

Monday, 12 September



Track 1
WATER UTILITY
MANAGEMENT

Track 2
WASTEWATER
TREATMENT AND
RESOURCE RECOVERY

Track 3
DRINKING WATER
AND POTABLE REUSE

Track 4
CITY-SCALE
PLANNING AND
OPERATIONS

Track 5
COMMUNITIES,
COMMUNICATION
AND PARTNERSHIPS

Track 6
WATER RESOURCES
AND LARGE-
SCALE WATER
MANAGEMENT



Monday | Programme

Keynote Plenary	09:00 - 09:50	<p>Keynote: A Practical Perspective in Building Resilience Into Urban Water Management, Prof. Rohit T. Aggarwala Panel: Mark Fletcher, Austin Alexander, Lynn Broaddus, Chien-Hsin Lai, Tony Wong</p>		
Coffee Break	09:50 - 10:30			
Session 1	10:30 - 12:00	<p>HIGH-LEVEL SUMMIT — WATER AS A KEY TO ACTION ON CLIMATE AND THE SDGS</p> <p>INNOVATIVE FINANCING FOR SDGS AND CLIMATE CHANGE ACTION</p> <p>Chair: Tom Mollenkopf, <i>IWA President</i></p> <p>Summit organised by the International Water Association, Danish Water and Wastewater Association, the Municipality of Copenhagen, P4G and the Confederation of Danish Industry, in cooperation with the Ministry of Environment of Denmark and the Ministry of Foreign Affairs of Denmark. With water prominent in the SDG and climate agendas, the Summit will contribute to a powerful message on the need for cities to elevate water as they pursue their ambitions to create smart and secure liveable cities for all.</p> <p>The first session will focus on innovative financing for the SDGs and climate change action.</p> <p>By invitation</p> <p>Discussion facilitator: Corinne Trommsdorff, <i>Water Cities</i></p>	<p>Room A2 Summit</p> <p>GROUNDWATER FORUM I — GROUNDWATER MANAGEMENT</p> <p>Chair: Ida Holm Olesen, <i>Denmark</i></p> <p>Introduction by Anders Bækgaard, <i>IWA WWC President</i> and Dr Stephen Foster, <i>IWA Groundwater Management Specialist Group: Groundwater Frontiers for a Sustainable and Resilient Future</i></p> <p>Groundwater for Sustainable Development: Embracing the Challenges and Strengthening the Synergies, Dr. Karen G. Villholth, <i>Director, Water Cycle Innovation, South Africa</i></p> <p>Groundwater management in Kenya: opportunities and challenges, Julia Gathu, <i>Operations Manager-Drilling for Life, Kenya and Secretary for the IWA Groundwater Management Specialist Group</i></p> <p>Replenishing aquifers in water-scarce countries: assessing groundwater quality changes induced by the large-scale injection of reclaimed wastewater, Dr. Henning Prommer, <i>Principal Research Scientist at CSIRO Land and Water, Australia, and Winthrop Research Professor at the University of Western Australia</i></p>	<p>Room A3 Forum</p>
Lunch	12:00 - 13:30			
Session 2	13:30 - 15:00	<p>HIGH-LEVEL SUMMIT — WATER AS A KEY TO ACTION ON CLIMATE AND THE SDGS</p> <p>URBAN WATER GOVERNANCE FOR SUSTAINABLE CITIES</p> <p>Chair: Diane D'Arras, <i>former IWA President</i></p> <p>Summit organised by the International Water Association, Danish Water and Wastewater Association, the Municipality of Copenhagen, P4G and the Confederation of Danish Industry, in cooperation with the Ministry of Environment of Denmark and the Ministry of Foreign Affairs of Denmark. With water prominent in the SDG and climate agendas, the Summit will contribute to a powerful message on the need for cities to elevate water as they pursue their ambitions to create smart and secure liveable cities for all.</p> <p>The second session will focus on urban water governance for sustainable cities.</p> <p>By invitation</p> <p>Discussion facilitator: Corinne Trommsdorff, <i>Water Cities</i></p>	<p>Room A2 Summit</p> <p>GROUNDWATER FORUM II — GROUNDWATER SUSTAINABILITY</p> <p>Chair: Katerina Tsitonaki, <i>Denmark</i></p> <p>Sustainable management of slow groundwater in a fast-changing world: challenges and opportunities, Mark Cuthbert, <i>Principal Research Fellow & Reader, Cardiff University, UK</i></p> <p>Sustainability assessment of groundwater use. How can we integrate long term water quality in the assessment?, Martin Rygaard, <i>Associate Professor, Technical University of Denmark</i></p> <p>The importance of groundwater in San Francisco and the Bay Area, California, Paula Kehoe, <i>Director of Water Resources, SF Public Utilities Commission</i></p>	<p>Room A3 Forum</p>
Coffee Break	15:00 - 15:45			
Session 3	15:45 - 17:15	<p>HIGH-LEVEL SUMMIT — WATER AS A KEY TO ACTION ON CLIMATE AND THE SDGS</p> <p>PARTNERSHIPS FOR INNOVATION AND TECHNOLOGY SHARING</p> <p>Chair: Carl-Emil Larsen, <i>DANVA</i></p> <p>Summit organised by the International Water Association, Danish Water and Wastewater Association, the Municipality of Copenhagen, P4G and the Confederation of Danish Industry, in cooperation with the Ministry of Environment of Denmark and the Ministry of Foreign Affairs of Denmark. With water prominent in the SDG and climate agendas, the Summit will contribute to a powerful message on the need for cities to elevate water as they pursue their ambitions to create smart and secure liveable cities for all.</p> <p>The third session will focus on partnerships for innovation and technology sharing.</p> <p>By invitation</p> <p>Discussion facilitator: Corinne Trommsdorff, <i>Water Cities</i></p>	<p>Room A2 Summit</p> <p>GROUNDWATER FORUM III — PROTECTION OF GROUNDWATER QUALITY</p> <p>Chair: Martin Rygaard, <i>Denmark</i></p> <p>The impact of contaminated sites on groundwater. Risk assessment and decisions to treat or not, Niels Døssing Overheu, <i>Environmental Engineer, Environmental Section, The Capital Region of Denmark</i></p> <p>Agriculture and drinking water from groundwater: vulnerability for diffuse pollutants, Ingeborg Joris, <i>Researcher, Flemish Institute for Technological Research</i></p> <p>The challenge of PFAS in groundwater: lessons learned and best practice guidance from the United States, Seth Kellogg, <i>Principal Geologist, Geosyntec</i></p>	<p>Room A3 Forum</p>
Break	17:15 - 17:30			
Keynote Plenary	17:30 - 18:20	<p>Keynote: A Roadmap for Achieving SDG 6.2, Sanitation for All and How to Connect the Unconnected, Nathalie Olijslager Panel: Sylvain Usher, Brian Arbogast, Kate Medicott, Jennifer Molwantwa, Mathivathanan Govindarajan</p>		

