Co-UDlabs

Building Collaborative Urban Drainage research labs Communities

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008626

Co-UDlabs InfoDay

March 18, 2025

Fundación Galicia-Europa, Brussels (Belgium)

09:00-10:00 Reception of participants and welcoming coffee

10:00-10:20 Institutional opening

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

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

11:40-12:30 Co-UDlabs' legacy towards an international UD community

12:30-13:30 Networking corner

Co-UDlabs InfoDay

March 18, 2025

Fundación Galicia-Europa, Brussels (Belgium)

10:00-10:20 Institutional opening

- Dr. *Elena Garbarino* (REA, European Commission)
- *Jose Anta* (Co-UDlabs Coordinator, UDC)
- *Ana Ramos* (Fundación Galicia-Europa)

Co-UDlabs InfoDay

March 18, 2025

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

An overview of Co-UDlabs, its activities, goals, and expected and achieved results.

Jose Anta, Universidade da Coruña

Why Co-UDlabs?

Urban drainage systems (UDS) are **critical infrastructures** that safely convey stormwater and wastewater to treatment facilities.

UDS challenges

- **Urbanization and climate change**: more vulnerability to flooding and aquatic pollution
- **UDS are deteriorating and ageing**: huge investment needed for its rehabilitation and replacement
- **UDS complexity and harsh environments** conditions makes monitoring, control and management extremely difficult.
- **Using traditional approaches is unaffordable** and UDS have to implement Nature Based Solutions such as Sustainable Urban Drainage Systems

Why Co-UDlabs?

Urban drainage systems (UDS) are **critical infrastructures** that safely convey stormwater and wastewater to treatment facilities.

UDS opportunities

- **Water digitalization:** IoT devices – low cost sensoring, Imaging techniques
- **New modelling approaches:** digital twins, data driven models, AI, ..
- **Role or Research Infrastructures:** The Urban Drainage Community is not organized around a consolidated ecosystem of research infrastructures

ENVRI Hub

Welcome to the Data Portal of the European Environmental Research Infrastructures

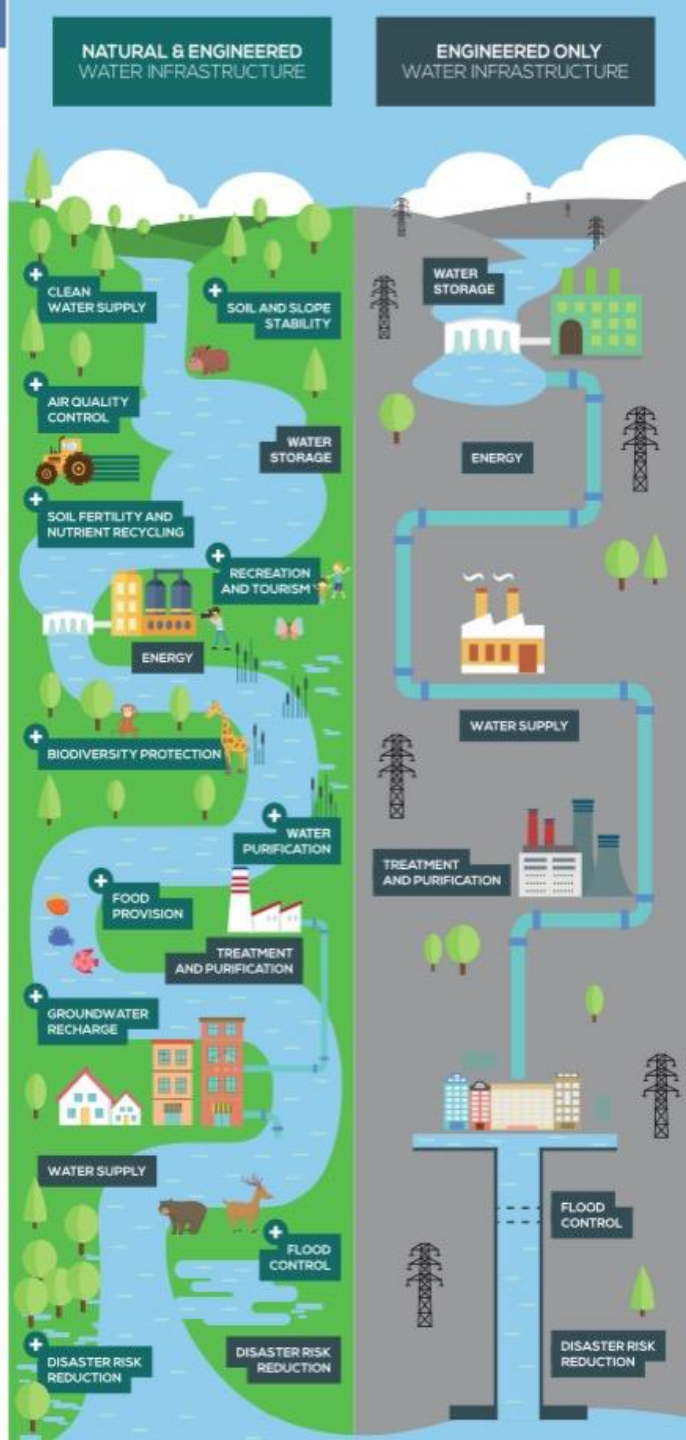
Why Co-UDlabs? The role of RI

Water utilities are **traditionally cautious innovation adopters**, **often requiring full or near-full scale testing of novel solutions** prior to effecting widespread implementation

Research Infrastructures can help **to build trust in novel technologies more efficiently, faster and safer to full scale living labs and urban systems**

Technologies and the '***Hybrid Grey and Green Infrastructure***' are **Key Components for a Water Smart Society**. To date have been **tested primarily at pilot and small scale**

WATER EUROPE SIRA : Hybrid grey-green *water infrastructure is defined here as a* ***combination of grey***, ***smart*** *and* ***green*** *infrastructures, aimed at producing (climate) resilient water systems, reliably controlling peak flows and/or delivering clean water, sustaining environmental flows, and providing ecosystem, economic and social services*



What is Co-UDlabs?

Co-UDlabs is a **Horizon 2020 INFRAIA Starting Community** project aiming to integrate research and innovation activities in the field of **Urban Drainage Systems (UDS)** and address pressing public health, flood risks and environmental challenges.

Our consortium includes **nine partners** from **seven European countries**:

University of Sheffield
United Kingdom

Aalborg University
Denmark

INSA Lyon
France

Deltares
The Netherlands

IKT – Institute for Underground Infrastructure
Germany

University of A Coruña
Spain

EAWAG
Switzerland

Euronovia
France

GRAIE
France

CONSORTIUM
9 partners
7 countries

DURATION
4 years

START-END DATE
01.05.2021
30.04.2025

BUDGET
5 M€

What is Co-UDlabs?

Co-UDlabs is a **Horizon 2020** project aiming to integrate research and innovation activities in the field of **Urban Drainage Systems (UDS)** and address pressing public health, flood risks and environmental challenges.

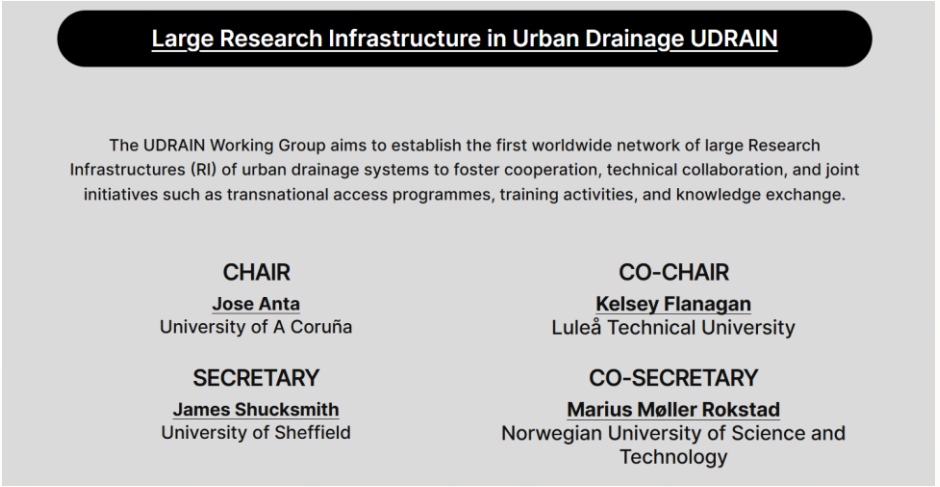
It has three key goals:

- **Foster a culture of cooperation** through networking activities aimed at the development of a more inclusive, open, and efficient research and innovation framework
- **Facilitate exchange and collaborative research** by offering free-of-charge Transnational Access to a unique research infrastructure, with researchers, utilities, practitioners, and the industry as main partners
- **Strengthen and improve services and venues** available to the urban drainage community via a set of joint research activities

What are our Networking Activities?

Co-UDlabs has developed a set of Networking Activities, designed to **engage with the larger UD community**, **involve practitioners** and **end-users**, as well as to promote and disseminate the knowledge produced within the project

- **Sectorial integration**: Co-UDlabs has established a community of about 130 stakeholders who have subscribed to the newsletter and are kept in the loop of all project activities and a community of about 200 participants in Co-UDlabs transnational access programme.
- Co-UDlabs researchers has promoted the creation of UDRAIN, the first **Working Group on Large Research Infrastructures** within the **Joint Committee of Urban Drainage of IAHR/IWA**
- **Science-to-policy and Science-to-practice actions**



What are our Networking Activities?

- **Harmonization and capacity building**: we have worked towards identifying the needs to improve the harmonisation of services and methods of facilities
- **Training activities:** dissemination and training has been essential to guarantee Co-UDlabs' outreach to a larger audience and engage with academia, experts, and policy-makers.
  - **Early-stage researchers** (4 workshops and 1 PhD course)
  - **Webinars** (academia) and **Workshops** (practitioners) like the "Webinar on Key findings from Co-UDlabs research and where to access them" (15 March). Available in our youtube channel.
  - Face to face **training for practitioners** on uncertainty assessment and metrology
- **Scientific dissemination**: Co-UDlabs has an ambitious plan to have at least 35 open-access publications, 20 datasets, and 10 open-science events organised by the end of the project. All available in open access in our zenodo community.

