



2018 National Capital Region Water Resources Symposium:

Resilient Solutions for Water Management in Urban Environments: Advances in Research, Technology, Financing and Policy

**Friday, April 6, 2018
8:30 a.m. – 5:00 p.m.**

**University of the District of Columbia (UDC)
David A. Clarke School of Law
4340 Connecticut Ave., NW, Washington DC**

Introduction

This one-day symposium will bring together experts from governmental agencies, academia, the private sector, and non-profits to present and discuss innovations in water research, technology, policy and management to respect and reflect the value of water in the National Capital Region, as well as nationally and internationally. We hope that you will make the most of the opportunity to meet other water resources professionals across the region.

The National Capital Region, encompassing the District of Columbia, and parts of Maryland, Virginia and West Virginia, has unique and challenging opportunities for sustainable management of water resources and water infrastructures. The region makes up a large portion of the watershed for the Chesapeake Bay, the largest estuary in the U.S; contains rivers which provide for the water needs of nearly six million people; and hosts many organizations and entities that consider water resources as their primary focus. The role of the AWRA-National Capital Region Section is to focus water resources professionals on water resources issues in the National Capital Region.

The theme of the 2018 Water Resources Symposium is *Resilient Solutions for Water Management in Urban Environments: Advances in Research, Technology, Financing and Policy*, a critical and futuristic topic that will be discussed by featured speakers in the plenary session.

Featured Speakers



Sudhir Murthy



Erica Brown



Fanny Carlet



Luke Wilson



Tyson Vaughan



Tracy Mehan, III

Sudhir Murthy, Ph.D., Innovations Chief for DC Water, leads the development and implementation of the Authority's innovation strategy. Dr. Murthy creates, defines and translates research and development into product, service and commercial technologies. He led the concept development for several programs at the Blue Plains facility that has led to nearly \$1 billion in engineering/construction. These innovative projects were developed through novel approaches of public-public partnership with other water utilities, and through collaboration with private enterprise and universities. More than 80 graduate students from universities in North America, Europe, Australia and Africa, have been 'insourced' to innovate at DC Water in a multifunctional and interdisciplinary setting. This approach is now viewed as a model for collaborative engagement by universities and utilities. Similarly, Dr. Murthy is developing commercial solutions with private enterprise through the development of public-private 'open-innovation' approaches between the water technology demand and supply sectors and through the co-development of patents. The DEMON and in DENSE technology platforms for biological nutrient removal are part of the commercial suite co-owned by DC Water. In the past five years, DC Water has won four of five Research Grand Prizes from the American Academy of Environmental Engineers and Scientists for new technologies developed in wastewater treatment. Dr. Murthy is a Professional Engineer and a Board Certified Environmental Engineer. He has received several Water Environment Federation awards including the Ralph Fuhrman Medal for Academia-Practitioner Collaboration, the George Gascoigne Medal for Wastewater Treatment Operational Improvement and the Camp Applied Research Award. Dr. Murthy has over 100 peer review publications and over 250 publications or presentations. He was most recently selected to serve on the board of directors of the International Water Association. He has a M.S. in Environmental Engineering and Ph.D. in Civil Engineering from Virginia Tech.

Erica Brown is Chief Strategy and Sustainability Officer for the Association of Metropolitan Water Agencies (AMWA) in Washington, D.C., an organization of large, publicly-owned drinking water utilities. In this capacity, she develops strategies to support and promote policies and innovations that enable the nation's publicly owned drinking water utilities to enhance their resilience while building a strong and sustainable organization in the midst of environmental, regulatory and community changes. Erica works with federal agencies on behalf of water utilities to advocate for actionable information and science to support water utility decision-making in sustainability actions, financing and climate resilience. Her professional expertise and knowledge are in the areas of environmental policy, public health, environmental regulation, homeland security, sustainability and climate change. Erica received her B.S. in Civil Engineering and M.T. in Secondary Science Teaching from the University of Virginia. In previous positions she has supported



EPA's drinking water rule development and served as a subject matter expert for the evaluation of facility anti-terror systems and technologies for the Department of Homeland Security and facilitated agile software development processes.