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POLICY TO PRACTICE DIALOGUE FOR NATURE-BASED SOLUTIONS	Room C0 Workshop	NEXT GENERATION WATER ACTION – THE WORLD’S BEST WATER NEWS IN 2030	Room C1 NextGen
Chair: Kari Vigarstol , <i>United States</i> and Eric Tardieu , <i>France</i> Nature-based solutions (NbS) have emerged globally as one of the key sustainable and affordable ways to fix the broken urban water cycle and contribute to improve river/ basin – cities health. While appropriate public policies are essential to mainstream the use of NbS, revisiting practical NbS implementation cases can provide important inputs to better understand how to properly shape these policies. Based on case studies from different geographies and social and economic contexts, this session aims to discuss how to create an enabling environment for mainstreaming NbS in urban and basin water management, considering the various implementation scales, the multiple stakeholders involved, and the technological solutions available. Speakers: Tony Wong , Sustainable Development, Monash University (AU), Katharine Cross , Australian Water Partnership (AWP)(AU), Hitesh Vaidya , National Institute of Urban Affairs (NIUA) (IN), Pawel Licznar , Retencja (PL), Kirsty Carden , University of Cape Town (SA), Sophie Tremolet , The Nature Conservancy (TNC) (UK), Suresh Rohilla , International Water Association (IWA) (UK)	Chairs: DTU Skylab, DTU Sustain, IWA & IWA Young Water Professionals, ICCK Bangalore Join a facilitated innovation workshop to discuss, co-create and share ideas on what solutions will make the headlines in 2030 for their impact on transforming future cities. Participants are invited to jointly create visionary ambitions together with international young and experienced individuals from academia and start-up environments in India, Korea, Mexico, Denmark and Kenya. We promise a creative, engaging and visionary session, a hands-on experience with innovation tools used by DTU Skylab – the hub for innovation and entrepreneurship at DTU, and connections to the international youth delegation that is part of www.NextGenerationWaterAction.com.		
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
AQUARATING WORKSHOP	Room C0 Workshop	AFRICA BUSINESS FORUM — ACCELERATING ACHIEVEMENTS TOWARD SDG6 IN AFRICA: KEY STAKEHOLDERS, METHODS AND FOCUSES	Room C1 Workshop
Chair: Corinne Cathala , <i>United States</i> AquaRating is a performance evaluation system that was developed by the IDB in close collaboration with IWA to improve water and sanitation utilities. The AquaRating standard consists of 112 assessment elements organised into 8 areas of evaluation as well as groups of best practices. AquaRating is based on three pillars consisting of performance indicators, good practices, and the reliability of the information through an audit. The session will describe in detail the tool and will showcase its products as well as several case studies of water utilities from different regions of the world which have implemented the AquaRating tool. Speakers: Corinne Cathala , <i>IDB (US)</i> , Carlos Diaz , <i>IWA (UK)</i> , Francisco Cubillo , <i>AquaRating (ES)</i> , Veronica Sanchez , <i>EPMAPS-Quito</i> , Fabio Hernandez , <i>AyA Costa Rica (CR)</i> , Amit Chanan , <i>Water Authority of Fiji (FJ)</i> , Daniela Patino Piñeros , <i>WIN</i> , Umrbek Allakulov , <i>WIN</i> , Brenda Ampomah , <i>IWA (UK)</i> , Hector Barreda , <i>OTASS Peru (PE)</i>	Chairs: Mugisha Silver , <i>Uganda</i> and Usher Sylvain , <i>Cote d'Ivoire</i> The WHO/UNICEF joint report released in March 2022 found that achieving SDG6 targets in Africa will require a 12x increase in the current rate of progress on safely managed drinking water, a 20x increase in safely managed sanitation and a 42x increase in basic hygiene services. Indeed, in those 20 years, 411 million lacked basic water services, while 779 million lacked basic sanitation services and 839 million still lack basic hygiene services. In Africa, this could be explained by factors such as: (i) lack of skills, (ii) overlapping responsibilities in governance; as well as the Covid-19 pandemic. Hence, Africa is not on track to achieve SDG6 by 2030. Some potential solutions include: (i) sharing best practises in the sector through Peer-to-Peer Learning Partnership; (ii) emerging new actors and new collaboration approaches; (iii) improving governance; and (iv) capacity building. Presenters: Dr Rachid MBaziira , <i>AMCOW, Nigeria: Governance and Institutions</i> ; Dr Eng. Simeon Kenfack , <i>AfWASA, Côte d'Ivoire: Approaches and Methods</i> ; Yvonne Magawa , <i>ESAWAS, Zambia: Framework and Regulations</i> Panellists: from NWSC, Uganda, SODECI and ONEP, Cote d'Ivoire, and the presenters		
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
PROFESSOR GUSTAF OLSSON: FESTSCHRIFT PRESENTATION AND LEGACY LECTURE	Room C0 Lecture	TRANSFORMING RESEARCH RESULTS INTO INNOVATION UPTAKES	Room C1 Research
Special session marking the contribution of eminent academic Professor Gustaf Olsson The session has been organised to honour Professor Gustaf Olsson as he retires from his Editor role on several IWA Publishing journals. Speakers: Gustaf Olsson , <i>Lund University (SE)</i> , Pernille Ingildsen , <i>Hillerød Utility (DK)</i> & Wolfgang Rauch , <i>University of Innsbruck (AT)</i>		The objective of this workshop is to 1. identify the bottlenecks in the innovation uptake process, 2. share experience on tools, incentives, processes, and practices, and 3. develop guidelines for good practises for accelerating innovation uptake. Speakers: Harsha Ratnaweera , <i>Norwegian University of Life Science (NMBU) (NO)</i> , Wendy Francken , <i>VLARIO (BE)</i> , Sudhir Murthy , <i>NEWhub Corp (US)</i> , Ashish Sahu , <i>CAMBI (NO)</i> , Thomas Wintgens , <i>RWTH-Aachen University (DE)</i> & Zakhar Maletskyi , <i>Norwegian University of Life Science (NMBU) (NO)</i>	
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Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
5.8 THE ART OF COLLABORATION: CROSSING BORDERS TO SOLVE SYSTEMS-BASED PROBLEMS Room C2 Workshop Chairs: Shannon Spurlock, United States and Eric Rosenblum, United States Building water security and resiliency across a region requires deliberate, collective action. Decision-makers and practitioners must keep an eye on the needs of their immediate community while working toward more robust, regional solutions. With respect to water, agencies across the region can work together to identify their individual opportunities and constraints, and collaborate to achieve a multi-benefit outcome that simultaneously addresses many water, wastewater, and storm water challenges. In this session, attendees will engage with each other to gain an understanding of the various aspects of collaboration, including regulation, governance, economics, management, and leadership. Roundtable exercises will build an awareness of how regional opportunities can be actualized when agencies work together for the collective good. Hypotheses will be presented, and participants will also have an opportunity to share their experiences with collaboration on a local, regional, and national scale. Speakers: Shannon Spurlock, Ochotona LLC (US), Eric Rosenblum, Water Resource Consultant (US) & Felicia Marcus, Water Policy Group (US)		2.1.2-1 ANAEROBIC DIGESTION AND ENHANCED PERFORMANCE Room C3 Technical Chairs: Ioannis Alexiou, United Kingdom and Gabriel Capson Tojo, Spain Fungal bioflocculation of <i>Euglena Gracilis</i> : a rapid harvesting method, Danielle Bansfield, Aalto University and the Finnish Environment Institute, Finland Fungi-assisted bioflocculation as a promising strategy for microalgae harvesting: a statistical analysis of literature and experimental study, Jesna Fathima, IIT Hyderabad, India The impact of concentration in electrolyte on ammonia removal in flow electrode capacitive deionization system, Kuo Fang, Tsinghua University, China Innovative technology to remove nitrogen and produce climate friendly fertilizer, Anna Lundbom, Ragn-Sells AB, Sweden ---- POSTERS ---- Effect of nutrient media on lipid content of microalgae: a statistical analysis, Asams MA, College of Engineering, Trivandrum, India Anaerobic digestion of sewage sludge - semi full-scale thermophilic capacity experiment, Jesper Olsson, Kappalförbundet, Sweden	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
1.1 NATURE-BASED SOLUTIONS — A WAY TO MAKE OUR CITIES CIRCULAR Room C2 Workshop Chairs: Gunter Langergraber, Austria and Theis Raaschou Andersen, Denmark The workshop will discuss challenges, possibilities, drivers and implications when implementing NbS in the urban environment in order to make our cities circular in the context of case studies around the world. Speakers: Gunter Langergraber, Institute of Sanitary Engineering and Water Pollution Control; University of Natural Resources and LifeSciences (AU), Theis Raaschou Andersen, Research Centre for Built Environment, Energy, Water and Climate, VIA University College (DK), Mia Rix, Randers Municipality (DK), Natasa Atanasova, University of Ljubljana (SI), Bart de Gussemme, Ghent (BE) & Anja Wejs, Niras (DK)		2.1.2-1 ANAEROBIC DIGESTION AND ENHANCED PERFORMANCE Room C3 Technical Chairs: Kwok-Wai Richard Tsang, United States and Pritha Chatterjee, India Thermal and ultrasound pre-treatment prior to anaerobic digestion, Farokh Laqa Kakar, Ryerson University, Canada Integration of anaerobic digestion and hydrothermal liquefaction for treatment of manure: the influence of microbial adaption, Leendert Vergeynst, Aarhus University Centre for Water Technology (WATEC), Denmark Model-based evaluation of full-scale anaerobic digester failure and recovery strategies, Ramesh Saagi, Lund University, Sweden Graphene oxide amended sludge enhances micropollutant removal during anaerobic digestion of waste activated sludge, Oriol Casabella, Institut Català de Recerca de l'Aigua, Spain ---- POSTERS ---- Machine learning prediction of biogas production, David Getreuer Jensen, EnviDan, Denmark Demonstration of anaerobic wastewater treatment in the UK, Ana Soares, Cranfield University	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
6.4 SURFACE WATER ISSUES RELATED TO ECOSYSTEM, RECREATION, DRINKING WATER SOURCE AND MONITORING Room C2 Technical Chairs: Kari Vigerstøl, United States and Farida Gitonga, Kenya Becoming uncultured: daily recreational water quality monitoring and public notification at Chicago beaches using QPCR, Abhilasha Shrestha, University of Illinois Chicago, United States A satellite-based approach to freshwater ecosystem monitoring and for SDG 6.6.1 progress reporting, Christian Tottrup, DHI, Denmark Microbiological whole river surveys: lessons learned and future visions on faecal pollution and antimicrobial resistance analysis, Andreas Farnleitner, ICC Water & Health, KL Krems und TU Wien, Austria Ensuring safe drinking water for the greater Toronto Area using the Lake Ontario Water Quality Forecasting System, Patrick Delaney, DHI Water and Environment, Inc, Canada ---- POSTERS ---- DHI's global hydrological model: a real-time and forecasting hydrological system for the entire planet, Alexandra Murray, DHI A/S, Denmark Predictive models of algal bloom with sparse modeling and support vector machine, Yohei Miura, Tohoku University, Japan		2.1.2-2 IMPROVED ANAEROBIC PROCESS Room C3 Technical Chairs: Chris Hertle, Australia and Pabel Cervantes, Mexico New circular model for biogas purification coupled with biomass generation and carbon capture, Tanja Radu, Loughborough University, United Kingdom Prediction of animal by-products composition, for biogas production, using pocket-size near infrared spectrometer, Ana Otero, IRTA - Institute of Agrifood Research and Technology & UB - University of Barcelona & Mafra, Spain Bioelectrochemical anaerobic sewage treatment - from laboratory tests to full scale implementation, Boris Tartakovsky, National Research Council Canada, Canada Iron addition for enhancing AnMBR removal efficiency and biofouling control, Argyro Plevri, National Technical University of Athens, Greece ---- POSTERS ---- Conversion of wastewaters and organic waste into valuable chemicals, energy and biofertiliser, Rita Noelle Moussa, University of Aberdeen, United Kingdom Mesophilic biodigestion of soybean molasses in sequencing batch reactor: operational optimization and techno-economic viability, Giovanna Lovato, University of Sao Paulo, Brazil	
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Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
2.5.1 SEWER CORROSION AND ODOUR MANAGEMENT	Room B5 a Technical	3.1 TECHNOLOGIES AND OPERATIONS I	Room B5 b Technical
