Co-UDlabs
COLLABORATIVE URBAN DRAINAGE RESEARCH LABS COMMUNITIES

Final
Media Press Kit

Foreword

Urban Drainage Systems (UDS) are critical infrastructures that manage wastewater and stormwater from various sources and contribute crucially to public health and environmental protection. However, cities worldwide face significant challenges with UDS: aging infrastructure, increased pollution released to aquatic media, heightened flood risks due to urbanization and climate change, among many others.

The Co-UDlabs project began working four years ago to integrate innovation and research activities in the field of urban drainage through a network of seven Research Infrastructures offering free transnational access (TA) to more than 200 users involved in 31 multidisciplinary projects and experimental campaigns. Co-UDlabs has provided high-quality laboratory and fields facilities, human resources, and improved data-sharing platforms to users, while implementing a series of key joint research activities for the sector and developing intense networking and training activities. Through this collaborative effort, our network has supported the urban drainage research community, water infrastructure operators, and regulators and local administrations in addressing the social, environmental, and economic sustainability challenges that are increasingly affecting the way UDS are designed, made and regulated.

In addition to the significant progress made in this short period, we believe that many results are yet to come, as research timelines typically do not coincide with funding periods. The project's comprehensive approach includes testing new sensing techniques, asset management methodologies, and hydraulic and water quality processes that were tested, developed, and innovated in our research infrastructures.

Looking ahead, Co-UDlabs aims to establish a pan-European network of research facilities dedicated to urban drainage systems, fostering collaboration, knowledge-sharing, training and innovation, all the while ensuring that Europe remains at the forefront of urban drainage research and technological development. By continuing to support multidisciplinary research and providing access to state-of-the-art facilities, Co-UDlabs has been contributing to the creation of sustainable resilient, and efficient urban drainage systems for the future.

Dr. José Anta Álvarez,
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Universidade da Coruña, Spain

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Co-UDlabs

CONSORTIUM	9 partners
	7 countries
DURATION	4 years
START-END DATE	01.05.2021
	30.04.2025
BUDGET	5 M€

The project in a nutshell

Co-UDlabs 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.

Co-UDlabs (Building Collaborative Urban Drainage research labs communities) aims to integrate research and innovation activities in the field of **Urban Drainage Systems** (UDS) to address pressing **public health, flood risks and environmental challenges.**

The project provides a **transnational multidisciplinary collaborative research framework** for developing, testing and implementing innovative projects in the **urban drainage sector**. By accessing top-class research infrastructures offered by Co-UDlabs project partners, stakeholders, academic researchers and innovators in the field come together, share ideas and co-produce new applications and projects. The result is the establishment of a new collaborative **European Urban Drainage innovation community.**

A collaborative EU-funded project

The Co-UDlabs consortium is coordinated by the University of A Coruña (Spain) and is implemented by 9 partners from 7 European countries.

It brings together partners that have been selected and integrated based on their specific know-how, experience and track record in the **urban drainage water sector**.

The project involves **4 Universities** (University of A Coruña, The University of Sheffield, INSA Lyon and Aalborg University) with world-class urban water research groups, combined with **3 leading national research institutes** (Deltares, EAWAG, and IKT), **a non-profit organization** (GRAIE) and **a SME** (Euronovia). Among them, **7 partners** offer access to **17 research facilities.**
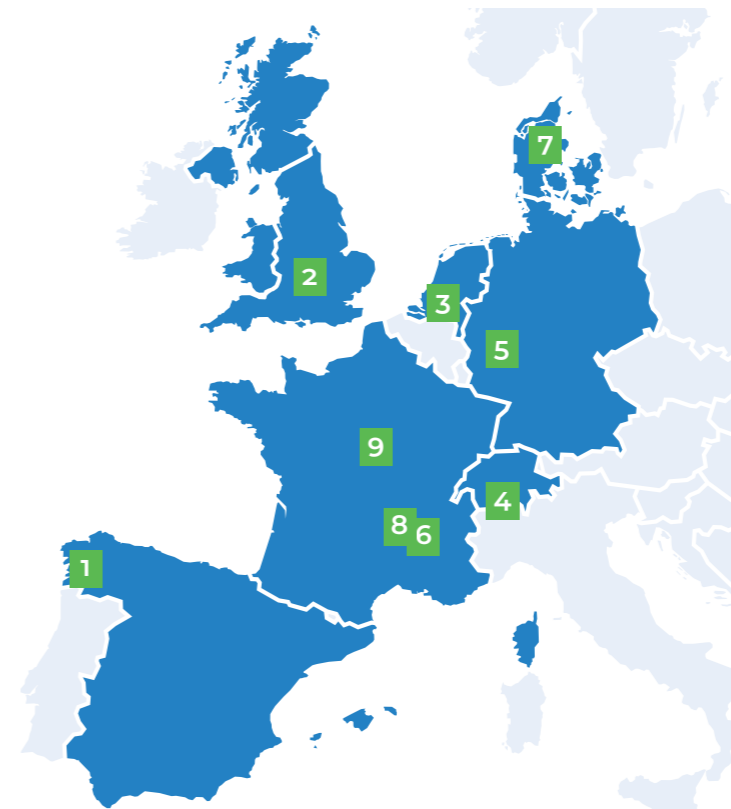
1 UNIVERSIDADE DA CORUÑA
→ 1:1 Street model (STREET)
→ Scientific platform for urban runoff tests (BLOCK)
→ Bens WWTP flume facility (BENS FLUME)

