



## **2020 National Capital Region Water Resources Symposium:**

### **Water Management in the Era of Artificial Intelligence: Digital Solutions & Smart Technology Applications**

**Friday, April 3, 2020**

**8:30 a.m. – 5:00 p.m.**

**University of the District of Columbia (UDC)**  
**UDC Student Center – Level 1**  
4200 Connecticut Ave., NW, Washington DC 20008

### **Introduction**

This one-day symposium brings 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 2020 Water Resources Symposium is ***Water Management in the Era of Artificial Intelligence: Digital Solutions & Smart Technology Applications***, a critical and futuristic topic that will be discussed by featured speakers in the plenary session.

## Featured Speakers



**James P. Cooper**



**Steven E. Bieber**



**Chandra S. Pathak**



**Elkin Hernandez**



**Christian Manalo**



**Alexandra  
Campbell-Ferrari**

**James P. Cooper** is a Vice President at Arcadis and serves as their Global Solution Leader for Intelligent Water. In this role, he collaborates with water sector utilities throughout the world to better understand their assets, systems, organizations and customers by exploring how advanced digital solutions, such as artificial intelligence (AI) and predictive analytics, might help their workforces create more sustainable, human-centric outcomes. Jim earned an Executive Certificate in *Artificial Intelligence: Implications for Business Strategy* from the Massachusetts Institute of Technology and is the principal author of the fourth edition of the American Water Works Association’s *M32 Computer Modeling of Water Distribution Systems*, published in 2018. He is a well-established industry thought leader, authoring more than 45 publications on utility management, system optimization and intelligent systems, and maintaining licenses and certifications in sustainability, project management, and water and wastewater plant operations. Jim is also a Professional Engineer in seven states, and currently serves as a Trustee of the Engineering & Construction Division of the American Water Works Association and immediate past president of his local Water Environment Federation section.

**Steven E. Bieber** serves as Acting Water Resources Program Director, Department of Environmental Programs Metropolitan Washington Council of Governments. He is responsible for managing COG’s water resources programs including regional Anacostia Restoration Partnership, water security programs, drought management, urban stream restoration, and other related environmental programs for local governments and utilities in the Washington, DC area. Mr. Bieber has over 30 years of experience in the water sector. He holds a B.S. in Zoology from Michigan State University, an M.S. in Oceanography from Old Dominion University, and an MPA degree from the University of Baltimore.

**Chandra S. Pathak PhD** serves as a senior policy advisor and subject matter expert in hydrologic and hydraulic engineering for the U.S. Army Corps of Engineers Engineering and Construction Division at headquarters in Washington, D.C., where he manages national water resources issues. Dr. Pathak has more than 35 years of broad water resources and environmental engineering



experience; including water resources planning, flood risk infrastructure (dams, levees and floodwalls), and complex hydrologic and hydraulic studies. Dr. Pathak is skilled in numerical (hydrologic, hydraulic and water quality) models and geographic information systems and program and project management. Currently, he is also an adjunct professor at the George Mason University at Fairfax, Virginia. Dr. Pathak received his doctorate from Oklahoma State University in hydrologic engineering. Dr. Pathak has authored and co-authored more than 100 peer reviewed publications. In 2007, he was awarded Diplomate of Water Resources Engineering and Fellow Member of the American Society of Civil Engineers.

**Elkin Hernandez** is the Director of Maintenance Services at DC Water, with over 20 years of experience in the design, construction, commissioning, maintenance and operation of large utilities as a contractor, consultant and utility employee. Mr. Hernandez background includes work on telecom cation, automation, process control and cybersecurity. Currently his work is focused in the fields of smart water, management, and maintenance optimization. Mr. Hernandez holds Bachelors and Master's degree in Electrical and Computer science.

**Christian Manalo**, P.E., DEE, F.ASCE, is a Lead Associate with Booz Allen Hamilton based in McLean, Virginia. He has extensive experience in security and emergency preparedness for water utilities both internationally and domestically. He has performed dozens of physical and cyber security risk assessments and provided training in these areas, including for USEPA's Water Security Division. He currently supports the U.S. Army Corps of Engineers, Engineering & Construction Division, where he manages both the agency's Resilience Initiative and Infrastructure Sustainability Initiative. Mr. Manalo holds both M.S. and B.S. degrees in Civil and Environmental Engineering, previously served as President of ASCE's National Capital Section, and is an active AWRA member.

