IAHR/IWA JOINT COMMITTEE ON URBAN DRAINAGE (JCUD) – MARCH 2025 NEWSLETTER 38

Every year, IWA/IAHR Joint Committee on Urban Drainage (JCUD) publishes a newsletter to inform the community about recent and upcoming activities, events, conferences and publications in urban drainage.

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This could be you! See the Call for NEW member nominations.	

Chairman's Thoughts

Dear members of the Urban Drainage community,

It is an honour to address you in this introduction to our annual JCUD newsletter, following my election to this position in June 2024. I would like to express my gratitude for the trust placed in me and reaffirm my commitment to strengthening our global community of urban drainage researchers and practitioners.

Urban drainage has never been more critical. With rapid urbanization, climate change, and increasing extreme weather events, our field is at the forefront of developing sustainable and resilient water management solutions. The complexity of challenges has grown, requiring not only traditional engineering approaches but also integrated strategies that incorporate blue-green infrastructure and ecosystem services. These nature-based solutions emphasize collaboration across disciplines, reinforcing the need for inter- and transdisciplinary work between engineers, urban planners, ecologists, data scientists, and social scientists.

New technological advancements provide us with unprecedented opportunities. More and better data from satellites, drones, and increasingly affordable sensors enable deeper insights and improved decision-making. Artificial intelligence applications are opening new frontiers in predictive modelling, automation, and real-time control, offering exciting possibilities for our field.

However, in many parts of the world, scientists face increasing challenges due to growing scepticism toward science among the public and policymakers. This makes our role in communicating our work and its societal benefits more important than ever. The JCUD remains committed to supporting the community by fostering international collaboration, facilitating networking opportunities, and organizing key events such as the International Conference on Urban Drainage (ICUD) and specialized conferences like Urban Drainage Modelling (UDM) and Sewer Processes and Networks (SPN).

Moving forward, we aim to enhance international exchange by providing more opportunities for collaboration, sharing ideas, educational materials, and datasets. We also continue to support our scientific journals, ensuring the highest quality of research dissemination.

We warmly invite all members of the community to engage with JCUD: subscribe to our newsletter, participate in our events, and consider joining IWA or IAHR, our parent organizations. Together, we can drive innovation, strengthen our scientific impact, and contribute to more sustainable urban drainage solutions worldwide.

Looking forward to an exciting year ahead!

Manfred Kleidorfer

Chair of Joint Committee on Urban Drainage

From the Secretary's Desk

General JCUD information. The Joint Committee on Urban Drainage (JCUD) is an active Specialist Group working under both IWA and IAHR, you can keep up to date through our website and mailing list as well as our LinkedIN group and see us on IWAConnectPlus. The JCUD organises the International Conference on Urban Drainage (e.g. 2014: Malaysia, 2017: Czech Republic, 2021: Australia, 2024: Netherlands, 2027: China). The JCUD also oversees various working groups, many of which organise its own three-yearly conference (e.g., Sewer Processes and Networks; Urban Drainage Modelling, Urban Rainfall, etc.). JCUD aims to encourage knowledge exchange, stimulate contacts and networking, and everyone is most welcome to get engaged in the activities of the JCUD and its working groups.

Changes in membership

In 2024 we have said goodbye and many thanks to David McCarthy, Ullrich Dittmer, Karine Borne, Juan Pablo Rodrigues and Takashi Sakakibara, and we welcomed to Seith Mugume, Maria Sambito, Frederic Cherqui and Veljko Prodanovic. We've also created some exciting new JCUD member roles, (Education and Social Media) and divided up the roles a bit differently. We have also welcomed Thiruni Thirimanne and Baiqian (Luke) Shi as new young water professional members.

The current roles and responsibilities of the JCUD committee members are:

- Chair: Manfred Kleidorfer
- Secretary: Alma Schellart
- Treasurer: Jon Hathaway
- Awards: Franz Tscheikner-Gratl
- Newsletter: Seith Mugume and Frederic Cherqui
- Webmaster: Wan Hanna Melini Wan Mohtar
- IWA link/Specialist group connector: Frederic Cherqui
- IAHR link/Specialist group connector: Maria Sambito
- Young Water Professionals: Maria Sambito
- Working Groups: Sylvie Spraakman
- Events: John Okedi
- Social Media: Veljko Prodanovic and Maria Sambito
- Education: Frederic Cherqui and Veljko Prodanovic

Our current Young Water Professional members are Job van der Werf, Thiruni Thirimanne and Baiqian (Luke) Shi.

How to contact us?

Should you have any questions about or any suggestions for the JCUD, please do not hesitate to get in contact with me or with any of the JCUD members, see our details on page 2.

How to share exciting news and opportunities

Please help JCUD in encouraging international collaboration in urban drainage research, by sharing all your exciting news such as workshops, conferences, PhD and research job vacancies, new books… you can do so by subscribing to our mailing list (please do not use it for commercial purposes), or our LinkedIN group.

JCUD Newsletter. This annual newsletter is published to serve the international urban drainage community and meet the requirements of our parent organisations. The main purpose of the newsletter is to facilitate communications and interactions among specialists in our field, rather than to present detailed information. The most recent newsletter can be found on our website. We distribute this Newsletter to our JCUD mailing list and participants of the ICUD and NOVATECH conferences. Please share your electronic newsletter copy widely with colleagues. Your comments on this newsletter issue and contributions to future newsletters are most welcome.

Our activities. After 2024's successful ICUD 2024 at TUDelft, The Netherlands, we are looking forward to several exciting new activities, such as the International Conference in Urban Drainage Modelling (UDM) in Innsbruck, Austria in 2025, SPN in Trondheim, Norway in 2026, and Novatech in Lyon, France in 2026, and ICUD 2027 in Ningbo, China; see our 'upcoming events' section for details on these and other activities.

We also aim to maintain our series of webinars as an effective low carbon way to keep our international community informed and engaged in between conferences, please do consider organising a webinar and do contact us to help advertise it!

Involvement of young members in the management team. We invite young members (PhD students, young PostDocs) to get involved in the committee. The idea is to have young people work closely together with experienced members in the roles mentioned above. If you are interested, please send your CV and a short application (half a page) stating why you are interested to join JCUD and in which role you are interested to manfred.kleidorfer@uibk.ac.at (chair) and a.schellart@sheffield.ac.uk (secretary). Applications are always possible.

Best regards,

Alma Schellart

JCUD secretary

JCUD Management Committee: Call for new member nominations

The Management Committee of the IWA/IAHR Joint Committee on Urban Drainage (JCUD) will have 2 vacancies later this year and is looking for a possible replacement as a part of continuous revitalization of the Committee. Details follow below.

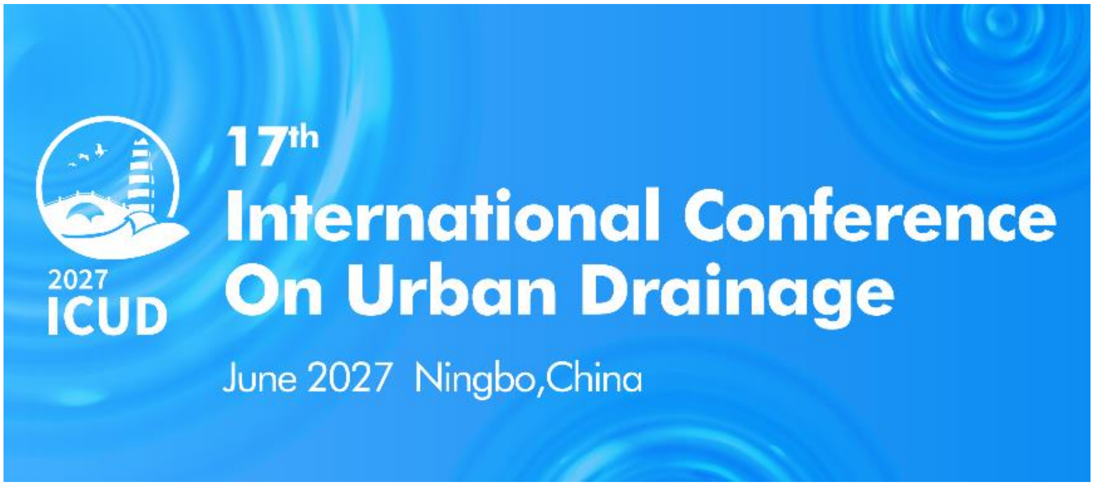
Job description: all members operate in their own way and contribute accordingly. Typical contributions include proposing to organize workshops/conferences and training courses (usually in collaboration with our working groups), organizing or contributing to publications (monographs, or journal review papers), contributing news from their country or region to the Committee's annual newsletter, participating in email discussions, attending JC meetings held annually in conjunction with drainage conferences, and promoting JC activities and visibility in general.

Qualifications: we are looking for colleagues actively involved in any aspect and sector of urban drainage. However, perhaps the most important qualification is having some time to devote to the committee activities and personal initiative in proposing and implementing new activities. One reason why our Committee has been successful in its more than 35 years of operation is our ability to attract highly motivated members to serve on the Committee. The elected candidates must be (or become, within one month of being elected) members of one of the parental organizations (IAHR or IWA), and our statutes allow only one member per country; if your country is already represented on the committee, you may have to wait till there is a vacancy, or even better, simply join in the meantime one of our working groups and start contributing to our efforts that way. The information on the Joint Committee and the current membership can be found on our website: www.jcud.org.

Application procedure: you can either nominate yourself for JCUD membership, or you can nominate another person (ideally after establishing their willingness to serve, otherwise this will have to be done by JCUD), and submit electronically the following two documents to the current JC Chairman, Prof. Dr. Manfred Kleidorfer (Manfred.Kleidorfer@uibk.ac.at), copied to JC secretary Dr Alma Schellart (a.schellart@sheffield.ac.uk): (a) A brief CV, and (b) a statement of activities you would like to contribute to the JC program. Neither document must exceed one page, using a 10-point font or larger.

Deadline: 15th August 2025: The applications received will be distributed to the JCUD members for assessment and voting; the results will be announced after the JC meeting at 15th September 2025

Upcoming Event Announcements



17th International Conference on Urban Drainage (ICUD) in 2027 in Ningbo, China

We are pleased to announce that the 17th International Conference on Urban Drainage will be held in Ningbo, China in the summer of 2027.

The proposed theme "For a Green and Sustainable Future" will primarily focus on future approaches and solutions to urban drainage encompassing a broad range of topics with specific attention on sustainable urban development and planning. The conference's local organizers will be Ningbo University, Tsinghua University, Zhejiang University, and Tongji University. The conference chairs are Dr. David Z. Zhu (Ningbo U. / U. Alberta), Dr. Haifeng Jia (Tsinghua U.), and Dr. Jean-Luc Bertrand-Krajewski (INSA Lyon, France). The chairs of the International Scientific Committee are Dr. Joseph Lee (IAHR President), and Dr. Zhiguo Yuan (Hong Kong City U.). They are world leading researchers on urban drainage with very strong connection to both IWA and IAHR.

Tentative themes for the conference are: Sponge City and Low Impact Development, Drainage System Assessment and Modernization, Climate Adaptation and Resilient Infrastructure, Urban River Water Ecology and Environment. Special topics include Water Energy Nexus, Digital Sewer Management, Integrated Management of Sewers, WWTP and Receiving Water.

Conference key members Dr. David Zhu, Dr. Haifeng Jia, Dr. Jean-Luc Bertrand-Krajewski and Dr. Zhiguo Yuan got together in Oct. 19-22, 2023, during the 3rd International Symposium on Sustainable Urban Drainage in Jiashan, China. The preparation for the 2027 ICUD in Ningbo was discussed among the local organizing committees. More meetings will be scheduled for further discussion. The official website, social media, conference logo, and detailed information of the 2027 ICUD will be available on the 16th ICUD in Delft. Suggestions or communications with us on the 2027 ICUD is sincerely appreciated.