What are our Joint Research Activities?

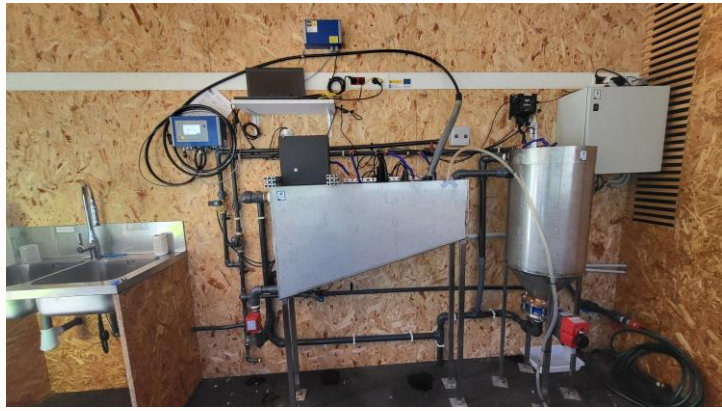
Co-UDlabs works on three different but interconnected Joint Research Activities to advance and innovate in urban drainage areas

- **Smart sensing and monitoring in urban drainage** is looking for new technology (sensors, materials, tools) and methods (data, protocols, analysis) to streamline the move towards digitised, sensorised, and evidence-based decision-making in urban drainage
- **Evaluation of assets deterioration in UDS** is updating and improving work on pipe defects, monitoring, and rehabilitation, in order to increase durability and sustainability of a system which has been heavily challenged by time, climate change, and disorderly urbanization
- **Improving resilience and sustainability of urban drainage solutions** is working to demonstrate how more efficient and sustainableurban drainage is essential to reduce the consequences of pollution and flooding to extreme events

What are our Joint Research Activities?

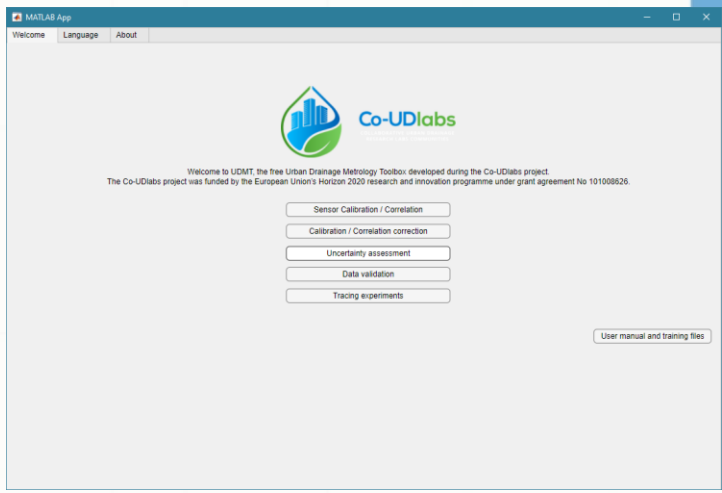
Smart sensing and monitoring in urban drainage

Identify and evaluate new sensors and technologies for hydrology and hydraulics, pollutant load monitoring, and UD underground asset inspection



Evaluation of assets deterioration in UDS

Define and evaluate new methods and tools to improve evidence base for reliable and validated urban drainage monitoring data



Improving resilience and sustainability of urban drainage solutions

Define and evaluate new methods to analyze and interpret urban drainage space and distributed data

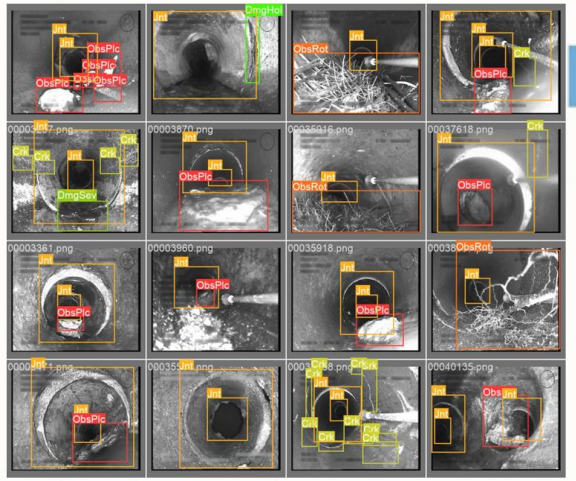
What are our Joint Research Activities?

Smart sensing and monitoring in urban drainage

Evaluation of assets deterioration in UDS

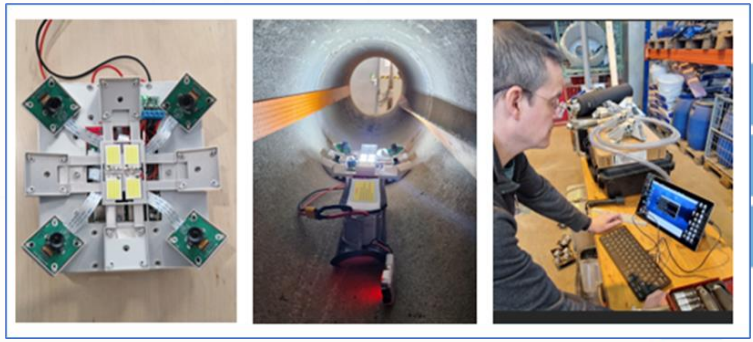
Improving resilience and sustainability of urban drainage solutions

Asset Inspection – evaluation of defect identification and condition classification using a developed AI labelling tool and risk defects models



Deterioration estimation and understanding of mechanisms through the revision of models, developing a catalogue of defects using laboratory testing

System performance and impacted caused by asset deterioration by integrating previous tasks into numerical models of existing networks



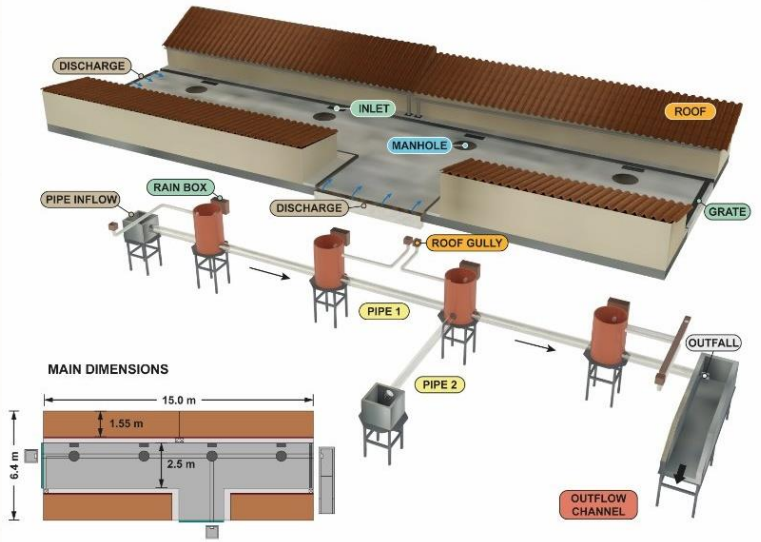
What are our Joint Research Activities?

Smart sensing and monitoring in urban drainage

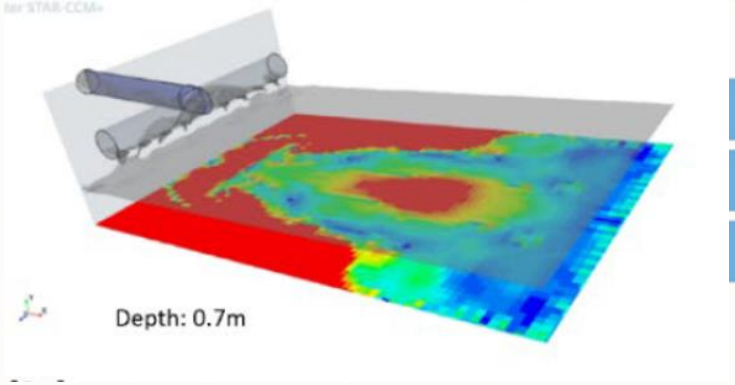
Evaluation of assets deterioration in UDS

Improving resilience and sustainability of urban drainage solutions

Development of Consensus on Measurement of Hydraulic and Water Quality Performance through developing novel techniques (DMT, imaging, temperature) and methods (clogging permeable pavements or GI ageing, plastic transport)



Quantifying the resilience of urban drainage infrastructure through the assessment of energy losses and pollution transport in dual drainage systems



Improving sustainability with SuDS by analyzing stormwater tanks and filter soils

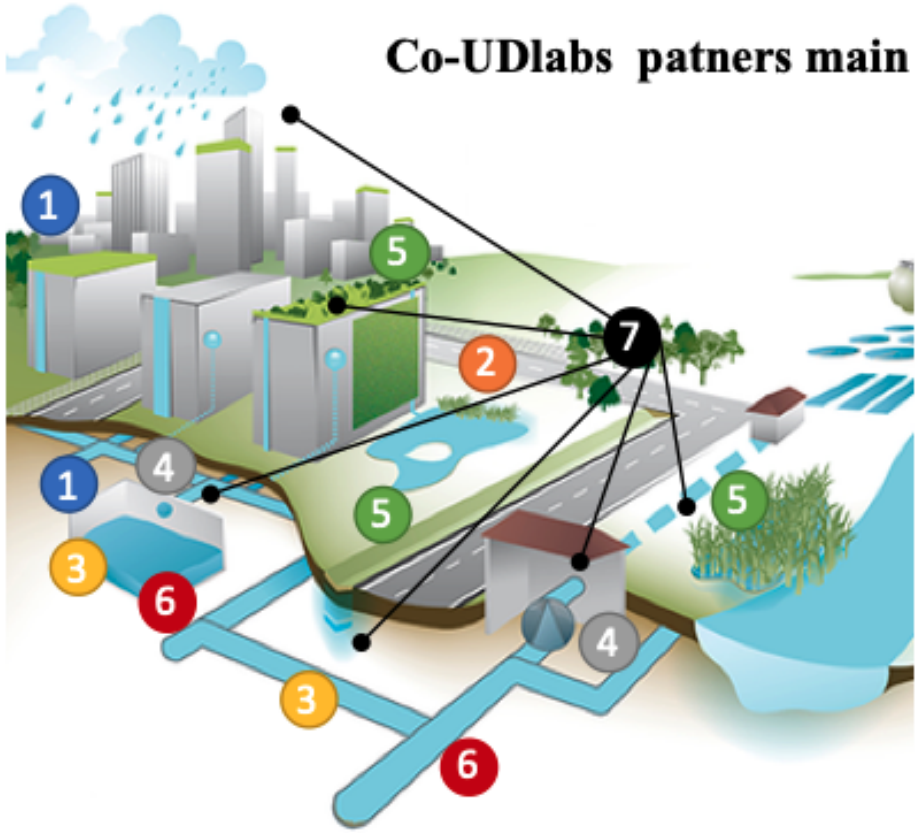
What is our Transnational Access programme?