**Alexandra Campbell-Ferrari** is the Co-Founder and Executive Director of the Center for Water Security and Cooperation, a 501(c)(3) based in Washington, D.C. dedicated to understanding, evaluating, and innovating in water law and governance. Alexandra specializes in water and sanitation law, including water quality, water allocation, and interstate water law. She has worked in private practice and was a Fulbright Scholar in Spain researching water law and watershed management in Spain and the European Union. Alexandra previously taught Legal Research and Writing to International LLM students at The George Washington University Law School and served as the Chair of the Environment and Energy Committee for the ABA Young Lawyers Division (YLD), successfully leading the passage of a Resolution by the YLD recognizing the Human Right to Drinking Water and Sanitation. Alexandra currently teaches Water Law at the University of Maryland Carey School of Law and American University Washington College of Law. Alexandra has been an invited speaker at the Wall Street Journal, the American Bar Association, International Bar Association, World Water Week, Africa Water Week, among others, is featured in *Beyond the Brink*, a documentary on water scarcity and national security, and serves as a Co-Chair of the Water, Wastewater and Waste Pillar for Denton's Smart Cities and Communities Think Tank.



**Program**

8:00 a.m.	~~ REGISTRATION ~~	<b>Ballroom A</b>
8:45 a.m.	<p style="text-align: center;"><b>Opening &amp; Welcome</b></p> <ul style="list-style-type: none"> <li>• <b>Seth Lawler</b> (Dewberry), AWRA-NCR Section President</li> <li>• <b>Tolessa Deksissa</b>, Director, Water Resources Research Institute &amp; Professional Science Master’s Water Resource Management Program, University of the District of Columbia; President-Elect, AWRA-NCR Section</li> <li>• Dwane Jones, Acting Dean, College of Agriculture, Urban Sustainability &amp; Environmental Sciences (CAUSES) , University of the District of Columbia</li> <li>• <b>Tamim Younos</b>, Founder &amp; President, Green Water-Infrastructure Academy Symposium Chair &amp; Vice President AWRA-NCR Section, Fellow Member AWRA Introduction: Symposium Theme and Agenda</li> </ul>	<b>Ballroom A</b>
9:15 a.m.	<p style="text-align: center;"><b>Keynote</b></p> <p><b>James P. Cooper, PE</b>, Intelligent Water Lead at Arcadis Introduction by <b>Sandra Pavlovic</b>, AWRA-NCR Section Past President</p>	<b>Ballroom A</b>
10:00 a.m. 10:30 a.m.	<p>~~ Break ~~</p> <p>Please visit posters on display</p>	<b>Ballroom A</b>



10:30 a.m.	<p><b>Symposium Theme &amp; Invited Panel:</b> <i>Water Management in the Era of Artificial Intelligence: Digital Solutions &amp; Smart Technology Applications</i></p> <p><b>Moderator:</b> <b>Steven Bieber</b>, Acting Water Resources Director, DC Council of Governments</p> <p><b>Panelists:</b> <b>Chandra S. Pathak</b>, PhD, U.S. Army Corps of Engineers <b>Elkin Hernandez</b>, DC Water <b>Christian Manalo</b>, PE, Booz-Allen-Hamilton</p>	<b>Ballroom A</b>
11:50 a.m.		
Noon	<p><b>Luncheon Speaker:</b> <b>Alexandra Campbell-Ferrari</b>, Co-Founder and Executive Director, The Center For Water Security and Cooperation Introduction by <b>Lorena Kowalewski</b>, AWRA-NCR Section Vice Pres. / Program Committee Chair <b>Lunch</b> (provided)</p>	<b>Ballroom A</b>

### Con-Current Sessions at a Glance

1:15 p.m. - 2:45 p.m.	<p><b>Special Session 1 (Panel).</b> EPA Water Reuse Action Plan <b>Session A:</b> Emerging Technologies and Data Management Tools</p>	Ballroom A Ballroom B
8:30 a.m. – 3:30 p.m. (2:45 – 3:15 p.m.)	<p><b>Poster Presentations</b> <b>(Poster Award Presentation)</b></p>	Ballroom A
Noon – 1:00 p.m.	<p><b>Lunch &amp; Luncheon Speaker</b></p>	Ballroom A
3:15 p.m.- 5:00 p.m.	<p><b>Special Session 2 (Panel).</b> Microplastics Pollution: Research &amp; Education Strategies <b>Session B:</b> Advances in Water Management Systems <b>Workshop:</b> An Experiential Workshop for YOU (the Water Expert) to Create Your First Online Education and Engagement Program on Water</p>	Ballroom A  Ballroom B Executive Conf. Room
5:15 p.m.	<p><b>Optional Post- Symposium TOUR: UDC Campus Green Infrastructure</b></p>	Meet in Ballroom A