<p>Chairs: Liu Ye, <i>Australia</i> and Irina Pulyakhina, <i>Netherlands</i></p> <p>Hydrogen sulphide control in sewer systems by gravity aerators, Jarmo Sallanko, <i>AFRY Finland Oy, Finland</i></p> <p>Sewer process modelling as a tool to predict and manage odour and corrosion in a drainage system, Esther Vollertsen, <i>EnviDan, Denmark</i></p> <p>Liquid H₂S online measurement for optimized sewer system insights and H₂S control, Marie Inizan, <i>HACH, France</i></p> <p>Network-wide control of sewer corrosion and odour by optimization of chemical dosing, Jiuling Li, <i>the University of Queensland, Australia</i></p> <p>---- POSTERS ----</p> <p>Modelling the addition of liquid oxygen to prevent hydrogen sulphide production in a pressurized sewer using WEST, Fabio Polese, <i>DHI AJS, Denmark</i></p> <p>Monitoring and predicting of N₂O emissions in wastewater treatment plants with adaptive data-driven soft-sensors, Pedram Ramin, <i>Technical University of Denmark, Denmark</i></p>		<p>Chairs: Yaroslav Olach, <i>United States</i> and Muhammad Anique Azam, <i>Pakistan</i></p> <p>Comparison of water treatment processes' potential to cope with climate change related challenges and related costs, Irene Slavik, <i>University of Applied Sciences Magdeburg-Stendal, Germany</i></p> <p>Environmental impact of NOM-removal from drinking water by enhanced coagulation: the importance of process design, Paula Pellikainen, <i>Bergen Vann, Norway</i></p> <p>Investigating virus reduction efficiencies in coagulation-sedimentation—rapid sand filtration or coagulation—microfiltration by a combination of full-scale, Daiki Shirakawa, <i>Hokkaido University, Japan</i></p> <p>Effects on biostability in drinking-water from treatment with ozonation and activated carbon filtration, Per Paulsson, <i>Ramboll, Sweden</i></p> <p>---- POSTERS ----</p> <p>Divalent oxyanion and bicarbonate synergistically enhance hydrolysis and coagulation performance of high-basicity PACI coagulants, Yize Chen, <i>Hokkaido University, Japan</i></p> <p>Bio-based activated carbon from locally available biomass: comparison of carbon activation methods on water treatment performance, Oleksii Tomlin, <i>Aalto University, Finland</i></p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
2.1.4-2 BIOFILM REACTORS	Room B5 a Technical	3.2 TECHNOLOGIES AND OPERATIONS II	Room B5 b Technical
<p>Chairs: Kim Helleshøj Sørensen, <i>Netherlands</i> and Tao Liu, <i>Australia</i></p> <p>Nitrogen removal in MBBR plants at low temperatures - experiences from Norway, Hallvard Ødegaard, <i>Aquateam COWI, Norway</i></p> <p>Designing and building one of the largest MBBR-plants in the world - A SWOT analysis, Jonas Grunestam, <i>Käppalaförbundet, Sweden</i></p> <p>Insight into performance in a hybrid membrane-aerated biofilm reactor-AO system under low carbon nitrogen wastewater, Hsin-Chieh Lin, <i>National Taiwan University, Chinese Taipei</i></p> <p>Drivers and performance of full-scale membrane aerated biofilm reactor (MABR) for sustainable process intensification at existing WWTPs, Daniel Coutts, <i>Suez, United States</i></p> <p>---- POSTERS ----</p> <p>Treatment of thermally pre-treated sludge reject water in a novel IFas-SBR process, Statis Evangelos, <i>National Technical University of Athens, Greece</i></p> <p>Nitrogen removal and nitrous oxide emissions from MABR technology, Nerea Uri Carreño, <i>VCS Denmark, Denmark</i></p>		<p>Chairs: Alba Cabrera Codony, <i>Spain</i> and Muhammad Anique Azam, <i>Pakistan</i></p> <p>Improving biological stability of drinking water from surface water using ultrafiltration posttreatment - a field case, Leonie Marang, <i>Evides, Netherlands</i></p> <p>Brackish to seawater desalination pilot study with cc-ro for drinking water production at the Flemish coastal region, Evelyn de Meyer, <i>De Watergroep, Belgium</i></p> <p>Investigation of scaling mechanisms and scale inhibition potential of antiscalants in reverse osmosis, Shambhavi Arvind Kaushik, <i>DVGW-forschungsstelle TUHH, Germany</i></p> <p>Enhanced removal of dissolved organic compounds using ethylenediamine modified polyacrylonitrile ultrafiltration electromembranes, Muhammad Usman, <i>Technische Universität Hamburg, Germany</i></p> <p>---- POSTERS ----</p> <p>Ten years of advanced surface water treatment piloting with ion exchange, inline coagulation and ceramic microfiltration, Bram Martijn, <i>PWNT, Netherlands</i></p> <p>Synthesis and characterisation of polymeric flocculants for water treatment, Khethobole Sekgota, <i>Rand Water, South Africa</i></p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
2.1.5 MEMBRANE BIOREACTORS AND FOULING CONTROL	Room B5 a Technical	3.5 DECENTRALISED SOLUTIONS AND POTABLE WATER REUSE	Room B5 b Technical
<p>Chairs: Eduardo Subtil, <i>Brazil</i> and Rizza Ardiyanti, <i>Norway</i></p> <p>Brine recovery from hypersaline wastewater treatment after selective removal of the organics in a tubing bioreactor, Maria Concetta Tomei, <i>Water Research Institute C.N.R., Italy</i></p> <p>Quorum quenching (QQ) in anaerobic membrane bioreactor: isolation of novel QQ consortia and elucidation of comprehensive anti-fouling mechanisms, Boyan Xu, <i>National University of Singapore, Singapore</i></p> <p>Development of a hydrogen peroxide based cleaning strategy for ultrafiltration processes in wastewater treatment, Maximilian Werner, <i>MANN+HUMMEL Water & Fluid Solutions, Germany</i></p> <p>Dodecyl-β-D-Maltoside blocks bacterial appendage attachment to wastewater treatment membranes, Eakalak Khan, <i>University of Nevada, Las Vegas, United States</i></p> <p>---- POSTERS ----</p> <p>Removal and recovery of ammonium from effluent of AnMBR treating domestic wastewater by polymer hydrogels, Meibo He, <i>National University of Singapore, Singapore</i></p> <p>Antifouling membranes based on PES and optimized ZnO CuO Fe₃O₄ catalyst under dark ambient conditions, Sheng-Jie You, <i>Chung Yuan Christian University, Chinese Taipei</i></p>		<p>Chairs: Paul Jeffrey, <i>United Kingdom</i> and Hayat Raza, <i>Canada</i></p> <p>Combination of electrocoagulation with ultra-low-pressure ultrafiltration for arsenic removal from drinking water, Franz-Benrd Frechen, <i>University of Kassel (retired), Germany</i></p> <p>Successful implementation of in-situ microbiological testing of point-of-use water treatment technologies: lessons from the field, Caetano Dorea, <i>University of Victoria, Canada</i></p> <p>Managing potential pathogens in stored rainwater using small-scale in-situ electrochemical activation, Gillian Clayton, <i>University of the West of England, United Kingdom</i></p> <p>Drinking water production from urban wastewater combining planted bio-reactor, activated carbon fluidised bed and hollow fiber nanofiltration, Philippe Sauvignet, <i>Veolia, France</i></p> <p>---- POSTERS ----</p> <p>Microbial investigations on recirculating showers, Tamara Pérez Guillemette, <i>DTU Environment, Denmark</i></p> <p>Discerning differences among non-potable reuse water, potable reuse water, and conventional drinking water — a core microbiome perspective, Matthew Blair, <i>Virginia Tech, United States</i></p>	
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Session 1	10:30 - 12:00		
3.12 WATER MANAGEMENT: SOURCE TO CONSUMER	Room B4 a Technical	5.1 BOTTOM-UP RESILIENCE PLANNING ACROSS THE WATER CYCLE	Room B4 b Technical
<p>Chairs: Regina Sommer, Austria and Korse Doe-Bansah, Ghana</p> <p>Distribution network failures as threats for Finnish drinking water safety, Ilkka Miettinen, Finnish Institute for Health and Welfare, Finland</p> <p>Case study on response to eutrophication of the New River, Belize, Stacey Alpuche, Ministry of Sustainable Development, Climate Change and Disaster Risk Management, Belize</p> <p>Water demand management and use efficiency: customer metering & demand management, Ian Rodgers, Xylem inc, United Arab Emirates</p> <p>Comprehensive study on factors affecting consumers' choice of bottled drinking water: a case study of Dar Es Salaam, Margaret Kironde, Water Institute, Tanzania</p> <p>---- POSTERS ----</p> <p>Statistical tools and water quality indices for the groundwater quality assessment and suitability for agriculture - a study case of Thiaroye Quaternary Aquifer Sands in Senegal, Huguette Emvoutou, UCAD, Senegal</p> <p>Intermittent supply system challenges and optimisation: customer metering, Ian Rodgers, Xylem, Inc, United Arab Emirates</p>		<p>Chairs: Mariska Ronteltap, Netherlands and Lee-Ann Modley, South Africa</p> <p>A rethinking of community based water management planning through a renewed focus on seasonal representations, Miriam Jensen, AAU, Denmark</p> <p>Urban stormwater management in the face of extreme events and failure incidents: diverse resilience perspectives through participatory modelling in the BEJonD Project, Katharina Kearney, University of Natural Resources and Life Sciences, Vienna, Austria</p> <p>Stream regeneration for flood prevention, and a better Saavedra Park, Mariano Kristoff, Ciudad Autónoma de Buenos Aires, Argentina</p> <p>Decolonialising sustainabilities: reflecting on the coproduction of nature-based solutions as empowerment for researchers, communities and the landscape in, Patience Mguni, University of Copenhagen, Denmark</p> <p>---- POSTERS ----</p> <p>Principles of sustainable water services systems and resilient organisations, Tapio Katko, Tampere University, Finland</p> <p>Review on the slippage factors towards open defecation after the implementation of the Community Led Total Sanitation (CLTS) a pproach, Hemez Ange Aurélien Kouassi, International Institute for Water and Environmental Engineering (2IE), Burkina Faso</p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
6.5 EARTH OBSERVATION FOR WATER MANAGEMENT — BUILDING A COMMUNITY OF PRACTICE	Room B4 a Workshop	5.2 INCENTIVES AND DRIVERS TO ENABLE CHANGE	Room B4 b Technical
<p>Chairs: Apostolos Tzima, Greece and Katherine Cross, Australia</p> <p>This session will be an opportunity to discuss how the recently established IWA Earth Observation Community of Practice can contribute to overcoming barriers in the adoption of EO technologies.</p> <p>Speakers: Apostolos Tzima, EMVIS (GR), Katharine Cross, Water Cities/ Australian Water Partnership (AU), Eva Haas, EOMAP (DE) & Djalila Mutangampundu, African Water Association (CI)</p>		<p>Chairs: Melissa Meeker, United States and Emily Ryan, Netherlands</p> <p>Leveraging public expectations to support a water sensitive circular economy in Europe, Heather Smith, Cranfield University, United Kingdom</p> <p>Who knows the price of water services, and does it make a difference? An exploratory study with domestic consumers in Portugal, Ligia Pinto, University of Minho, Portugal</p> <p>Can digital solutions enhance public involvement in urban water management? Evidence from case studies in Berlin and Paris, Ulf Stein, Ecologic Institute, Germany</p> <p>Life cycle assessment to optimize environmental impact of the groundwater treatment plant, Jeppu Poulsen, COWI, Denmark</p> <p>---- POSTERS ----</p> <p>The Digital Water Revolution: what can go wrong?, Lucia Alexandra Popartan, University of Girona, Spain</p> <p>Method for identifying water-related optimisation measures in SMEs as a basis for standardised water audits, Christian Platzer, AEE - Institute for Sustainable Technologies, Austria</p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
3.5 PREVENTION AND MANAGEMENT OF TASTE-AND-ODOUR EVENTS IN SUPPLIES	Room B4 a Workshop	5.1 HOW THE WATER INDUSTRY CAN SUPPORT WOMEN INTERNATIONALLY	Room B4 b Workshop
<p>Chairs: Ricard Devesa, Spain and Tsair Fuh-Lin, Chinese Taipei</p> <p>Consumers associate off-flavours, bad tastes, or unexpected organoleptic changes in tap water with a health risk. As a result, they reject drinking it. International experts will give cutting-edge information about how to prevent, characterise, manage and minimise T&O and algal toxins events (source, treatment, network) and algal toxins. 4-5 talks (60 mins) followed by an open roundtable/discussion (30 mins) about key issues of the talks, their extrapolation, ideas, and solutions to classical problems and new challenges (i.e., climate change).</p> <p>Speakers: Tsair Fuh-Lin, National Cheng Kung University (TW), Zamyadi Arash, (AU) Jacqueline Frizenschaf, Water Research Australia (AU) & Yi-Ting Chen</p>		<p>Chairs: Arlinda Ibrahimllari, Albania/Canada and Maria Estefanía Borthiry Buide, Argentina</p> <p>This workshop will provide perspectives from all sectors of the water industry, as well as diverse parts of the globe. Professionals from different regions will share their experiences, providing information on challenges, lessons learned, and strategies for addressing gender equity issues.</p> <p>Speakers: Eugenia Ghiotto, AySA (AR), Diane d'Arras, Bunzi International (FR), Louise Dudley, Titilola Bright-Oridami, Lagos Water Corporation (NG) & Farokh Laqa Kakar, Ryerson University (CA)</p>	
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
Keynote: A Roadmap for Achieving SDG 6.2, Sanitation for All and How to Connect the Unconnected, Nathalie Olijslager Panel: Sylvain Usher, Brian Arbogast, Kate Medicott, Jennifer Molwantwa, Mathivathanan Govindarajan			

