



National Stormwater Symposium 2020

Draft Technical Program

(Updated November 26, 2019)

March 15 – 17, 2020

**Duke Energy Convention Center
Cincinnati, Ohio**

This conference is organized by the Water Environment Federation Stormwater Institute (SWI) in cooperation with the Ohio Water Environment Association, Sanitation District No. 1 of Northern Kentucky, Metropolitan Sewer District of Greater Cincinnati, American Society of Adaptation Professionals, Civic Garden Center of Greater Cincinnati, Ohio Stormwater Association, Tinker's Creek Watershed Partners, and the Water Research Foundation (WRF).

Pre-Conference Workshops

(Additional fees apply)

Workshop A: Intelligent Wet Weather Systems – Active Monitoring and Control

Sunday, March 15

8:30 AM – 5:00 PM

With the exponential growth of water quality/quantity sensing technologies, combined with the explosion of our data analytics capabilities supported by big data, cloud computing and machine learning, we are on verge of a massive shift in how we monitor, control and optimize our wastewater and stormwater collection systems. As we better understand and realize the roles that these collection systems play in the dynamics of water quality degradation, urban flooding, and public health protection, our ability to monitor and control these systems, using emerging sensing, digital communication, data management technologies and machine learning approaches, will be increasingly needed.

This workshop will explore the concepts, designs, implementation, and real-world results of these intelligent wet weather systems and the capabilities that emerging technologies can provide to successfully monitor and control wastewater/stormwater collection systems in near real time based on water quality/quantity data acquisition and analytics.

Workshop B: Innovative Funding, Financing and Alternative Project Delivery Frameworks and Applications in the Stormwater Sector

Sunday, March 15

8:30 AM – 12:00 PM

WEF has estimated an annual funding gap of \$7.5B in the stormwater sector, which is likely a conservative estimate. The need for new sources of funding is the focus of the EPA Stormwater Funding and Financing Task Force, and topic of expanded funding/financing potential is near or at the top of many surveys in the stormwater sector. In a similar way, there is a growing interest in the use of alternative project delivery approaches to implement infrastructure projects at an accelerated pace and with greater cost efficiency. An approach tailored to the stormwater program is the Community-Based Public-Private Partnership (CBP3) approach, which has been implemented in multiple locations and is of growing interest in communities across the country.

This workshop will present new approaches in the context of the Clean Water SRF program, the WIFIA program, and other financing programs. In addition, an overview and update on the status and progress of CBP3 programs as well as potential future trends in the use of alternative project delivery in the stormwater sector.

Pre-Conference Workshops

(Additional fees apply)

Workshop C: Designing Successful Stormwater Facilities with Maintenance and Enforcement in Mind

Sunday, March 15

1:30 PM – 5:00 PM

Learn how facility type, location, design, and approach can impact the overall success of today's most widely implemented stormwater facilities from the people who work every day to keep them up and running.

This workshop will cover

- Maintenance responsibilities and capabilities of a large stormwater maintenance organization and the typical issues encountered with facility design
- A wide variety of case studies involving facilities that failed and became maintenance headaches; learn what steps you can take to ensure your facilities do not suffer a similar fate
- How managers structure private stormwater programs and what site elements are critical to maintenance and enforcement at those facilities
- Explore the struggles that homeowners and enforcement officials face when trying to maintain or reestablish private stormwater facilities with daunting design issues
- Practice stormwater plan review and implement the lessons learned to critically assess stormwater facility types, layouts, and other features
- Work as a group to identify potential points of failure and means of making sites more maintenance and enforcement friendly in order to prolong the lifespan of onsite stormwater facilities.

Facility Tours

(Additional fees apply)

Tour 1: MSD Green Bus Tour: Lick Run Greenway

Tuesday, March 17

1:00 PM – 4:00 PM

Join us for a “behind the scenes” look at the Metropolitan Sewer District of Greater Cincinnati’s (MSD) Lick Run Greenway project, a \$90 million stormwater management and CSO reduction project in Cincinnati. This is a driving and walking tour with stops at key elements of the Greenway, including a forebay, headwaters, mile-long stream channel, pond, and outfall into the Mill Creek, a tributary of the Ohio River. Sections of this tour will be in an active construction site; therefore, proper PPE will be required. Please wear your own steel-toed shoe/boots and let us know if you don’t own any. We will provide a safety vest and hard hat.