At the core of European INFRAIA projects is the idea of **making large infrastructure networks available** to researchers, practitioners, and the innovation community.

Transnational Access with Co-UDlabs was 100% free: our project covered travel, accommodation, and allowance costs for all users visiting the facilities. More important, also included training and support to develop the access projects (in-person or partially-remote)

What is our Transnational Access programme?

Our TA programme includes 7 RI institutions and 17 research facilities which cover the whole UDS spectrum



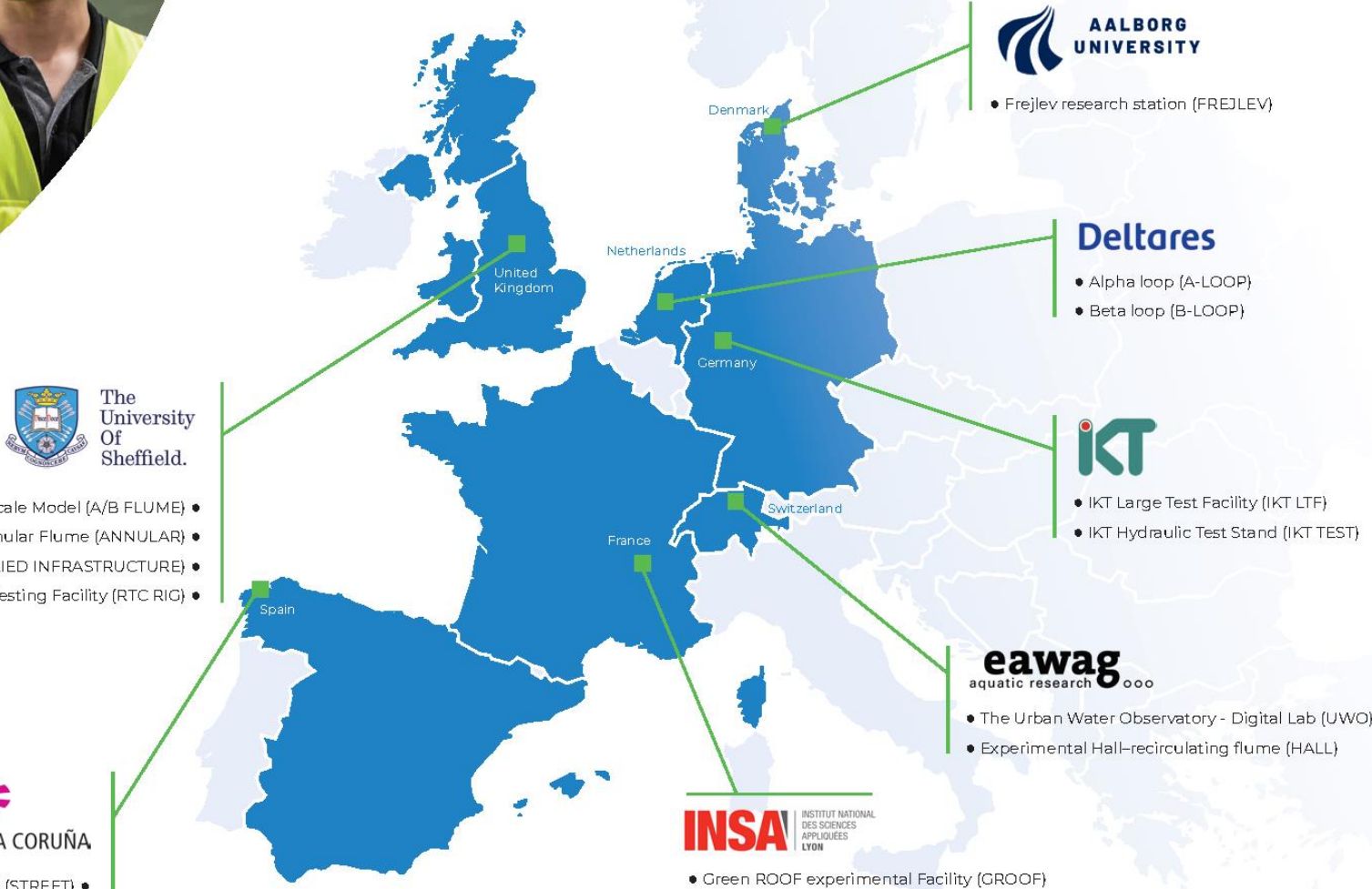
Co-UDlabs patners main research expertise areas

		UDC (SP)	USFD (UK)	DEL (NL)	EAWAG (CH)	IKT (D)	INSA (FR)	AaU (DK)
1	urban flooding	X	X			X		
2	runoff pollution	X	X				X	
3	in-sewer process	X	X	X	X			X
4	system performance	X	X	X	X	X	X	X
5	SuDS solutions	X				X	X	
6	assets deterioration		X			X		
7	digital water solutions	X	X	X	X	X	X	X

Background figure - https://www.ctc-n.org/products/optimized-urban-drainage

What facilities can you Access with a TA?

Co-UDlabs Research Infrastructures



AALBORG UNIVERSITY

- Frejlev research station (FREJLEV)

Deltares

- Alpha loop (A-LOOP)
- Beta loop (B-LOOP)

The 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)

IKT

- IKT Large Test Facility (IKT LTF)
- IKT Hydraulic Test Stand (IKT TEST)

eawag aquatic research

- The Urban Water Observatory - Digital Lab (UWO)
- Experimental Hall–recirculating flume (HALL)

UNIVERSIDADE DA CORUÑA

- 1:1 Street model (STREET)
- Scientific platform for urban runoff tests (BLOCK)
- Bens WWTP flume facility (BENS FLUME)

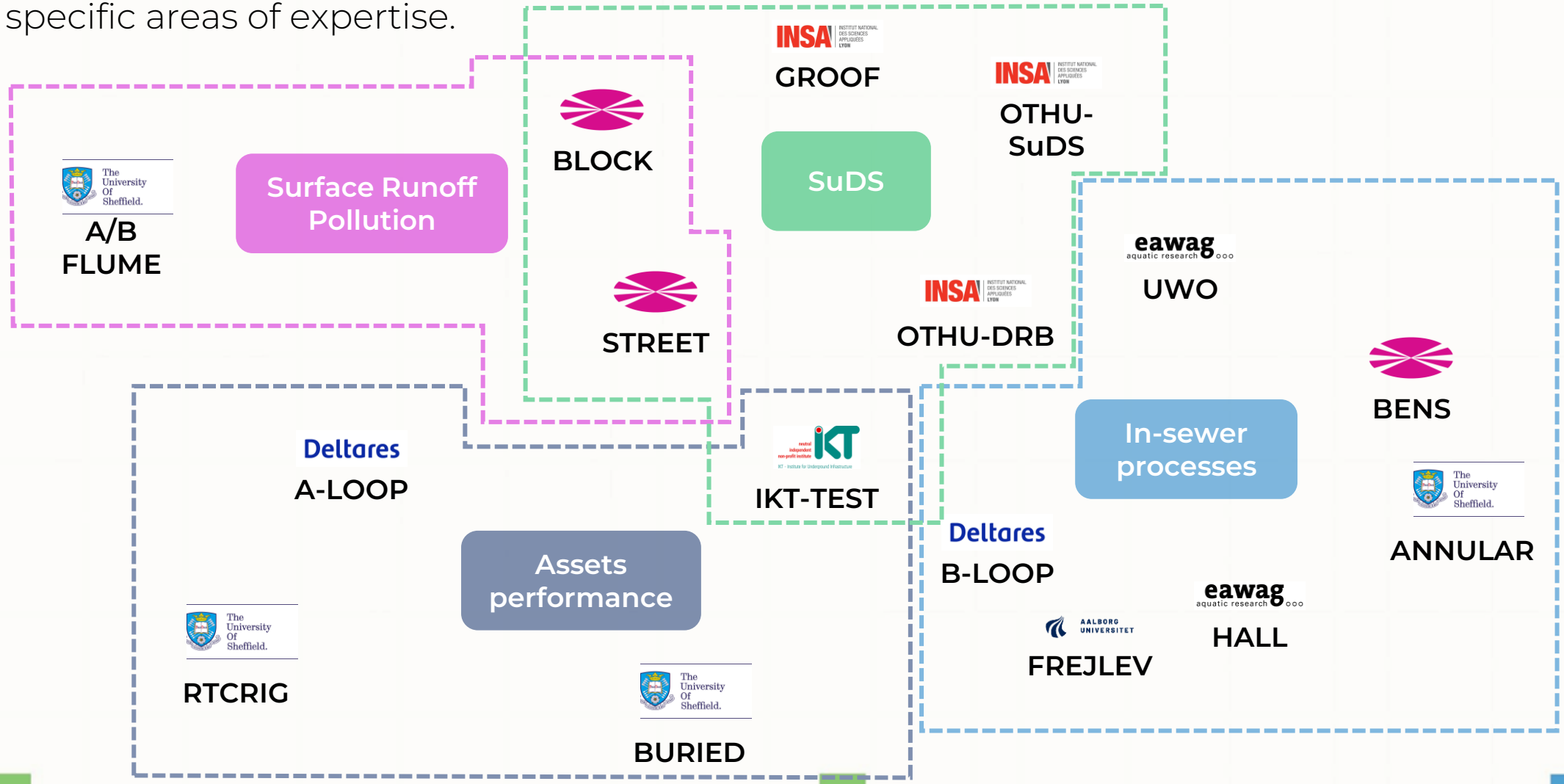
INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

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

More information:

What facilities can you access?