Keynote Plenary	09:00 - 09:50		
Keynote: A Practical Perspective in Building Resilience Into Urban Water Management, Prof. Rohit T. Aggarwala Panel: Mark Fletcher , Austin Alexander , Lynn Broaddus , Chien-Hsin Lai , Tony Wong			
Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
5.6 YOUNG WATER ENTREPRENEURS: ENTREPRENEURSHIP AS A WAY TO BRIDGE RESEARCH AND PRACTICE	Room B4 c Workshop	1.12 INFRASTRUCTURE REHABILITATION	Room B4 d Technical
<p>Chairs: Yang Villa, <i>Philippines</i> and Jacob Amengor, <i>Ghana</i></p> <p>For existing and novel technologies to turn into water solutions, YWPs must recognise their role in the co-creation process of end-user driven solutions and bring them to the market. The session aims to provide guidance to young water professionals by identifying the value proposition and the partnerships that can support the implementation of new water solutions. The session will include practical examples and propose next steps towards a stronger IWA network that can support entrepreneurship, business development, and water solution applications at both local and global scales.</p> <p>Speakers: Pia Rask, <i>Grundfos (DK)</i>, Wim Audenaert, <i>AM Team (BE)</i> & Lars Andersen, <i>China Resources Management (DK)</i></p>		<p>Chairs: Cor Merks, <i>Netherlands</i> and Francis Mwai Karingithi, <i>Kenya</i></p> <p>Integrated radar and ultrasonic pipe scanner for condition-based maintenance of water and wastewater pipes, Andreas Reason Dahl, <i>Equanostic as, Norway</i></p> <p>First impoundment response analysis of an earth dam using coupled numerical-soft computing technique, Mir Jafar Sadegh Safari, <i>Yasar University, Turkey</i></p> <p>An asset management-oriented methodology for sustainable pipe rehabilitation planning, Kristiane Jensen, <i>Greater Copenhagen Utility, Denmark</i></p> <p>Anticipated challenges and suggestive solutions for sewer network design in Cold Desert Region (Ladakh) of India, Anjali Bansal, <i>Ramboll, India</i></p> <p>---- POSTERS ----</p> <p>Development and optimization of parametric tools and methods for the evaluation of the physical integrity of sewage networks, Axumawit Tesfamariam, <i>University of Oulu, Finland</i></p> <p>JalTantra: a web-based open-source platform for water network optimal design, Abhishek Sinha, <i>IIT Bombay, India</i></p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
4.4.8 INNOVATIVE MODELLING TOOLS FOR URBAN WATER SYSTEMS	Room B4 c Technical	1.2 METHODOLOGY AND CONTEXT FOR QUANTIFYING YOUR SEWER METHANE	Room B4 d Workshop
<p>Chairs: Martin Gambrill, <i>United Kingdom</i> and Jiuling Li, <i>Australia</i></p> <p>Digital twins of urban drainage system — what about trust? Agnethe Pedersen, <i>VCS Denmark, Denmark</i></p> <p>Development of a 'digital twin' as part of a greater bulk water decision support system (DSS) for the City of Cape Town, Petr Ingeduld, <i>DHI, Czech Republic</i></p> <p>Deep learning for modelling of urban drainage networks: a physics-informed surrogate model using measured and simulated data, Salar Haghghatafshar, <i>Lund University, Sweden</i></p> <p>Using data science to optimize meter asset management: a case study in 2 large utilities, Ian Rodgers, <i>Xylem, Inc, United Arab Emirates</i></p> <p>---- POSTERS ----</p> <p>An automated SWMM toolkit for optimal planning and design of hybrid decentralized urban drainage systems, Amin Ebrahim Bakhshipour, <i>TU Kaiserslautern, Germany</i></p> <p>IoT as an enabler for distributed online monitoring of the urban water cycle, Malte Ahm, <i>Aarhus Vand Ltd, Denmark</i></p>		<p>Chairs: John Willis, <i>United States</i> and Asbjørn Hanning Nielsen, <i>Denmark</i></p> <p>This training provides proof of sewer methane's existence and significance and shows how utilities can estimate it in their GHG inventories, closing centralised wastewater's largest GHG vulnerability.</p> <p>Speakers: John Willis, <i>Brown and Caldwell (US)</i> & Asbjørn Hanning Nielsen, <i>Aalborg University (DK)</i> & Jóannes Gaard, <i>Ministry of Environment (DK)</i></p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
1.3 NEW SERVICES AND PERSPECTIVES FOR WATER UTILITIES	Room B4 c Technical	1.13 SEWER OVERFLOW MANAGEMENT AT UTILITY LEVEL	Room B4 d Technical
<p>Chairs: Kazuya Naito, <i>Japan</i> and Mbali Sibiya, <i>South Africa</i></p> <p>From polluted industrial harbour - to residential area with bathing waters, Jes Clauson-Kaas, <i>Hofor, Copenhagen, Denmark</i></p> <p>Integrated framework for urban water management in secondary cities of India, Mitthan Lal Kansal, <i>IIT Roorkee, India</i></p> <p>The procurement approach that enabled Australia's first biofactory, Rachael Nuttall, <i>SUEZ Water Australia & New Zealand, Australia</i> & Charlie Littlefair, <i>South East Water, Australia</i></p> <p>How do you put people at the centre of business transformation decisions?, Fionn Boyle and Tertius Rust, <i>Anglian Water, United Kingdom</i></p> <p>---- POSTERS ----</p> <p>Water supply and sanitation services in Brazil: regional solutions through a water resources security lens, Sergio Ayrimorae Soares, <i>National Water and Sanitation Agency - ANA Brazil, Brazil</i></p>		<p>Chairs: Jean-Luc Bertrand-Krajewski, <i>France</i> and Vatsal Khandelwal, <i>India</i></p> <p>Future city flow - online value-based decision support for optimized real time forecast and control of sewerage systems, Douglas Lumley, <i>DHI Sverige AB, Sweden</i></p> <p>A novel screening methodology to create a programme to progressively reduce pollution from combined sewer overflows (CSOs) using nature-based solutions, Eddison Ruswa, <i>Jacobs, United Kingdom</i></p> <p>Sewer overflow management at utility level: real time decision making, Ian Rodgers, <i>Xylem Inc, United Arab Emirates</i></p> <p>Infiltration and inflow water (I I-water) and risk assesment, Krisitn Jenssen Sola, <i>Asker Municipality, Norway</i></p> <p>---- POSTERS ----</p> <p>Rainwater-basin monitoring and optimisation using machine learning, Peter Rasch, <i>Dryp A/S, Denmark</i></p> <p>Using flow duration curves for evaluating the hydrological performance of green roofs, Elhadi Abdalla, <i>Norwegian University of Science and Technology, Norway</i></p>	
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
Keynote: A Roadmap for Achieving SDG 6.2, Sanitation for All and How to Connect the Unconnected, Nathalie Olijslager Panel: Sylvain Usher , Brian Arbogast , Kate Medicott , Jennifer Molwantwa , Mathivathanan Govindarajan			