Fanny Carlet, Ph.D., has broad substantive research interests including issues in environmental policy, with topical emphases on water resources management, climate change adaptation and heuristics in environmental decision-making. Her doctoral research focused on green infrastructures for stormwater management. Building on theories of diffusion of innovation and technology acceptance, she sought to understand how municipal official's perceptions of green infrastructure influence their attitude towards adoption. Fanny holds a MS degree in Architectural Engineering from University of Padua (Italy), and a PhD in Planning, Governance and Globalization from Virginia Tech, and worked as a structural engineer and urban planning research consultant.

Luke Wilson, JD, LL.M., is the Co-Founder and Deputy Director of The Center for Water Security and Cooperation (CWSC). In addition to his work at The CWSC, Luke teaches international law and business law at The George Washington University. Before founding The CWSC, Luke was a law clerk to judges of the International Court of Justice in The Hague, where he worked on cases involving urban water issues, sustainable development and transboundary conflicts, among others. Luke also worked on Development Law and Policy as a consultant at the World Bank, and as a human rights attorney with the American Bar Association.

Tyson Vaughan, Ph.D. is a AAAS Science & Technology Policy Fellow at the Institute for Water Resources in the U.S. Army Corps of Engineers. His monograph, *Reconstructing Expertise: Participatory Recovery Planning in Post-Disaster Japan*, is an ethnography of the reconstruction of disaster-struck communities and the concomitant social construction of expertise in Kobe and Tōhoku, Japan. He has worked on disaster risk governance and recovery policy with the International Atomic Energy Agency (IAEA), the United Nations Office for Disaster Risk Reduction (UNISDR), World Bank, World Health Organization, and the government of Japan. He is co-editor of the forthcoming volume *The Quotidian Anthropocene: Reconfiguring Environments in Urbanizing Asia*, and he co-founded the academic blogs *Teach 3.11* and *Disaster Governance: Asia*. He started "dot com" companies in the late 1990s, holds degrees from Stanford and Cornell University, and pursued post-doctoral research at the National University of Singapore.

G. Tracy Mehan, III is Executive Director, Government Affairs, for the American Water Works Association (AWWA). He is also an Adjunct Professor at the Antonin Scalia School of Law at George Mason University and Carnegie Mellon University's Heinz College. He was an independent consultant and served as Interim President of the U.S. Water Alliance and national Source Water Protection Coordinator for the U.S. Endowment for Forestry and Communities and was Principal with The Cadmus Group, Inc., an environmental consulting firm, from 2004 to 2014. Mehan served as Assistant Administrator for Water at the U.S. Environmental Protection Agency from 2001-2003. He served as Environmental Stewardship Counselor to the 2004 G-8 Summit Planning Organization (2004). Mehan also served as director of the Michigan Office of the Great Lakes (1993-2001) and as Associate Deputy Administrator of EPA in 1992. He was director of the Missouri Department of Natural Resources from 1989 to 1992. Mehan is a graduate of Saint Louis University and its School of Law. Mehan served on the Water Science and Technology Board and now the Committee on the Mississippi River and the Clean Water Act for the National Research Council of the National Academies. He was also an independent expert judge for the City Water Conservation Achievement Award program (2006 & 2011) sponsored by The U.S. Conference of Mayors and its Urban Water Council. Mehan is a member of the Environmental Law Institute (ELI) and a regular book reviewer for ELI's flagship publication, *The Environmental Forum*. Mehan serves on EPA's Environmental Financial Advisory Board as well as the boards of the U.S. Water Alliance and the Great Lakes Observing System. He is also a member of the Advisory Board of the Center for Environmental Policy, School of Public Affairs, American University and a past member of the board of the Potomac Conservancy (2006-2014).