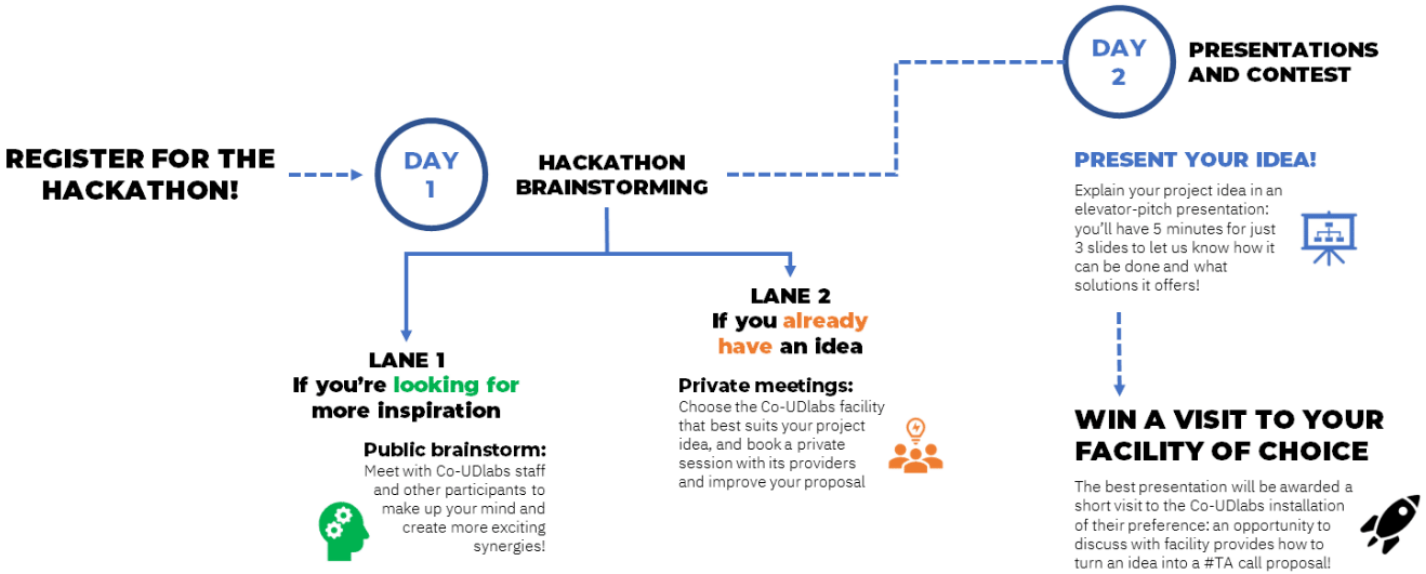
Each facility helped a research team with analysis, research, and testing on specific areas of expertise.



What is our Transnational Access programme?

A continuous set of **tailored actions** was performed during the project to reach **new users and consolidate the TNA programme**, including

- Guidelines for TNA access (facilities, TNA call, evaluation criteria)
- Webinars to promote the call (2 online webinars and 1 in person)
- Organization of two hackathons to promote the access with a field – trip prize



What is our Transnational Access programme?

We organized 3 open calls for access to the TNA programme

- 1st call January 2022 – 13 projects
- 2nd and 3rd call January 2024 – 18 projects

The last projects are about to finish during this month

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

Co-UDlabs

Results of our TA campaigns

What is our Transnational Access programme?

Through all 3 TA calls combined, Co-UDlabs has involved **227 user-group members from 26 countries** (11 non-EU), led by user-group leaders from **16 countries** (5 non-EU).

Ultimately, 54 users are women (23.8%), 67 are from non-EU countries (29.5%), and 75 are from non-academic institutions (33%).

Throughout the three years of activity of its TA programme, Co-UDlabs has accepted 31 proposals.

To conclude

Co-UDlabs
COLLABORATIVE URBAN DRAINAGE RESEARCH LABS COMMUNITIES

The Co-UDlabs project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008626.

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. (...)

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. (...)

Co-UDlabs
COLLABORATIVE URBAN DRAINAGE RESEARCH LABS COMMUNITIES

THANKS!!!!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008626

AALBORG UNIVERSITY
euronovia
Deltares
INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON
graie
IKT
eawag aquatic research
The University Of Sheffield.
UNIVERSIDADE DA CORUÑA

Co-UDlabs InfoDay

March 18, 2025

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

Round Table: Co-UDlabs and translating science into policy and practice

Moderator: Iain Naismith, *IKT Institute of Underground Research*

- **Co-UDlabs' Policy Briefs:** key policy recommendations for the urban drainage community. *Simon Tait, University of Sheffield*.
- **Research Infrastructure networks and European urban water policy: the view from EU institutions.** *Trudy Higgins. Directorate General for Environment. European Commission*.
- **Research Infrastructures, community-building, and knowledge exchange: the view from water utilities, industry, and organisations.** *Thomas Brüggemann, IKT Institute of Underground Research*.

Q&A and feedback from participants and attendees.

Session wrap-up: Jose Anta, *Universidade da Coruña*

Round Table: Co-UDlabs and translating science into policy and practice

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Sewer Overflows
Policy and Discussion Points
Roundtable
18th March 2025

- Simon Tait, University of Sheffield

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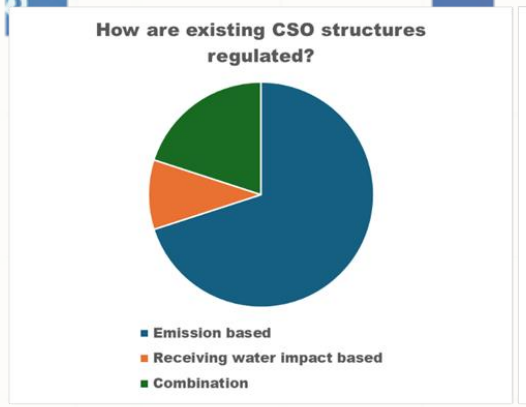
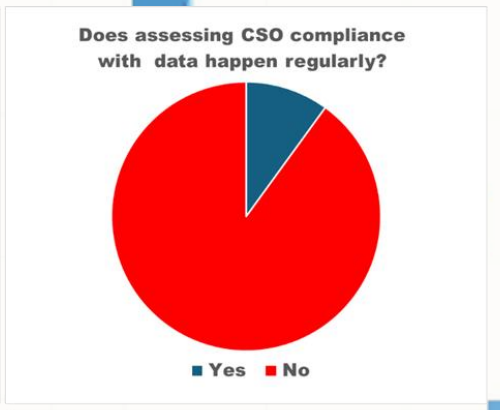
Recast UWWTD

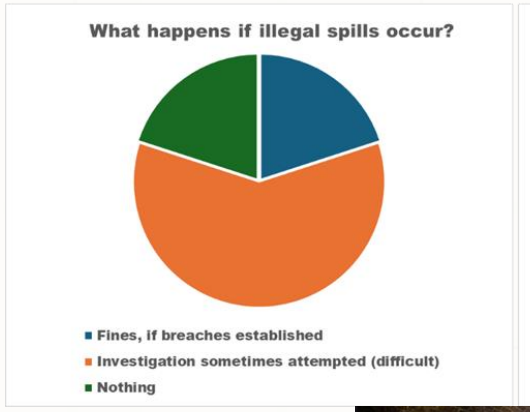
- Expansion of wastewater collection systems - condition.
- More focus on storm sewer overflows – environmental harm and public health impacts.
- Integrated urban wastewater management plans - local level
- Focus on emissions
- (Indicative) annual pollution load limit
- Demonstration that local urban wastewater management plans are effective.
- Obligation to make environmental data public reinforced in recast UWWTD

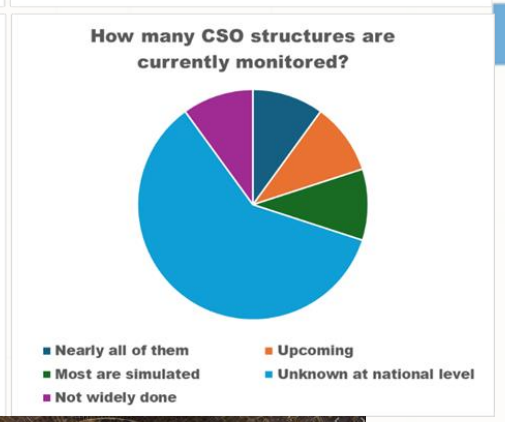
Storm Sewer Overflows

- Scale of issue poorly quantified - CoUD Labs questionnaire
- Measuring SSO emissions and impacts difficult – intermittent flows, broad range of pollutants
- Conceptual mis-match WFD impact based, UWWTD emission based
- Historical national design standards