Monday | Programme

Keynote Plenary		09:00 - 09:50	
Keynote: A Practical Perspective in Building Resilience Into Urban Water Management, Prof. Rohit T. Aggarwala Panel: Mark Fletcher , Austin Alexander , Lynn Broaddus , Chien-Hsin Lai , Tony Wong			
Coffee Break		09:50 - 10:30	
Session 1		10:30 - 12:00	
1.21 INTEGRATED DIGITAL WATER UTILITY Chairs: Zoran Kapelan , <i>Netherlands</i> and Kelvin Mwangi Wambui , <i>Kenya</i> How is digital transformation impacting the water utility sector? Insights from a worldwide online utility survey, Ivo Daniel , <i>Technische Universität Berlin, Germany</i> Understanding the challenges and opportunities of smart water technology - water utility perspectives, Heather Smith , <i>Cranfield University, United Kingdom</i> Integrated urban wastewater management in Greater Copenhagen and its digital future, Barbara Greenhill , <i>BIOFOS, Denmark</i> WaterLAB and SuperDMA — R&D and demonstration platforms for smart water applications, Patryk Wójtowicz , <i>Savonia University of Applied Sciences, Finland</i> ---- POSTERS ---- Lessons learned from an ongoing digital journey in a smaller water utility, Annika Malm , <i>Kungsbacka Municipality, Sweden</i> LEAK365 full scale smart water leakage management, Thorkil Neergaard , <i>Bronderslev Water Utility Ltd, Denmark</i>		Room B3 a Technical 4.4.3 MICROBIAL AND CHEMICAL RISKS FOR CITY PLANNING Chairs: Willy Verstraete , <i>Belgium</i> and Sital Uprety , <i>Switzerland</i> Application of hydraulic modelling and quantitative microbial risk assessment (QMRA) for cloudburst management in cities with combined sewer systems, Claus Jørgensen , <i>DHI A/S, Denmark</i> Microbial drinking water safety requirements of river catchments in view of global climate change - The QMRAcatch approach, Katalin Demeter , <i>TU Wien, ICC Water & Health, Austria</i> Low flow diversion — an alternative solution to manage polluted stormwater in highly urbanized areas?, Ida Knudsen , <i>Hojor A/S, Denmark</i> Identifying measurement errors in continuous stormwater quality data by comparison with traditional sampling and analysis, Nikita Razguliaev , <i>Luleå University of Technology, Sweden</i>	
Lunch		12:00 - 13:30	
Session 2		13:30 - 15:00	
1.19 DIGITAL BUSINESS MANAGEMENT APPROACHES AT UTILITY SCALE Chairs: Dragan Savic , <i>Netherlands</i> and Antti Vuorela , <i>Finland</i> New trends in water utility management: how digitization of water and wastewater service can improve business operation, Alessandro Bettin , <i>Senior Water Resources Engineer, Italy</i> From data to insights — utility management from a business intelligence perspective, Rasmus Dahl , <i>Dryp, Denmark</i> H2PORTO technological platform for the integrated management of Porto's urban water cycle, Ruben Fernandes , <i>Águas e Energia do Porto, E.M, Portugal</i> Data sharing in publicly owned utilities. why is that not a problem?, Anders Faber , <i>BIOFOS, Denmark</i> ---- POSTERS ---- Comparative leakage detection accuracy analysis of different water network models using artificial neural network, Amlan Chakrabarti , <i>University of Calcutta, India</i>		Room B3 a Technical 4.4.2 DRIVERS AND HAZARDS AT CITY SCALE Chairs: Arslan Ahmad , <i>Netherlands</i> and Shane Morgan , <i>Australia</i> Interaction between subsurface urban infrastructure and groundwater — ignore at your risk?, Constantin Gogu , <i>Technical University of Civil Engineering, Bucharest, Romania</i> Under pressure: exploring the interdependent challenges of housing and water infrastructure capacity in Irish Towns, Sarah Cotterill , <i>University College Dublin, Ireland</i> Benefits and challenges of having a practical and strong water safety plan implemented: the case of Porto, Flávio Oliveira , <i>Águas e Energia do Porto, Portugal</i> Rainfall series for urban drainage system design and analysis under the impact of climate change, Søren Thorndahl , <i>Aalborg University, Denmark</i> ---- POSTERS ---- VeVa — a Danish water utility association utilising rainfall and weather radar data for hydrological and hydraulic applications in the urban water cycle, Malte Ahm , <i>Aarhus Vand Ltd, Denmark</i> Flood management in Uddevalla — unexpected challenges, Mattias Salomonsson , <i>Sweco Sweden, Sweden</i>	
Coffee Break		15:00 - 15:45	
Session 3		15:45 - 17:15	
1.20 UTILITY-SCALE DATA COLLECTION, VISUALISATION AND UTILISATION Chairs: Stephan Köhler , <i>Sweden</i> and Brooke Mason , <i>United States</i> Water analytics digital twin: a platform for improving efficiency in water distribution networks, Socrates Metaxas , <i>Water Board of Lemesos, Cyprus</i> Augmented reality for geographical information systems — digital transformation of field services at AdRA, Nuno Soares , <i>AdRA-Águas da Região de Aveiro, SA, Portugal</i> A step-wise approach for utilizing real-time data in the water sector, Jon Røstum , <i>Volue, Norway</i> Smartphone-based reality capture for subsurface utilities, why settle for less?, Torbjørn Pedersen , <i>Landinspektørfirmaet LE34 A/S, Denmark</i> ---- POSTERS ---- Digital twin for optimal processes at PUB IVP, Otto Icke , <i>Royal HaskoningDHV, Netherlands</i> 3D printing use in water utilities — Watter FabLab at Águas e Energia do Porto, Maria Veiga , <i>Águas e Energia do Porto, E.M, Portugal</i>		Room B3 a Technical 4.4.5 FLOOD RISK MANAGEMENT Chairs: Gerard Luyet , <i>Switzerland</i> and Joachim Bach , <i>Denmark</i> The Aarhus Method secures a wise investment decision-making to support flood risk mitigation and liveable cities, Mads Uggerby , <i>EnviDan, Denmark</i> Investment cycle of flood protection in Japan: the relationship between budget and damage, Mikio Ishiwatari , <i>The University of Tokyo, Japan</i> Dynamic adaptive flood risk management planning in Denmark, Rick Kool , <i>NIRAS A/S, Denmark</i> Adaptation strategies to sea level rise and storm surges in Arctic Cities, Torbjørn Friborg , <i>Sweco, Norway</i> ---- POSTERS ---- Delivering smart flood management in Bangkok, Ismail Osman , <i>Mott Macdonald, Singapore</i> A method to counter the massive jurisdictional burden from the historic cloudburst event 2014 in Malmö, Patrik Nilsson , <i>VA SYD, Sweden</i>	
Break		17:15 - 17:30	
Keynote Plenary		17:30 - 18:20	
Keynote: A Roadmap for Achieving SDG 6.2, Sanitation for All and How to Connect the Unconnected, Nathalie Olijslager Panel: Sylvain Usher , Brian Arbogast , Kate Medicott , Jennifer Molwantwa , Mathivathanan Govindarajan			

