

**Monday 1/10**

**Tuesday 1/11**

**Wednesday 1/12**

8:00 AM			
8:15 AM		<b>Special Session B</b>	<b>Keynote</b>
8:30 AM	Opening Ceremony	GI Design (Stovin)	Precipitation & Climate Change
8:45 AM	Keynote	Trace Contaminants (Vezzaro & Mutzner)	Prof. Lizzie Kendon
9:00 AM			UK Met Office & Bristol Univ.
9:15 AM		<b>Concurrent</b>	
9:30 AM	<b>Concurrent</b>	<b>Technical Sessions D</b>	<b>Posters &amp; Flash Presentations</b>
9:45 AM	<b>Technical Sessions A</b>		
10:00 AM		1. RFL - 1	coffee/tea break
10:15 AM	1. MLPP - 1	2. RTC - 1	
10:30 AM	2. MIIS - 1	3. SCM - 3	<b>Concurrent</b>
10:45 AM	3. SCM - 1	coffee/tea break	<b>Technical Sessions G</b>
11:00 AM	coffee/tea break		
11:15 AM		<b>Plenary/Keynote</b>	1. EXTEV - 1
11:30 AM	<b>Concurrent</b>		2. DATA - 3
11:45 AM	<b>Technical Sessions B</b>		3. SCM - 5
12:00 PM	1. COPINT - 1		Closing Ceremony
12:15 PM	2. MLPP - 2	Lunch	Report-outs from Special Sessions and workshops
12:30 PM	3. ALTAPP-1		Awards
12:45 PM	Lunch		END
1:00 PM			
1:15 PM		<b>Concurrent</b>	
1:30 PM	<b>Workshop/</b>	<b>Technical Sessions E</b>	
1:45 PM	<b>Special Session A</b>		
2:00 PM	Community SWMM (Hodges)	1. RFL - 2	
2:15 PM		2. RTC - 2	
2:30 PM	coffee/tea break	3. SCM - 4	
2:45 PM		coffee/tea break	
3:00 PM			
3:15 PM	<b>Posters &amp; Flash Presentations</b>	<b>Workshop/Special Session C</b>	
3:30 PM			
3:45 PM	<b>Concurrent</b>		
4:00 PM	<b>Technical Sessions C</b>		
4:15 PM		<b>Concurrent</b>	
4:30 PM	1. DATA - 1	<b>Technical Sessions F</b>	
4:45 PM	2. MIIS - 2		
5:00 PM	3. SCM - 2	1. TRANSP - 1	
5:15 PM		2. RTC - 3	
5:30 PM		3. DATA - 2	
5:45 PM			
6:00 PM		<b>Dinner Social for in-person</b>	
6:15 PM			
6:30 PM			
6:45 PM			
7:00 PM			

## Monday Jan 10 | 09:30 - 11:00 PST

### Concurrent Technical Sessions A

#### 1. Application of machine learning processes and protocols - 1 (MLPP - 1)

Data-driven emulation of computationally expensive urban drainage simulators using deep learning and automatic hyperparameter optimization  
Leveraging Generative Adversarial Networks (GANs) to Improve the Accuracy of Data-Driven Combined Sewer Flow Prediction Models  
Potential of machine learning for estimating the impact of water efficient scenarios on solids accumulation in sewers  
Using the right wastewater characteristics for early COVID-19 pandemic warning and forecast using deep machine-learning.

#### Presenter

Marco Mahmoodian  
Alireza Koochali  
Roni Penn  
Jean-David Therrien

#### 2. Modeling Interactions and Integrated Systems (MIIS - 1)

A Multi-Domain Solver for integrated modelling  
The power of Open Data - Using free data for a preliminary screening of impact from urban wet-weather discharges on Danish streams  
A computationally efficient urban flood model with a novel approach for determining water discharge through complex drainage network  
New modeling capabilities with the SWMM5+ parallel hydraulic solver

#### Presenter

Manfred Schutze  
Luca Vezzano  
Lianhui Wu  
Ben R. Hodges

#### 3. Representation and performance of SCMs/SUDs/WSUDs - 1 (SCM-1)

Fine Scale Hydrologic Modelling of Bioretention Using DRAINMOD  
Using LID Physical Properties to Predict Unsaturated Flows with SWMM  
Modeling Long-Term Water Balances of Green Infrastructures using SWMM Extended with the Evapotranspiration Model SWMM-UrbanEVA  
Comparing Estimates of Urban Tree Impacts on Stormwater Runoff using i-Tree Hydro Model Predictions and Hyperlocal Observations

#### Presenter

Ghada Diab  
Simon De-Ville  
Birgitta Hvøðnschemeyer  
James Kruegler

## Monday Jan 10 | 11:15 - 12:45 PST

### Concurrent Technical Sessions B

#### 1. Coupled and/or Integrated Modelling - 1 (COPINT - 1)

Coupling SWMM and MODFLOW: Developing and applying a model integration scheme for urban settings with wetlands and shallow groundwater  
Modelling bioretention hydrology in the SWMM LID module and DRAINMOD-Urban  
Modelling hydrodynamic and pathogen dynamics in a stormwater constructed wetland with multiple inflows  
Prediction of the Catchment-Scale Efficiency of Stormwater Control Measures in an Urban Watershed using a Process-Based Modelling Approach