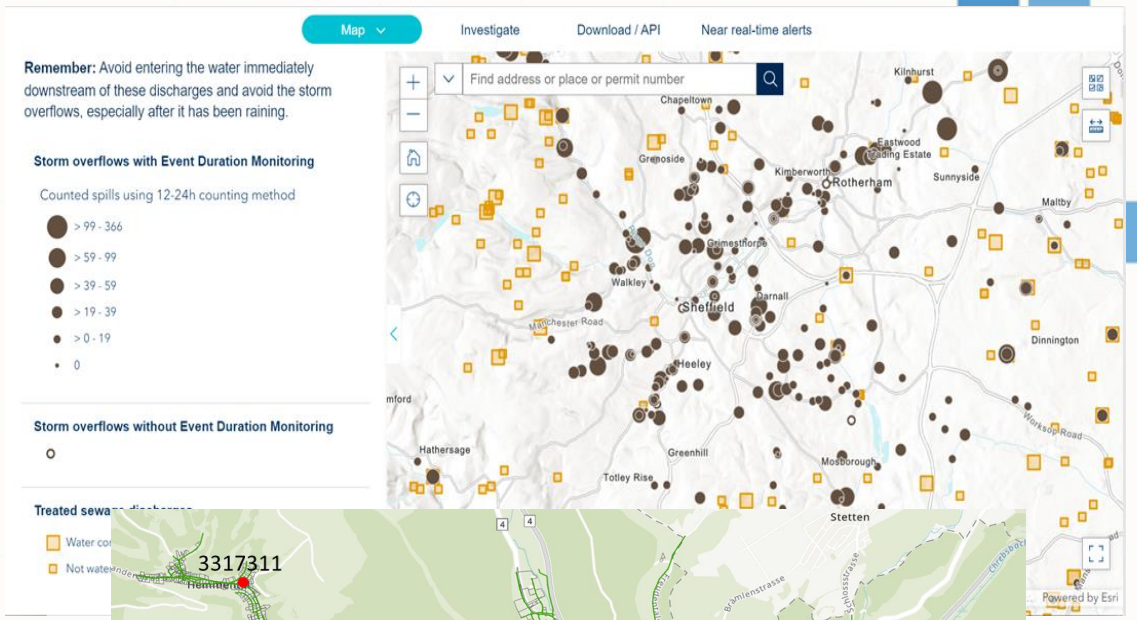


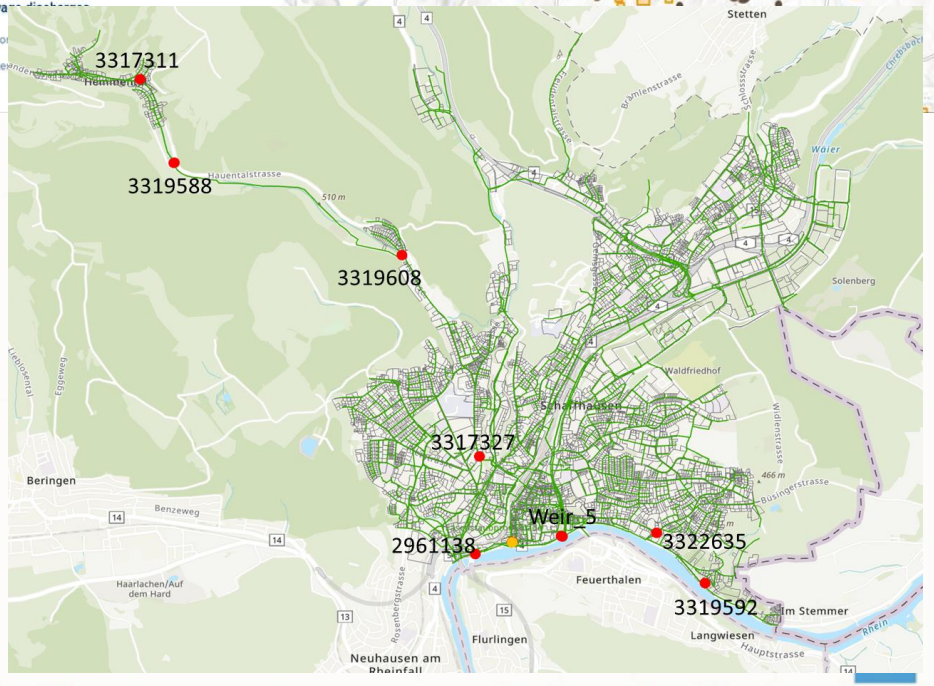




Storm Sewer Overflows 2

- Role of public data on SSO performance – will this lead to more investment?
- Re cast UWWTD pragmatic, monitoring/ or water quality modelling can be used; in UK all 15000 SSOs must be monitored by 2035
- Acceptable to public?





CSO Policy discussion points

Assessing CSO spills

Co-UDlabs
COLLABORATIVE URBAN DRAINAGE RESEARCH LABS COMMUNITIES

Summary

Sewage discharges from Combined Sewer Overflow (CSO) structures into receiving waters can prevent floods in urban areas but can also harm ecosystems and public health. In many countries there is a lack of reliable data on their operational frequency and pollution loads released. Assessing the impact of CSOs is challenging, emission-based rules that focus on the number of spills per year are insufficient to quantify environmental harm and lack of continuous information on the receiving water makes impact-based regulations hard to enforce.

From Co-UDlabs we recommend further research on environmental and human impacts of intermittent CSO spills, operational improvements to eliminate dry-weather spills, integrated CSO impact evaluation with wastewater treatment plant (WWTP) discharges, and targeting stormwater inflows by promoting Nature Based Solutions. Climate change and hydrological signature modifications must be considered for instance by performing projections of future rainfall patterns or river flows and changes in land uses. We recommend supporting the recast of the Urban Waste Water Treatment Directive (UWWTD) with monitoring technology development projects involving large Research Infrastructures and see substantial business opportunities in CSO monitoring innovations. We also recommend funding to enable the sharing of monitoring experience between all water utilities to share learning. Raising awareness of CSO spills and sewer systems may likely generate adverse public but will foster public support for infrastructure investment, to mitigate flooding, environmental impacts and public health.

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Contributors (in alphabetical order)
Jose Anta, Universidade da Coruña
Antonio Moreno-Ródenas, Stichting Deltares
Jörg Rieckermann, EAWAG
Alma Schellart, University of Sheffield
Simon Tait, University of Sheffield

Disclaimer
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Contact
Jose Anta
Universidad da Coruña
contact@co-udlabs.eu

www.co-udlabs.eu

Policy Recommendations

- Balance emission-based standards and environmental quality standards (impact analysis) with CSO regulations to ensure environmental protection and public health compliance. Emission standards like CSO spill annual pollution loads provide clear compliance targets, but they do not adequately consider regional variability and not always guarantee water quality objectives as they do not account, for example, for acute impacts. Environmental quality standards focus on water quality. This has encouraged integrated stormwater planning which includes Urban Drainage Systems, WWTP, and potentially also industrial spills and agriculture diffuse pollution. This approach, however, complicates compliance assessment. A hybrid approach — one which combines emission standards with a pressure-sensitivity impact assessment for large urban agglomerations and sensitivity aquatic ecosystems — could promote regulatory clarity and cost-effective investment.
- Make CSO performance data publicly available with unified data descriptors and commons licenses, while also providing guidance on responsible data sharing, clear explanations, and collaboration with local citizen groups and communication experts. Public access to CSO and WWTP data through European Data Spaces would increase innovation, transparency, and smart governance. Digital platforms could be used to distribute common planning information, such as unified climate projections for rainfall and river flows. This would save resources, enable cross-country comparisons, and common approaches to infrastructure design.
- Enhance CSO monitoring by seeking skilled personnel in urban drainage and promoting the adoption of innovative sensors and procedures. Water utilities, stakeholders, and regulators personnel involved in CSO performance must be familiar with fundamental hydraulics and environmental processes occurring during wet weather flows, acknowledging how monitoring and modelling uncertainty may mask non-compliance and influence infrastructure design decisions and legal requirements. More innovation in this sector will make implementation of new sensors for water quality and ecotoxicity easier. Multidisciplinary approaches combining data from field campaigns, modelling, and machine learning algorithms should also be incentivized. More investment in CSO monitoring technology and data analysis can increase the innovation capacity of the EU's wastewater industry altogether.
- Support effective implementation of the UWWTD at national level. This should be achieved by launching EU-wide regional case-study work on data-based CSO compliance assessment — as well as by engaging river basin authorities, utilities, citizen groups, and research infrastructures. Develop a specific funding program involving international and national associations of wastewater operators to share information on existing experiences and lessons learned and establish an appropriate level of investment for compliance monitoring — all consistent with the timeline of the renewed UWWTD and the new Europe-wide policy efforts in this field.

Recast Urban Wastewater Treatment Directive

Co_UDlabs Info Day

March 18, 2025

Trudy Higgins
DG Environment
Unit ENV C.2: Marine Environment and Clean Water Services

Evaluation

The 1991 Directive

- **Collection**
- **Treatment**
- **Monitoring & Reporting**

Lessons learnt

- Effective tool – Tangible impacts
- Simple and targeted instrument
- Carrot and stick
- Benefits >>> costs

Room for improvement

- Remaining pollution
- Eutrophication
- Energy use, sludge management
- Governance – transparency/reporting
- Coherence with other legislation

Source: European Commission, 2019, UWWTD Evaluation

Recast UWWTD – summary

Directive - EU - 2024/3019 - EN - EUR-Lex

- Extended scope to 1.000 p.e.
- New rules for individual treatment

Secondary Treatment

Tertiary Treatment

Revised Nitrogen / Phosphorus standards and, broader applicability

Integrated wastewater management plans

Quaternary Treatment for micropollutants (financed through Extended Producer Responsibility)

Energy neutrality

- Access to sanitation/Justice/Information
- Surveillance of health parameters
- Better water and resource (re)use
- Risk-based approach

Integrated Urban Wastewater Management Plans (Art. 5)

- Agglomerations 100 000 p.e. and above: **plans** established by end 2033, reviewed every six years.
- Agglomerations 10 000 p.e. – 100 000 p.e.: **list** of agglomerations by (22 June) 2028; updated every six years
- Agglomerations 10 000 p.e. – 100 000 p.e.: **plans** established by end 2039, reviewed every six years.
- Secondary legislation: methodologies and format adopted by January 2028

European Commission

Content of Integrated Urban Wastewater Management Plans (Annex V)

Pollution reduction objective: Agglomerations 100 000 p.e. and above: 2039;

Agglomerations 10 000 p.e. – 100 000 p.e.: 2045

Analysis of the drainage area, for combined sewer and storm sewers, including dynamic modelling (hydrologic, hydraulic and water quality)

Hierarchy of measures:

1. Preventative: e.g. natural water retention, rainwater harvesting; green & blue spaces
2. Optimisation of existing infrastructure
3. New infrastructure: green and blue infrastructure prioritised (over grey)

Clear identification of actors and responsibilities to deliver measures

European Commission

Thank you!

European Commission

Co-UDlabs

Building Collaborative Urban Drainage research Labs communities

Co-UDlabs InfoDay

18 March 2025

Fundación Galicia-Europa, Brussels

Round Table: Co-UDlabs and translating science into policy and practise

How to involve utilities and industries?