Program

8:00 a.m.	~~ REGISTRATION ~~	Fifth Floor Lobby
8:45 a.m.	<p>Opening & Welcome</p> <ul style="list-style-type: none">• Elisabeth Ross Eveleigh, AWRA-NCR Section President• Tolessa Deksissa, Director, Water Resources Research Institute & Professional Science Master's Water Resource Management Program, University of the District of Columbia• Sabine O'Hara, Dean, College of Agriculture, Urban Sustainability & Environmental Sciences, University of the District of Columbia• Tamim Younos, President, Green Water-Infrastructure Academy, Washington, D.C. Symposium Chair & Vice President AWRA-NCR Section, Fellow Member AWRA Introduction to the Symposium Theme	Room 518
9:15 a.m.	<p>Keynote</p> <p>Dr. Sudhir Murthy, Innovation Chief, DC Water Introduction by Svetlana (Lana) Sindler, AWRA-NCRS President-Elect</p>	Room 518
10:00 a.m.	~~ Break ~~ Please visit posters on display in the break area	Fifth Floor Lobby



10:30 a.m.	<p>Invited Panel: Resilient Solutions for Water Management in Urban Environments: Advances in Research, Technology, Financing and Policy</p> <p>Moderator: Tyson E. Vaughan, PhD AAAS Science & Technology Policy Fellow, US Army Corps of Engineers, Washington, D.C.</p> <p>Panelists: Luke Wilson, JD, Deputy Director, The Center for Water Security and Cooperation. Fanny Carlet, PhD, Sustainable Urban Solutions, LLC. Erica Brown, Chief Strategy and Sustainability Officer, Association of Metropolitan Water Agencies</p>	Room 518
Noon		
Noon	<p>Luncheon Speaker: G. Tracy Mehan, III - Executive Director, Government Affairs, American Water Works Association Introduction by , Norm Starler AWRA-NCRS Past President Lunch (provided)</p>	Room 214

Con-Current & Poster Sessions

1:15 p.m. - 2:45 p.m.	<p>A. Special Session: Advances in Water Reuse Technology and Implementation B. Stormwater and Flood Management</p>	<p>A: Room 518 B: Room 505</p>
2:45 p.m.	<p>~~ Break ~~ Please visit the posters on display in the break area</p>	Fifth Floor Lobby
3:00 p.m. 4:30 p.m.	<p>C. Water and Environment D. Resilience and Sustainability E. Remote Sensing, Modeling and GIS</p>	<p>C: Room 518 D: Room 505 E: Room 506</p>
8:30 a.m. – 3:30 p.m.	Poster Presentations	Fifth Floor Lobby
5:00 p.m.	Optional Post- Symposium TOUR: UDC Campus Green Infrastructure	Meet in 1st floor lobby



Con-Current Sessions (A, B)
1:15 p.m. – 2:45 p.m.

<p>A. Special Session: Advances in Water Reuse Technology and Implementation</p> <p style="text-align: center;">Room 518</p> <p>Moderator: Micah Vieux, Program Development Manager, Loudoun Water, Ashburn, Virginia.</p> <p>Nationwide perspective on trends in water reuse and implications for the Mid-Atlantic Region. Justin Mattingly, Research Manager, Water Research Foundation, Alexandria, Virginia.</p> <p>Improving water reuse for a healthier Potomac Watershed. Erik Rosenfeldt, PhD, Associate at Hazen and Sawyer, Richmond, Virginia.</p> <p>Hampton Roads Sanitation District’s (HRSD) vision for managed aquifer recharge in Eastern Virginia: Sustainable Water Initiative for Tomorrow (SWIFT). Charles Bott, PhD, Director of Water Technology and Research, Hampton Roads Sanitation District, Virginia Beach, Virginia.</p> <p>New WHO Guidelines for Potable Reuse: Impact on Reuse Opportunities. Joseph Cotruvo, PhD, BCES, President, Joseph Cotruvo & Associates LLC. (First Director of USEPA Drinking Water Standards Division).</p>	<p>B. Stormwater and Flood Management</p> <p style="text-align: center;">Room 505</p> <p>Moderator: Celso Ferreira, George Mason University</p> <p>Flood modeling for major intersections known to flood near WMATA stations outside of the regulatory floodplain. Laurens van der Tak, PE, Technologist Management; Celeste R. Ostman, Water Engineer, JACOBS, Silver Springs, Maryland.</p> <p>Site evaluation and design challenges of MS4/TMDL restoration projects in the urban environment of Baltimore City. John Shen, PhD, PE, Senior Water Resources Engineer; Michael Blose, MBE, PE, Director, Water Resources Engineering, Straughan Environmental, Inc., Columbia, Maryland.</p> <p>Catchment-scale evaluation of stormwater green infrastructure using a flexible surface-subsurface interaction model. Mohammad Almadani, King Abdul-Aziz University; Arash Massoudieh, Associate Professor, Civil Engineering Dept., The Catholic University of America, Washington, DC.</p> <p>Assessing the effectiveness of urban gardens as green infrastructure in the Washington, DC area. Anna Spiller, M.S. in Agricultural Sciences and Resource Management in the Tropics and Subtropics, University of Bonn, Germany; Harrison Hyde, undergraduate student in Environmental Science; Keeli Howard, graduate student in Environmental Science; and Karen Knee, Assistant Professor of Environmental Science, American University, Washington, DC.</p>
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Con-Current Sessions (C, D, E)
3:00 p.m. – 4:30 p.m.