#### Presenter

Jorge Gironas  
Whitney Lisenbee  
Xixi Shi  
Arash Massoudieh

#### 2. Application of machine learning processes and protocols - 2 (MLPP - 2)

Analysis of Urban Stormwater Control Measures Using Automated Modeling and Multi-criteria Evaluation  
Optimal deployment of the water quality sensors in urban drainage systems  
Predicting Event Mean Concentrations (EMCs) of Nutrients and Sediments in Urban Runoff Using A Random Forest Approach

#### Presenter

Matej Radinja  
Gabriele Freni  
Mina Shahed Behrouz

#### 3. Alternative Modeling Applications - 1 (ALTAPP - 1)

Groundwater shoaling impacts on coastal drainage infrastructure (case study: Imperial Beach)  
Analysis of sampling strategies for pulse loads in sewer catchments  
The South Orange County, California Flow Ecology Study: Part 1, Watershed Hydrology  
The South Orange County, California Flow Ecology Study: Part 2, Flow Ecology Approach for Flow Management Prioritization

#### Presenter

Kian Bagheri  
Albert König  
Rich Wildman  
Kris Taniguchi-Quan

## Monday Jan 10 | 15:30 - 17:00 PST

### Concurrent Technical Sessions C

#### 1. Data Collection In Support of Model Development, Calibration, and Validation - 1 (DATA - 1)

Stochastic modelling of trace contaminants in wet-weather discharges  
Does distributed monitoring improve the calibration of urban drainage models?  
Insights into stormwater drain hydrology and water quality via low-cost sensor monitoring  
Aliso Creek Smart Watershed Network: A High-Resolution Data Acquisition and Analysis Platform to Support Urban Runoff Management and Water Recovery

#### Presenter

Lena Mutzner  
Omar Wani  
Dusan Jovanovic  
Austin Orr

#### 2. Modeling Interactions and Integrated Systems - 2 (MIIS - 2)

Coding disasters: an open tool for managing municipal drainage network in risk areas  
Impact of model structure on analysing malfunctions in urban drainage systems  
Dilution and pollution: effects of wastewater reuse on water quality in the Los Angeles River  
Data-Driven Extraneous Water Quantification

#### Presenter

Larissa Thaina Schmitt Azevedo  
Fabian Funke  
Victoria Hennon  
Hugo Macedo

#### 3. Representation and performance of SCMs/SUDs/WSUDs - 2 (SCM - 2)

Design Storm and Continuous Simulation methods for Resilient SCM Design  
Models of wet basin design response with residence time metrics for presumptive guidance  
Sensitivity analysis of long-term transformation strategies for sustainable rainwater and wastewater management within an integrated model  
Maximizing BMP Performance in Urban Areas: A Modeling Approach to More Accurately Estimate Performance to Minimize BMP Footprint

#### Presenter

Robert Traver  
David Spelman  
Claudia CAMPUSANO GARCIA  
Sam Sarkar

## Tuesday Jan 11 | 09:15 - 10:45 PST

### Concurrent Technical Sessions D

#### 1. Representing Rainfall and Hydrology - 1 (RFL - 1)

Using isotopic source partitioning of urban runoff to verify effective impervious area model in a partially forested, partially developed urban watershed  
Where Old Data Meets New Technology: The Los Angeles Flood Control District Hydraulic and Hydrologic Model  
Requirements for case-specific calibration in urban hydrological modeling

#### Presenter

Victoria Rexhausen  
TJ Moon  
Sedki Karim

#### 2. Real-time Control, Analytics, and Software Integration - 1 (RTC - 1)

Development and implementation of a large-scale Real Time Control system: the Rotterdam case study  
Screening tool for control potentials in urban drainage systems ,Ài reviving a dormant research field  
Pipedream: a digital twin model for stormwater networks  
Towards fault-tolerant strategies for water quality-based control of the integrated urban wastewater system

#### Presenter

Jeroen Langeveld  
Nadia Lund  
Matthew Bartos  
Sovanna Tik

#### 3. Representation and performance of SCMs/SUDs/WSUDs - 3 (SCM - 3)

Hydraulic and hydrologic modelling to evaluate the design of permeable pavement in a catchment perspective  
Combined sewer networks for cities with hot and dry climates; a design optimization approach  
Challenges and opportunities for storage and infiltration-based LIDs in coastal catchments of Chennai, India  
Simulation of historical and design rainfall events in two large sewage collectors in the Valley of Mexico.