**Con-Current Sessions  
1:15 p.m. – 2:45 p.m.**

<p><b>Special Session 1: EPA Water Reuse Action Plan</b> Convened by the Water Reuse Association</p> <p style="text-align: center;">Ballroom A</p> <p><b>Moderator:</b> Greg Fogel, Policy Director, Water Reuse Association</p> <p><b>Panelists:</b> Steve Via, Director of Federal Relations, American Water Works Association Sharon Nappier, Senior Microbiologist, US Environmental Protection Agency Claudio Ternieden, Senior Director of Government Affairs &amp; Strategic Partnerships, Water Environment Federation</p> <p><b>Panel Overview</b> In September 2019, EPA released a draft Water Reuse Action Plan that “identifies priority actions and the leadership and collaboration that is needed between governmental and nongovernmental organizations to implement these actions.” According to the Plan, possible sources of water for potential reuse include municipal wastewater, industry process and cooling water, stormwater, agriculture runoff and return flows, and oil and gas produced water. Examples of reuse applications include agriculture and irrigation, potable water supplies, groundwater storage and recharge, industrial processes, onsite non-potable use, saltwater intrusion barriers, and environmental restoration. The Action Plan was created in coordination with the U.S. Department of Agriculture, Army Corps of Engineers, Department of Interior, Department of Energy, Bureau of Reclamation, and Council on Environmental Quality (CEQ). The panel will introduce and discuss various aspects of the Action Plan, state of the progress, technical, policy, and other relevant issues.</p>	<p><b>Session A: Emerging Technologies and Data Management Tools</b></p> <p style="text-align: center;">Ballroom B</p> <p><b>Moderator:</b> Alaina Armel, AECOM</p> <p><b>Serverless interactive web maps for rapid validation of probabilistic flood risk assessment data.</b> Jason Matney, PhD, Senior GIS Professional at Dewberry. Email: <a href="mailto:jmatney@Dewberry.com">jmatney@Dewberry.com</a></p> <p><b>Use of mobile, GPS-Enabled data collection tools and operational dashboards to efficiently manage water resource assessments.</b> Alicia Ritzenthaler, Heather Bourne, Brad Udvardy, LimnoTech. Email: <a href="mailto:aritzenthaler@limno.com">aritzenthaler@limno.com</a></p> <p><b>Mapping National Water Model (NWM) forecasts with FEMA HEC-RAS models – a pilot application in the Whitemarsh Run watershed, Maryland.</b> Jennifer McGee, PE, CFM, Water Resources Engineer; Kristine Mosuela, EIT, Water Resources, Wood E&amp;I. Email: <a href="mailto:jenna.mcgee@woodplc.com">jenna.mcgee@woodplc.com</a></p> <p><b>Be prepared: climate resilience and mitigation planning for the Washington Suburban Sanitary Commission.</b> Miranda Santucci, PE, Water Engineer; Lee Tharps, PE, Water Engineer; Paula Sanjines, PE, Wastewater Regional Solutions Leader, Jacobs. Email: <a href="mailto:miranda.santucci@jacobs.com">miranda.santucci@jacobs.com</a></p>
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**Con-Current Sessions  
3:15 p.m. – 5:00 p.m.**

**Special Session 2: Microplastics Pollution: Research & Education Strategies**

Ballroom A

**Moderator:** Julie Lawson, Director of the DC Mayor's Office of the Clean City

**Panelists:**

Jesse Meiller, PhD, Hurst Senior Professorial Lecturer, Environmental Science Program, American University  
Bob Murphy, Fisheries Ecologist at Tetra Tech  
Beth Gingold, Founder, Recycle Leaders LLC

**Panel Overview**

Plastic debris that are less than five millimeters in length are called microplastics and are found in a variety of environments including oceans and freshwater ecosystems. Microplastics originate from a variety of sources; larger plastic debris that break down into smaller pieces; and microbeads, tiny pieces of polyethylene plastic added to health and beauty and other home products. By 2018, microplastics had been found in more than 114 aquatic species in marine and freshwater ecosystems. Health and environmental impacts of microplastics are emerging societal issues. The panel will discuss complexity of microplastic pollution, ongoing research, and microplastic pollution prevention strategies including citizen awareness and role.