C. Water and Environment	D. Resilience and Sustainability	E. Remote Sensing, Modeling, GIS
<p style="text-align: center;">Room 518</p> <p>Moderator: Leila Farhadi, George Washington University</p> <p>Regulating environmental impacts of ‘fracking’ in the UK: lessons drawn from New York and California. Miriam R. Aczel, Centre for Environmental Policy, Imperial College London.</p> <p>Chemical mass balance source apportionment of trace metals in road dust. Matthew Fiala and Hyun-Min Hwang, Dept. of Environmental and Interdisciplinary Sciences, Texas Southern University.</p> <p>Proof of management success in an agriculturally-impacted Delaware Estuary. Gulnihal Ozbay, Matthew Stone, Kristopher Roeske, Laurieann Phalen, and Karuna Chintapenta, Department of Agriculture and Natural Resources, Delaware State University, Dover, DE.</p> <p>Developing a salt management strategy for Northern Virginia. Will Isenberg, Water Quality Assessment and TMDL Coordinator; Dave Evans, Nonpoint Source TMDL Coordinator, Virginia Department of Environmental Quality.</p>	<p style="text-align: center;">Room 505</p> <p>Moderator: Karin Bencala, Interstate Commission on the Potomac River Basin</p> <p>A novel online control monitoring shortcut nitrogen removal in wastewater treatment plant. T. Le^{1,2}, A. Massoudieh¹, C. Su², B. Peng^{2,5}, A. Al-Omari², S. Murthy², B. Wett³, C. Bott⁴ and H. De Clippeleir² ¹Dept. of Civil & Environ. Eng. The Catholic University of America; ²DC Water and Sewer Authority; ³ARAconsult, Austria; ⁴Hampton Roads Sanitation District, Virginia Beach, VA; ⁵Dep. of Civil & Enviro. Eng. The University of Maryland, College Park, MD.</p> <p>Incorporating climate resilience and mitigation planning into asset management for a water and wastewater utility. Laurens van der Tak, PE, D.WRE, JACOBS, Silver Springs, Maryland.</p> <p>Evaluating the impacts of three intervention techniques to increase UDC student’s knowledge and awareness on the university’s water sustainability projects. K. Zendehelda¹, X. Hub², H. Trobman². ¹Assistant Director of Center for Sustainable Development (CSDR); ²Project Specialist, CSDR, CAUSES, UDC.</p>	<p style="text-align: center;">Room 506</p> <p>Moderator: Sandra Pavlovic, National Water Center, NOAA National Weather Service</p> <p>Monitoring water and energy cycle from space. Abedeh Abdolghafoorian, Graduate Research Assistant and Leila Farhadi, Assistant Professor, Civil and Environmental Engineering Department, George Washington University, Washington, DC.</p> <p>RiverEye bathymetry retrievals (REBaR): A remote sensing approach to bathymetry and discharge estimation in rivers. Peter J. Rusello¹, Steven P. Anderson¹, and Edward D. Zaron, ¹Areté Associates, Arlington, Virginia, ²Depart. of Civil and Environ. Eng., Portland State University, Portland, Oregon.</p> <p>A flexible framework for modeling surface-subsurface hydraulic and water quality processes. Arash Massoudieh, Associate Professor, Civil Engineering Dept., The Catholic University of America, Washington, DC</p> <p>ArcGIS online – how to make a story map (no coding). Jennifer McGee, Water Resources Engineer – Information Management Amec Foster Wheeler (recently acquired by Wood), Chantilly, Virginia.</p>