2 University of Sheffield
→ Above/Below Ground Urban Drainage Scale Model (A/B FLUME)
→ Temperature controlled Annular Flume (ANNULAR)
→ Full Scale Buried Cell Flume (BURIED INFRASTRUCTURE)
→ Real Time Control Testing Facility (RTC RIG)

3 Deltares
→ Alpha loop (A-LOOP)
→ Beta loop (B-LOOP)

4 eawag aquatic research
→ The Urban Water Observatory - Digital Lab (UWO)
→ Experimental Hall–recirculating flume (HALL)

5 IKT
→ IKT Large Test Facility (IKT LTF)
→ IKT Hydraulic Test Stand (IKT TEST)

6 INSA
→ Green ROOF experimental Facility (GROOF)
→ Django Reinhardt detention and settling basin (OTHU-DRB)
→ OTHU SuDS research facilities (OTHU SuDS)

7 AALBORG UNIVERSITY
→ Frejlev research station (FREJLEV)

8 graie

9 euronovia

Work plan presentation

WP1

>> Sectorial Integration and Sustainability Strategy
to develop recommendations and a roadmap for a more rapid transition to smart and sustainable urban drainage systems, thus contributing to the long-term sustainability and impact of the Co-UDlabs project.

WP2

>> Harmonization and capacity building
to exchange best practices and know-how for the organization and consolidation of harmonized methodologies, procedures and data from the different research facilities of the consortium, and to integrate the Co-UDlabs data in the European Open Science Cloud.

WP3

>> Training activities
to strengthen the collaboration between the Co-UDlabs partners and enhance the transfer of knowledge to the whole urban drainage community.

NETWORKING ACTIVITIES

WP4

>> Communication, Dissemination and Exploitation of the results
to increase the impact of Co-UDlabs research for targeted end-users across industry, water utilities, policy makers, academia and the wider public.

WP5

>> Management of TA
to organize the procedures and rules for the transnational access of external user groups to the 17 large research facilities offered in Co-UDlabs.

WP6

>> Smart sensing and monitoring in urban drainage systems
to foster a paradigm shift in UDS management: transitioning from current inefficient approaches towards a digitized, informed, shared, evidence-based decision process based on truly smart monitoring.

JOINT RESEARCH ACTIVITIES

WP7

>> Evaluation of assets deterioration in urban drainage systems
to understand and find a consensus on the quality and quantity of urban asset defect and condition data necessary to ensure that sewer network renewal/renovation and repair operations can be objectively selected.

WP8

>> Improving resilience and sustainability in urban drainage solutions
to understand the hydraulic and pollutant retention performance of emerging urban drainage infrastructure to develop strategies and tools to increase their sustainability and resilience.

WP9

>> Transnational access provision
to allow research teams from academy, industry and other urban drainage stakeholders to implement their research projects in the advanced Co-UDlabs urban drainage facilities.

TRANSNATIONAL ACCESS

Transnational Access

Co-UDlabs brings together 17 unique large and full-scale urban drainage experimental facilities, hosted by 7 organisations in Europe.