Ideas of networking and collaboration for research institutes and universities

Thomas Brüggemann, IKT (Germany)

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 101008626

How to involve utilities and industrie?

Players in the water sector (urban drainage):

How to connect science with…?

Science and Testing:

- Developing and testing innovative solutions
- Testing products
- Practical and basic research
- Consulting

Asset owners:

- Public and private companies, Municipalities and Water management associations
- Responsible for maintainance of assets and for implementing innovative solutions ⇨ **main player**

Industry:

- Manufacturers and supplier of products and materials for urban drainage
- Developing innovative products and solutions
- Service companies for the asset owners

Water (umbrella) organisations

- international e.g. EWA, IWA and national Vlario, Rioned, DWA, ….
- Pooling and representing the interest of the water sector
- Participation in standardization committee

Politics and authorities, national differences in:

- Laws, regulation
- Funding research
- Monitoring compliance with laws

How to connect project-related?

Co-UDlabs TA-project "AIR – Assessment of inspection tools for rising mains"

Background: problems, how to inspect rising mains

Initiating project, defining test requirements

Network owners /utilities

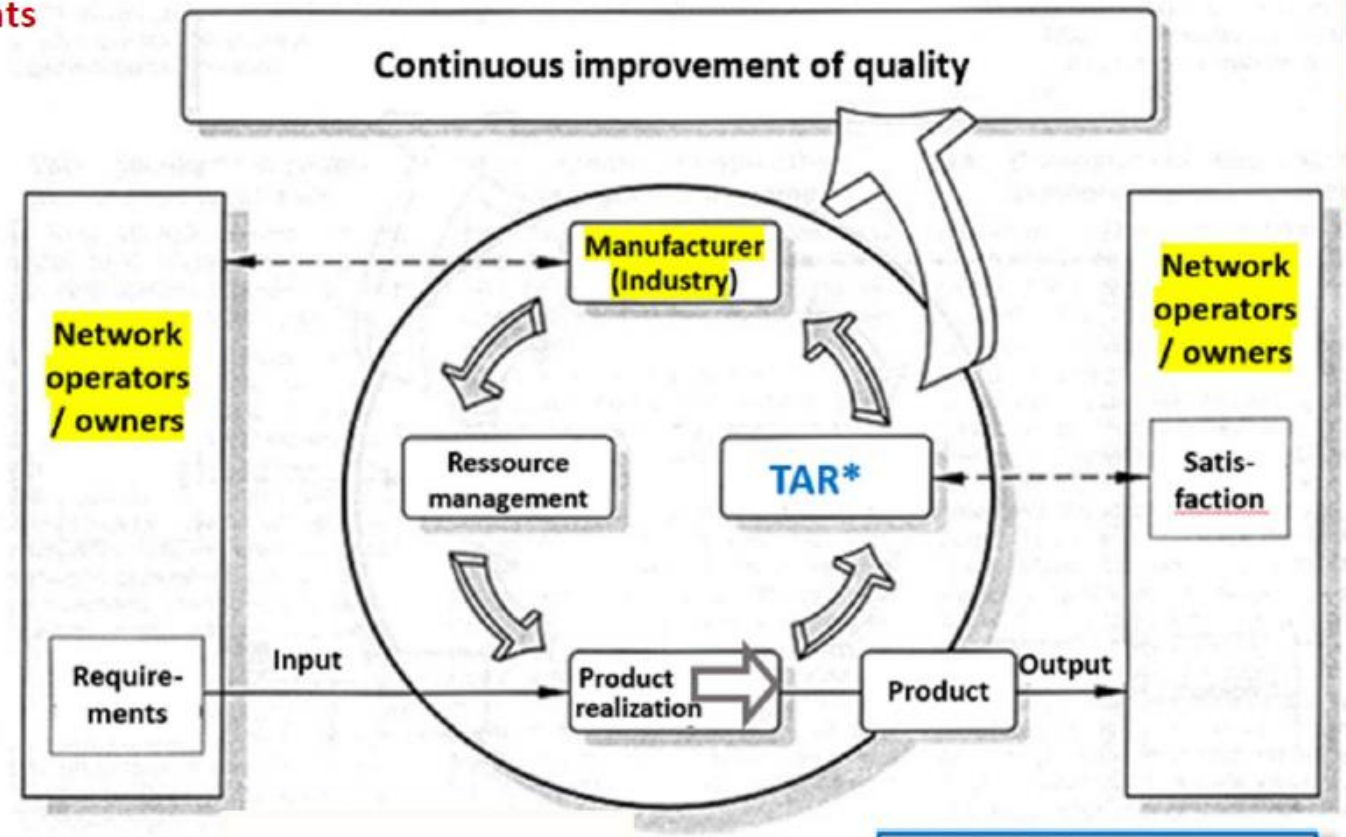
STICHTING RIONED – STAD | WATER | MENS — Water umbrella association

Gemeente Arnhem

Yorkshire Water

Severn Trent

United Utilities



Manufacturer (industry)

xylem — acquaint — ROSEN

Several different innovations for techniques

Providing research infrastructure & support

Science / testing

Co-UDlabs — IKT — University of Sheffield — University of Bristol

inovations

***TESTING, ANALYSIS, RECOMMONDATIONS (Science, Testing Institute)**

Funding body — European Union

The AIR-project and what next?


Acquaris: ultrasonic


Xylem Smart ball: acoustic

rioned report


UoB: ultrasonic

UoS: acoustic


Rosen device

Outcome:

Information about the performance of the systems and their application limits (at lab)

Outlook:

Basis for a current pilot study “behaviour in reality” in the Netherlands

Q&A and feedback from participants and attendees.

CSO Policy discussion points

- Focus of regulation – on “emissions” or in receiving water environmental harm “impact”.
- How to determine environmental harm – all pollutants or scientifically surrogates?
- Monitoring – how comprehensive? Do national regulations need to be designed for “transparent” compliance
- The role of open data – when and what to release – what level of quality assurance is needed?
- Role of innovation and transnational learning in CSO mangement

Co-UDlabs InfoDay

March 18, 2025

Fundación Galicia-Europa, Brussels (Belgium)

11:40-12:30 Co-UDlabs' legacy towards an international UD community

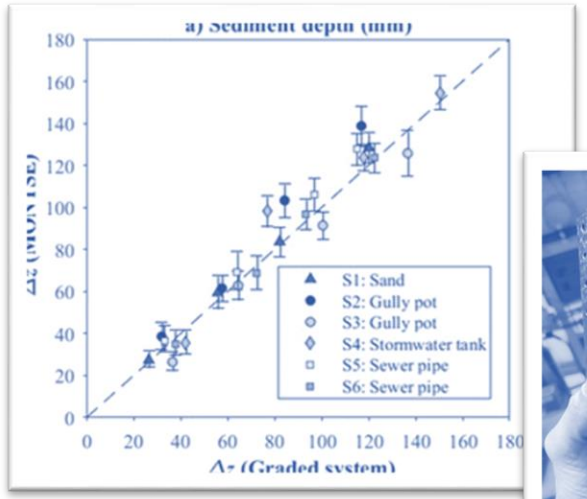
An open-floor conversation on Europe-wide collaboration and networks in urban drainage, new opportunities for collaboration, and the lessons learned by Co-UDlabs' partners and stakeholders.

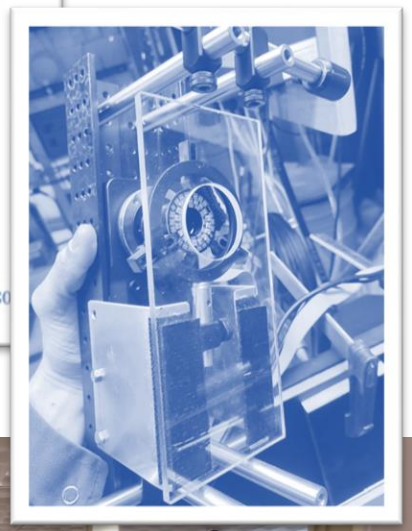
Joao P. Leitao, EAWAG.

Jean-Luc Bertrand-Krajewski, INSA-Lyon.

Alejandra Pimiento, Universidade da Coruña.

James Shucksmith, University of Sheffield.





Co-UDlabs' legacy towards an international UD community

From science to networking to innovation and back

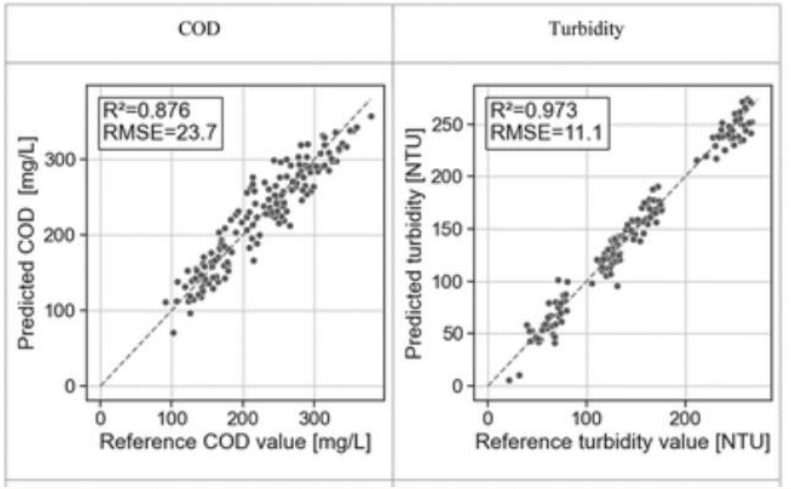
All Co-UDLabs partners

Presenting: João P. Leitão (Eawag)

Science: Publications & Open Datasets (selected)

CAMERA-BASED MONITORING: ADVANCES IN WASTEWATER OBSERVATION

- Hyperspectral imaging enables real-time wastewater quality assessment



SEWER REAL-TIME SEDIMENT DEPTH MONITORING (MONTSE)