**Session B. Advances in Water Management Systems**

Ballroom B

**Moderator:** Matt Schley, Hydrologist, National Park Service

**A low flow forecast system for water supply operations during droughts.** Alimatou Seck, PhD, Water Resources Scientist; Cherie L. Schultz, PhD, Director of Operations; Luke Vawter, Research Support Analyst, ICRPB. Email: [aseck@icprb.org](mailto:aseck@icprb.org)

**Regional hydrological methods for estimation of maximum flood discharges in ungauged dry streambeds, Gobi Region, Mongolia.** Myagmarsuren Bat-Erdene (doctoral student) and S.Erdenesukh, Dept. of Geography, National University of Mongolia. Email: [miga\\_b2006@yahoo.com](mailto:miga_b2006@yahoo.com)

**Impact on water supplies of projected changes in inter-annual variability of streamflows due to climate change.** C. Schultz, PhD, Director of Operations; S. Ahmed, Water Resources Eng. Analyst; A. Seck, Water Resources Scientist, ICRB Email: [cschultz@icprb.org](mailto:cschultz@icprb.org)

**A reduced-adjoint variational data assimilation for estimating soil moisture profile.** Parisa Heidary, Graduate Student; Leila Farhadi, Assistant Prof., George Washington University; Muhammad U. Altaf, Div. of Earth Sciences, King Abdullah University of Science and Technology, Saudi Arabia. Email: [parisaheidary@gwu.edu](mailto:parisaheidary@gwu.edu)

**Use of autonomous instruments to conduct continuous, in-situ nutrient monitoring providing real-time results.** Alicia Ritzenthaler, Ed Verhamme, Greg Cutrell, LimnoTech Email: [aritzenthaler@limno.com](mailto:aritzenthaler@limno.com)

## Poster Presentations Ballroom A

**Real-time flood forecast for the National Capital Region.** Gustavo de A. Coelho, PhD Student; Celso M. Ferreira, Associate Professor, Department of Civil, Environmental and Infrastructure Engineering, George Mason University. Email: [gcoelho2@gmu.edu](mailto:gcoelho2@gmu.edu)

**Compound urban flooding: The emerging hazard for Washington DC Metropolitan Area.** Selina Jahan Sumi, PhD Student; Celso Ferreira, Associate Professor, Department of Civil, Environmental and Infrastructure Engineering, George Mason University. Email: [ssumi@masonlive.gmu.edu](mailto:ssumi@masonlive.gmu.edu)

**Water resources of Mongolia.** Myagmarsuren Bat-Erdene (Doctoral Student), S. Erdenesukh, Department of Geography School of Arts and Sciences, National university of Mongolia; D. Oyunbaatar, Hydrology Section, Information and Research Institute of Meteorology, and Hydrology and Environment, Ulaanbaatar, Mongolia. Email: [miga\\_b2006@yahoo.com](mailto:miga_b2006@yahoo.com)

**Chlorine removal from drinking water by a polymer bonded novel reducing agent.** X. Song, Associate Professor and Chairman of Division of Sciences and Math; W. Li, Visiting Associate Professor; Akil Mondie, Student Senior, Division of Science and Math, University of the District of Columbia. Email: [william.li@udc.edu](mailto:william.li@udc.edu), [xsong@udc.edu](mailto:xsong@udc.edu)

**Spatiotemporal-based assessment of drinking water quality problems using NYC311 Data.** Miah Cohall, Undergraduate Researcher; Juneseok Lee, Associate Professor, Department of Civil and Environmental Engineering, Manhattan College, Riverdale, NY. Email: [mcohall01@manhattan.edu](mailto:mcohall01@manhattan.edu), [juneseok.lee@manhattan.edu](mailto:juneseok.lee@manhattan.edu)

**Classical and deep learning based time series forecasting of drinking water quality complaints in New York City.** Jarai Sanneh, Graduate Researcher; Juneseok Lee, Associate Professor, Department of Civil and Environmental Engineering, Manhattan College, Riverdale, NY. Email: [jsanneh01@manhattan.edu](mailto:jsanneh01@manhattan.edu), [juneseok.lee@manhattan.edu](mailto:juneseok.lee@manhattan.edu)

**Assessing water quality contamination in Washington, DC: Determination of trace metals in Anacostia Tributary sediment by ICP-MS.** Maryam Saur, Candidate of Professional Science Master's in Water Resources Management; Sania Rose, Project Assistant, Water Resources Research Institute; Sebhat Tefera, Project Specialist, Water Resources Research Institute; Tolessa Deksissa, Director, Professional Science Master's Program, College of Agriculture, Urban Sustainability and Environmental Sciences, University of the District of Columbia. Email: [maryamsabur@gmail.com](mailto:maryamsabur@gmail.com) , [tdeksissa@udc.edu](mailto:tdeksissa@udc.edu)