The project offers the R&D community, water infrastructure operators and their supply chain high quality laboratory and field facilities, human resources, high level training opportunities and improved data sharing platforms in order to meet major **Urban Drainage** societal, environmental, and economic sustainability challenges.

Transnational access is designed for research across **7 fields of expertise**: Urban flooding, Runoff pollution, In-sewer process, Performance of urban assets, SuDS solutions, Assets deterioration and Digital water solutions.
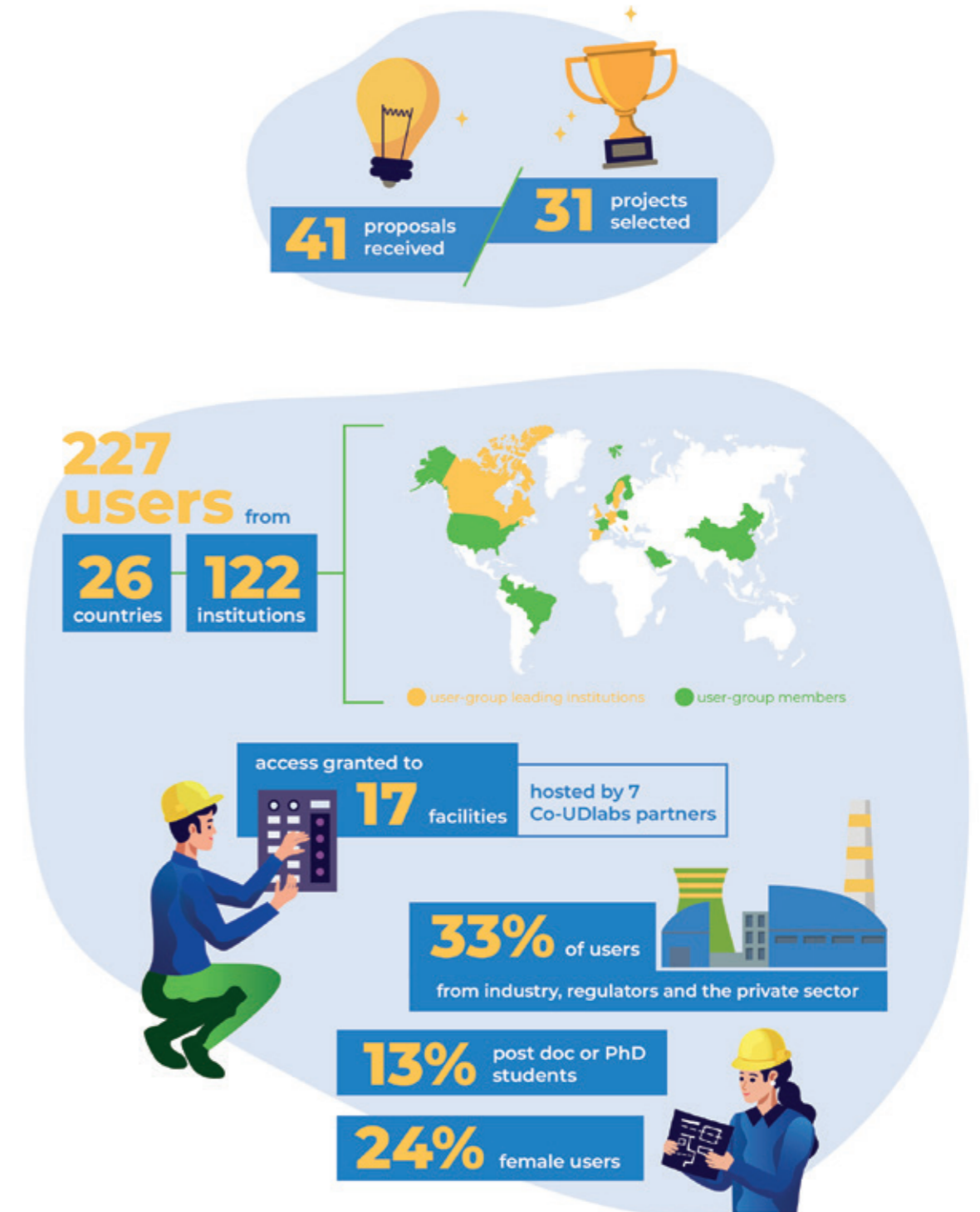
Co-UDlabs starts
May 2021

1st Transnational Access Call
October 2021 – January 2022
(13 proposals selected)

2nd Transnational Access Call
July 2023 – October 2023
(16 proposals selected)

3rd Transnational Access Call
December 2023 – January 2024
(2 proposals selected)

Co-UDlabs ends
April 2025

Check the testimonials from Co-UDlabs TA users!