If you have any suggestions on the 2027 ICUD, or would like to get involved in organizing this important event, please feel free to contact us at: dzhu@ualberta.ca (David Zhu) or qianyu@nbu.edu.cn (Yu Qian).

We are looking forward to seeing you in Ningbo in 2027!

https://icud2027.cn/

Urban Drainage Modelling Conference 2025 – Stay Updated!

The Urban Drainage Modelling (UDM) Conference is returning for its 13th edition from September 15-19, 2025, in Innsbruck, Austria. Organized by Manfred Kleidorfer, Wolfgang Rauch, and Robert Sitzenfrei, this prestigious event will bring together experts from around the world to discuss the latest advancements in urban drainage modelling and digitalization.

A Legacy of Excellence – UDM History

The UDM conference series, organized by the International Working Group on Data and Models under the IWA / IAHR Joint Committee on Urban Drainage, has been a global platform for innovation and collaboration since its inception in 1986 in Dubrovnik, former Yugoslavia. Over the years, UDM has been hosted in renowned locations such as the River Volga, London, Orlando, Dresden, Melbourne, Tokyo, Belgrade, Québec, Palermo, and Costa Mesa, reflecting its worldwide significance.

Each edition has brought together researchers, practitioners, and industry leaders to exchange knowledge, advance modelling techniques, and address emerging challenges in urban drainage. The 2025 edition in Innsbruck continues this tradition, focusing on the latest developments in centralized and decentralized urban drainage systems, climate adaptation, and the role of digitalization.

Abstract Submission Closed – Thank You!

We are thrilled by the response to our Call for Abstracts! More than 250 abstracts were submitted, including nearly 100 from students, showcasing the next generation of researchers. The diversity of contributions is remarkable, with authors representing 39 different countries, emphasizing the global importance of urban drainage modelling in tackling water challenges.

Now, the rigorous review process is under way, ensuring a high-quality and engaging program. A huge thank you to all authors and our reviewers for their upcoming efforts in shaping UDM 2025!

Conference Schedule

- **Monday, Sept 15** – Workshops
- **Tuesday to Thursday, Sept 16-18** – Conference Sessions
- **Friday, Sept 19** – Tour

Registration Opens in April!

Stay up to date by registering in the Conference Submission and Registration Portal at www.udm2025.org to receive updates **program, speakers, and key events**.

For **sponsorship and exhibition opportunities**, please contact us at **contact@udm2025.org**.

We look forward to welcoming you to **Innsbruck in 2025** for an inspiring conference filled with **cutting-edge research, insightful discussions, and new collaborations!**

Novatech 2026 Conference

We are pleased to remind you that the next Novatech conference will be held in Lyon, in 2026, from 29 June to 2 July (in a new and very comfortable venue, very close to public transport!).

For more than 30 years, the Novatech conference has been regarded as an international benchmark in the promotion of solutions for integrated and sustainable urban water management, through the intersection of approaches and dialogue between practitioners, policy-makers and researchers. Novatech promotes a dynamic of innovation, from nature-based solutions to water-wise cities, towns and regions! It is a great opportunity to present and discover recent results on asset management, performance assessment, real-time control, monitoring, urban landscape integration, water and biodiversity, impacts on waterways, etc. And, at last but not least, Novatech is a great chance to make new friends or catch up with old ones!

2 additional clarifications:

Novatech will continue to propose innovations such as the presentation of "just-getting-started" projects, and focus-sessions on education and training related to urban water management!

Novatech will be held in a new and prestigious venue, very close to the Perrache train station and the historic heart of Lyon: we will be pleased to welcome you in comfortable, relaxed and easily accessible premises.

The call for papers is not yet open, but stay tuned!

Don't forget to save the conference dates: 29 June - 2 July 2026 and see you in Lyon!

Elodie Brelot, Tim Fletcher and Frederic Cherqui

SPN 2026 Conference

The Department of Civil and Environmental Engineering of the Norwegian University of Science and Technology in Trondheim, Norway is pleased to invite you to the 11 th International Conference on Sewer Processes and Networks of the Joint IWA/IAHR Working group on Urban Drainage.

The conference will be held from 20th to 22nd of May 2026 in Trondheim → Save the date.

The International Conference on Sewer Processes and Networks (SPN) is held every 3rd year by the Sewer Systems and Processes Working Group under the IWA specialist group on Urban Drainage (Joint IAHR/IWA). The last of these conferences, the SPN 8, SPN 9 and SPN10, were held in Rotterdam, The Netherlands, organized by Jeroen Langeveld from TU Delft, in Aalborg, Denmark, organized by Jes Vollertsen, and in Graz, Austria organized by Dirk Muschalla from TU Graz. The attendance is usually around 100 participants.

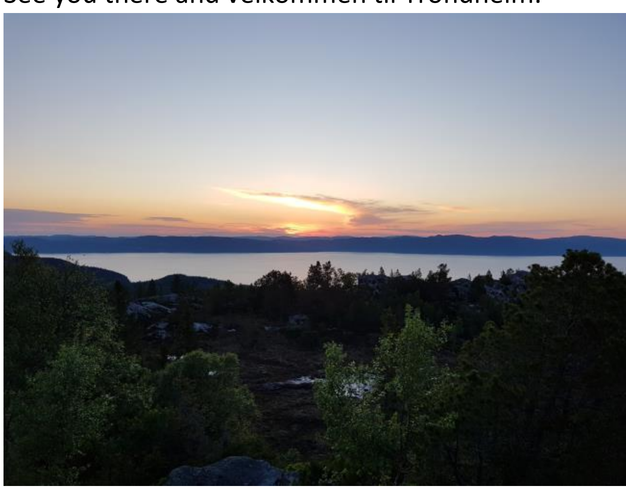
To underline the virtues of being a specialist conference there are no parallel tracks to allow all attendees to participate in discussions.

https://iwa-network.org/events/11th-international-conference-on-sewer-processes-and-networks/

The topic areas have been selected to encompass all the scientific and technical areas (physical/chemical and biological processes, operation, monitoring and management) that are important for sewer networks. The topics cover pure scientific topics as well as more technical fields of interest, such as sewer asset management and inspection techniques.

The call for papers is not yet open, but will come soon!

See you there and velkommen til Trondheim.




Franz Tscheikner-Gratl, Marius Møllller Rokstad, Thomas Meyn, Vincent Pons, Tone Muthanna

Sensing in Water 2025: A Premier International Conference on Water Sensing Technologies and Applications, 24th – 25th September 2025

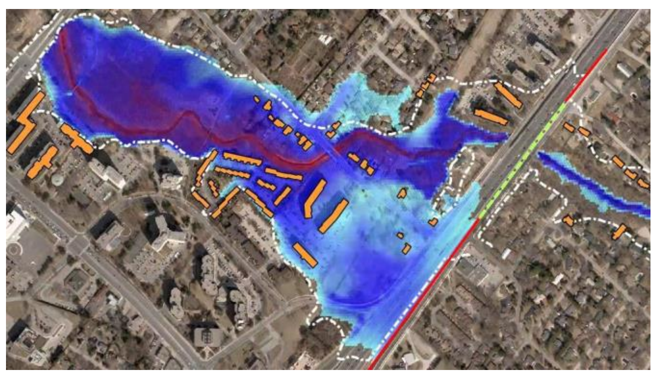
We are pleased to announce *Sensing in Water 2025*, an international conference dedicated to advancing the development and application of sensing and monitoring technologies for the water industry. Scheduled for the 24th and 25th of September 2025, this event will take place at the Holywell Park Conference Centre at Loughborough University, UK, offering state-of-the-art facilities within a leading academic environment. Sensing in Water has established itself as a premier forum for scholars and practitioners alike, bridging academic research with industry applications. The 2025 conference will bring together a diverse international audience, including experts from water utilities, technology suppliers, researchers, and policymakers, all focused on the latest innovations in water sensing. This unique convergence of academia and industry presents an invaluable opportunity for knowledge exchange, fostering collaborative solutions to critical challenges in water supply, catchment management, and urban drainage. The event will feature academic presentations on emerging trends in water sensing, hands-on exhibitions with new technology demonstrations, and structured networking opportunities to connect attendees across the water sector supply chain. Additionally, participants are invited to a gala dinner and networking evening at the newly refurbished Burleigh Court Hotel, creating an engaging space for discussions and future collaborations. Academics and industry professionals interested in the forefront of water sensing research and applications are encouraged to attend. **Click here for registration and abstract submission details**. We look forward to welcoming you to this significant gathering of international water sector expertise!

Advancing Urban Flood Resilience: The ARTIFACT Project's Summer School on AI Applications, 30th June to 4th July 2025

Urban flooding poses a significant threat to cities worldwide, exacerbated by climate change and rapid urbanization. Addressing this challenge requires innovative approaches that integrate advanced technology with sustainable solutions. The ARTIFACT project (ARTificial Intelligence for Flood Resilient Infrastructure, artifact-project.com) is Horizon Europe, Twinning Green Deal project, which is at the forefront of this endeavour, aiming to revolutionize flood modelling and infrastructure planning by combining artificial intelligence (AI) with nature-based solutions.

ARTIFACT is an ambitious Horizon Europe, Twinning Green Deal project dedicated to enhancing urban flood resilience. By leveraging cutting-edge AI and sustainable practices, the project seeks to transform how cities predict, plan for, and respond to flooding events. This initiative not only focuses on technological advancements but also emphasizes community engagement and education to promote sustainable practices (artifact-project.com).

Upcoming Summer School: AI Tools for Modeling Urban Flood Risks



As part of its commitment to knowledge dissemination and capacity building, ARTIFACT is organizing a **FREE Summer School** from June 30 to July 4, 2025, in Novi Sad, Serbia. This program is designed to equip participants with the skills to utilize AI tools in modelling urban flood risks. The curriculum includes:

- **Fundamentals of Physics-Based Flood Modelling:**
- **Introduction to Deep Learning and Computer Vision:**
- **Practical Applications**

This comprehensive program aims to bridge the gap between traditional flood modelling methods and modern AI applications, fostering innovative solutions for urban flood management. For more information and to register for the summer school, please visit the ARTIFACT project website: www.artifact-project.com

Reports from 2024 Events

16th ICUD Conference, 2024, Delft, the Netherlands

The 16th international conference on Urban Drainage (ICUD) was held in Delft, 9-14 June 2024 (see https://icud2024.org). The conference addressed a wide range of topics of direct interest to both academics and practitioners working in the field of urban drainage. The focus was on complex and interdisciplinary challenges in these systems related to management, sustainability, climate change adaptation, socio-economic and other aspects. The aim was to present the latest advances and innovations in both fundamental and applied research related to these and other topics.

A total of 360 extended abstracts / papers were received and presented, either as full or shorter (flash) oral presentation in 5 parallel sessions that were held during the five conference days. A number of posters were also presented during the conference. The conference was attended by 519 registered delegates from around 60 different countries from all five continents. Selected conference papers have been invited for publication in the Water Science and Technology journal. Technical excursions to local urban drainage and other facilities in Rotterdam, Amsterdam, Gouda and Delft were organised allowing glimpse into specific challenges of Dutch urban drainage systems. All these were well attended and received a positive feedback from the participants.

The ICUD 2024 conference featured five inspiring keynote talks. Prof Perter Steen Mikkelsen from Technical University of Denmark reflected on previous 30 years of research in urban drainage while Dr Wendy Francken, President of the European Water Association and Vlario, delivered an informative talk on the implications and challenges of the new European Directive. Prof David McCarthy from Queensland University of Technology delivered an inspiring talk on low cost sensors whilst Dr Lena Mutzner, young water professional from the EAWAG in Switzerland, talked about various aspects of emerging pollutants in urban drainage systems. The final day of the conference saw a keynote talk delivered by Prof Michael Templeton from Imperial College London on sustainable sanitation using non-sewered solutions in lower-middle income countries. Keynote talks were followed by interactive Q&A sessions and have clearly inspired conference participants, especially the young water professionals.

