https://doi.org/10.71573/q5mqx342

© Authors. This work is licensed under a Creative Commons Attribution 4.0 International License

13th Urban Drainage Modelling Conference Editors' Notes

Manfred Kleidorfer [1, *] https://orcid.org/0000-0002-4001-1711, *Robert Sitzenfrei* [1] https://orcid.org/0000-0003-1093-6040, *& Wolfgang Rauch*[1] https://orcid.org/0000-0002-6462-2832

[1]*University Innsbruck, Innsbruck, Austria*
**Corresponding author email: manfred.kleidorfer@uibk.ac.at*

Abstract

The 13th Urban Drainage Modelling Conference (UDM 2025) was held from 15–19 September 2025 at the University of Innsbruck in Innsbruck (Austria), continuing a long-standing tradition of international exchange on advances in urban drainage modelling. The conference, organised in collaboration with the International Working Group on Data and Models (IWGDM) under the Joint Committee on Urban Drainage (JCUD), received 244 submissions from 52 countries and featured 141 oral and 88 poster presentations. Abstracts were reviewed by at least two experts to ensure scientific quality and coherence, and all accepted contributions are published in these Proceedings, with authors able to opt into open-access publication. Finally these proceedings contain 101 submissions.

UDM 2025 showcased developments in hydrodynamic and water-quality modelling, real-time control, blue–green infrastructure, digital twins, and the growing role of artificial intelligence. The programme included three keynote lectures, seven technical workshops, and—for the first time—a "Combat on retrofitting drainage networks with nature-based solutions" (NBS Retrofit Combat). Integrated and cross-sectoral approaches linking urban drainage with heat mitigation, drought resilience, and microclimate analysis were prominent throughout.

These Proceedings summarise the scientific contributions and emerging trends discussed at UDM 2025 and document the continued evolution of the field toward data-centric modelling, nature-based approaches, and integrated urban resilience.

Introduction

Since its establishment in 1986, the Urban Drainage Modelling (UDM) Conference has served as the leading international forum for scientific and technical exchange on the modelling, analysis, and management of urban drainage systems. Over nearly four decades, UDM has accompanied—and often shaped—the evolution of the field from early hydrodynamic modelling to today's integrated digital infrastructures, data-driven approaches, real-time control, and climate-resilient planning. The 13th Urban Drainage Modelling Conference (UDM 2025), held from 15–19 September 2025 at the University of Innsbruck, Austria, continues this tradition of scientific excellence and community building.

UDM 2025 was co-organised with the International Working Group on Data and Models (IWGDM) under the Joint Committee on Urban Drainage (JCUD), a joint body of the International Water Association (IWA) and the International Association for Hydro-Environment Engineering and Research (IAHR). The activities of this working group—ranging from benchmarking initiatives to advances in methodological standards and data–model integration—substantially contributed to the scientific depth and coherence of the conference and the contributions assembled in these Proceedings.

The conference received 244 submissions from 52 countries, resulting in 141 accepted oral presentations and 88 poster presentations, and hosted 285 participants, including a substantial

proportion of early-career researchers. All accepted abstracts underwent scientific review coordinated by the Scientific Committee. The resulting contributions were included in the Proceedings distributed to all registered participants. Authors were able to opt for open-access publication; opted-in contributions are collected in the openly accessible section of this volume. In addition, a Special Issue in the journal Water Science and Technology is currently in preparation, featuring extended versions of selected contributions of particular scientific quality and relevance.

The scientific programme comprised seven pre-conference workshops, 24 thematic sessions, a poster reception, and concluding plenary reflections. Key themes included real-time control, uncertainty analysis, blue–green infrastructure, water-quality modelling, digital twins, and applications of artificial intelligence in urban drainage.

Keynote Speakers

UDM 2025 hosted three distinguished keynote speakers whose contributions framed the central themes of resilience, scientific integrity, and data-driven transformation in urban drainage.

Prof. David Butler (University of Exeter, United Kingdom) discussed strategies to strengthen the resilience of urban water systems under the pressures of climate change, urbanisation and systemic uncertainty.

Prof. Ana Deletic (Queensland University of Technology, Australia) offered a critical and humorous reflection on the evolving landscape of scholarly publishing, examining issues of quality, openness and digital transformation.

Dr. Riccardo Taormina (Delft University of Technology, Netherlands) highlighted recent advances in artificial intelligence for forecasting, design and operational support of drainage networks and addressed the importance of transparency and responsible use of AI-based tools.