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Transnational Access
Key figures

41 proposals received / **31** projects selected

227 users from **26** countries – **122** institutions

- user-group leading institutions
- user-group members

access granted to **17** facilities hosted by **7** Co-UDlabs partners

33% of users from industry, regulators and the private sector
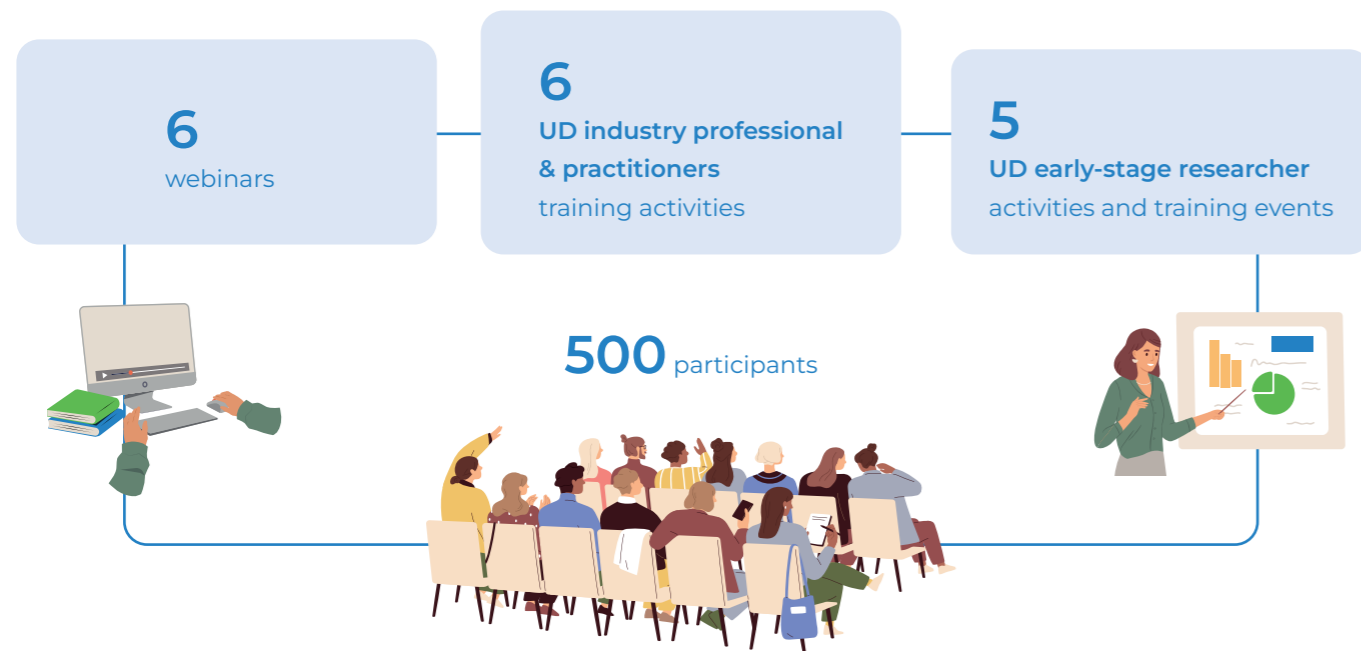
13% post doc or PhD students

24% female users

6

Events organised by the project

Co-UDlabs organized a series of successful training and education events throughout its implementation over the past four years.

All materials are available in open access
on the Co-UDlabs website, on our Zenodo community and our Youtube channel.

6	**6**	**5**
webinars	UD industry professional & practitioners training activities	UD early-stage researcher activities and training events

500 participants

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Final InfoDay

📅 March 18, 2025

📍 Brussels – hosted by the Fundación Galicia-Europa

Several specialised associations and European organisations alongside representatives from industries and utilities join the consortium to exchange on Co-UDlabs results.