A number of awards were presented during the conference. The Poul Harremoës award for the best urban drainage paper by a young water professional was awarded to Travis Dantzer from the University of Michigan in the US for his work on "Tunable linear feedback control of urban drainage systems using models defined purely from data". The JCUD Mid-Career Achievement award was presented to Prof Manfred Kleidorfer from the Innsbruck University whilst the Career Achievement Awards was given to Prof Ana Deletic from the Queensland University of Technology, both for outstanding respective contributions to the field of urban drainage.

The conference concluded with the following key observations:

1. It was great to see that the field of urban drainage is going on as strong as ever with researchers and practitioners addressing a wide range of important and complex challenges. This trend is likely to continue into the future.

2. Even though the conference addressed a wide range of challenges and issues across the urban water cycle some topics received more attention than the others. An increasing number of researchers seem to be focusing on different aspects of sustainable drainage solutions (aka blue-green infrastructure) and related water quality issues, including emerging pollutants. Also, quite a few presentations were made on improved real-time control of urban drainage systems and a related topic of the development of new methods and sensors that are needed for this. Finally, it is clear that artificial intelligence and machine learning methods are being increasingly used to address a wide range of challenges in urban drainage and this trend is likely to continue into the future.

3. Finally, it has become clear from the presentations and discussions that addressing complex challenges in urban drainage requires an increasingly interdisciplinary based approach. This approach is already used in the community but this is likely to increase substantially in the future.

The ICUD 2024 was a great success, as noted by many conference participants in their informal feedback and posts made in social media, both during and after the event. The next ICUD conference will be held in Ningbo, China in 2027.

Prof Zoran Kapelan, Dr Jeroen Langeveld and Dr Job van der Werf

15th International Conference on Hydro informatics, Beijing, China

The 15th International Conference on Hydroinformatics (HIC2024), hosted by China's Ministry of Water Resources, IAHR, and IWA, and organized by IWHR, concluded in Beijing on May 29, convening nearly 500 representatives from 34 countries/regions. The event included 3 plenary sessions, 48 parallel sessions, and 235 technical presentations, and witnessed the announcement of the Beijing Initiative Digital Twins for Water and the release of SkyLIM, the model series independently developed by IWHR.

The Secretary General of the NOC, IWHR's Vice President Ding Liuqian and IAHR President Philippe Gourbesville delivered closing remarks, highlighting the event's significant contributions to advancing hydro informatics and addressing global water challenges amid climate change, and emphasizing the importance of digital transformation in water management and encouraged continuous innovation and youth involvement in digital twins for water. Awards for Best Posters, Best Presentation of Young Expert, and Best Presentation were granted during the closing ceremony. Professor Pilar García Navarro from the University of Zaragoza in Spain, which will be the host of the next event in 2026, presented an introductory video and invited experts around the globe to attend the next event in Zaragoza.

Young Researcher Profiles

This is a new section of the newsletter to recognise upcoming leaders in the Urban Drainage field. Check out the profiles of these folks who are currently or have recently completed their PhDs, and send them a virtual kudos!

Dr. Viviane Furrer

Doctor of Philosophy, Eawag - Swiss Federal Institute of Aquatic Science and Technology

Thesis Title: Temporal dynamics of dissolved organic micro pollutants in combined sewer overflows

Supervisors: Dr. Christoph Ort, Heinz Singer, and Prof. Max Maurer

Defence Date: 9th January 2025

Abstract: Combined sewer overflows (CSOs) are an important pathway for organic micro pollutants into water bodies, yet little is known about their intra-event dynamics. In this thesis, we collected high temporal resolution (3 to 10 min) data for over 60 dissolved micro pollutants at two CSO sites (2,700 & 159,000 inhabitants). The data showed rapid concentration fluctuations (up to 10-fold in 3 min), especially for indoor substances in the smaller catchment. To minimize uncertainties, a short sampling interval (< 3 min) should be chosen, also for composite samples. Source-specific dynamics were observed for tire wear leachates in both catchments, and for indoor substances in the large catchment. Indoor substances also negatively correlated with discharge, facilitating modelling and online monitoring. However, there were no clear patterns for indoor substances in the small catchment and for pesticides. Non target analysis revealed over 3,000 compounds with wastewater-like dynamics, highlighting the importance of raw wastewater despite dilution and the underestimation with current target lists. Chemical risk assessment showed high variation in acute risk, with no consistent period of a CSO event being more critical than others. Both raw wastewater and storm water contributed significantly to the overall risk. The variability in risk and elevated concentrations throughout CSO events challenge mitigation efforts.

Publications

Furrer, V.; Froemelt, A.; Singer, H.; Ort, C. (2025) Source-specific dynamics of organic micro pollutants in combined sewer overflows. Water Research, 123416. DOI: https://doi.org/10.1016/j.watres.2025.123416

Furrer, V., Junghans, M., Singer, H and Ort, C (2025) Realistic exposure scenarios in combined sewer overflows: how temporal resolution and selection of micropollutants impact risk assessment, Water Research, 123318, https://doi.org/10.1016/j.watres.2025.123318.

Furrer, V., Mutzner, L., Ort, C and Singer, H (2023) Micropollutant concentration fluctuations in combined sewer overflows require short sampling intervals, Water Research X (21) 100202 https://doi.org/10.1016/j.wroa.2023.100202

Dr. Shamsuddin Daulat

Doctor of Philosophy, NTNU - Norwegian University of Science and Technology

Thesis Title: Confronting the Challenges of Integrated Multi-infrastructure Asset Management

Supervisors: Assoc. Prof. Franz Tscheikner-Gratl, Assoc. Prof. Marius Møller Rokstad, Assoc.

Prof. Jeroen Langeveld, and Prof. Alex Klein-Paste

Submission Date: 2024

Link: https://hdl.handle.net/11250/3134948

Abstract: The well-being and economic prosperity of urban areas are tied to the effectiveness and reliability of their infrastructure systems. These systems are interdependent, influencing each other across various dimensions. Moreover, the infrastructures are aging, and cities are confronted with growing challenges due to increasing populations and environmental concerns. Infrastructure managers are facing increasing pressure to address these evolving challenges. Infrastructure asset management (IAM) approaches are the norm for managing infrastructure by their managers. However, infrastructure managers often overlook the potential benefits of coordinating their asset management works among various interdependent infrastructures. This oversight is typically due to a lack of tools, interest, and other factors. The benefits of coordination can range from cost and carbon savings to reduced community disruptions and increased performance. This thesis explores the potential of Integrated Multi-Infrastructure Asset Management (IMAM) to efficiently manage and coordinate various infrastructures that are in geographic proximity, like water, sewer, and road networks. The thesis first identifies the challenges hindering the application of IMAM and then addresses selected challenges. The identified challenges are: dependencies and interdependencies, data quality, availability and interoperability, uncertainties in modelling and decision-making, comparability, problems of scale, problems of fit, and problems of interplay. To address the problems of spatial scale and fit, and quantify the spatial interdependencies, the thesis proposes two metrics—shared surface area and shared trench volume—and combines them to quantify the degree of colocation of various infrastructures. The degree of co-location also serves as a proxy for the potential cost savings through coordinated interventions. Case of up to 24% in urban and 11% in rural settings is possible through IMAM. For the challenge of data unavailability for water and sewer infrastructure networks, the thesis evaluates the transferability of deterioration models across utilities. Utilizing datasets from multiple Norwegian utilities, global models (based on aggregated datasets) and local models (based on individual utility datasets) are developed. These models were then evaluated for their ability to predict water pipe failures/sewer pipe conditions in utilities that were not part of the training set. This study highlights how small utilities can leverage existing datasets and models from other utilities, thereby circumventing the challenges posed by data limitations. To confront the problem of interplay, the thesis introduces a spatio-temporal model that integrates spatial and temporal analyses to identify critical geographic “hotspots” suitable for simultaneous interventions across multiple infrastructure systems. Employing a case study in a medium-sized Norwegian city, the research evaluates integrated interventions across water, sewer, and road networks. The resulting “hotspot maps” furnish tactical insights into feasible locations for coordinated multi-infrastructure interventions. These maps enable utilities to engage in joint planning.

In summation, this research bridges gaps in literature and practice, providing actionable insights and tools for decision-makers in urban infrastructure management. It also provides an outlook for future research and suggestions for practitioners.

Working Group Reports

During 2023 the JCUD has carried out a review of all the working groups. As a result, some of the working groups which were no longer active have been closed down or are in the process of a 'rebirth'. We have one brand new working group on Emerging Contaminants, and more new working groups are currently being formed.

To create a streamlined and transparent process of maintaining a vibrant and dynamic set of active working groups, the JCUD has created a 'JCUD working groups good practice' document, which is shown at the end of this section. We have reports from several working groups (below), and the list of active working groups and contacts of leadership for those working groups is shown following the reports. If you are part of a working group and have not been in touch with us, please contact the chair and secretary of JCUD with your information.

Call for new working groups!

People interested in creating a new working group under the JCUD, on topics not covered by existing WGs (see here for the list of existing WGs), are welcome to contact the JCUD to discuss such an initiative (JC Chairman, Dr Manfred Kleidorfer (Manfred.Kleidorfer@uibk.ac.at), copied to JC secretary Dr Alma Schellart (a.schellart@sheffield.ac.uk).

Introducing JCUD's New Working Group: UDRAIN

The UDRAIN Working Group aims to establish the first global network of large research infrastructures focused on urban drainage systems. This initiative addresses the lack of coordination in Europe and worldwide, providing versatile and unique testing ground opportunities in laboratory conditions to improve knowledge, technology, and methods in urban water and drainage management. At the 16th ICUD conference in Delft, on June 11, 2024, UDRAIN celebrated its launch meeting, with the original promoters of the initiative as well as partners that had been among the first responders to the group's call for expressions of interest in participating in the Working Group among the attendees.

In November the first meeting was held with those interested in being part of the core group and the board was defined:

- Chair: Jose Anta – University of A Coruña
- Co-Chair: Kelsey Flanagan – Luleå Technical University
- Secretary: James Shucksmith – University of Sheffield
- Co-Secretary: Marius Møller Rokstad – NTNU - Norwegian University of Science and Technology
- YWP representative – Jakob Benisch - TU Dresden

Mapping RI

An initial survey was conducted to determine interest in participating in the working group and the availability of research resources. Responses were obtained from 30 countries and 63 different institutions around the world. Figure 1 shows a map of respondents. A significant part of the institutions that expressed an interest in UDRAIN, however, currently proceed from an academic background: 83.1% of respondents belong to a research centre or university. Only seven responses came from the private sector.

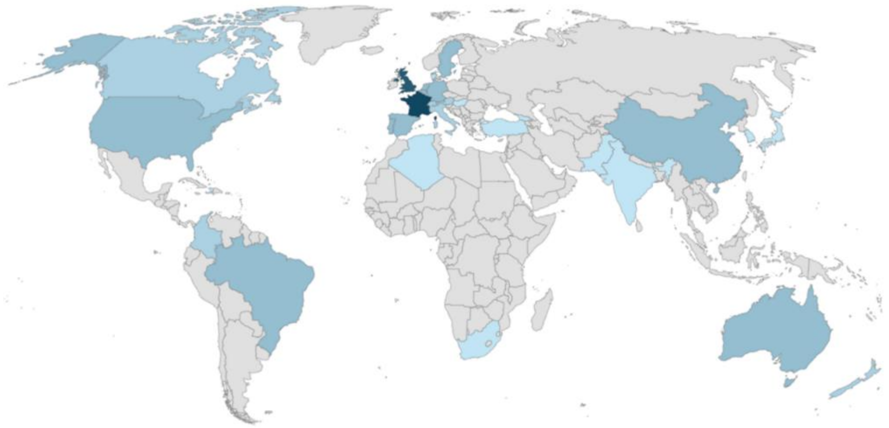


Figure 1. Map of countries of work of survey respondents (colour intensity denotes frequency of responses).