Tour 2: Public Service Park Tour

Travel across the river to see a variety of stormwater best management practices (BMPs) at Public Service Park, located on SD1’s main campus in Northern Kentucky (1045 Eaton Dr. Ft. Wright, KY 41017). The park features more than 10 BMPs, including a vegetated roof, wetland, pervious pavements and more. You can learn more about the park and all of the BMPs [here](#).

The following are the tour options:

Self-guided tour

Sunday, March 15 - Wednesday, March 18 (anytime from dawn to dusk)

Signs are posted throughout the park to explain the BMPs in detail and you can access an audio tour through your cell phone wherever you see a circular blue "Mobile Audio Tour" sign in the park. A map including the audio tour locations is available [here](#). Access to the vegetated roof is not available during the self-guided tour.

SD1-guided tour

Tuesday, March 17, 5:30 – 6:30 PM or Wednesday, March 18 11:30 AM – 12:30 PM

Explore the park with an SD1 guide to learn more about the BMPs and our multifaceted education program. This tour will include access to the vegetated roof and fresh water aquarium. The tour is free but you must register [here](#) prior to the event.

Post-Conference Special Seminar

Quantifying and Monetizing Co-Benefits of Green Stormwater Infrastructure: Analysis Framework and Supporting Tools

Wednesday, March 18

8:30 AM – 10:30 AM

This seminar will demonstrate the capabilities and applications from “Framework and Tools for Quantifying Green Infrastructure Co-Benefits and Linking with Triple Bottom Line Analysis”. In addition, it will connect with "Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC)", a cloud-based decision support system. CLASIC tool outputs include: (1) life cycle costs; (2) assessed value of co-benefits (environmental, social, financial); and (3) performance. The participants will have an opportunity in joining the discussion on how to quantify and monetize various co-benefit categories of green stormwater infrastructure. Furthermore, this seminar will provide a summary of case studies and ongoing community engagement.

Opening General Session
Monday, March 16, 8:30 AM -10:00 AM

- 8:30 AM** **Welcome to the 2019 Conference!**
John Phillips, *Parametrix, 2020 Co-Chair*
Leslie Schehl, *Metropolitan Sewer District of Greater Cincinnati, 2020 Co-Chair*
- 8:35 AM** **WEF Welcome**
Mark Poling, *WEF Board of Trustees, Clean Water Services*
- 8:40 AM** **Ohio Water Environment Association Welcome**
- 8:45 AM** **WEF Stormwater Institute Update**
Fernando Pasquel, *SWI Advisory Committee Chair, Arcadis*
- 9:05 AM** **A Perspective on Federal Stormwater Policy**
Chris Kloss, *US EPA*
- 9:25 AM** **Inspiring Action Through Storytelling**
Kristin Reilly, *Choose Clean Water Coalition*
- 10:00 AM** **Session Adjourns for Networking Break**

Session 01: Stormwater Worldwide
Monday, March 16, 10:45 AM - 12:15 PM

- 10:45 AM** **Greening the Pipeline: Re-Purposing a Heritage Listed Asset to Enhance Community Well-Being**
David Howard, GHD
- 11:15 AM** **Green Infrastructure for Long-Term Provision of Ecosystem Services: Developing a Universal Framework Under Different Cultures and Climates**
David Gamstetter, Davey Resource Group; Ishi Buffam, University of Cincinnati
- 11:45 AM** **Flood Management in Mexico City – Vicente Guerrero StormWater Pumping Station**
Elena Rodriguez Hernandez, INDAR
- 12:15 PM** **Session Adjourns for Networking Luncheon**