Keynote Plenary	09:00 - 09:50		
Keynote: A Practical Perspective in Building Resilience Into Urban Water Management, Prof. Rohit T. Aggarwala Panel: Mark Fletcher, Austin Alexander, Lynn Broadbus, Chien-Hsin Lai, Tony Wong			
Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
4.1 THE ROLE OF WATER AND WASTEWATER UTILITIES IN SUPPORTING SUSTAINABLE DEVELOPMENT GOALS	Room B3 c Workshop	2.1 FUTURE WS 2.1 - FUTURE CHALLENGES FOR WASTE WATER TREATMENT PLANTS. FROM FOCUS ON PARTICULATE MATTER AND NUTRIENTS TO TOXIC MICRO POLLUTANTS AND CHEMICALS OF EMERGING CONCERN	Room B3 d Workshop
<p>Chairs: Arlinda Ibrahimllari, Albania/Canada and Sylvain Usher, Côte d'Ivoire</p> <p>The 2030 Agenda for Sustainable Development, adopted by the United Nations (UN) in September 2015, has given a new impetus to global efforts to achieve sustainable development.</p> <p>Water and wastewater utilities globally play a vital role in supporting several of the SDGs. A primary challenge faced by utilities is to analyse the various SDGs and develop strategic plans for addressing the goals where there is the most impact and where they have the most capacity. The workshop will provide examples of how such strategic plans have been developed by utilities in Europe, Asia, Latin America, and Africa. The workshop will address not only SDG 6 relating specifically to drinking water but all SDGs where water utilities can contribute.</p> <p>Expected participants: Individuals of any age or level of expertise interested in learning how to use the SDGs as a framework for corporate strategic planning.</p> <p>Speakers: Arlinda Ibrahimllari, IWA SG Sustainability in the Water Sector / UK Consulting Company (AL), Sylvain Usher, African Water Association (AfWA) (CI), Troels Kærgaard Bjerre, VCS (DK), Nerina di Lorenzo, Melbourne Water (AU), Labrini Niaama, Jose Luis Inglese & Faustina Boachie, Ghana Water Company Limited, GH</p>		<p>Chairs: Jan Christensen, Denmark and Peter Mortensen, Denmark</p> <p>Improved treatment of wastewater is a key target in addressing the global need for clean water (SDG targets 6.3 and 3.9). Studies measuring the joint toxicity of whole wastewater samples and identifying how much of the toxicity is explained by the monitored chemicals show very large gaps in our present knowledge. Wastewater treatment plants of today often focus on sanitary treatment and the removal of nutrients only. Future plants will have to further address the growing concern of toxic chemicals being emitted into the environment. The purpose of the workshop is to provoke a fruitful discussion about the future ways to monitor and control the emission of micropollutants. We will discuss the present knowledge we have about existing wastewater related chemicals and their toxicity on the basis of research conducted in Denmark, Sweden and Germany.</p> <p>Speakers: Peter Mortensen, Eurofins Environment Denmark (DK), Jan Christensen, Copenhagen University (DK), Kristoffer Kilpinen, Eurofins Miljø a/s (DK), Mafalda Castro, University of Copenhagen (DK), Nina Cedergreen, Dines Thornberg, BIOFOS (DK)</p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
4.2 EVALUATION CRITERIA AND APPROACHES FOR TOOLS IN NBS PLANNING	Room B3 c Workshop	2.5.3-1 WASTEWATER EPIDEMIOLOGY: SARS-COV-2	Room B3 d Technical
<p>Chairs: Martijn Kuller, Switzerland and Peter Vanrolleghem, Canada</p> <p>Decision-Support Systems (DSS), models, and tools are widely used socio-technical methods to support the planning and implementation of Nature-Based Solutions (Nbs) for climate adaptation in cities. The quality of these models and tools is hard to validate, evaluate, or even define appropriately. Lack of agreed and standardised quality evaluation methods has led to underutilization of what could be helpful DSS. This workshop aims to shed light on such critical, yet underreported evaluation methods for socio-technical decision support used by planners and modellers of Nbs. Projected outputs include systematically elicited preferences from workshop participants from various backgrounds on the objectives and associated promising evaluation approaches of DSS. These outcomes will contribute to the development of widely agreed and applicable standards and a framework for the evaluation and validation of DSS to support the planning and implementation of Nbs.</p> <p>Speakers: Martijn Kuller, Swiss Federal Institute of Aquatic Science & Technology (Eawag) (CH), Peter Vanrolleghem, Université Laval (CA), Danielle Dagenais, Université de Montréal (CA), Ole Fryd, University of Copenhagen (DK) & Sandrine Lacroix, Polytechnique Montreal (CA)</p>		<p>Chairs: Jörg E. Drewes, Germany and Alexandra Tsitouras, Canada</p> <p>Tracking SARS-CoV-2 in upstream sewage systems to monitor COVID-19 spread in communities, Jiaying Li, University of Queensland, Australia</p> <p>Environmental surveillance of SARS-CoV-2 and its variants: geospatial predictive analysis in a Spanish municipality sewage network, Nuria Zamorano, Sociedad de Fomento Agrícola Castellonense S.A, Spain</p> <p>1.5-years experience in Covid-19 tracking of Turkey via wastewater based epidemiology (WBE): regional distribution maps, early warning, variants, dashboards, Bilge Alpaslan-Kocamemi, Marmara University, Turkey</p> <p>SARS-CoV-2 signal in wastewater relates to hospitalization occupancy in Austria, Hannes Schenk, Leopold-Franzens-Universität Innsbruck, Austria</p> <p>---- POSTERS ----</p> <p>The development of water quality-based COVID-19 surveillance for non-sewered areas, Sudhir Pillay, Water Research Commission, South Africa</p> <p>Sampling strategies for SARS-CoV-2 wastewater surveillance, Rodrigo de Freitas Bueno, Federal University of ABC, Brazil</p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
4.3 NATURE-BASED SOLUTIONS FOR CLIMATE-RESILIENT CITIES IN DEVELOPING COUNTRIES UNDER CHANGE	Room B3 c Workshop	2.5.3-2 WASTEWATER EPIDEMIOLOGY: ARGs, SARS-COV-2 AND OTHER PATHOGENS	Room B3 d Technical
<p>Chairs: Nilo Nascimento, Brazil and Eduardo Mario Mendiondo, Brazil</p> <p>We evaluate the experiences of cities from the developing world in planning and implementing nature-based solutions (Nbs) in urban water management. To support COP26's Net Zero goals under IPCC's scenarios, the Nbs brings solutions to adaptation and mitigation. Various Nbs' approaches, i.e., Low Impact Development (LID), Sustainable Drainage Systems (SuDS), Water Sensitive Urban Drainage (WSUD), and Sponge Cities (SC), offer greener pathways. However, climate-resilient cities in developing countries challenge the feasibility of those Nbs' approaches, especially after the COVID19 pandemic has set new preferences on planning budgets. Hence, this IWA Session welcomes experiences gained, lessons learnt and visionary scenarios around Nbs from a diverse range of stakeholders, i.e., from urban water utilities, municipality agents, water authorities, under-represented groups, technicians and academia.</p> <p>Speakers: Nilo Nascimento, Federal University of Minas Gerais (BR), Eduardo Mario Mendiondo, University of Sao Paulo (BR), Juan Pablo Rodriguez Sánchez, Universidad de los Andes (CO), Neil Armitage, University of Cape Town (ZA), Maryam Imani, Anglia Ruskin University (UK), Melissa Graciosa, Iwona Wagner, Hafiz Muhammad Abd-m-Rehman, The University of New South Wales (AU), Deyvid Rosa, Federal University of Minas Gerais (BR), Daniela Bemfica, IWA (UK) & Abby Daniela</p>		<p>Chairs: Gertjan Medema, Netherlands and Amy Pruden, United States</p> <p>Using machine learning to identify discriminatory ARGs and socio-economic factors that shape resistome risk in water systems, Peter Vikesland, Virginia Tech, United States</p> <p>Quality assessment of SARS-CoV-2 nanopore sequencing data in wastewater variant monitoring, Livia Bomediano, Federal University of ABC, Brazil</p> <p>Comparable data on Norovirus and Rotavirus prevalence, excretion rates and wastewater concentrations are required for microbial water quality modelling, Nancy Mondragon, Wageningen University and Research, Netherlands</p> <p>Developing rapid measurement of actinomycetes using quantitative PCR method to prevent proliferation in wastewater treatment plant, Takeshi Nakamura, Tokyo Metropolitan Sewerage Service Corporation, Japan</p> <p>---- POSTERS ----</p> <p>Long-term wastewater Norovirus surveillance and its correlation with clinical reports, Yifan Zhu, Tohoku University, Japan</p> <p>Using viability quantitative PCR to evaluate the health risk of virus pollution derived from combined sewer overflow, Hiroyuki Katayama, The University of Tokyo, Japan</p>	
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
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Coffee Break		09:50 - 10:30			
Session 1		10:30 - 12:00			
2.2.1-1 WATER RECLAMATION FOR NON-POTABLE REUSE		Room B3 e Technical	2.3.2-1 ADVANCED OXIDATION PROCESSES - GROUP 1	Room B3 f Technical	
Chairs: Esper Ncube , <i>South Africa</i> and Alba Martinez , <i>Denmark</i> Disinfection of extracellular antibiotic resistance genes using peracetic acid (PAA) and performic acid (PFA), Hiroki Kobayashi , <i>Kitasato University, Japan</i> Microbiology contamination in grass irrigated with different water sources, Rita Lourinho , <i>Instituto Superior Técnico, Portugal</i> Sustainable and synergic solutions to increase wastewater reuse in industrial sectors, Cecilia Bruni , <i>Marche Polytechnic University, Italy</i> Frequency and application of dual water supply systems, Seyed Ali Ghassemi , <i>Mashhad Water and Wastewater Company, Iran</i> <p style="text-align: center;">--- POSTERS ---</p> New fluorescence sensor for pathogen monitoring in wastewater reuse, Santiago , <i>AIMEN Technology Centre, Spain</i>			Chairs: Pablo Ledezma , <i>Australia</i> and Dana Hernandez , <i>United States</i> Effects of conventionally-treated and additionally ozonated wastewater on survival, biomarkers and behavior of two aquatic invertebrate species, Louisa Rothe , <i>University of Duisburg-Essen, Germany</i> Water treatment by combining of a plug-flow tubular cavitation reactor in with H ₂ O ₂ dosage, Andreas Schmid , <i>University of Applied Sciences Hof, Germany</i> Assessment of CuO nanomaterials assisted oxidation versus self activation of peroxymonosulfate for the degradation of recalcitrant pollutants, Pieter van Aken , <i>KU Leuven, Belgium</i> Emerging advanced oxidation processes for water and wastewater treatment — a guideline for future research, Uwe Huebner , <i>Technical University of Munich, Germany</i> A digital twin for the ozonation process at the Wervershoof WWTP: towards real-time prediction of micropollutant removal and bromate formation, Wim Audenaert , <i>AM-Team, Belgium</i> <p style="text-align: center;">--- POSTERS ---</p> Effects of water matrices on removal of pharmaceuticals by photo-fenton process and ozone-based oxidation processes, Masahiro Tokumura , <i>University of Shizuoka, Japan</i>		
Lunch		12:00 - 13:30			
Session 2		13:30 - 15:00			
2.2.1-2 WATER RECLAMATION FOR NON-POTABLE REUSE		Room B3 e Technical	2.3.2-2 ADVANCED OXIDATION PROCESSES - GROUP 2	Room B3 f Technical	
Chairs: Aaron Burton , <i>United Kingdom</i> and Chelsea Hayward , <i>Australia</i> Performance and benchmarking study of newly developed aquaporin inside®CLEAR series low energy BWRO membranes, Khung Hanh Le , <i>Aquaporin Asia, Singapore</i> Water reuse in agriculture: Konya Closed Basin case study, Burcu Yazici , <i>Turkish Water Institute, Turkey</i> Verification monitoring program for a regional Australian recycled water scheme, Natalie Crawford , <i>Atom Consulting, Australia</i> Prevalence of antibiotic resistance genes in drinking and environmental water sources of the Kathmandu Valley, Nepal, Tsubasa Takezawa , <i>Kitasato University, Japan</i>			Chairs: Jouke Boorsma , <i>Netherlands</i> and Jia-Qian Jiang , <i>Scotland</i> A new bromate-free ozone micropollutants treatment, Laurent De Franceschi , <i>Suez Water Technologies and Solutions, Switzerland</i> Effective removal of residual pollutants in treated municipal wastewater using in-situ generated ferrate, Yumin Oh , <i>Pusan National University, Republic of Korea</i> Leachate treatment of the landfill sites by electrochemical oxidation (ECO), Jun Hee Lee , <i>Michigan Technology Corp, Republic of Korea</i> Optimization of the AOP to prevent DBPs formation: case of study in DWTP of Figueres, Laura Ferrandez , <i>Universitat de Girona, Spain</i> Role of electrochemically-generated sulfate radicals on the electro-mineralisation of PFASs in water, Pablo Ledezma , <i>University of Queensland Australian Centre for Water and Biotechnology (ACWEB), Australia</i>		
Coffee Break		15:00 - 15:45			
Session 3		15:45 - 17:15			
6.5 TECHNICAL ACHIEVEMENTS FOR SURFACE WATER CONTROL		Room B3 e Technical	WATER SECURITY AND SANITATION CHALLENGES IN THE SMALL ISLAND STATES		Room B3 f Workshop
Chairs: Vadim Malkov , <i>United States</i> and Juan José Iervasi Scokin , <i>Argentina</i> High-resolution nitrate sensors can help provide better monitoring of water quality in Danish streams, Sofie vant Veen , <i>EnviDan, Denmark</i> The dynamic aquatic simulation hub: an agile, integrated model and boundary object for integrated water resources management, Shane Carnohan , <i>RISE Research Institutes of Sweden, Sweden</i> Digital solutions and early warning system for decision support and risk management in water reuse for irrigation, Alessia Foglia , <i>Marche Polytechnic University, Italy</i> Vortex chamber to trap particulate urban pollution, Rob Collins , <i>The River Trust, United Kingdom</i> <p style="text-align: center;">--- POSTERS ---</p> Performance of a hydrodynamic vortex separator for treatment of road runoff, Kristine Bergseng , <i>Ramboll, Norway</i> Evaluating the Paraopeba's River water treatability and water quality after the Tailings Dam rupture in Brazil, Marcelo Libanio , <i>UFMG, Brazil</i>			Chairs: Amit Chanan , <i>Fiji</i> and Bruno Nguyen , <i>France</i> The Small island developing states (SIDS) are characterized by small size, narrow resource base, distant geography, and high vulnerability to climate related environmental challenges. There are over 38 SID states located in the Caribbean, in the Pacific, and in the Atlantic, Indian Ocean, Mediterranean and South China Sea. The Session will bring together key water management players working across these SID states to share their challenges in water and sanitation services in the face of climate change impacted decline in freshwater resources. The session will culminate in announcement of a new Specialist Group focusing on Water Management in Small Island States. It will also serve to mainstream water issues, climate change vulnerability of small island states for broader IWA community. Speakers: Adrian Cashman , <i>AKWATIX: Water Resources Management, Barbados</i> ; Bambos Charalambous , <i>Director Hydrocontrol Ltd, Cyprus</i> ; Gerard Luyet , <i>COO, Geneva Water & Swiss Humanitarian Aid</i> ; Didier Vallon , <i>Suez Water Overseas Territories</i> ; Dr Sherub Phuntso , <i>University of Technology Sydney, Australia</i>		
Break		17:15 - 17:30			
Keynote Plenary		17:30 - 18:20			
Keynote: A Roadmap for Achieving SDG 6.2, Sanitation for All and How to Connect the Unconnected, Nathalie Olijslager Panel: Sylvain Usher , Brian Arbogast , Kate Medicott , Jennifer Molwantwa , Mathivathanan Govindarajan					