AGENDA

09:30-10:00 Reception of participants

10:00-10:20 Welcome and institutional opening (REA, UDC, Fundación Galicia-Europa)

10:20-10:40 Introduction: four years of Co-UDlabs

10:40-11:40 Round Table: Co-UDlabs and translating science into policy

12:00-12:30 Co-UDlabs' legacy towards an international UD community

12:30-13:30 Networking corner

Scientific Publications

Co-UDlabs' legacy stands also in the publications that have built on its joint research activities.

All **scientific publications** and project reports (deliverables) are included in the Co-Udlabs Zenodo hub.

European stakeholders' visions and needs for stormwater in future urban drainage systems,
>> Urban Water Journal, 2023

Flow rate influence on sediment depth estimation in sewers using temperature sensors,
>> Water Science & Technology, 2024

Towards urban drainage sediment accumulation monitoring using temperature sensors,
>> Environmental Science Water Research & Technology, 2023

Concepts and evolution of urban hydrology,
>> Nature Reviews Earth & Environment, 2024

Sets of infiltration models for water infiltration in sustainable urban,
>> Journal of Hydrology, 2023

Combining a daily temperature pattern analysis and a heat-pulse system to estimate sediment depths in sewer systems,
>> Environmental Science Water Research & Technology, 2024

Towards non-contact pollution monitoring in sewers with hyperspectral imaging,
>> Environmental Science Water Research & Technology, 2024

Large-scale clogging experiments assessing the hydraulic performance of porous asphalt during their service life,
>> Blue-Green Systems, 2025

Low-cost monitoring systems for urban water management: Lessons from the field,
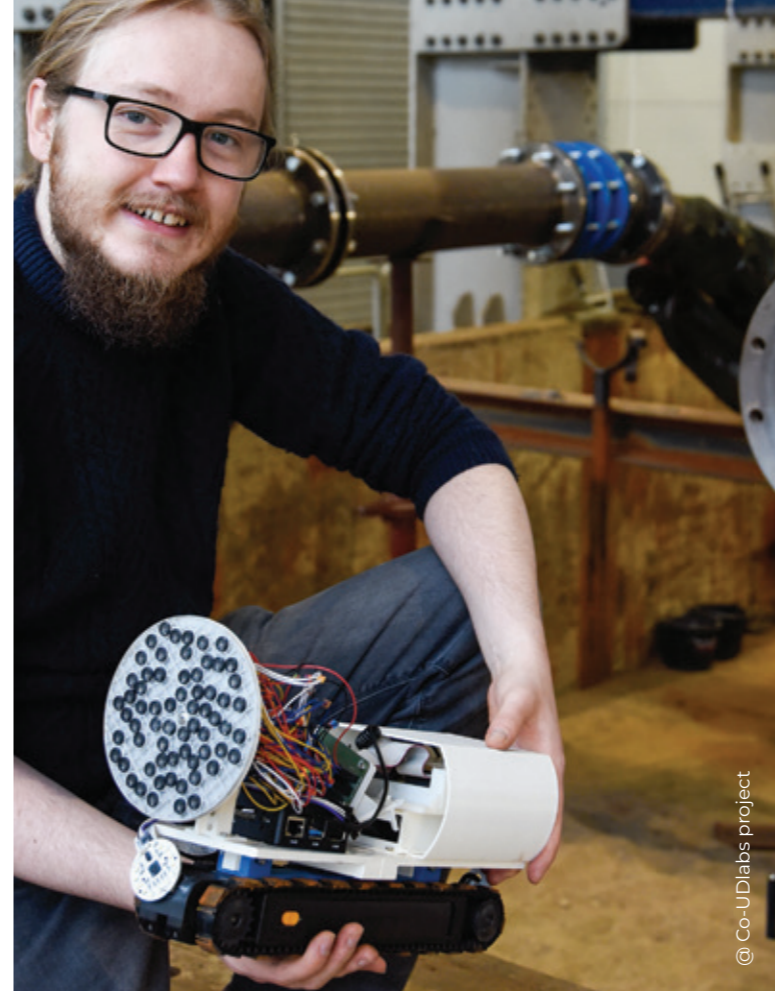>> Water Research X, 2024

Understanding sediment wash-off in road drainage systems under intense rainfall and high sediment masses: Insights from a large-scale modeling facility,
>> Science of the Total Environment, 2025

Measuring heat transfer processes in gully pots for real-time estimation of accumulated sediment depths,
>> Environmental Science Water Research & Technology, 2024

Success
stories

Read [all success stories](#) of the Co-UDlabs project!