The next step will be to create an Atlas of Research Infrastructures with information provided by those interested in being part of the working group and it will be updated periodically.

International Working Group on Urban Drainage Asset Management (UDAM)

UDAM: what is it? UDAM is an active working group of the Joint Committee on Urban Drainage, whose goal is to give a platform to everyone working on Urban Drainage Asset Management. Formed in 2018, it now gathers >65 members from 16 countries. If you want to participate join us on https://form.jotform.co/udam/join

UDAM members map

In September 2024, we organized the 9th EURO-SAM workshop in Sheffield, UK. The event gathered 25 participants from 12 countries and was a great opportunity to discuss the most advanced applied research in the field of urban drainage asset management. Stay tuned for the next edition: https://udam.home.blog/euro-sam/. Few lessons learnt from the 2024 edition:

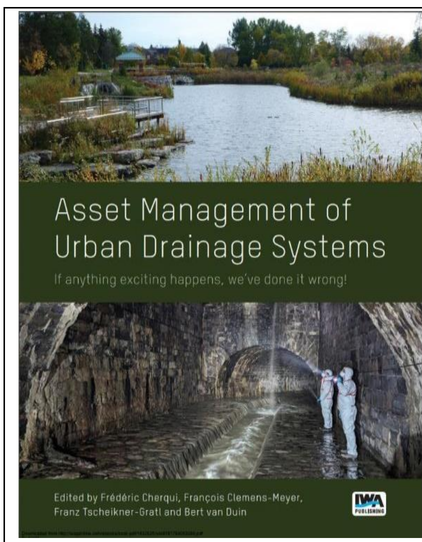
*** The field of automatic sewer defect recognition and condition assessment is very promising: as data availability increases machine learning approaches are getting more and more accurate.

*** Failure and condition modelling, from survival analysis to advanced machine-learning is still a growing field to support rehabilitation strategies. Improvements are being achieved in data management, at defect level, financial level, using hybrid approaches or understanding the causes of failure.

*** Asset management of blue-green infrastructure is a promising field for the next few years. Is it possible (and necessary) to implement real-time asset tracking? How to monitor maintenance needs and get an overview of asset condition and annual investment needs? Many questions raised and surely a very relevant field for future research.

The 9th EURO-SAM workshop in Sheffield, UK

2024 was also the year of the publication of "the book" on Urban Drainage Sewer Asset Management on behalf of the working group. The book editors are Frederic Cherqui, Francois Clemens-Meyer, Franz Tscheikner-Gratl and Bert van Duin. **You can download the book for free here: https://doi.org/10.2166/9781789063059**



UDAM book cover, 2024,

Table of contents

Huge thanks to the 52 authors from nine countries who contributed to the book! That is to say by alphabetical order : Maria do Ceu Almeida, Steve Auger, Mahdi Bahrami, Sylvie Barraud, J.-B. Besnier, Floris Boogaard, Emanuela Bosco, Bert Bosseler, Liam Carson, Frederic Cherqui, Gilles Chuzeville, Francois Clemens-Meyer, Shamsuddin Daulat, Cornelis de Haan, Gersende Fernandes, Fabian Funke, Marcel Goerke, Nathalie Hernandez, M.G. Jaatun, Francine Kelly-Hooper, Karsten Kerres, Manfred Kleidorfer, Ingo Kropp, Jeroen Langeveld, Yves Le Gat, David Lembcke, Mathieu Lepot, R. A. Luimes, Konstantinos Makris, Magnus Moglia, Sheida Moin, Marius Møller Rokstad, Tone Muthanna, Norman Neuman, Martin Oberascher, Aad Oomens, G. E. Oosterom, Bardia Roghani, Frits Rooyackers, Jon Røstum, Lisa Scholten, Irene Sheperboer, Will Shepherd, Joakim Skjelde, Akke Suiker, Franz Tscheikner-Gratl, Rita Ugarelli, Marco van Bijnen, Ferry van der Valk, Martijn van der Valk, Bert Van Duin, Wouter van Riel!

In 2025, we are glad to invite you to join the 10th Leading Edge Conference for Strategic Asset Management (LESAM), to be held in Pafos (Cyprus) from 28th to 30th of April. More information is available here: https://iwacyprus2025.com/.

Also in 2025, we are excited to share information about the 27th European Junior Scientist Workshop on Urban Drainage Asset Management for Grey and Blue-Green Systems, which will be held from October 5–11, 2025, on the beautiful Pico Island, Azores, Portugal. This workshop offers an excellent platform for junior scientists to present their work, engage in discussions, and participate in hands-on sessions and demonstrations of advanced asset management methods. The sessions go beyond passive listening, focusing on collaborative learning and joint problem-solving. Participants will also have the chance to network with other junior scientists, fostering future collaborations and knowledge exchange in an interactive and enriching environment, distinct from traditional conferences. We warmly invite junior scientists from all around the world to apply for participation. More detailed information, including recent flyer, can be found on the UDAM website: https://udam.home.blog/ejsw-udam/

See you soon!

Nicolas Caradot (chair) from KWB Berlin,

Frédéric Cherqui (vice-chair) from INSA Lyon / University of Melbourne

Franz Tscheikner-Gratl (secretary) from NTNU Trondheim,

Nathalie Hernandez (secretary) from STEIN Infrastructure Management GmbH,

International Working Group on Urban Rainfall (IGUR)

IGUR Annual Meeting 2024: The annual meeting of the IGUR in 2024, took place during the ICUD conference in Delft, The Netherlands on 10 June 2024 as partly hybrid event. The next annual meeting is scheduled to be held at the 13th Urban Drainage Modelling Conference (UDM 2025, Innsbruck, 15-19 September 2025.

- IGUR activities

The IGUR currently has three subgroups:

- The IGUR publication subgroup for a publication on ***Rainfall-related Consequences of Climate Change on Applications for the Urban Population***

  A call for contributions has been published, and a structure for this publication preliminarily has been defined. Currently, the process is delayed because the designated publisher is extremely slow to respond. This activity is coordinated by Simon Beecham (University of South Australia).

- State-of-the-Art publication on ***Climate data for the urban drainage community***

  A subgroup headed by Vincent Pons (NTNU Trondheim) and Lauren Cook (EAWAG) has started to focus on the adequate data preparation from climate models in order to have a state-of-the-art document and project support so that further work can concentrate on climate model run consequences. Today, there is no clear guidance on how to use such model results for urban hydrological applications. The sub-group has met during ICUD and has had a further meeting in autumn. This subgroup seems to strive to become a full working group parallel to the IGUR.

- IGUR internal statutes

  A third subgroup is more concerned with the update of the IGUR statutes which were formulated before the year 2000 and need to be modernised. Currently, a new version is under discussion and due to be voted and decided before summer. This subgroup is coordinated by Thomas Einfalt.

  Activities with participation of IGUR members

- OPENSENSE

  On the initiative of Czech Technical University CTU, the OPENSENSE COST action on opportunistic precipitation measurements has started in August 2021 (https://opensenseaction.eu/, chairman: Vojtech Bares). Objectives are to make data from different sources and devices openly available and to maintain a comparable quality standard. The final conference will take place on 25 - 26 June 2025 in Offenbach (Germany) (https://opensenseaction.eu/joint-meetingconference-2025/call-for-abstracts/)

- WMO JET OWR: Radar Best Practices Guide

  The WMO JET OWR (Joint Expert Team on Operational Weather Radar) has produced the radar best practice guide (BPG) and published it in 2024. Details can be found at https://community.wmo.int/en/activity-areas/weather-radar-observations/best-practices-guidance

- The WMO RDP "Paris 2024" (Olympic Games)

There was a specific working group on high resolution nowcasting in particular with use of AI (https://www.umr-cnrm.fr/RDP_Paris2024/?page=private/nowcasting). The main outcome might be the preparation of a new RDP to advance meteorological research on the theme of the "future Weather Forecasting systems at 100m (or finer) resolution for urban areas" at the horizon of 2030.

- Ra2DW:

  This international project focuses on Radar Rainfall Drop size distribution and Wind (https://hmco.enpc.fr/portfolio-archive/ra2dw/) to measure and simulate across wide ranges of spatio-temporal scales of rainfall and atmospheric turbulence to improve the quality of weather radar quantitative precipitation estimates at high space-time resolution and their applicability to urban storm water management. It has been funded through the PRCI (programme for international collaborations) scheme of the French National Research Agency, and the Taiwanese National Science and Technology Council.

- IGUR website. The website is being maintained by Martin Fencl (CTU Prague).

Chairman: Prof. Daniel Schertzer, Hydrology Meteorology and Complexity lab (HM&Co), Ecole Nationale des Ponts et Chaussées | Institut Polytechnique de Paris, 6-8 avenue B. Pascal, 77455 Marne-la-Vallée cedex 02, France, Daniel.Schertzer@enpc.fr, https://hmco.enpc.fr

Secretary: Dr. Thomas Einfalt, hydro & meteo GmbH, Breite Strasse 6-8, D 23552 Lübeck, Germany; e-mail: einfalt@hydrometeo.de. Group's web site: https://igur.org/

International Working Group on Data & Models (IWGDM)

Ico Broekhuizen and João P. Leitão

The group secretary, Roni Penn, decided to continue her career outside academia and thus left the role as secretary. At the working group's meeting during ICUD 2024 (Delft, the Netherlands), Ico Broekhuizen (ico.broekhuizen@ltu.se) from Luleå University of Technology (Sweden) was elected secretary of the IWGDM for the period 2024-2025.

Other topics discussed at the meeting at ICUD included data sharing, interoperability, standards and other related issues; how to engage more people in group activities, and ideas for workshops that could be hosted at the International Conference on Urban Drainage Modelling (September 2025). Minutes from the meeting are available at: https://sites.google.com/view/iwgdm/meetings-and-minutes/delft-icud-10th-june-2024

In September 2025 the International Conference on Urban Drainage Modelling (UDM) will be hosted at the University of Innsbrück, Austria. Abstract submission for the conference was open until 31st of January 2025 as was the submission of proposals for workshops to be held in conjunction with the conference. More info: https://www.uibk.ac.at/en/congress/udm2025/. One activity at the conference will be the presentation of results of a competition about optimizing placement of Nature-Based Solutions.

Several members of the group including the secretary attended the start-up meeting of the new (sub) working group on climate change adaptation organized during ICUD by Vincent Pons, Lauren Cook, and Gersende Fernandes.

The next in-person meeting of the working group will be held during UDM in September 2025. Also at the conference, a vote will be held to select the host of the next UDM in 2028.

International Working Group on Urban Streams

It is expected that the portion of the global population living in the urban environment will reach 70 % by 2050. This rapid urbanization will impact many urban drainages and exacerbate environmental problems. Urban stream in particular will face water pollution and ecologic degradation and this is and will become even more a serious urban problem. However, in different cities, the challenges differ. Despite considerable conservation efforts, many urban streams are still heavily polluted. Improving the water quality, ecologic health, biodiversity and aesthetics of urban streams should be a worldwide priority.

The International Working Group on Urban Streams (IWGUS) aims to promote joint collaborative research and scientific knowledge transfer among the JCUD community. This includes the dissemination of scientific findings and innovative technologies related to urban stream restoration, including urban watershed environmental planning and management, urban runoff control, and LID BMPs. IWGUS is open to all the experts and professionals practicing in urban-stream-related fields. Several distinguished senior professors will be invited and act as advisors, along with many active midcareer experts that will contribute as the main body of this working group. Many young scholars or PhD students will also be recruited as volunteers. The diverse expertise, roles and responsibilities of various individuals within the group is key to contributing to the success and in achieving the goals of the working group.