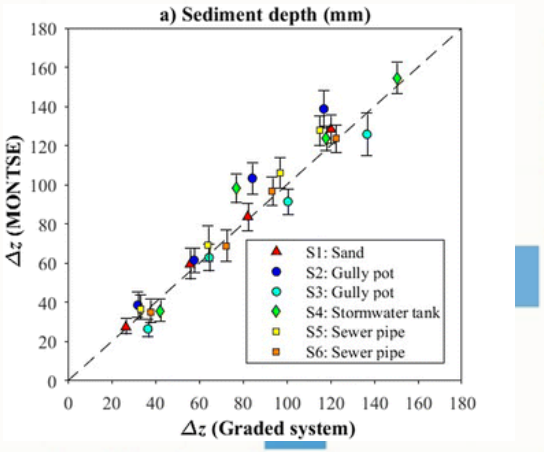
- Temperature-based sensing improves sediment accumulation tracking in sewers

LARGE-SCALE CLOGGING EXPERIMENTS OF POROUS ASPHALT

- Experimental studies reveal clogging dynamics in permeable pavement systems

UWO OPEN DATASET

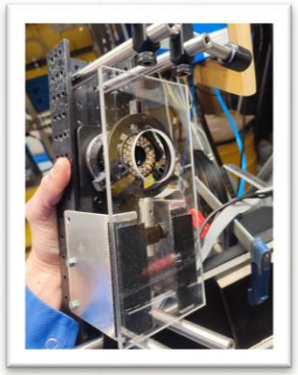
- A comprehensive dataset for urban water system modeling and analysis



Innovation: Technologies, „Market-Ready“

“POLLUTIONKEEPER” SENSOR (PHOTRACK AG, CH)

- **Non-contact** wastewater quality monitoring
- R&D project based on WP6 results



CORRELATION-BASED NH4-N MONITORING (GOSYS, DE)

- Tests suggest that the sensor is interesting for real-time, **correlation-based, NH4-N monitoring.**

OPTICAL E. COLI SENSOR: REFINEMENT NEEDED

- In-depth test in WP6 revealed that **results were not as good as expected** and further work is needed for UDS applications, e.g. to track coliforms in receiving waters

NETWORKING: NEW stakeholders

INDUSTRIAL PARTNERS

- Remote sensing hardware (USA)
- Hydraulic engineering (Poland)
- Weather service company (Iran)

RESEARCHERS FROM EASTERN EUROPE

- Warsaw Univ. of Technology, Poland
- Czech Technical University, Prague

Training and Education: Highlights

WEBINARS

- Acoustic and optical pollutant monitoring, FTIR chemical mapping of microplastics
- Data validation and underground state monitoring

EARLY-STAGE RESEARCHER ACTIVITIES:

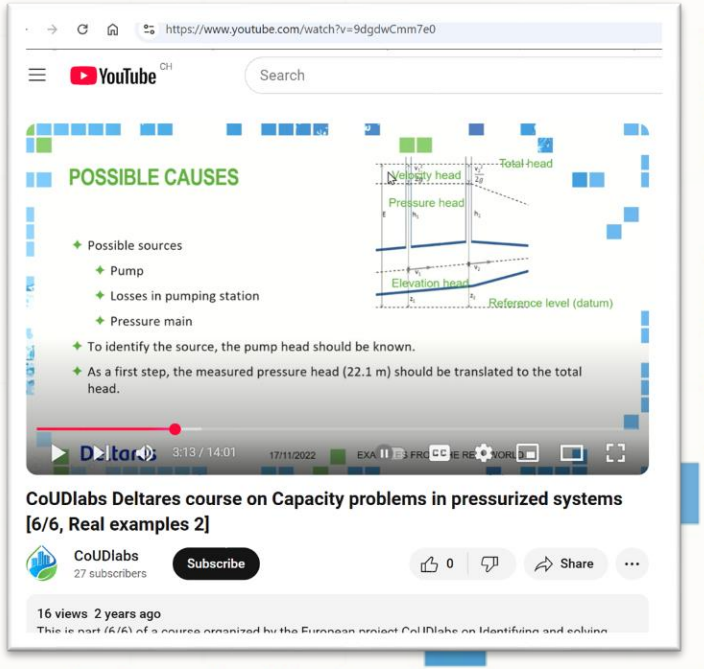
- European Junior Scientist Workshop (EJSW) on sewer monitoring in 2022 and 2024
- Specialized seminars

INDUSTRY PROFESSIONAL TRAINING

- Workshops on urban drainage, **capacity challenges, uncertainty assessment,** and UD metrology

ONLINE TRAINING

- Six-Part **Course on Pressurized Systems,** documented on Co-UDLabs **youtube channel**



COMMUNITY ACTIONS: building data archives

INTERNATIONAL WORKING GROUP ON DATA AND MODELS

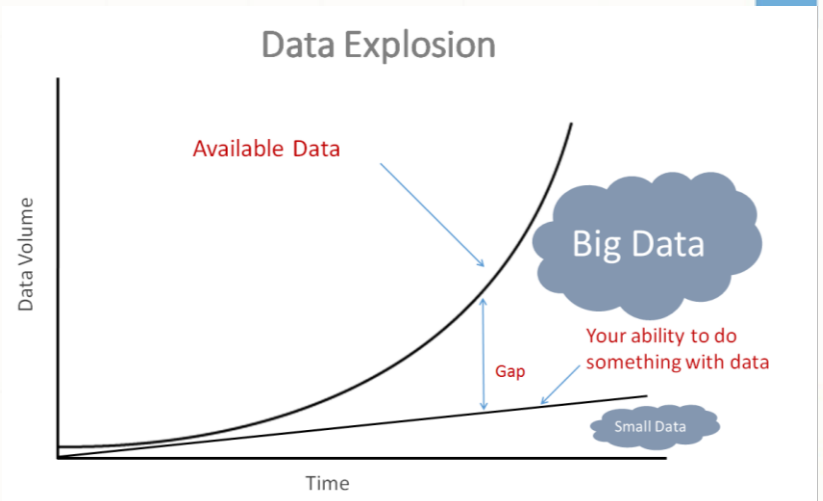
- Working group of the **IWA/IAHR Joint Committee on Urban Drainage (JCUD).**
- IWGDM aims to furthering research and disseminating **knowledge and technology related to data collection and modelling** of urban drainage systems.

WHY OPEN DATA?

- Machine Learning (ML) needs large datasets
- Data often attached to single publications, limiting reuse

KEY CONTRIBUTIONS

- Bellinge dataset: Urban drainage case study
- UWO Data Set: Sewer flow time-series for UDS research
- Flood data: Fast surrogate models for flood prediction
- Spectrometer data: Expanding wastewater analytics
- **GROOF DATA SET (RESULT FROM INDOOR – GRASP TA)**



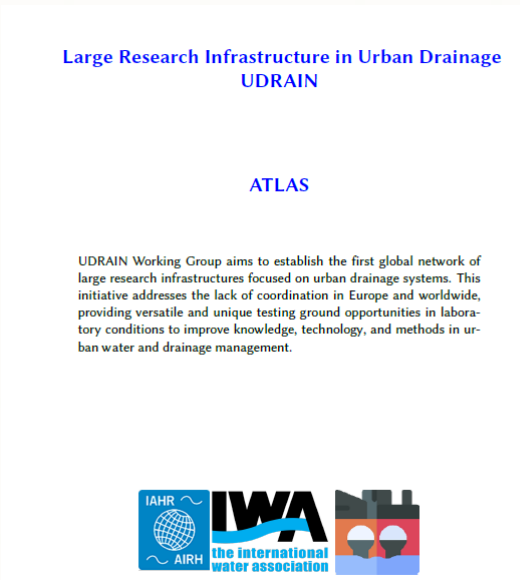
https://medium.com/data-science/machine-learning-with-big-data-86bcb39f2f0b

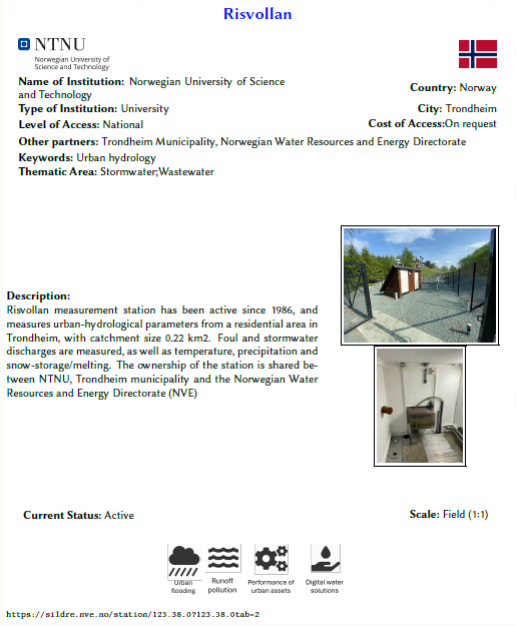
https://www.eawag.ch/en/department/sww/projects/inscribe/

COMMUNITY ACTIONS: udrain and Urban m20

UDRAIN: NEW WORKING GROUP ON LARGE RESEARCH INFRASTRUCTURES

- Working group of the **IWA/IAHR Joint Committee on Urban Drainage (JCUD).**
- create the first global network of large Research Infrastructures (RI) in urban drainage systems
- **This initiative seeks to enhance collaboration, technical cooperation, and joint ventures**





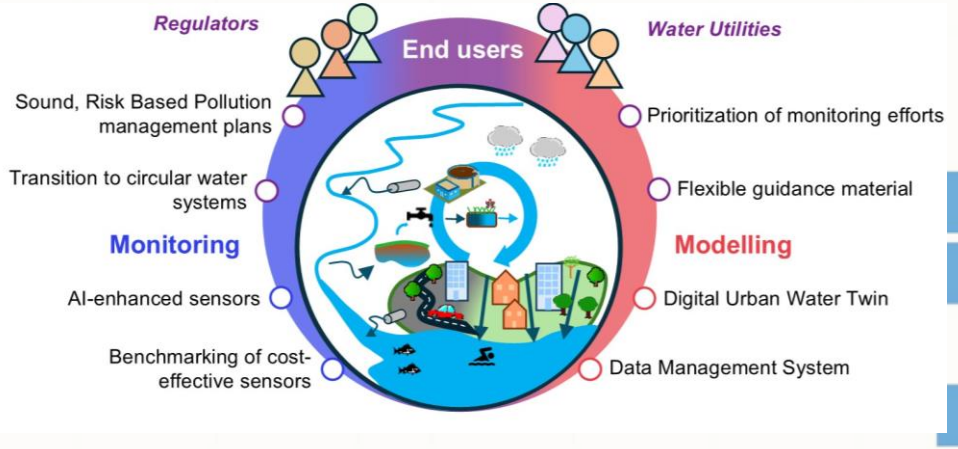
Be part of the UDRAIN Atlas

COMMUNITY ACTIONS: udrain and Urban m20

URBAN M2O PROJECT (H2020)

URBAN M2O aims to create solutions to generate the crucial information that is needed to develop and implement risk-based urban water quality management plans at the city scale.