Session 02: Survey of Lessons Learned
Monday, March 16, 10:45 AM - 12:15 PM

- 10:45 AM** **Identifying Priorities and Addressing Risks: A Project Evaluation and Prioritization Framework for a Regional Stormwater Management Program**
Joseph Danyluk, Jacobs Engineering Group, Inc.; Paul Kovalcik, Northeast Ohio Regional Sewer District
- 11:15 AM** **WEF Stormwater Institute National MS4 Needs Assessment Survey Update**
Rebecca Arvin-Colon, WEF
- 11:45 AM** **Roadway-Generated Stormwater in Arizona: A Survey**
David Mack, Arizona Department of Transportation
- 12:15 PM** **Session Adjourns for Networking Luncheon**
- Alternate:** **One Water Cities: Ideas and Lessons Learned from Coast to Coast**
Inge Wiersema, Jacquelin Reed, Carollo Engineers

Session 03: Maintaining Control – Managing Storm Water Assets to Maintain Beneficial Use

Monday, March 16, 10:45 AM - 12:15 PM

- 10:45 AM** **Opportunities to Improve Winter Safety and Reduce Road Salt Pollution with Permeable Interlocking Concrete Pavements**
Jennifer Drake, Jeff Marvin, Jody Scott, University of Toronto; Kirti Sehgal
- 10:45 AM** **Transitioning Stormwater Facility Maintenance from Reactive to Proactive: An Experiment in Risk Assessment and Predictive Analytics.**
Eric Caldwell, Fairfax County Stormwater Management
- 11:45 AM** **DC Water’s Green Infrastructure Asset Management Program**
Ramakrishna Jeedigunta, Greeley and Hansen LLC; Seth Charde, Monica Outland, DC Water
- 12:15 PM** **Session Adjourns for Networking Luncheon**
- Alternate:** **The Nitty Gritty on Inspection and Maintenance of Green Infrastructure Practices in Capitol Region Watershed District**
Mark Doneux, Capitol Region Watershed District

Session 04: Multi-Purpose Stormwater Projects: Insights and Lessons Learned
Monday, March 16, 1:30 PM - 3:00 PM

- 1:30 PM** **Performance of a Stormwater Treatment Chain During Winter Rain and Thaw Conditions: Case Study of a Bioretention in Series with a Retention Pond**
Béatrice Pineau, Paul Lessard, Genevieve Pelletier, Université Laval Dept Of Civil and Water Engineering; Sophie Duchesne, INRS Centre Eau Terre Environnement
- 2:00 PM** **Living Schoolyards as Stormwater Infrastructure: San Francisco's Stormwater Schoolyards Program**
Sarah Bloom, San Francisco Public Utilities Commission; Rosey Jencks, Brown and Caldwell
- 2:30 PM** **Malibu Legacy Park: Learning from Nine Years of Successes and Lessons**
Brenda Ponton, Kathleen Higgins, Persephene St. Charles, Woodard & Curran
- 3:00 PM** **Session Adjourns for Networking Break**

Session 05: Stormwater Action Planning
Monday, March 16, 1:30 PM - 3:00 PM

- 1:30 PM** **Lancaster's Integrated Green Infrastructure Plan: Analyzing a Decade of Implementation and Planning for the Next**
Andrew Potts, Jacobs; Ruth Hocker, City of Lancaster; Leah Rominger, CH2M; Courtney Finneran, Jacobs
- 2:00 PM** **Green Infrastructure Implementation at the Metropolitan Water Reclamation District of Greater Chicago**
John Watson, Metropolitan Water Reclamation District of Greater Chicago
- 2:30 PM** **How Pittsburgh Water and Sewer Authority is Achieving Affordable Water Quality through Integrated Watershed Management**
Ana Flores, Pittsburgh Water and Sewer Authority
- 3:00 PM** **Session Adjourns for Networking Break**

Session 06: Performance of Post-Construction Control Measures
Monday, March 16, 1:30 PM - 4:45 PM