Awards

Several distinguished awards were presented to acknowledge outstanding scientific contributions:

IWGDM Best Student Paper Award:

Ying Song (Czech Technical University) presented an innovative approach to event-based urban runoff prediction using raw commercial microwave link (CML) attenuation data (Song et al., 2025). Instead of converting CML signals into quantitative precipitation estimates, the study directly used the unprocessed attenuation information within a machine-learning framework to predict runoff dynamics. This work demonstrates the potential of raw CML data as a valuable, data-driven source for urban drainage modelling and short-term runoff forecasting.

Best Poster Awards:

1st Place: Helieh Abasi (Abasi et al., 2025): Cost-efficiency of integrating network separation and source control solutions to reduce combined sewer overflows.
2nd Place: Ekaterina Andrusenko (Andrusenko et al., 2025): Balancing Climate Adaptation and Urban Water Demand in Dutch Cities
3rd Place: Mohammad Mahdi Noroozi (Noroozi et al., 2025): Experimental modelling of a stormwater gully pot: Hydrodynamic evaluation

NBS Retrofit Combat

A notable innovation at UDM 2025 was the introduction of the Combat of Retrofitting Urban Drainage Networks with Nature-Based Solutions (NBS) (Oberascher et al., 2025), a hands-on, challenge-based competition included in the conference programme for the first time. The competition invited teams

to propose creative, technically grounded NBS retrofit strategies for existing drainage systems and was evaluated on innovation, hydraulic performance, feasibility, co-benefits and clarity of communication.

The inaugural awards were presented to:
1st Place: Graz Drainage Gladiators, Technical University Graz, Austria
2nd Place: UNIPV – University of Pavia, Italy
3rd Place: RainRangers, Delft University of Technology, Netherlands

Key Outcomes and Emerging Trends

Several overarching developments emerged from UDM 2025. Artificial intelligence is gaining increasing prominence in urban drainage modelling. Although often perceived as a new direction, methods such as machine learning, surrogate modelling and pattern recognition have been present in the community for decades. The rapid progress in modern AI—deep learning, physics-informed models and scalable computing—now accelerates the broader digital transformation of infrastructure systems, supporting advances in forecasting, anomaly detection, asset management, model reduction and integrated decision support.

Blue–green infrastructure has become a fully recognised component of urban drainage practice, and substantial progress was shown in modelling infiltration systems, detention measures, green roofs, vegetated channels and decentralised treatment features. The conference highlighted increasing efforts to capture long-term water balances, local hydrological processes and future climate stressors.

Urban drainage models are also becoming more deeply integrated with other aspects of urban resilience. Several contributions linked drainage modelling with urban heat mitigation, drought resilience, groundwater interactions, microclimate and land-surface processes, demonstrating the move toward multi-benefit and cross-sectoral assessments. Together, these developments reflect a maturing field embracing digitalisation, nature-based solutions and integrated climate-resilience concepts.

The next UDM Conference will take place in 2028 at the University of Exeter, United Kingdom, continuing the long tradition of hosting the conference at leading international research institutions.

Acknowledgements

The Editors express their gratitude to the Scientific Committee and all abstract reviewers, whose efforts ensured a coherent and scientifically robust programme. We thank the organising team at the University of Innsbruck, student assistants, and our conference partners and sponsors, in particular Innsbrucker Kommunalbetriebe and Institut für technisch-wissenschaftliche Hydrologie GmbH ITWH, for their essential support. We also acknowledge the University and State Library and its Open Journal Systems infrastructure for supporting the publication of these Proceedings.

References

Abasi, H., Duchesne, S., Pelletier, G., & Rokhzadi, A. (2025). Cost-efficiency of integrating network separation and source control solutions to reduce combined sewer overflows. 13th Urban Drainage Modelling Conference, Innsbruck.

Andrusenko, E., Werf, J. A. v. d., Hoek, J. P. v. d., & Langeveld, J. (2025). Balancing Climate Adaptation and Urban Water Demand in Dutch Cities. 13th Urban Drainage Modelling Conference Innsbruck, Austria.

Noroozi, M. M., Sokolova, E., Jonsson, I., Ann-Margret Strömvall, & Bondelind, M. (2025). Experimental modelling of a stormwater gully pot: Hydrodynamic evaluation. 13th Urban Drainage Modelling Conference Innsbruck, Austria.

Oberascher, M., Funke, F., Satish, R., Rajabi, M., Dastgir, A., Minaei, A., Back, Y., Chen, S., Hauser, M., Hajibabaei, M., Ngoc, C. H. T., Leitao, J. P., Rauch, W., Kleidorfer, M., & Sitzenfrei, R. (2025). Combat of Retrofitting Urban Drainage Networks with Nature-Based Solutions. 13th Urban Drainage Modelling Conference, Innsbruck.

Song, Y., Fencl, M., & Bares, V. (2025). Benefits of using raw commercial microwave links data on urban runoff prediction. 13th Urban Drainage Modelling Conference, Innsbruck.