The activities of IWGUS will include: (1) Organizing one annual meeting in JUCD flagship conferences: ICUD, Novatech, SPN and/or UDM, (2) Hosting a special session in ICUD conference every three years, (3) Organizing workshops and webinars relating to urban streams in different countries (4) Organizing special issues in international journals, and (5) Publishing newsletters of the working group regularly to promote it in different social media, such as LinkedIn, ResearchGate, twitter, IWA connect+, and WeChat.

On June 10, 2024， IWGUS (Urban Streams working group) meeting was held in TU Delft as a section of ICUD 2004. Around 20 participants from China, United States, Germany, Sweden, Japan, Canada, etc, attended the meeting. Prof. Haifeng Jia, the chair of IWGUS, gave a welcome speech first, then all the partici-pants made a self-introduction. In the main section of the meeting, background, aim, structure, and the main activities of IWGUS were presented by Prof. Haifeng Jia. Prof. Peng Huang from University of Hong Kong gave a special presentation on their research works related to urban streams in recent years. Then all participants had discussions on how the make IWGUS more active and powerful, especially Prof. John Chapman from University of Minnesota, Prof. Bjorn Helm from TU Dresden gave many detailed comments on webinars, newsletters, review papers and workshop arrangements.

Some of the WG members organized the 14th International Conference on Environmental and Public Health Issues in Asian MegaMega-cities, from 13th – 15th November 2024 (https://epam.uos.ac.kr/index.php). The EPAM conference is held once a year since 2009 on a rotational basis between Japan, Korea, and P. R. of China. EPAM 2024 is being held in November 13-15th, 2024 in the most beautiful city, Seoul, Korea. This forum will focus mainly on innovative and strategic solutions relating to the current and emerging environmental and public health issues such as, micropollutants, e.g., pharmaceuticals, micro micro-plastics etc., waste recycle/reuse, and particulate matters in Asia.

IWGUS is open to all the experts and professionals practicing in urban-stream-related fields. Several distinguished senior professors will be invited and act as advisors, along with many active mid-career experts that will contribute to the main body of this working group. Many young scholars or PhD students will also be recruited as volunteers. The diverse expertise, roles and responsibilities of various individuals within the group is key to contributing to the success in achieving the goals of the working group. All experts and young professionals are welcome to JOIN and CONTRIBUTE to IWGUS Please contact: Haifeng JIA (jhf@tsinghua.edu.cn) and Hyunook KIM (h_kim@uos.ac.kr) to get involved.

International Working Group on Emerging Contaminants (IWGEC)

Lena Mutzner, Kefeng Zhang, Helene Österlund

The International Working Group on Emerging Contaminants (IWGEC) was established in 2024 with Co-Chairs Kefeng Zhang (UNSW, Australia), Lena Mutzner (Eawag, Switzerland) and Secretary Helene Österlund (Luleå University of Technology, Sweden). During ICUD Delft 2024, the first working group meeting was held to promote the working group to new members and identify topics of interest to the community. The IWGEC now has 41 members.

In November 2024, we hosted a Webinar on "**Sources and Treatment of Emerging Contaminants in Blue-Green Systems"** with **Speakers** Dr Alexandra Müller (Luleå University of Technology, Sweden), who presented on *Sources of Emerging Contaminants*, Dr Timothy Rodgers (University of British Columbia, Canada), who discussed *on Treatment of Emerging Contaminants in BGs & Future Direction in area from a north American perspective* and Dr Kefeng Zhang (UNSW Sydney, Australia), who shared insights on *Enhancing Stormwater Reuse: A Comprehensive Review of Organic Micropollutant Treatment Performance and Risk Assessment*. The webinar generated significant interest, with active discussions among participants and valuable suggestions for future webinar topics.

After the webinar, a working group meeting was held, where the main discussions surrounded water quality data and strategies for data sharing. A questionnaire highlighted the participants' strong motivation to share their data and the need for tools to facilitate effective data sharing. In 2025, planned activities include a webinar on "hands-on lab and field monitoring", a working group meeting at the UDM conference and work towards standardized water quality data. Everyone is welcome to join the working group. To sign up, please click the link (https://forms.office.com/r/3Sy9BdtCqA)

Or contact Lena Mutzner (lena.mutzner@eawag.ch) and Kefeng Zhang (Kefeng.zhang@unsw.edu.au)

International Working Group on Blue-Green Infrastructure

Lessons learned from conferences you attended this past year.

ICUD

Blue-Green Infrastructures for a wide range of purposes are being tested, implemented, tried and maintained globally. We see substantial consideration of these solutions in much of the research for climate adaptation, flood mitigation, water quality control and uses beyond urban drainage, where water still plays a central role. There are also parallel efforts to demonstrate the power of quantitative approaches (models to support implementation of BGI), technological solutions and, more actively now, efforts to improve their operation and maintenance (real-time monitoring and control, digitalization, fault detection and condition assessment). We, however, risk reinventing the wheel as we see similar approaches towards "reinventing the wheel" around BGIs, perhaps in the absence of proper guidance documents in practice and the need for localized knowledge and support tools, warranting the need for better knowledge exchange worldwide. On a humorous side, also experienced in the rebirth of the iBGI group was still the debate around 'preferred terminology', to which there is no consensus. But Blue-Green Infrastructures (BGI), SuDS (Sustainable Drainage Systems) and Nature-based solutions (NBS) appear to be the three common candidates.

ASABE

The 2024 Annual International Meeting was held in July in Anaheim, CA, USA, uniting the core scientific and practitioner community in North America's agricultural, food, and biological engineering fields. BGI was at the forefront of the conference discussions. Contributions in the area of the iBGI's working group highlighted the necessity for further research to enhance design tools and to update BGI hydroclimatic calculations to account for climate change variations. This effort aims to mitigate the risk of future performance failures. There is a strong call for innovative, holistic methodologies for designing long-term BGIs that incorporate current and realistic design variables. Furthermore, more field studies and modeling initiatives supported by high-quality data—specifically, sub-hourly intervals for event-based modeling and hourly data for present and future hydrologic projections—are essential for computing key variables such as the WQ design storm event and IDF curves.

- New research or articles in your field.

Some recent papers that have been published by various members of the group:

- Chen, J., Bach, P.M., Nice, K.A. and Leitão, J.P., 2024. Investigating the efficacy of a fast urban climate model for spatial planning of green and blue spaces for heat mitigation. *Science of the Total Environment*, *955*, p.176925.
- Zhang, J., Prodanovic, V., O'Carroll, D.M., Zheng, Z. and Zhang, K., 2024. Real time control of stormwater biofilters improves the removal of organic chemicals. *Water Research*, *266*, p.122411.
- Lippera, M.C., Khurelbaatar, G., Despot, D., Kouyi, G.L., Rizzo, A. and Friesen, J., 2025. Spatial-economic scenarios to increase resilience to urban flooding. *Water Research X*, *26*, p.100284.
- Allende-Prieto, C., Roces-García, J. and Sañudo-Fontaneda, L.Á., 2024. The High-Resolution Calibration of the Topographic Wetness Index Using PAZ Satellite Radar Data to Determine the Optimal Positions for the Placement of Smart Sustainable Drainage Systems (SuDS) in Urban Environments. *Sustainability*, *16*(2), p.598.

- Lacroix, S., Kuller, M., Gougeon, G., Petrucci, J., Lemieux-Chalifour, F., Rioux, A., Dagenais, D. and Bichai, F., 2024. Can we stop reinventing the wheel in blue-green infrastructure planning? Using value-focused thinking to enable transferability of a multicriteria planning support system. *Landscape and Urban Planning*, *252*, p.105188.

Also…

- The first SuDS Design Manual for Atlantic Climates was published (in Spanish), freely available to download online
- Currently the journal Land Use Policy is featuring a special issue on "Social aspects of green stormwater infrastructure in a resilient urban environment" – editors Bill Hunt, Juan Pablo Rodriguez Sanchez and Luis Sañudo Fontaneda among others [Link] – deadline for papers is 30th June 2025

- Updates from working groups.

The rebirth of the iBGI working group happened in June 2024 at the ICUD Conference with a joint meeting of all interested parties, there have been delays in getting the group started due to organizational and personal reasons of several members of the management committee, but the group is underway to kick-start things in March 2025. Following things will happen in the coming weeks:

- The website: www.iBGI.group will be online and operational
- Our communications will be through a common Discord channel, all members who have registered their interest will be invited to join the Discord channel and we can post a link for this in the next JCUD Newsletter
- We will announce our first open meeting where people can join and suggest activities that the group can support
- Face-to-face group meetup at the UDM Conference in Innsbruck (anyone who is around)
- Some activity between members, who are part of the CO-UDLabs Project (probably will be mentioned as part of the JCUD newsletter)

- Upcoming events, webinars, conferences.

- The UDM conference series will take place in Innsbruck next September. This event is organized by the International Working Group on Data and Models, which falls under the IWA/IAHR Joint Committee on Urban Drainage (JCUD). It offers a valuable opportunity to convene in person and share insights regarding modelling within the framework of BGI techniques. The conference will also address some of the most critical research areas related to the future of our WG.

- The Spanish SUDS network will gather next April in Santander at the University of Cantabria to celebrate their biannual meeting, showcasing the experiences and lessons learned over the years in the design and implementation of SUDS in the country, also considering innovative international experiences. The Spanish network works closely with the iBGI WG, which positive experience wants to be also explored with other international BGI networks across the world during 2025, gathering and sharing the expertise and promoting knowledge transfer using the iBGI group as a main vehicle and common ground internationally.

Real-time Control Working Group

The Real-time Control (RTC) Working group is excited to announce a new year of activities focused on promoting research and implementation of active control in urban drainage systems. Last year, the working group convened at the 2024 International Conference on Urban Drainage in Delft for a brainstorming workshop focused on applications of real-time control to new problems in urban watershed management.

In the coming year, the working group plans to hold a ‘bring-your-own-data’ workshop at the 2025 Urban Drainage Modelling conference in Innsbruck. This workshop will focus on developing standardized datasets and test cases for RTC studies. The anticipated outcome is a repository of urban drainage system models, control scenarios, and measured data from around the world that will facilitate better comparative studies of RTC strategies. The working group will also be holding virtual meetings throughout the year. If you are interested in getting involved, please contact Matthew Bartos (mdbartos@utexas.edu) or Luke Shi (baiqian.shi@monash.edu). Regarding the funds available for our working group, we discussed the issue, and we are interested in using them to sponsor travel costs to a JCUD-affiliated conference for a presenter working on RTC research from a lower-income country. We are happy to review abstracts to decide on how to disburse the award.

New sub working group on climate change adaptation

We would like to share the news about our new sub working group on climate change. There is a new sub working group on Climate Change Adaptation, led by Vincent Pons (NTNU and LTU), LaurenCook (Eawag) and Gersende Fernandes (INRAE). The goal of the group is to provide the urban drainage community with the knowledge, tools, and collaborative environment to address climate change in their work. We welcome all inputs and new members (contact Vincent at vincent.pons@ntnu.no).

JCUD working groups: how they work & best practices

The IWA/IAHR Joint Committee of Urban Drainage (JCUD) aims for a vibrant and dynamic set of active working groups. The JCUD appreciates that each working group will have their own ways of working suitable to their scope and aims, however, from years of experience the JCUD has gathered examples of good practice. General good practice that the JCUD would expect all their working groups to follow is described below.

Vision and mission. Each working group has its own purpose and goals, and so the activities they take on will vary. Typical activities include: international workshops, webinars, and conferences, joint publications such as conference papers, white papers or books.