- 1:30 PM** **Why a National Testing and Verification Program for Stormwater Products and Practices is Needed and How it Can Benefit the Stormwater Sector: An Update on the STEPP Program**
Seth Brown, Storm and Stream Solutions LLC
- 2:00 PM** **Let's Talk Trash: Developing a Scalable Pilot Study for Implementation of Stormwater Control Measures**
Bethany Bezak, DC Water; Olivia August
- 2:30 PM** **Maximizing the Benefits of Standardized Green Infrastructure During and Post Construction**
Eric Lienhard, Hazen and Sawyer; Seth Charde, DC Water
- 3:45 PM** **ODOT Research- Soil Amendment for Stormwater Volume Reduction**
Anil Kumar Tangirala, MS Consultants Inc.; Jonathan Prier, Ohio Department of Transportation
- 4:15 PM** **Stormwater Conveyance to Green Infrastructure Installations by Curb Cut Inlets**
Miki Urisaka, John McLaughlin, Paul Wojtal, NYC DEP; Jerry Kleyman, Heather Smith, Arcadis
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **Taking the First Step Toward a Stormwater Program with Adaptive Real-Time Controls: Atlanta, Georgia Case Study**
Dayton Marchese, Opti; Todd Hill, City of Atlanta

Session 07: Computer Based Innovation for Stormwater Management
Monday, March 16, 3:45 PM - 4:45 PM

- 3:45 PM** **Spatial Analysis of Retarding Basin Opportunities: Next Steps for Melbourne's Liveability Journey**
Casey Furlong, David Howard, GHD
- 4:15 PM** **Modernizing Stormwater Programs through Digital Transformation**
Gary Conley, Nicole Beck, 2NDNATURE
- 4:45 PM** **Session Adjourns for Networking Reception**
- Alternate:** **The 2-Dimensional Inundation Simulation Using Hydrological and Hydraulic Modeling and Its Applications to Urban Flood Control**
Mengye Chen, Xiangyu Luo, Zhi Li, Yang Hong, University of Oklahoma

Session 08: WEF Stormwater Institute - National Municipal Stormwater and Green Infrastructure Award Winners
Monday, March 16, 3:45 PM – 4:45 PM

Final agenda to be confirmed

In the fifth annual National Municipal Stormwater and Green Infrastructure Awards, twenty-two high-performing municipalities and one university received recognition. These awards celebrate administrators of municipal separate storm sewer systems (MS4s) that perform beyond regulatory requirements. The awards were developed and introduced in 2015 and recognize performance in the categories of innovation and program management, as well combined high scores in both categories. Applications for the National Municipal Stormwater and Green Infrastructure Awards are reviewed by a broad work team of water sector experts.

For this session, winners of the 2019 Awards will present their program aspects that go above and beyond their regulatory requirements.

Rebecca Arvin-Colon, Water Environment Federation

Session 09: Influence and Action – Outreach, Education, and Training Strategies
Tuesday, March 17, 8:30 AM - 12:15 PM

- 8:30 AM** **One Community, Many Voices. The Role of Strategic Communications when Implementing a Stormwater Fee**
Rebecca Zito, Pittsburgh Water and Sewer Authority
- 9:00 AM** **Adopt-a-Drain: Measuring the Impacts of Resident Engagement on Water Resources**
Jana Larson, Hamline University
- 9:30 AM** **DC Water’s Clean Rivers Project Robust Outreach Program for Green Infrastructure**
Amanda Zander, Delon Hampton & Associates; Seth Charde, DC Water
- 10:00 AM** **Networking Break**
- 10:45 AM** **Getting Rain Gardens Built without Lifting a Shovel: Lessons Learned in Outreach & Education**
Elizabeth Hiser, Cuyahoga Soil & Water Conservation District; Susan Bryan, Washtenaw County
- 11:15 AM** **Follow the Drop Mobile App: Building Water Resiliency**
Lauren Roth Venu, 3Rwater
- 11:45 AM** **NGICP Training Program: Lessons Learned from Implementing the NGICP Program in the Nation’s Capital**
Kamran Zendeheel, University of the District of Columbia; Harris Trobman, UDC CAUSES
- 12:15 PM** **Session Adjourns for Lunch**
- Alternate:** **Stormwater Roadshow: Building Trust with the Public**
Spencer Peck, Todd Hill, City of Atlanta; Susan Rutherford; Julie Owens
- Alternate:** **The Good, The Bad and the Meh of Watershed Education**
Danielle Wynne, Christopher Mueller, Fairfax County Stormwater Management

Session 10: Program Development, Management, Planning and Analysis
Tuesday, March 17, 8:30 AM - 12:15 PM