**Monitoring polycyclic aromatic hydrocarbons in the downstream tributaries of the Anacostia River in Washington DC.** Sania Rose, Project Assistant; Maryam Sabur, Research Assistant; Tolessa Deksissa, Director, Professional Science Master's Program, College of Agriculture, Urban Sustainability and Environmental Sciences, University of the District of Columbia. Email: [sania.rose@udc.edu](mailto:sania.rose@udc.edu), [tdeksissa@udc.edu](mailto:tdeksissa@udc.edu)





**Investigating extreme precipitation events and the error propagation from satellite-based input precipitation to output water quality indicators simulated by a hydrologic model.** Jennifer Solakian, Doctoral Student, Viviana Maggioni, Associate Professor, Department of Civil, Environmental and Infrastructure Engineering, George Mason University; Adil Godrej, Research Associate Professor/ Co-Director, Occoquan Watershed Monitoring Laboratory, Department of Civil and Environmental Engineering, Virginia Tech.  
Email: [jsolakia@gmu.edu](mailto:jsolakia@gmu.edu)



**The three biggest mistakes the water sector makes online – and the 5 steps to creating your first high-engagement high-impact experiential online education program on water.** Cat Shrier, PhD, Founder of the WaterCitizen Education Foundation, Ronnie “Tsunami” Gandiza. Founder of Changemaker Academy and CEO of the Plant-Based Network. Email: [cat@watercitizen.org](mailto:cat@watercitizen.org),  
Email: [rgandiza@plantbasednetwork.com](mailto:rgandiza@plantbasednetwork.com)

### Workshop

3:15 p.m. – 5:00 p.m.

Executive Conference Room

#### An Experiential Workshop for YOU (the Water Expert) to Create Your First Online Education and Engagement Program on Water

	<p><b>Ronnie “Tsunami” Gandiza.</b> Founder of Changemaker Academy and CEO of the Plant-Based Network, Ronnie “Tsunami” Gandiza has been in the online education-based marketing, training and education space for over 35 years. His learning solutions have been implemented in more than 10,000 academic institutions, non-profits and enterprise organizations including Microsoft and the US Air Force. He has helped to build online and local support communities with millions of members in information technology, business, and health and wellness. Email: <a href="mailto:rgandiza@plantbasednetwork.com">rgandiza@plantbasednetwork.com</a></p>
	<p><b>DR. Cat Shrier.</b> Cat is a Water Planning &amp; Policy, Online Education &amp; Engagement Expert with 25+ years’ experience conceptualizing and implementing strategic and purposeful communications, education, outreach, and inreach programs. She is the Founder of the WaterCitizen Education Foundation, Publisher/Editor of WaterCitizenNews.Com, Producer/Host of "The Water Show!" and has provided live coverage of water-related conferences, briefings, and events as the "Water Mobile Journalist.” She has developed online education-based launches, summits, courses, and shows. Email: <a href="mailto:cat@watercitizen.org">cat@watercitizen.org</a></p>

#### Workshop Overview

Do you want to turn your water expertise into online courses, shows, or communities? Does your agency, company or organization, or university have a new water policy, program, or practice you are trying to share with a large group – or perhaps a small targeted group – using online approaches? How can you develop and promote your program in a way that will attract the RIGHT audience of students who will benefit from your program – and how to support them in completing your program and getting results? In this experiential workshop, WaterCitizen’s Dr. Cat Shrier and Changemaker Academy’s Ronnie Tsunami will walk you through the development of your first high-engagement experiential online education program on water. **Bring your laptops!**

**Please also view the poster display:** (Ballroom A)

<p>5:15 p.m.</p>	<p><b>Optional Post- Symposium TOUR: UDC Campus Green Infrastructure.</b> Led by Dr. Tolessa Deksissa, Director, DC Water Resources Research Institute &amp; Professional Science Master’s Water Resource Management Program</p>
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## Registration

Please register online by Monday, April 9 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	
<b>Registration Fees</b> (includes lunch & coffee breaks)	<b>Member or Presenter/Moderator</b>	<b>Non- Member</b>	<b>Member or Presenter</b>	<b>Non- Member</b>
On-line thru March 31, 2020	\$35	\$50	\$15	\$25
On-site April 3, 2020	\$50	\$75	\$25	\$35



**The American Water Resources Association National Capital Region Section Leadership  
 2019-2020**

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