Chair and secretary. Each working group shall appoint a chair and a secretary for a 3-year period. After the 3 year period, a new chair and a new secretary should be sought. For continuity, the secretary may be appointed as the new chair, however everybody can apply. We expect the chair and secretary to work in different countries. Working groups may also wish to appoint a co-chair and a co-secretary, which may help with attendance of, and visibility in conferences. New appointments should follow a democratic process, with consideration of past chair/secretary geographies and gender.

Reporting. Each working group is to provide a brief summary of their activities and any key developments in their field to the yearly JCUD newsletter, as well as advertise their activities on IWAconnect+ and through the urban drainage mailing list.

Annual meetings. It is expected that each working group has at least one annual meeting (suggested to be held at our flagship conferences: ICUD, Novatech, SPN and/or UDM). The group should make every effort to attend our main ICUD conference every three years, either to host a workshop, a special session or hold a meeting.

Duration. The working groups may be short-lived, come together for a specific aim and then dissolve, or, the working groups may be long standing. However, JCUD will go through a working group evaluation process every 3 years, whereby inactive working groups will be closed down. Inactivity might be defined as those WGs that do not regularly attend our flagship conferences, those that do not contribute to the newsletter, those that do not organise workshops or other events (such as webinars). JCUD can assist with advertisement and organisation of activities to ‘regenerate’/’rejuvenate’ working groups.

New working groups. To become a new working group, the chair and secretary (or advocate/champion) shall provide a half-page summary of their scope and aim to the JCUD, as well as a 100 words short description of their scope. This scope will be considered by the JCUD in their next meeting (which occurs roughly every 3 to 4 months). Once approved, the group will be listed on the JCUD’s website working groups landing page (https://jcud.org/89-2/). The JCUD landing page can then link through to a working group's own platform (which could be e.g. a website, mailing list or social media), but we do not require each working group to have their own platform.

News from Related Organizations and Projects

Co-UDlabs INFRAIA project set to end after four years of transnational collaboration on Urban Drainage

Co-UDlabs INFRAIA project set to end after four years of transnational collaboration on Urban Drainage. Co-UDlabs (Building Collaborative Urban Drainage research labs communities) is a Horizon 2020 project in the Research Infrastructures (INFRAIA) framework, a funding mechanism designed specifically to establish research networks and communities at large-scale infrastructures. For the past four years, Co-UDlabs has brought together 17 unique large- and full-scale urban drainage experimental facilities, hosted by seven organisations in Europe: University of Coruña (Spain), University of Sheffield (UK), INSA Lyon (France), Aalborg University (Denmark), Deltares (Netherlands), EAWAG (Switzerland) and IKT (Germany). Co-UDlabs ends on April 30, 2025, following four intense years of ground-breaking research collaboration and initiatives and the successful provision of 31 transnational accesses, which involved over 220 research group members from 26 different countries (11 of which from outside the EU).

In its final weeks, Co-UDlabs has focused on enhancing its contribution to innovation and cutting-edge research in urban drainage and water management. Emphasizing a stronger science-to-policy link, the project ensures that its four-year efforts translate into impactful results and benefits for urban communities worldwide. Co-UDlabs organised a final event on March 17-18, 2025 in Brussels – hosted by the Fundación Galicia-Europa. Several specialised associations and European organisations alongside representatives from industries and utilities joined the consortium to exchange on Co-UDlabs results. Co-UDlabs has also worked on the development of various Policy Briefs, EU-backed policy documents that link research progress and results with actual policy recommendations and guidelines for European, national, and local policy-makers and regulators. Co-UDlabs aims to keep on working in close collaboration with its partners and the European Commission to strengthen its science-to-policy contribution, while also using Co-UDlabs' legacy to expand the urban drainage community and create new and effective opportunities for cross-border research cooperation.

Over the past few months, moreover, Co-UDlabs has helped establish the new Joint Committee on Urban Drainage (JCUD) Working Group on Large Research Infrastructure in Urban Drainage (UDRAIN). UDRAIN aims to develop an improved cooperation roadmap for urban drainage organisations, research centres, and partners worldwide. The group is already working on an updated Atlas of relevant urban drainage large Research Infrastructures and will work with JCUD to create more synergies across Working Groups. Co-UDlabs' legacy stands also in the training and education events and material it has developed throughout its lifetime (available on its webpage and YouTube channel), the deliverables and technical contributions that will be publicly accessible on its Zenodo hub, as well as in the publications that have built on its joint research activities. Co-UDlabs is immensely grateful to its partners for the very valuable work they have put in the project, as well as to all the associates, collaborators, stakeholders, and supporters that have accompanied the consortium during four years of intense and rewarding work. The project will keep on consolidating this network and disseminate its results, hoping to contribute to an even stronger, more innovative, and more inclusive sustainable urban drainage community, in Europe and elsewhere.

Useful links
Co-UDlabs Website: https://co-udlabs.eu/ ; UDRAIN WG: https://jcud.org/89-2/
Co-UDlabs Transnational Access figures and data: https://co-udlabs.eu/access/ta-call/
Co-UDlabs Zenodo community: https://zenodo.org/communities/coudlabs/
Co-UDlabs YouTube channel: https://www.youtube.com/@coudlabs3583

DRIZZLE – Competence Centre for Storm water

DRIZZLE is a competence centre for stormwater that started in 2017. Within DRIZZLE, companies, public actors, and researchers, under the leadership of Professor Maria Viklander at Lulea University of Technology, Sweden, conduct excellent and needs-driven research and development of innovative stormwater solutions. Solutions that can better treat water from pollutants and manage more intense rainfall caused by climate change. The research consists of everything from laboratory experiments to field research. Since its start, DRIZZLE has e.g., conducted a large number of studies on organic pollutants such as PFAS, microplastics and pesticides in stormwater. Other research studies include multifunctional blue/green infrastructure that considers technical and environmental aspects (water quality and quantity/flooding), as well as socio-economic aspects. The studies have been published in highly ranked scientific journals and have also received media attention.

The picture below shows a stormwater treatment facility next to the high-traffic E4 at the Sundsvallsbron high bridge.

The facility consists of several parts, including so-called stormwater biofilters that have been built with different types of design in order to enable research on which type of biofilter works best. Biofilter is a plant-covered infiltration surface where the stormwater infiltrates and is treated by the plants and the soil. As can be seen on the picture, one of the investigated biofilters in Sundsvall was built without vegetation to be able to evaluate the importance of the plants in the treatment process. DRIZZLE research shows that the two investigated types of biofilters had a good ability to remove microplastics. The vegetated biofilter showed better removal efficiency compared to the non-vegetated filter. This is good news according to Professor Maria Viklander, as vegetated biofilters are generally considered to be more aesthetically pleasing. They also require less maintenance than biofilters without plants, as they suffer from a lesser degree of clogging. For more information on DRIZZLE – centre for stormwater management: www.ltu.se/DRIZZLE

Future Water Institute, University of Cape Town, South Africa

As part of our ongoing efforts in urban water resilience, we are excited to share updates on two key projects: the DANIDA-funded Pathways to Water Resilient South African Cities (PaWS) and the Water Research Commission Managed Aquifer Recharge Blue-Green Infrastructure project. The PaWS project aims to identify opportunities for and generate knowledge on the physical and institutional integration of decentralized nature-based solutions into the urban water cycle, supporting the transition toward water resilience in South African cities. The experimental work is addressed through two interrelated work packages: WP1 focuses on physical experimentation with and evaluation of Water Sensitive Design (WSD) options at different urban scales, while WP2 explores governance processes that enable these transitions.

DANIDA-funded Pathways to Water Resilient South African Cities (PaWS)

Continued Water Experiments Monitoring

Renovation efforts for the pond retrofit included the construction of a concrete measuring weir at the outlet, repairs to two inlets, and the installation of riprap litter check weirs in the infiltration swale. Maintenance activities also involved reinforcing the sandbag wall, general litter clearing, and weeding. These efforts were undertaken by the Future Water team in collaboration with local labourers. The water experiment (water quality and quantity experiments) is continuously monitored through onsite observations, and student-led PhD research exploring the use of IoT for managing groundwater resources on the Cape Flats. The installation of outlet weir (with permission from the City of Cape Town) allows for citizen science opportunities in monitoring flow, as residents contribute real-time data by capturing images of water overflowing the weir and sharing them with the project team.

Social Activities and City Engagements

Community engagement has been central to the project, facilitating interactions between residents and city officials. An introductory meeting was held to discuss pond management under the PaWS project. Ongoing activities included seed broadcasting in partnership with the City of Cape Town’s biodiversity department, which is a training opportunity for the local pond committee on indigenous plant species. A Citizen Placemaking Toolkit was developed, as part of a MSc Landscape Architecture students’ output, incorporating landscape elements designed to guide citizens in placemaking initiatives within blue-green infrastructure. Ongoing surveys with local residents continue to explore blue-green infrastructure as a functional urban space.

Further engagement includes ongoing pond cleaning and planting activities for the pond’s knowledge garden. The team also conducted site visits to other locations around Cape Town where sustainable urban drainage systems (SuDS) are being implemented, including housing developments and a MSc project is using stormwater modelling and monitoring to determine the SuDS effectiveness.

City engagements remain ongoing, focusing on the maintenance of pond vegetation and fostering skill development for river wardens - workshops were conducted in collaboration with Nature Connect and the City of Cape Town, providing training as part of the River Wardens skills development program.

Communications and Presentations

The project team has actively disseminated findings and engaged in knowledge-sharing through various international and local platforms. Presentations have been delivered at a University of Sheffield seminar on “the role of communities of practice in water-sensitive city transitions in South Africa”; an Imperial College workshop on “Building collaborations for the Equitable Co-production of Nature Based Solutions for Sustainable, Equitable and Resilient water futures”, a City of Cape Town session on “the role of integrated spatial planning and policy in a water sensitive city transition”; and at the Climatopolis meeting in Sao Paulo, Brazil, on “Climate change – the challenge of global cooperation for urban adaptation”. The team continues this knowledge sharing with our Community of Practice webinars and newsletter circulation.

Water Research Commission Managed Aquifer Recharge Blue-Green Infrastructure project.

As part of the Water Research Commission Managed Aquifer Recharge & Blue-Green Infrastructure project, the final research report and guidelines for the Implementation of Managed Aquifer Recharge (MAR) in combination with Blue-Green Infrastructure (BGI) at Local Settlement Level were submitted, marking the conclusion of this three-year project. The guidelines aim to make use of blue-green infrastructures (BGI) within urban areas with the intention of enhancing aquifer recharge processes as well as increasing the potential of stormwater harvesting via managed aquifer recharge (MAR), and to provide a wider range of water-related, amenity and liveability services. This research involved a collaborative effort between key stakeholders namely: City officials, technical specialists and local residents.

Stay informed about our project updates and publications via our website and social media platforms (website, Instagram, twitter, Facebook and LinkedIn): https://futurewater.uct.ac.za | @futurewateruct | @futurewaterinstituteuct





Green Autonomy Ambassadors; Green Bay Balwin Site; Ezemvelo Browns Farm, Phillipi; PaWS Clean-up & gardening; River Wardens Workshop

Codes for the analysis of concentration/mixing and solute transport data

We have released two pieces of code over the last year to support the analysis of concentration/mixing/solute transport data, such as those collected during dye tracing of sewer networks. The first code is TCPAT2 , which provides a toolkit for analysing longitudinal temporal concentration data with various preprocessing options and implementations of both the Advection-Dispersion Equation and Aggregated Dead Zone models.

https://orda.shef.ac.uk/articles/software/Temporal_Concentration_Profile_Analysis_Tool_2/26739427

The second code, ADE_FDM, implements a numerical solution to the steady 2D depth-averaged Advection-Dispersion Equation with transverse varying depth and velocity in a straight uniform channel.

https://orda.shef.ac.uk/articles/software/A_2D_Depth-averaged_Advection_Dispersion_Equation_Finite_Difference_Model_Code_for_Transverse_Solute_Mixing/28295204

These codes are made available with the hopes of increasing the feasibility of robust repeatable analysis of concentration data and are particularly suitable for use in optimisation approaches.