#### Presenter

Fernando Wu  
Ulrich Dittmer  
Bakkiyalakshmi Palanisamy  
Josua Rojas

## Tuesday Jan 11 | 13:15 - 14:45 PST

### Concurrent Technical Sessions E

#### **1. Representing Rainfall and Hydrology - 2 (RFL - 2)**

Geostatistical Approach to Understanding the Effect of Rainfall Spatial-Temporal Uncertainty on a Small Urban Hydraulic Model  
Radar data for long-term simulation - a viable alternative to rain gauges?  
Future evolution of CSO discharges under climate change, a case study in the Mediterranean region  
Using weather radar to improve the prediction accuracy of LSTM neural networks for anomaly detection of water level measurements in UDS

#### **Presenter**

Phillippa Mohan  
Michael Geyer  
Frederic Gogien  
Phillip Aarestrup

#### **2. Real-time Control, Analytics, and Software Integration - 2 (RTC - 2)**

Model predictive control of retention basins enhances removal of nonpoint-source pollutants  
Real Time Control in Urban Drainage Systems: Risks associated with rainfall and system capacity uncertainty  
Quantifying the Performance of RTC to Enhance Urban Flooding Resilience under Climate Change

#### **Presenter**

Jeil Oh  
Job van der Werf  
Jiada Li

#### **3. Representation and performance of SCMs/SUDs/WSUDs - 4 (SCM - 4)**

Riparian buffer strips: Case study of a catchment in Victoria, Australia  
Using random forest algorithms and globally sourced data to improve floating treatment wetland design and stormwater pond performance  
Recent progress in self-cleansing urban drainage channel design  
Design of An Oil/Grit Separator Under Dry and Wet Weather Conditions

#### **Presenter**

Timothy Jia Young Lim  
Ryan Winston  
Mir Jafar Sadegh Safari  
James Li

## Tuesday Jan 11 | 16:15 - 17:45 PST

### Concurrent Technical Sessions F

#### **1. Transport and Sewer Processes of Microconstituents and Pathogens - 1 (TRANSP - 1)**

Detecting human faecal pollution in mixed use rural-residential catchments using a Markov Chain Monte Carlo source apportionment model  
Improving QMRAs with next generation sequencing  
Effective Deployment Strategy Model of SARS-CoV-2 Sampling Tools for Wastewater-Based Epidemiology  
Particle characterisation and transport processes in view of modelling the fate of SARS-CoV-2 in sewer systems

#### **Presenter**

Robert Sargent  
Lynze Cheung  
William Walujono  
K. Haboub

#### **2. Real-time Control, Analytics, and Software Integration - 3 (RTC - 3)**

Studying the hydrological performance of a rainwater harvesting cistern with real time control collecting stormwater runoff from a green roof  
Hydrologic and Water Quality Implications of Real-Time Control Schemes in Bioretention  
BioRTC: a new model that simulates and explores real time control strategies of stormwater biofilters

#### **Presenter**

Nandan Shetty  
Jon Hathaway  
Pengfei Shen

#### **3. Data Collection In Support of Model Development, Calibration, and Validation - 2 (DATA - 2)**

Stochastic modelling of trace contaminants in wet-weather discharges  
Does distributed monitoring improve the calibration of urban drainage models?  
Insights into stormwater drain hydrology and water quality via low-cost sensor monitoring  
Aliso Creek Smart Watershed Network: A High-Resolution Data Acquisition and Analysis Platform to Support Urban Runoff Management and Water Recovery

#### **Presenter**

Lena Mutzner  
Omar Wani  
Dusan Jovanovic  
Austin Orr

**Wednesday Jan 12 | 09:45 - 11:15 PST**

**Concurrent Technical Sessions G**

**1. Extreme events: Deluges and Droughts - 1 (EXTEV - 1)**

Application of an optimization system to manage the risks of flash floods

HydroBID-Flood: an integrated modeling approach for flooding risk assessment/mitigation in urban watersheds. Study case of Santa Fe city, Argentina

Leveraging video data to assess urban pluvial flood hazard

Comparison of tools for mapping floodways in urban planning

**Presenter**

Mirjam Lawens

Pablo Cello

Joao P. Leitao

Thea Ingeborg Skrede

**2. Data Collection In Support of Model Development, Calibration, and Validation - 3 (DATA - 3)**

Developing a Surface Water – Groundwater Model for Green Stormwater Infrastructure to Estimate Water Supply Benefits

Evaluation of methods of measuring flowrates for bioretention planters

Reduction on nutrient concentration of Non-Point Source Pollution - an Example in Hu-Shan Reservoir, Taiwan

How Many Events Do You Need? A Statistical Approach to Developing a GSI/BMP Monitoring Program

**Presenter**

Scott Struck

Kiera Nissen

Marko Shaohua

Elizabeth Fassman-Beck

**3. Representation and performance of SCMs/SUDs/WSUDs - 5 (SCM - 5)**

Development of an Online Performance Calculation Tool for Bioretention Projects in Seattle, WA, USA

Co-Creating a Combined Sewer Plan ,Äi A Tool that Reports Infrastructure Costs and Benefits in Real Time to Facilitate Community Based Planning

Bioretention Design Modifications Targeting Climate Resiliency

Spatial impact of green infrastructures on urban drainage resilience

**Presenter**

Joanna Lewis

Alice Lancaster

Andrew Tirpak

Mayra Rodriguez