



2020 National Capital Region Virtual Water Resources Symposium:

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

Friday, October 9, 2020

9:00 a.m. – 5:15 p.m.

Virtual Platform

The University of the District of Columbia

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

	Breakout Room 1
9:00 a.m. 9:30 a.m.	<p style="text-align: center;">Opening & Welcome</p> <ul style="list-style-type: none">• Seth Lawler (Dewberry), 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; President-Elect, AWRA-NCR Section• Dwane Jones, Acting Dean, College of Agriculture, Urban Sustainability & Environmental Sciences (CAUSES) , University of the District of Columbia• Tamim Younos, Founder & President, Green Water-Infrastructure Academy Symposium Chair & Vice President AWRA-NCR Section, Fellow Member AWRA Introduction: Symposium Theme and Agenda• Sandra Pavlovic , AWRA-NCR Section Past President, Introducing the Keynote Speaker
9:30 a.m. – 10: 00 a.m.	<p style="text-align: center;">Keynote</p> <p>James P. Cooper, PE, Intelligent Water Lead at Arcadis</p>
10:00 a.m. 10:20 a.m.	Live Interactive Q/A



10:20 a.m.	Invited Panel: <i>Water Management in the Era of Artificial Intelligence: Digital Solutions & Smart Technology Applications</i>
10:20 a.m. 10:30 a.m.	Moderator: Steven Bieber , Acting Water Resources Director, DC Council of Governments
10:30 a.m. 11:30 a.m.	Panelists: Chandra S. Pathak , PhD, U.S. Army Corps of Engineers, Elkin Hernandez , DC Water Christian Manalo , PE, Booz-Allen-Hamilton
11:30 a.m. 12:00 p.m.	Live Interactive Q/A
12:00 p.m.	Lorena Kowalewski , AWRA-NCR Section Vice Pres. / Program Committee Chair, Introducing Luncheon Speaker
12:05 p.m.	Luncheon Speaker: Alexandra Campbell-Ferrari , Co-Founder and Executive Director, The Center For Water Security and Cooperation
12:30 p.m. 12:45 p.m.	Live Interactive Q/A
12:45 p.m. 1:15 p.m.	Lunch Break. Please visit Breakout Room 4 for live interaction with poster presenters.



Con-Current Sessions
1:15 p.m. – 3:00 p.m.

Breakout Room 1

Session 1 (Panel): EPA Water Reuse Action Plan

Convened by the Water Reuse Association

Moderator: Greg Fogel, Policy Director, Water Reuse Association

Panelists:

Steve Via, Director of Federal Relations, American Water Works Association (Email: svia@awwa.org)

Sharon Nappier, Senior Microbiologist, US Environmental Protection Agency (Email: nappier.sharon@epa.gov)

Claudio Ternieden, Senior Director of Government Affairs & Strategic Partnerships, Water Environment Federation (Email: cternieden@wef.org)

Panel Overview

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.

Breakout Room 2

Session 2: Emerging Technologies and Data Management Tools

Moderator: Alaina Armel, AECOM

Can losses from flood events be successfully modeled using an open source machine learning framework? Predicting aggregated insurance claims from anonymized Open FEMA data by leveraging a stacked ensemble machine learning method. Jason Matney, PhD, Senior GIS Professional at Dewberry. Email: jmatney@Dewberry.com

Use of mobile, GPS-Enabled data collection tools and operational dashboards to efficiently manage water resource assessments. Alicia Ritzenthaler, Heather Bourne, Brad Udvardy, LimnoTech. Email: aritzenthaler@limno.com

Mapping National Water Model (NWM) forecasts with FEMA HEC-RAS models – a pilot application in the Whitemarsh Run watershed, Maryland. Jennifer McGee, PE, CFM, Water Resources Engineer; Kristine Mosuela, EIT, Water Resources, Wood E&I. Email: jenna.mcgee@woodplc.com

Be prepared: climate resilience and mitigation planning for the Washington Suburban Sanitary Commission. Miranda Santucci, PE, Water Engineer; Lee Tharps, PE, Water Engineer; Paula Sanjines, PE, Wastewater Regional Solutions Leader, Jacobs. Email: miranda.santucci@jacobs.com



Breakout Room 1

3:00 p.m. – 3:15 p.m.
Poster Award Presentations

Con-Current Sessions
3:15 p.m. – 5:30 p.m.

Breakout Room 1

Session 3 (Panel) : Microplastics Pollution: Research & Education Strategies

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 (Email: meiller@american.edu)

Bob Murphy, Fisheries Ecologist at Tetra Tech (Email: Bob.Murphy@tetrattech.com)

Beth Gingold, Founder, Recycle Leaders LLC (Email: beth.gingold@recycleleaders.com)

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

Breakout Room 2

Session 4. Advances in Water Management Systems

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, ICPRB. Email: aseck@icprb.org

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

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

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

are emerging societal issues. The panel will discuss complexity of microplastic pollution, ongoing research, and microplastic pollution prevention strategies including citizen awareness and role.

Breakout Room 3

Workshop

3:15 p.m. – 5:15 p.m.

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



DR. Cat Shrier. Cat is a Water Planning & Policy, Online Education & 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: cat@watercitizen.org

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 will walk you through the development of your first high-engagement experiential online education program on water.

Breakout Room 1: Poster Displays (9:00 a.m. – 5:00 p.m.)

(Link will be provided)

Breakout Room 4: (1:15 p.m. – 2:15 p.m.)

Live Interaction Q/A (poster presenters should be available)

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

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

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, 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, 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, juneseok.lee@manhattan.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, 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, Dept. of Civil and Environ. Eng., Virginia Tech. Email: jsolakia@gmu.edu



Registration

Please register online by Friday, September 25. Payment is accepted online by credit card. .

Step 1: Go online to the link: <https://co.clickandpledge.com/?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

Registration will close on October 4

	Member or Presenter/Moderator	Non-Member	Students
Registration Fees	\$15	\$20	\$5



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

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