GreenStorm (2024 – 2026) - Design and Deployment of Stormwater Nature-Based Solutions (NBSsw) for a Resilient and Livable City

The GreenStorm project (https://arceau-idf.fr/en/projects/greenstorm), which was started in January 2024 as part of the Driving Urban Transition partnership, targets nature-based solutions designed for the management of urban stormwaters (NBSsw).

The project brings together 14 partners from 5 European countries: Denmark, France, Greece, Italy and Sweden. It is also a platform for dialogue between scientists and urban partitioners.

The objective of GreenStorm is to increase the resilience of NBSsw to future climate extremes across Europe, but also to enhance their benefits for citizens. A special focus is put on the resilience of urban greening in a context where water resource availability, heat and drought can become a challenge for the survival of vegetation.

In 2024, the work focused on the construction of datasets for present and future climate modeling; the monitoring and modelling of the hydrologic, thermal and ecophysiologic response of NBSsw for a range of facilities; and the implementation of innovative and community co-designed NBSsw within the living lab in Copenhagen. A climate extreme scenario was defined and simulated in the SenseCity climate chamber (https://sense-city.ifsttar.fr/), and the representativity of such controlled climate experiments is currently analysed.

Over the next two years, improved NBSsw structures, but also pathways for their acceptable implementation in urban areas will be developed based on co-creation workshops with all relevant stakeholders - professionals and citizens. GreenStorm aims to foster a larger scale implementation of NBSsw, in a community engaged approach and with an attention to justice and equity. This will be demonstrated in a real case study in Copenhagen. Feedback from Paris, Athens, Genoa and Östersund, will allow identifying drivers for stormwater NBS upscaling for a diversity of urban and institutional contexts. Potential for widespread implementation of NBSsw at large urban catchment scale will be analysed in the 5 partner countries and the hydrologic/hydraulic and thermal benefits will be modelled.

Facilitating early adoption of Blue-Green Infrastructure for urban water system adaptation in Eastern Africa (2023 – 2025)

By Erik Nilsson, Johanna Sorensen, Seith Mugume, Umaru Garba Wali and Marie Leonce Murebwayire

The main aim of this project was to establish new research collaborations on Blue-Green Infrastructure (BGI) between two ARUA universities – Makerere University (MU) and University of Rwanda (UR) – and one U21 university – Lund University (LU). The project which was funded by Universitas21 and ARUA commenced in September 2023 and will end in April 2025. (https://portal.research.lu.se/en/projects/facilitating-early-adoption-of-blue-green-infrastructure-for-urba-2)

In addition, the project was aimed at developing strategies for implementation of BGI in the cities of these universities – Kampala, Kigali, and Lund – which are all experiencing strong population growth, intensified runoff through property development, and increased frequency of high-intensity rainfall due to climate change. To adapt to these changes, urban water managers require new strategies to reduce urban flood risk. Since the 1970s, BGI has been suggested as a sustainable way to manage storm water to reduce flood risk and mitigate urban heat islands. While solutions like green roofs, rainwater harvesting systems, and bio-swales have been developed, large-scale implementation has been slow.

This project addressed the slow uptake of BGIs by conducting a comparative study of barriers to implementation of BGI in the three case cities. This was achieved through a co-creation process based on literature reviews, stakeholder workshops, expert interviews, field visits, and compilation of previous flood protection measures, as well as urban flood modelling for selected areas in Kampala and Kigali. The project team also built on previous cases, expertise in the research network, and diversity of urban conditions in the case study cities to develop recommendations for implementation of BGI in the case study cities. Key project outcomes include:

- Workshops, field visits, stakeholder meetings and expert interviews undertaken in Kigali (4-9th March 2024), Kampala (11 - 16th March 2024) and Lund (3 - 8th June 2024)
- Barriers and Opportunities for implementation of BGI identified in each of the three cities and preliminary results from the project presented during the 2024 ICUD conference in Delft
- Coupled one-dimensional–two-dimensional (1D–2D) modelling was applied to assess the effectiveness of BGI options (rainwater harvesting systems, infiltration trenches, bio retention cells, and detention ponds) for two case study urban drainage systems located in Kampala.
- Investigated the performance of an adapted grey-blue-green urban drainage system considering scenarios of structural failures and climate change induced extreme rainfall.
- Through collaborations established in the project, the following MSc Theses undertaken by Lund University students have been organised to support the development of the project and have supervised by the team members: Modelling the effect of sediment and solid waste deposition on urban flooding in Kampala by Hjalmmar Olsson *(Manuscript accepted for publication in WST);* Blue-Green Infrastructure in Kigali - Priorities and Strategies for increased implementation; Evaluation of Constructed Wetlands in Kigali - A field study on the effects of water quality and Urban Flood Risk Modelling in Kigali
- At Makerere University, the project has led to an ongoing collaboration with Lund University, focusing on collection of high resolution rainfall and water level measurements in the Lubigi catchment and improved 2D flooding modelling in rapidly urbanizing cities

Recent papers published by various members involved in the research exchange collaboration

- Mugume, S. N., Murebwayire, M., Wali, U. G., Nilsson, E., & Sörensen, J. (2024). Synthesis of barriers to implementation of Blue-Green Infrastructure for urban stormwater – case studies in Uganda, Rwanda & Sweden. 16th IAHR/IWA International Conference on Urban Drainage, 1–4. (https://program-icud2024.iwcconferences.com/event/4709/)
- Mugume, S.N., Kibibi, H., Sörensen, J., Butler, D (2024) Can Blue Green Infrastructure Enhance Resilience of Urban Drainage Systems? Water Science and Technology Journal Vol 89 (4) pp. 915-944 https://doi.org/10.2166/wst.2024.032
- Mugume, S. N., & Nakyanzi, L. P. 2024. Evaluation of effectiveness of Blue-Green Infrastructure for reduction of pluvial flooding under climate change and internal system failure conditions. Blue-Green Systems, 6(2), 264–292. https://doi.org/10.2166/bgs.2024.030

OPUR6: 6th phase of the Ile-de-France observatory of urban hydrology (2024 – 2028)

The OPUR program (https://www.leesu.fr/opur/), a long-term French research initiative in urban hydrology, continues its journey with the launch of its 6th phase (OPUR6). Since its creation in 1994, OPUR has relied on an extensive observation infrastructure and a tight partnership between researchers and operational stakeholders in the water and sanitation sector in the Paris metropolitan area to develop knowledge on water and contaminant flows in urban environments.

The 6th phase, running from 2024 to 2028, is organized around 2 research themes:
1) Urban water and health challenges: examining the role of the city and its sanitation systems in exceeding planetary boundaries, with a focus on plastic pollution, biocides, and harmful chemicals like PFAS, while continuing to investigate the effectiveness of water treatment infrastructures as well as the quality of their discharges.

2) Decentralized water management: Examining the benefits of on-site stormwater managements systems at every scale—from individual infrastructures to the entire city, under current and future climate and with an increasing focus on vegetation — while exploring the potential of alternative water sources in a changing climate.

Within theme 1, several theses have been defended on micropollutants occurrence in wastewater and their potential toxic effects (Fidji Sandre, 2023), as well as their treatment with emerging oxidants such as performic acid and advanced oxidation (Christelle Nabintu Kajoka, December 2023). Two PhD theses were also dedicated to the occurrence of microplastics in wastewater (Trang Nguyen, 2023) and in SUDS and runoff (Max Beaurepaire, 2023). Pierre Martinache defended his PhD thesis in January 2025, on the topic of biocides occurrence in indoor air and in greywater, and studied the behavior of consumers and their perception of risks associated with these micropollutants.

Within theme 2, in 2024, the hydrologic performance of a range of nature-based runoff source control measures was monitored and modelled as part of the PhD theses of Ahmeda Ouedraoggo (defended in June 2024), Hayat Zime and Tinghao Huang (to be defended in 2025). Andrea Oudot finished in November 2024 her PhD on the microbial communities present in SUDS soils and their potential for micropollutant biodegradation. The postdoctoral work of J.M. Tunqui allowed further development of the SUDS module added in the TEB hydro-climatic model, in order to assess city scale performance of SUDS deployment strategies, while the long-term evolution of SUDS behavior was assessed within the postdoc of S. Sandoval.

Climate change could overwhelm our sewers

By Myra Rodriquez, Postdoctoral Researcher, Earth Observation Science, Plymouth Marine Laboratory (https://theconversation.com/climate-change-could-overwhelm-our-sewers-heres-how-green-infrastructure-could-help-244460)

Aside from hotter summers and melting glaciers, climate change is transforming how, when and where rain falls. This challenges much of the world's sewer systems, especially with the added strains of population growth and increased urbanisation.

Victorian-era sewage systems were simply not designed for the climate we are heading towards. Thishas major implications for public health, water quality and urban living. The increasing population means sewers are sometimes overwhelmed without any rainfall at all. Then, add climate change to the mix. Heavier downpours are becoming more common, which spells trouble for sewer systems that simply cannot cope with increasing volumes of water. One type of system, called a combined sewer system – the predominant type in the UK and Europe – is especially vulnerable.

These systems carry wastewater from homes and storm water from streets in the same pipes. When it rains heavily, the pipes can become overwhelmed, resulting in permitted discharges of untreated wastewater from combined sewer overflows (CSOs). This untreated overflow discharges into the ocean, rivers and streams, pollutes the environment, threatens wildlife and harms public health. And this problem is only expected to get worse. Results from my doctoral research show climate change could triple sewage overflow discharge into waterways by 2099.

But there is a ray of hope: "green infrastructure", which mimics nature by retaining or slowing down the flow of rainwater into the environment, allowing it to evaporate or soak away. Examples include green roofs, permeable pavements and rain gardens which already exist in many UK cities and towns, including London and Sheffield.

Instead of relying solely on traditional pipes and tanks to remove rainwater, green infrastructure solutions manage rain where it falls. Green roofs retain rainwater and help increase evaporation. Permeable pavements allow water to seep through into the ground instead of running off into sewers. Bio retention cells or "soakaways" are landscaped areas like rain gardens that collect and filter storm water before releasing it slowly into the ground or drainage systems. Wetlands and rainwater harvesting tanks also reduce the total amount of water going into sewers or delay the entrance of water into them.

My team's research explores how effective these solutions could be and highlights how best to plan green infrastructure improvements and deal with increasing rainfall. Our study simulated how sewer systems would perform with and without green infrastructure under future rainfall patterns, using climate models. We found that green infrastructure improves resilience to climate change but has limits: while reducing the severity of combined sewer overflows, it could not fully offset the effects of climate change even with maximum deployment. However, different combinations of green infrastructure show promise.

Our study highlights that these solutions need to be carefully designed to suit the setting and context. If incorrectly located, they can increase the rainwater discharge duration following a storm, because they release the retained water into the system while the sewer is still overwhelmed, and can thus extend the period of sewer discharge.

The effectiveness of green infrastructure varies across different parts of the sewer system. Solutions need to be tailored to specific locations and conditions.

Measurements are also critical, because what gets measured, gets managed. The magnitude of the problem can only be accurately understood by measuring both the sewer overflow discharge and what is going on with our sewer systems. Otherwise, we are trying to solve a problem that we do not have parameters for.

Good computer models play a crucial role in helping researchers and urban planners understand how our system works. Models offer a cost-effective way to test different interventions, but they need to be representative of reality. An inaccurate model can lead to big differences in how effective these solutions seem, affecting decisions on how to manage storm water. Future rainfall patterns are critical too. Sewers' performance depends heavily on the characteristics of rainfall, which are influenced by climate change. More intense and longer storms might overwhelm even the most well-designed green roofs or permeable pavements.

