control and Prevention



Collaboration provided through the EPA's Environmental Science Connector: A portal for discussion, collaboration, and networking

Graywater Workgroup

The Graywater Workgroup is exploring the components of a guidance document that can be used by entities considering a water reuse program. This distance collaboration project has allowed the Agency to better understand the needs of the Regions and to partner with external collaborators such that the proposed content of the guidance document can encompass a wide range of reuse programs.

Quantitative Microbial Risk Assessment (QMRA)

Two QMRA focus groups are under development, one to aid in drinking water distribution system research for the next revision of the Total Coliform Rule and the other to assess the need for new criteria for recreational waters impacted by animal fecal sources. Use of the risk assessment/risk management paradigm analytic frameworks (including conceptual models, parameter estimations, and sensitivity analyses) are being developed to identify research required to better manage fecal and indigenous pathogen risks associated with distribution systems. A similar conceptual approach is being worked through for recreational waters. This effort has led to a determination that the peak occurrence of human-infectious pathogens and their fate and transport from animal manures to waters are the most important uncertainties to reduce in order to enable QMRA ranking of risks from animal versus human sources.

Sample Preparation and Concentration

Through discussions and virtual seminar presentations, the Agency is examining state-of-the-science environmental filtration approaches, microfluidic applications, and microarray utilization for concentrating and detecting waterborne pathogens.

Emerging Areas

Environmental microbiology focus areas that have developed through the virtual arena have been collaborative efforts related to mycobacteria detection and identification, microbial source tracking, biomonitoring, quantitative polymerase chain reactions (qPCR) and other molecular methods.

Additional information about the Environmental Science Connector can be found at <http://portal.epa.gov/ESC> or email: Mistry.Jatin@epa.gov.