Poster Presentations

Fifth Floor Lobby

A class in sustainability in housing: water as critical content

Kathleen Parrott, Ph.D., Professor, Virginia Tech

Water contingency planning in Skaneateles, NY: Watershed resilience, planning, and management

Joseph E. Copeland. Harvard University; Booz Allen Hamilton

Closing the loop, the UDC community compost project as part of the UDC food hub concept

Kamran Zendehtela¹, Paula Avellanb², Tony Fitzgeraldc³

¹Assistant Director of Center for Sustainable Development (CSDR); ²Student, Political Science Major; ³Student, Architecture Science Major. College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), University of the District of Columbia.

Assessment of catalytic wet peroxide oxidation for treating pharmaceuticals in water: A review.

¹Ifedolapo Akinleye, ¹Andri Antoni1 and ²Tolessa Deksissa. ¹Graduate Student, Professional Science Master's (PSM) in Water Resources Management, ²Director of Water Resources Research Institute and PSM, University of the District of Columbia/CAUSES

Evaluating effects of deficit irrigation strategies on the yield and nutritional values of ethnic crops

Temesgen Mendera¹, Alondra Thompson², Harry Schomberg³ and Tolessa Deksissa⁴

¹Graduate Assistant, ²Research Assistant, ³Research Ecologist, ⁴Director of Water Resources Research Institute, ^{1,4}College of Agriculture, Urban Sustainability and Environmental Sciences, UDC, ^{2,3}Beltsville Agricultural Research Center, USDA Agricultural Research Service

Trends of lead contamination in tap water

Pablo Sanchez Guerrero¹, Mac Deng¹ and Tolessa Deksissa² College of Agriculture, Urban Sustainability and Environmental Sciences, UDC, ¹Graduate student, Professional Science Master's (PSM) in Water Resources Management, ²Director of Water Resources Research Institute and PSM Program

Monitoring water quality variables in aquaponics systems

Caitlin Arlotta¹, Sarah Dachos¹, Keisha Williams¹ and Tolessa Deksissa²

University of the District of Columbia, CAUSES; ¹Graduate Student, Professional Science Master's in Urban Agriculture, ²Director, Water Resources Research Institute and PSM Program

Real-time flood forecasting for the National Capital Region: Integrating storm surge, tides and river flows

¹Arslaan Khalid and ²Celso Ferreira. ¹Graduate Student, ²Assistant Professor, Civil Engineering at George Mason University

Bi-directional waterway reveals nutrient runoff from cropland

Department of Agriculture and Natural Resources, Delaware State University, Dover, DE



5:00 p.m.	Optional Post- Symposium TOUR: UDC Campus Green Infrastructure Led by Dr. Tolessa Deksissa , Director, DC Water Resources Research Institute & Professional Science Master’s Water Resource Management Program	Meet in 1st floor lobby
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Registration

All attendees, including presenters/moderators, are expected to register. Please register online by Monday, April 2 for the early bird discount. Payment is accepted online by credit card or by cash/ check payment at the event.

- Step 1: Go online to the link: <https://co.clickandpledge.com/sp/d1/default.aspx?wid=58557>
- Step 2: Fill out the registration fee section
- Step 3: Fill out the contact information section
- Step 4: Scroll down and click “SUBMIT” to complete the registration and payment

	Professionals		Students	
	Member or Presenter/Moderator	Non-Member	Member or Presenter	Non-Member
Registration Fees (includes lunch & coffee breaks)				
On-line thru April 2	\$35	\$50	\$15	\$25
On-site April 6	\$50	\$75	\$25	\$35



**The American Water Resources Association National Capital Region Section Leadership
2017-2018**

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