How to build resilient sewers

To address the increasing challenges facing the UK's sewer system, cities and towns must invest in green infrastructure to reduce runoff and improve water quality. This also provides other benefits –such as keeping urban areas cool, and providing green spaces for communities. Traditional infrastructure needs an upgrade to modernise existing pipes and treatment facilities to handle higher volumes of water. This not only means bigger pipes but smarter systems. Local plans should depend on the particular needs of each neighbourhood. Solutions can be adapted accordingly, while also considering the catchment as a whole.

More accurate computer models need to be developed and adopted by infrastructure managers, researchers and consultancies. With trusted and robust models, we can prepare better and prioritise resources more effectively. Future climate scenarios are uncertain, so plans must be flexible and aim for a safe-to-fail approach. Urban planners, policymakers and communities need to work together to install well-designed solutions. The challenges posed by climate change are vast, but not insurmountable. By embracing innovation and planning carefully, cities and their sewers can adapt to the new realities of our changing world.

Open Data Sets for Urban Drainage

This section provides a list of sources from which open data for urban drainage can be accessed.

Fluorescent dye traces in four UK sewer networks
Description: This dataset describes experimental fluorescent dye traces (temporal concentration profiles) recorded in manholes within combined sewer networks located in four different cities across the United Kingdom. It accompanies the journal article entitled "Quantifying mixing in sewer networks for source localisation" (Sonnenwald et al., submitted). This dataset was collected by Professor Ian Guymer and colleagues. This archive was funded by EPSRC grant EP/P012027/1 and the UK Health Security Agency. **Ref**: Guymer, I., J. Shuttleworth, O. Bailey, M. Williams, J. Frankland, B. Rhead, O. Mark, M. Wade, and F. Sonnenwald. 2022. Fluorescent dye traces in four UK sewer networks. V1. Sheffield, UK: The Univ. of Sheffield Online Research Data. https://doi.org/10.15131/shef.data.20480241.
The Bellinge data set: open data and models for community-wide urban drainage systems research.
Description: A comprehensive data set from a combined sewer system in a 1.7 km2 suburban area is presented. Up to 10 years of observations (2010–2020) from level sensors, a flow meter, position and power sensors, rain gauges, X- and C-band weather radars, and a weather station; distributed hydrodynamic models; and CCTV pipe network data are included. This will enable independent testing and replication of results from future scientific developments within urban hydrology and urban drainage system research. **Ref:** Pedersen, A. N., Pedersen, J. W., Vigueras-Rodriguez, A., Brink-Kjær, A., Borup, M., and Mikkelsen, P. S. (2021). The Bellinge data set: open data and models for community-wide urban drainage systems research. Earth System Science Data, 13, p. 4779-4798. https://doi.org/10.5194/essd-13-4779-2021
A decade of monitoring micropollutants in urban wet-weather flows
Description: A paper and dataset published this year showed results from micropollutants data in wet-weather discharges from different papers resulting in data from 77 sites from around the world **Ref:** Mutzner, L., Furrer, V., Castebrunet, H., Dittmer, U., Fuchs, S., Gernjak, W., Gromaire, M.C., Matzinger, A., Steen Mikkelsen, P., Selbig, W.R., Vezzaro, L. 2022 A decade of monitoring micropollutants in urban wet-weather flows: What did we learn? Water Research, 223, 118968. https://doi.org/10.1016/j.watres.2022.118968 (Open Access), Data and code shared in a repository: https://doi.org/10.5281/zenodo.6808401
Urban Drainage dataset from The Brussels Capital Region (Belgium)
Description: FLOWBRU, the monitoring network of the Brussels' river and wastewater network, is managed by HYDRIA (https://hydria.be/fr/flowbru-fr/).FLOWBRU monitors rainfall (16 stations), levels and/or flows in the sewer network and storm basins (>50 stations), levels and/or flows of natural water courses (>20 stations), amongst which 5 also measure the surface water quality.All data can be consulted and downloaded freely via the website (French and Dutch): Flowbru.be
Open access water related datasets, including of dye traces undertaken in manholes

Description: open access water related datasets, including of dye traces undertaken in manholes, https://doi.org/10.15131/shef.data.13373039 and sewer network . They are all available on the University of Sheffield's Online Research Data site, ORDA, https://orda.shef.ac.uk/.
FloodCitiSense project
Description: The European FloodCitiSense project (Funding: JPI Urban Europe – Smart Urban Futures) explored the potential of citizen observations to monitor urban rainfall and pluvial flooding via the use of low-cost sensors and app reporting. Website link: http://www.floodcitisense.eu/
Event Duration Monitoring (EDM) for CSOs in England and Wales
Description: In England and Wales, an openly available database of annual summaries of Event Duration Monitoring (EDM) for most CSOs in England and Wales was made accessible by the Environment Agency: https://ckan.publishing.service.gov.uk/dataset/event-duration-monitoring-storm-overflows-annual-returns. This data has been used by NGOs such as the River Trust to reveal the spatial extent and size of CSO emissions: https://theriverstrust.org/sewage-map. In 2021 around 372,000 spill events with a combined duration of 2,667,452 hours were recorded.
Urban Water Observatory (UWO)
Description: The "Urban Water Observatory" (UWO) is a research project by the Department of Urban Water Management (SWW) of Eawag that collects data on precipitation and discharge processes in the sewage system. The project is supported by the municipality of Fehraltorf, CH. The data is analyzed to improve water protection and optimize municipal storm- and wastewater management. The project will provide an open dataset from January 1st 2019 - December 31st 2021 that includes rainfall data from 13 locations, 6 flow observations, 12 water level measurements, 5 storage tank data, 20 thermal-hydraulic measurements and the wireless sensor network performance (https://uwo-opendata.eawag.ch/). The UWO - Open dataset also contains geographical and SCADA data from the municipality of Fehraltorf and the WWTP of Fehraltorf-Russikon. The data and necessary metadata are expected to be available in the first quarter of 2023 on the Eawag Research Data Institutional Collection (https://opendata.eawag.ch/) and will be made public under a license for scientific and educational purposes.

Upcoming Events

A list of upcoming major IWA conferences is included below to assist with scheduling events to avoid conflicts (gray highlights indicate the JCUD flagship conferences). More events are updated continuously at https://iwa-network.org/all-events/

Conference	Date	Place	Website
10th Leading Edge Conference for Strategic Asset Management (LESAM)	April 28-30, 2025	Pafos, Cyprus	https://iwacyprus2025.com/
41st IAHR Congress	June 22-27, 2025	Singapore	https://www.iahr.org/index/detail/201
13th Urban Drainage Modelling Conference	September 15-19, 2025	Innsbruck, Austria	https://www.udm2025.org
11th Sewer processes and networks (SPN)	May 20-22, 2026	Trondheim, Norway	https://iwa-network.org/events/11th-international-conference-on-sewer-processes-and-networks/
12th Novatech International Conference on Urban Water (NOVATECH)	June 29- July 2, 2026	Lyon, France	To be announced
17th International Conference on Urban Drainage	June 2027	Ningbo, China	https://icud2027.cn/

News from IWA HQ

The **IWA Water and Development Congress & Exhibition** is scheduled to take place in **Bangkok, Thailand**, from **8-12 December 2025**. This event will focus on "Water, sanitation, and innovation – pathways to progress and a resilient future.

Key Details:

- **Dates:** 8-12 December 2025
- **Location:** Bangkok, Thailand
- **Theme:** Water, sanitation, and innovation – pathways to progress and a resilient future

Program Highlights:

The Congress will feature five thematic tracks:

1. **Ensure Safe Drinking Water:** Innovative approaches for treatment and supply.
2. **Advancing Wastewater Treatment and Sanitation Services:** Sustainable solutions for all.
3. **Smart Water Management:** Integrated approaches for effective water management and planning.
4. **Enhancing Utility Management and Operations for Sustainable Growth.**
5. **Strengthening Governance and Financial Systems for Long-Term Development.**

Why Attend?

- **Major Development-Focused Event:** Unite with experts to tackle pressing water and sanitation challenges, driving action toward the 2030 SDG targets.
- **Spotlight on Asia:** Delve into the Asian water sector's unique opportunities and engage with top regional stakeholders.
- **Cutting-Edge Insights:** Access global research, policy advancements, and practical solutions for water and sanitation.
- **Networking Opportunities:** Strengthen connections and form new partnerships with professionals worldwide.
- **Discover Bangkok:** Immerse yourself in Bangkok's vibrant culture and explore Thailand's natural and urban attractions.

For more information and updates, visit the official website: Water and Development Congress

News from IWA Publishing

Journal Articles
Optimizing urban flood management: enhancing urban drainage system efficiency under extreme rainfall events
Socio-economic optimum of urban drainage expansion for climate change adaptation

Books
Asset Management of Urban Drainage Systems: If anything exciting happens, we've done it wrong!
Decentralisation and Empowerment: The Odisha Model for Urban Development

Open Special Issues
Shaping Tomorrow's Cities In Times of Water and Climatic Extremes
Smart Water Supply Systems: Instrumentation, Metering, Controls and Sensors and Computational Intelligence

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News from IWA Learn

The place for learning & professional development in the water sector

Professionals in the water sector require continuous development to be able to stay abreast with the changing environment circumstances. No matter in which stage of your career, IWA provides you with guidance and opportunities to build up the competences required to succeed. This includes a set of tools on how to develop your career, as well as opportunity of professional updating, learning, training and networking.

To learn more, visit the IWA Learn platform: https://iwa-network.org/iwa-learn/

News from IAHR

#iahrLabel

IAHR Label for Water Training and Education, a UNESCO-IHP Flagship Initiative

The IAHR Label for Water Training and Education label is awarded by IAHR and UNESCO-IHP's flagship initiative to institutions promoting and implementing excellence in training and education programmes for competent and skillful professionals in the water sector.

This unique labelling system is conferred to specific programs, as a recognition of their dedication to providing education aligned with good practice and the requirements of water professionals. It aims to enhance the international acceptance of the excellence inherent in these educational and training initiatives.

Apply now to obtain the IAHR Label: https://www.iahr.org/index/detail/1318

#iahrWorldCongress

[Discover what's waiting for you at the 41st IAHR World Congress in Singapore from 22 to 27 June 2025]

The IAHR World Congress is the major event for professionals in the field of hydraulic engineering, water resources, and environmental management

The congress offers researchers, engineers, and experts a platform to present their work, discuss innovations, and collaborate on global water-related challenges!

In this edition, a record of over 1500 abstracts have been received for the 41st edition of the IAHR World Congress! For more info about the Congress: https://2025.iahr.org/

#iahrStrategicPlan

IAHR releases a new Strategic Plan 2024-2025

At IAHR, we're committed to harnessing collective expertise to tackle the world's most pressing water challenges. IAHR is the only global water association focused on the entire water cycle, from mountains to coasts and that's why we aim to be the global hub of knowledge and innovation for holistic water engineering. With the launch of our Strategic Plan 2024-2027, we're setting a bold vision to become the global hub of knowledge and innovation for holistic water engineering.

New Thematic Priority Areas:
- Climate Change Adaptation and Mitigation
- Energy Transition, Food Security, and Nature
- Resilience Against Water Hazards and Disasters
- Digital Transformation

Join Us: IAHR's strength lies in the energy and expertise of our members worldwide. We invite you to be part of this transformative journey. Together, let's shape a future where water is harnessed sustainably for the benefit of all.

More info: About Membership

Working Group Contacts

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Write to us!

The Newsletter is an opportunity to share information: points of view; policy developments; research; activities and events; worldwide. If you have an interesting project, comments, or are planning a conference or workshop, send it to us, including contact point for more information.

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