- 8:30 AM** **City of Portland's Approach to Developing and Asset Management Strategy for its Stormwater System**
Fred MacGregor, City of Portland, Bureau of Environmental Services
- 9:00 AM** **Stormwater BMP Performance in meeting Chesapeake Bay TMDL Goals in Prince George's County, MD**
Srikanth Gorugantula, HDR Inc; Pete Littleton, Corvias
- 9:30 AM** **Good Streams Make Good Neighbors: Enhancing Stream and Floodplain Restoration Projects Through Property Acquisitions**
Kristen Buccier, Northeast Ohio Regional Sewer District
- 10:00 AM** **Networking Break**
- 10:45 AM** **Holistic Stormwater Management with Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC) and Green Infrastructure Co-Benefits Tools**
Harry Zhang, The Water Research Foundation
- 11:15 AM** **Old Tampa Bay Circulation Improvement**
Shayne Paynter, Atkins
- 11:45 AM** **Capture and Use of Urban Runoff Conveyed Directly to a Drinking Water Treatment Facility as an Alternative Stormwater Management Strategy: A Sacramento Case Study**
Parmdeep 'Eric' Uppal, Civil Engineering, California State University, Sacramento; Brian Currier, Water Programs at Sacramento State; John Johnston, Global Water
- 12:15 PM** **Session Adjourns for Lunch**
- Alternate:** **Development of Stormwater Pipe Rehabilitation Management Plan**
Rajat Chakraborti, Jagjit Kaur, Jacobs

Session 11: Funding and Financing
Tuesday, March 17, 8:30 AM - 10:00 AM

- 8:30 AM** **The Evolution of a Stormwater Utility in St. Petersburg**
Andrew Burnham, Kelly Westover, Stantec
- 9:00 AM** **City of Guelph - Stormwater Service Fee - Financing, Implementation and Lessons Learned**
Arun Hindupur, City of Guelph
- 9:30 AM** **Quantifying and Monetizing Co-benefits to Leverage GI Opportunities and Incentives**
Janet Clements, Jim Henderson, Corona Environmental Consulting
- 10:00 AM** **Session Adjourns for Networking Break**

Session 12: Unpacking the Environmental Impact Bond
Tuesday, March 17, 10:45 AM – 12:15 PM

- 10:45 AM** **Introductions**
- 10:55 AM** **Genesis of the Competition**
- 11:00 AM** **Application Process and Hudson's Roadmap from Challenges Presented to Winning the Competition**
- 11:20 AM** **Discussion of How Environmental Impact Bonds Work in General and the Process**
- 11:45 AM** **Lessons learned from other EIBs**
- 12:00 PM** **Moderated Q&A and Discussion** -- items may include but not necessarily be limited to:
- Additional details regarding Quantified Ventures impact capital solutions in OH and/or across the U.S. and globally
 - Further insights regarding City Hudson stormwater management plans and capabilities
 - Understanding the transaction structuring process and its replicability across municipalities

Michelle Shin, Todd Appel, Benjamin Cohen, Quantified Ventures; Sanjiv Sinha, Environmental Consulting & Technology, Inc.; Amanda Hallauer, City of Atlanta Department of Watershed Management

**Session 13: National Policy, Legislative and Legal Hot Issues in Stormwater Sponsored by the National Municipal Stormwater Alliance (NMSA)
Tuesday, March 17, 1:30 – 3:00 PM**

Final agenda to be confirmed

The stormwater sector is dynamic, so it should not be surprising that aspects of the sector associated with policy are equally dynamic. This session will highlight rising topics in these areas and provide insights through thoughtful presentations on policies impacting the stormwater sector, such as water quality trading and market-based approaches, as well as Waters of the U.S. and how recent updates in these areas may impact local stormwater programs. National legislation in the stormwater space has been equally dynamic. The recent America's Water Infrastructure Act (AWIA) of 2018 drove the creation of the Stormwater Funding and Financing Task Force, whose recommendations may drive funding streams and programs in the future. The Water Resources Development Act (WRDA) of 2020 will spell out details regarding potential funding and financing options new to the sector, and may address additional challenges, such as providing updates on rainfall projections on a wide and consistent scale.