@ Co-UDlabs project

>> The Urban Drainage Metrology Toolbox (UDMT)

The Urban Drainage Metrology Toolbox is a free web app developed within Co-UDlabs aiming to facilitate the application of best practices and methods in monitoring urban drainage systems.

UDMT is free to use either online or to download, without any registration. In addition, the code for the app has been made available if users wish to adapt it for their own use or to integrate it into existing systems. The main purpose of the tool is to help disseminate improved practice in metrology: researchers and operators need to be aware of how to work more seriously and rationally with metrology, and the UDMT is a good teaching demo and incentive to do better.

[Access to the UDMT](#)

>> Deep-learning based framework for the automated detection of in-pipe defects in closed-circuit television (CCTV) sewer surveys

The framework developed within Co-UDlabs utilizes the Ultralytics YOLO v8 model for image processing and defect detection. By eliminating the need for manual feature extraction, this approach simplifies the identification of defects that are challenging to extract features from, such as those found in sewer pipes.

The source code (including sample images and written software support) is publicly available in open access on GitHub. It has been developed to a standard to encourage others, especially non-specialists in small companies and utilities, to try and investigate whether a more simplified defect classification scheme can provide the knowledge needed to enhance the management of buried sewer assets.

[Access to the CCTV application GitGub repository](#)

>> Investigating plastic transport in urban environments

Experimental research was developed in Co-UDlabs facilities (CITEEC and Deltares) to increase our understanding of plastic transport in urban environments, focusing on two key aspects: the mobilization of litter on impervious surfaces during rainfall events and the trapping efficiency of gully pots. By analysing the relationships between rainfall intensity, street runoff and litter movement, we established generalized thresholds for when and how plastic litter is mobilized (Karlsruhe Institute of Technology, Imperial College, Deltares, UDC). In parallel, we quantified the efficiency of gully pots in trapping macroplastics during rainfall events (UDC, Deltares).

These investigations provide initial critical insights into the mechanisms of plastic transport in urban environments, from the streets to the drainage systems. The findings will contribute to better urban drainage design, improved pollution management, and the development of strategies to mitigate plastic leakage into water systems during extreme rain events.

>> Assessment of inspection tools for sewer rising mains

The AIR project, part of Co-UDlabs TA programme, assessed inspection tools for pumped wastewater pipes. It compared methodologies for inspecting pressurized pipes, which are challenging due to their design. Six technologies were tested at IKT's Large Test Facility in Germany by a consortium led by Stichting RIONED to evaluate their accuracy in identifying pipe conditions and damage.

The project developed standardized procedures for each technology, highlighting that a combination of technologies might be necessary for comprehensive surveys. The data collected helps make informed decisions on the most suitable technologies for specific scenarios. Testing in a controlled research environment reduced risks associated with real-world implementation. The results provide valuable insights into the capabilities and limitations of leading technologies, promoting innovation and knowledge sharing.

>> Open access datasets

The Co-UDlabs consortium, in collaboration with transnational users, has developed and published over 10 open-access datasets containing key results and experimental data, ready to be used by other stakeholders. These datasets cover a diverse range of topics in urban drainage, including experimental data from laboratory and field studies. Among them are datasets on combined sewer overflows (CSOs), sediment transport dynamics, and the performance of sustainable drainage systems (SuDS). Additionally, the collection includes datasets on innovative methodologies, such as the application of imaging velocimetry techniques for flow analysis and the identification of sediment deposits using temperature signals.

These resources provide valuable insights for researchers and practitioners, supporting further research, modelling, and decision-making in urban water management. The datasets are designed to foster collaboration and advance knowledge in the field.

[Access the Co-UDlabs datasets](#)

From science to policy

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 has been working 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**.

>> UDRAIN

Co-UDlabs has worked proactively to 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 **Atlas of relevant urban drainage large Research Infrastructures** and will work with JCUD to create more **synergies across Working Groups**.

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in Co-UDlabs - Building Collaborative Urban Drainage research labs communities

Co-UDlabs

**COLLABORATIVE URBAN DRAINAGE
RESEARCH LABS COMMUNITIES**

Co-UDlabs contributes to a stronger, more innovative, and more inclusive sustainable urban drainage community, in Europe and elsewhere.