- Developing and benchmarking AI-enhanced, resource-effective **water quality monitoring technologies**;
- Developing fit-for-purpose water quality models and **harmonized data management systems;**
- **Transnational Access:** Industrial partners will […] benchmark novel solutions against state-of-the-art monitoring approaches for trace organic chemicals, microbial contaminants, and microplastics in all urban water systems



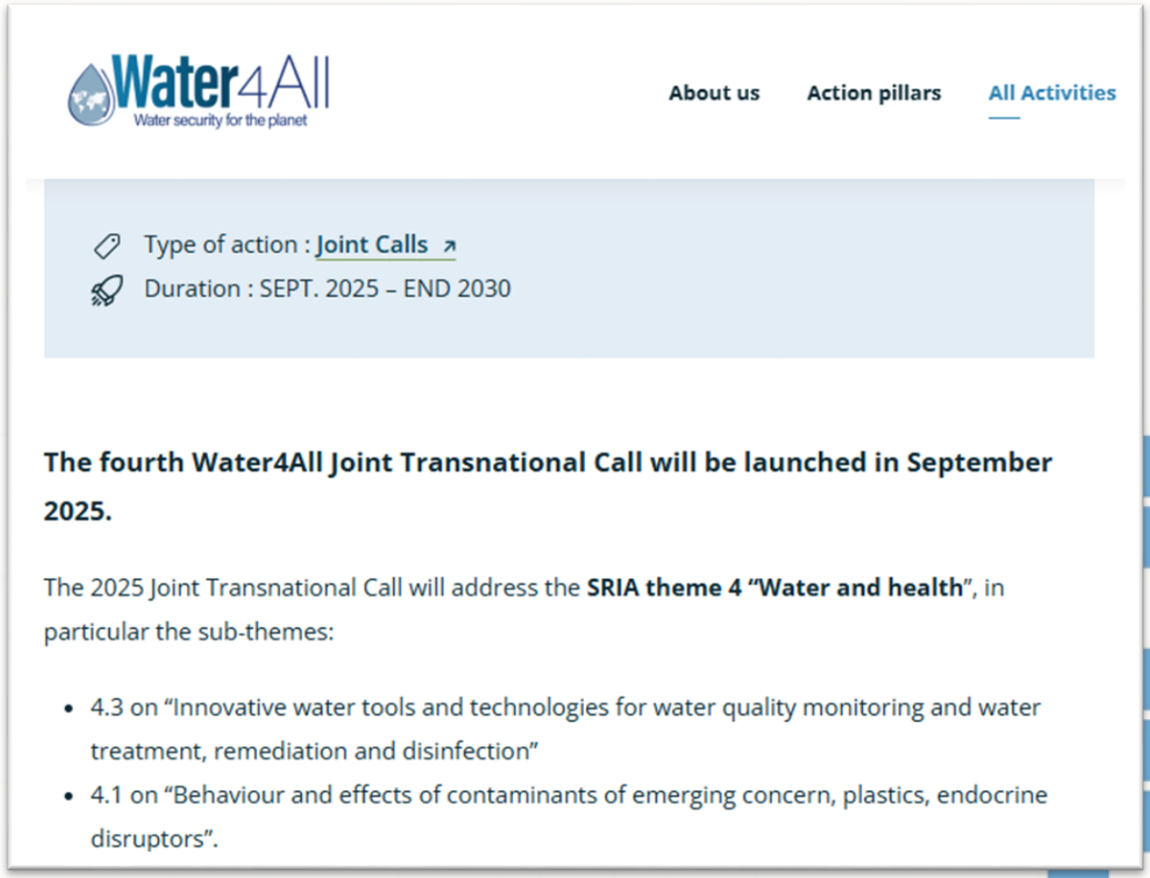
FUTURE collaboration: open and future calls

UPCOMING FUNDING OPPORTUNITIES!

- Water4All Call: European water research funding
- **Water and Health:** Water quality monitoring
- September 2025

ADDITIONAL INFORMATION ON CALLS WELCOME!

- Support UWWTD implementation
- Innovation around quantifying and reducing emissions from UDS
- …



Our Legacy?

Co-UDlabs

HOW TO USE/ BENEFIT FROM the Co-UDLABS LEGACY ?

STARTING WITH RESEARCH OR PRACTICE QUESTIONS AND SHOW HOW CO-UDLABS MAY HELP TO ANSWER THESE QUESTIONS

- Gives added value to Co-UDlabs outcomes (deliverables and papers, data sets on Zenodo, methods, tools and software)
- Shows how various outcomes of Co-UDlabs maybe used in a coordinated way

HOW TO USE / BENEFIT the Co-UDLABS LEGACY ?

- ***How to evaluate uncertainties in urban drainage monitoring and data sets?***
  - Use the *Urban Drainage Metrology Tool* (UDMT) software tool, available at...

HOW TO USE / BENEFIT the Co-UDLABS LEGACY ?

- ***How to improve the measurement/ monitoring of NH4 is sewer systems ?***
  - Use the GOSYS sensor tested in Co-UDlabs (re-use the deliverables and papers, to apply similar methodologies)
  - Compare your data with Co-UDLabs data (re-use of the uploaded Co-UDlabs data sets)
  - Process your data sets with UDMT (automated sensor correlation function, uncertainty assessment, automated assisted data validation, ...)

HOW TO USE / BENEFIT the Co-UDLABS LEGACY ?

- **FOR EACH JRA, an online matrix to link**
  - Rows with questions
  - Columns with Co-UDlabs outcomes (with access to links, contacts, etc.)
  - Red dots for practitioners, blue dots for researchers
  - Dark color: immediate full application
  - Light color: for information, example, can be used after adaptation

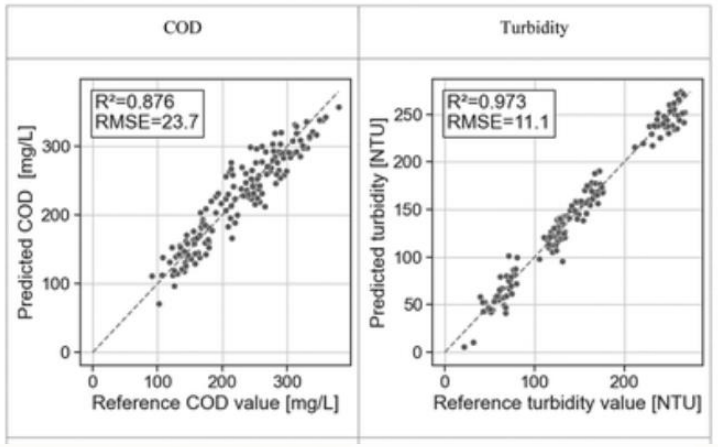
HOW TO USE / BENEFIT the Co-UDLABS LEGACY ?

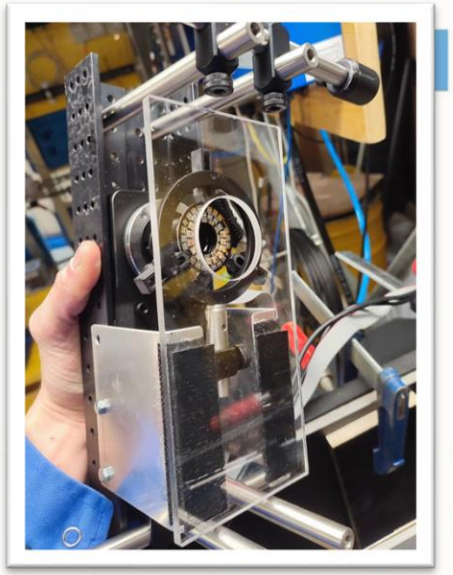
JRA1 Smart monitoring	contact less sensors	UDM/T sensor calibration	UDM/T uncertainty assessment	Co-Udlabs outcome 5	Co-Udlabs outcome 6	Co-Udlabs outcome 7
How to measure NH4 in sewers ?	● ●	● ●	● ●			
How to assess uncertainties in data ?			● ●			
Question 3				● ●		
Question 4						
Question 5						
Question 6						
Question 7						
Question 8						
Question 9						
Question 10						

our Legacy: discoveries, INNOVATion, Education

SCIENCE IMPACT: PUBLICATIONS & OPEN DATA

- New discoveries, e.g. on water quality monitoring
- Open research datasets (UWO open data, etc.)





INNOVATION: MARKET-READY TECHNOLOGIES

- Optical sensors for water quality
- Coliform monitor not fit for purpose

NETWORKING: EXPANDING GLOBAL COLLABORATIONS

- New partners
- UDRAIN working group

retencja.pl

UDS COMMUNITY:

- Training courses, Industry workshops, online training
- Develop open research data sets: INSCRIBE project
- Data harmonization and TA: URBAN M2O project

Co-UDlabs InfoDay

March 18, 2025

Fundación Galicia-Europa, Brussels (Belgium)

12:30-13:30 Networking corner

Hors d'oeuvre break, open to all attendees

Co-UDlabs
COLLABORATIVE URBAN DRAINAGE RESEARCH LABS COMMUNITIES

Thank you for your attention!

If you wish to know more about Co-UDlabs:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008626

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euronovia
Deltares
INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON
graie
IKT
eawag aquatic research
The University Of Sheffield.
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