Seth Brown, National Municipal Stormwater Alliance; Steve Dye, Water Environment Federation; Ryan Baron, Best, Best, & Krieger

Session 14: Evolution of Stormwater Utilities to provide Incentives for Green Infrastructure in CSO Communities
Tuesday, March 17, 1:30 PM - 3:00 PM

- 1:30 PM** **Implementation of a Green Infrastructure Program to Comply with a Unique CSO Consent Decree Requirement**
Joseph Danyluk, Jacobs Engineering Group, Inc.; Kimberly Colich, Northeast Ohio Regional Sewer District
- 2:00 PM** **Machine Learning and Statistics Confirm Green Infrastructure Performance for CSO Management**
Nikolaos Apsilidis, Greeley and Hansen; Seth Charde, DC Water
- 2:30 PM** **Onondaga County's Save the Rain CSO Abatement Program's Opportunistic Approach to Stormwater Management**
Zachary Monge, Jacobs; Frank Mento, Adam Woodburn, Onondaga County Department of Water Environment Protection
- 3:00 PM** **Session Adjourns for Networking Break**
- Alternate:** **Stormwater Management Capacity of Artificial Turf Grass Fields**
Miki Urisaka, John McLaughlin NYC DEP; Jerry Kleyman, Malcolm Pirnie Inc; Kimberly DiGiovanni, Auroran Environmental; Franco Montalto, eDesign Dynamics/Drexel University; Paul Wojtal, NYC DEP

Session 15: Sustainable Solutions to Climate and Flooding
Tuesday, March 17, 1:30 PM - 4:45 PM

- 1:30 PM** **Ecologically Sustainable Solution to Urban Flooding**
Chip Wendt, Coldwater Consulting, LLC; Don Romancak, Lorain County
Community Development
- 2:00 PM** **Fishermans Bend Water Sensitive Drainage and Flood Strategy**
Ryan Brotchie, David Howard, GHD
- 2:30 PM** **Stop the Tide, Save the Storage - Solutions for Flood Mitigation and
Beyond**
Nicole Dane, Michael Baker International
- 3:00 PM** **Networking Break**
- 3:45 PM** **Integrating Sustainable Drainage Within Urban Development, an Integrated
Design Approach**
Aidan Cooper, GHD
- 4:15 PM** **Mixing Water and Concrete: Locating Bluebelt Stormwater Management
Systems in Dense Urban Areas**
Charles Olson, NYCDEP, Bureau of Water and Sewer Operations; Eric
Rosenberg, Hazen & Sawyer; Flor Ruiz, NYCDEP
- 4:45 PM** **Session Adjourns for Social with Speakers**
- Alternate:** **Near Real-time Flood Threat Recognition Improves Resiliency in Urban,
Peri-urban and Natural Watersheds**
Baxter Vieux, Vieux & Associates, Inc. / AE Monitoring; Ben Wostoupal

Session 16: Technology and Innovation for Stormwater Management
Tuesday, March 17, 3:45 PM - 4:45 PM

3:45 PM **Reconstructing Interstate 95 - Large Scale Green Infrastructure Paves the Way for Community Transformations**
Christian Lynn, Edwina Lam, AECOM

4:15 PM **The Operational and Compliance Benefits of Real-Time Sewer Monitoring**
William Simcoe, City of Albany; Phil Brenner

4:45 PM **Session Adjourns for Social with Speakers**

Alternate: **Planning for Stormwater to Supplement San Diego's Pure Water Program**
Jim Rasmus, Carollo Engineers, Inc.; Karina Danek, Sara Dastgheibi, City of San Diego

Session 17: Optimizing Stormwater Management for Stream Integrity—A Northern Kentucky Case Study on the Science and Implementation
Tuesday, March 17, 3:45 – 4:45 PM

3:45 PM Monitoring Program History and Major Findings

4:05 PM Cooperative Research Partnerships, Pilot Projects and Their Use.

4:25 PM Culmination of the Program and Results

Matthew Wooten, Sanitation District #1; Robert Hawley, Katie Macmannis, Sustainable Streams LLC; Chris Rust, Strand