Keynote Plenary	09:00 - 09:50	
Coffee Break	09:50 - 10:30	
Session 1	10:30 - 12:00	
1.3 ADDRESSING WATER SHORTAGE MITIGATION IN THE MEDITERRANEAN REGION		Room B3 g Technical
<p>Speakers: Günter Langergraber, <i>Austria</i> and Manuel Sapiano, <i>Malta</i></p> <p>This session aims to contribute to the open debate on local water shortage mitigation and Mediterranean environmental challenges through state-of-the-art knowledge on NCWR techniques, management, planning and skills to reuse at territorial level for domestic and agricultural purposes.</p> <p>Speakers: Konstantinos Plakas, <i>Centre for Research and Technology-Hellas (CERTH) (GR)</i>, Günter Langergraber, <i>Mediterranean Agronomic institute of Bari (CIHEAM Bari) (AT)</i>, Manuel Sapiano, <i>Energy and Water Agency (MT)</i> & Fabio Masi, <i>IRIDRA Srl (IT)</i></p>		
Lunch	12:00 - 13:30	
Session 2	13:30 - 15:00	
1.18 UTILITY RESPONSES AND ADAPTATION TO CLIMATE CHANGE IMPACTS		Room B3 g Technical
<p>Chairs: Peter Dane, <i>Netherlands</i> and Shotaro Goto, <i>Japan</i></p> <p>Strengthening the blue and green infrastructure in the Ruhr metropolis: the Emscher-conversion as an opportunity for a regional approach to climate change adaptation, Stephan Treuke, <i>Emschergenossenschaft, Germany</i></p> <p>Climate adaption measures of the Great Belt Link and Oresund Link's onshore facilities in Denmark to future-proof critical national infrastructure assets, Jan Stæhr, <i>COWI A/S, Denmark</i></p> <p>Stakeholder and change management in long term climate adaptation projects, Sonia Sørensen, <i>Ramboll, Denmark</i></p> <p>Sanitation safety plan for a pre-potable use of reclaimed water, Marta Ganzer, <i>Aigües de Barcelona, Spain</i></p> <p style="text-align: center;">---- POSTERS ----</p> <p>Updated rainfall input and new tools for stormwater system design in Denmark, Ane Møllerup, <i>Novafos, Denmark</i></p> <p>FloodMan - a tool for sustainable management of flood mitigation, Lars Rosén, <i>Chalmers University of Technology, Sweden</i></p>		
Coffee Break	15:00 - 15:45	
Session 3	15:45 - 17:15	
1.3 INNOVATIVE APPROACH TO NATURE-BASED SOLUTIONS FOR URBAN CLIMATE RESILIENCE		Room B3 g Workshop
<p>Chairs: Lykke Leonardsen, <i>Denmark</i> and Christian Nyerup-Nielsen, <i>Denmark</i></p> <p>Nature-based Solutions have the potential to offer a triple win (societal, economic, natural) leverage to build climate-resilient urban spaces. Turning this potential into a reality will require hands-on, context-sensitive approaches.</p> <p>The purpose of this workshop is to present an innovative approach to operationalizing NbS in urban contexts. The approach is based on the selection and prioritisation of specific NbS typologies to address identified urban challenges.</p> <p>Participants will be active players and will learn about different NbS typologies, their values and limits, and the types of contexts in which they apply.</p> <p>The workshop will be an opportunity to exchange knowledge and build capacities on NbS and their applicability to achieve urban resilience.</p> <p>Speakers: Lykke Leonardsen, <i>Copenhagen Region Municipality (DK)</i>, Christian Nyerup-Nielsen, <i>Ramboll (DK)</i>, Fantine Hureau, <i>Ramboll (DK)</i>, Alvaro Fonseca, <i>Ramboll (DK)</i>, Barbara Cesar Barros, <i>C40 (BR)</i>, Pedro Rolim, <i>Rio City Hall (BR)</i>, Trine Munk, Ida Bulow Gregersen, Ida Hansen, <i>Ramboll (DK)</i> & Sari Suvanto</p>		
Break	17:15 - 17:30	
Keynote Plenary	17:30 - 18:20	

Monday | Business Forums

Keynote Plenary 09:00 - 09:50

BUSINESS FORUM ROOM 1 (HALL E)

11:15 — 12:00 | IDRICA

How the City of Houston has reduced SSOs and minimized cleaning OPEX with an intelligent sewer platform

The GoAigua software solution is helping the City of Houston optimize the resources allocated to predictive cleaning of the sewer network and to reduce overflows (SSOs) caused by grease and wipe blockages by over 70%.

- Joan Carles Guardiola

12:15 — 13:00 | DENMARK PAVILION

Stop water losses – Danish leakage management solutions

On a global scale, we are facing up to 40 % water loss which makes it difficult to fulfil the drinking water demands. In Denmark water loss is down to only 6-7 % and new innovative solutions can improve this water loss. This seminar will show new developments in leakage management and use of data.

- Kristiane Østergaard Jensen, Planner, HOFOR A/S
 - Klavs Høgh, Project Director, Niras A/S
 - Michael Ramlau, Global Brand Manager, AVK Holding A/S
 - Hans Christian Jørgensen, Head of Solution & Application management, Kamstrup A/S

13:30 — 14:15 | EWII

Data Liberalization in water utilities

Presentation of concept for data collection at the heart of water utilities we our mission is to integrate supply data into digital eco-systems to engage users, municipalities, industry, and utilities in co-creating the future supply security through balancing, sector coupling, and development of flexibility based on data driven decisions.

- Niels Kåre Bruun

14:15 — 15:00 | SUEZ

Eco-design based solutions – Pau-Lescar biofactory example

Tomorrow's wastewater treatment plant (the biofactory for resource recovery) modifies the operating principle of the sanitation system because it generates products that are useful to human activity. Natural resources are saved. The circular economy dynamic based on eco-design solutions is thus launched. Through Pau example, environmental footprint reduction will be illustrated.

- Eric Judenne mkt, com and sustainable development director – Suez TI

15:45 — 16:30 | RQMICRO

Watch live: Microbiological testing to take the guesswork out of water safety and management

Quantitative and rapid microbiological data are the missing element for effective water monitoring. We established a new method to quantify total bacteria or pathogens (*Legionella* and *E. Coli*) within 0.5-3 hours. On stage we will show how our solution works and how it helps to improve water management and safety.

- Bjoern Biedermann

16:30 — 17:15 | NOKIA

Ready for an open, standards based digital platform?

Smart Water Management R&D project (SWIM) aims to develop and test an open, flexible and standards-based digital platform that addresses global water utility challenges. Learn about this partner consortium's work in innovative WaterLAB and demonstrator SuperDMA in Kuopio, Finland - key learnings, next steps and how this empowers digital transformation.

- Dominique Verhulst, Global Utility Leader, Nokia
 - Patryk Wójtowicz, Research Manager, Savonia University of Applied Science

BUSINESS FORUM ROOM 2 (HALL C)

12:15 — 13:00 | JAPAN (JWWA)

Moving Towards Sustainable Water Future

Exhibitors of Japan Pavilion provide the best practices though Japan's experience. This session aims:

- to exchange information about good practices and cutting-edge technology through our challenges
- to exchange information for Moving Towards Sustainable Water Future
- Staffs of Japan pavilion exhibitors

13:30 — 14:15 | EASYMINING

Technologies for making today's wastewater treatment plants tomorrow's resource plants

In a circular society, the amount of both phosphorus and nitrogen in wastewater should be seen as an asset. Both phosphorus and nitrogen can be recovered brought back to the society as fertilizers, reducing greenhouse gas emissions.

In this session we will discuss the possibilities and introduce technologies making this happen!

- Yariv Cohen, Christian Kabbe, Jan Svärd and Anna Lundbom

14:15 — 15:00 | IDRICA

Smart irrigation pilot for green areas in Qatar

The GoAigua Smart Green solution increased the efficiency of the irrigation networks, streamlining the volume of water required and optimizing watering frequencies in the green areas of Al Khor in Qatar.

- Borja Moratal

15:45 — 16:30 | JACOBS

Overflow Control in the Digital Age

Combined Sewer Overflows are a growing challenge across the globe with aging infrastructure and extreme weather events. This session will highlight best practices in managing and mitigating CSOs and the digital innovations available to tackle additional CSO concerns such as safety, cybersecurity and workforce limitations

- Phil Higgins, Jacobs Executive Director of Operations;
 - Bill McMillin – Jacobs Global Technology Lead for Wet Weather

Keynote Plenary 17:30 - 18:20