



**Co-UDlabs**

Building Collaborative Urban Drainage  
research Labs communities

## Key findings from Co-UDlabs research and where to access them

JRA1 / WP 6

Smart sensing and monitoring in urban drainage

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**INSA** INSTITUT NATIONAL  
DES SCIENCES  
APPLIQUÉES  
LYON



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# JRA1 / WP 6

## Smart sensing and monitoring in urban drainage

Partners involved :

**EAWAG (CH)**

**Univ. of Sheffield (UK)**

**Univ. of A Coruña (ES)**

**Deltares (NL)**

**INSA Lyon (FR)**

**eawag**  
aquatic research ooo



 UNIVERSIDADE DA CORUÑA

**Deltares**

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## Work Package 6 – Smart sensing and monitoring in urban drainage

- **Urban drainage systems are key infrastructures in cities, but knowledge about their functioning remains poor due to insufficient and low-quality monitoring**
- **Three main tasks in WP 6:**
  - ◆ **Task 6.1:** *identify and evaluate new sensors and technologies* for hydrology and hydraulics, pollutant load monitoring, and UD underground asset inspection
  - ◆ **Task 6.2:** *define and evaluate new methods and tools* to improve evidence base for reliable and validated urban drainage monitoring data
  - ◆ **Task 6.3:** *define and evaluate new methods* to analyze and interpret urban drainage space and distributed data

# Work Package 6 – Smart sensing and monitoring in urban drainage

## ○ Task 6.1: Evaluation of sensor and new data sources for hydraulics, pollutant load monitoring and asset inspection (Lead: EAWAG)

◆ The 8 selected technologies (among a first list of 55) were distributed to WP6 partners for testing (Deltares, EAWAG, INSA, UDC, and USFD)

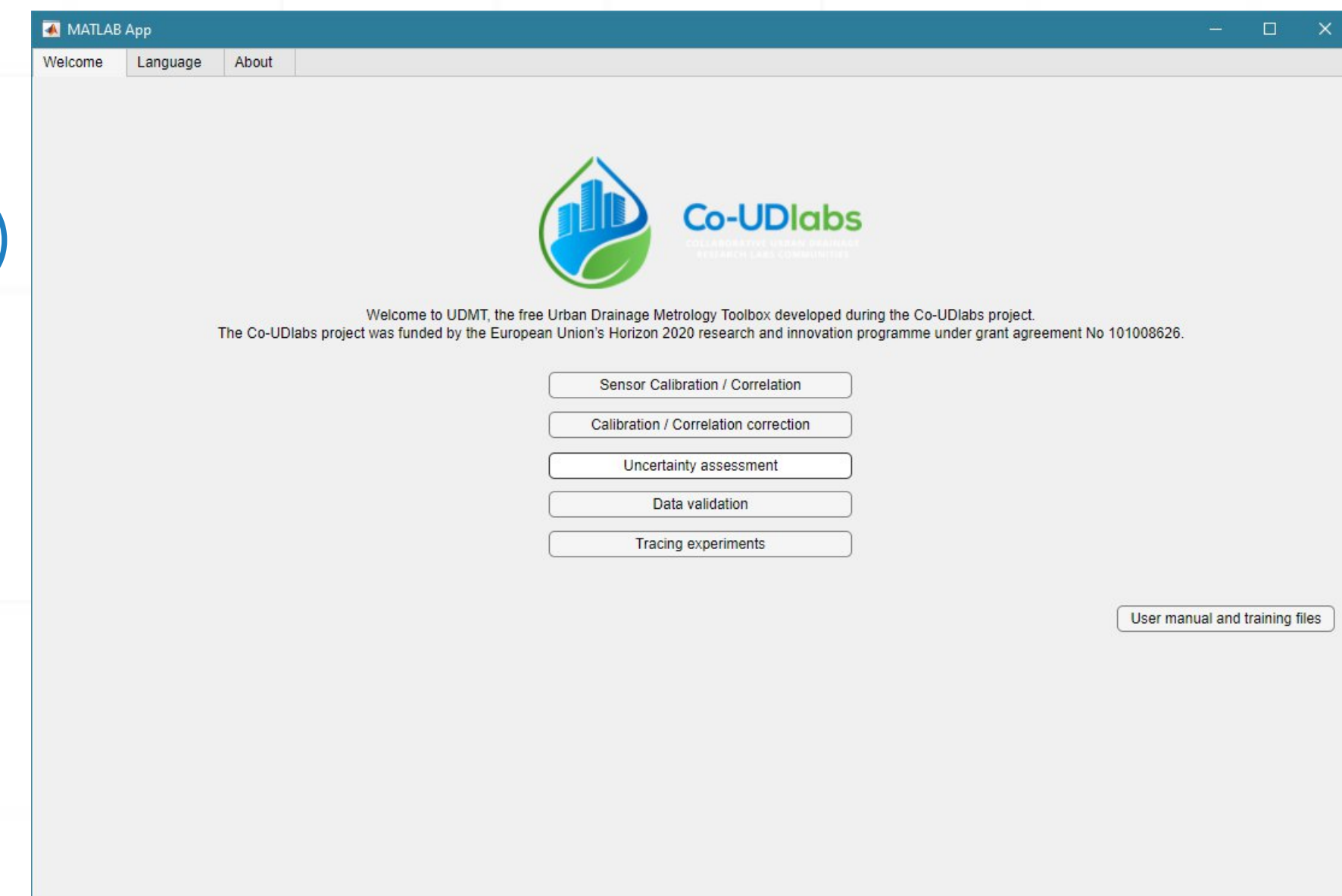
◆ Satisfactory to non-satisfactory results

| #  | Sensor name and manufacturer                           | Description   | Testing leader          | Completion |
|----|--|---|-------------------------|------------|
| 6  | Coliform (Proteus Instruments)                         | Fluorescence-based total coliforms and E. coli concentration measurement                    | University of Sheffield | 100%       |
| 7  | LPICM (in-house, EAWAG)                                | Ultra-low power sensor for the measurement of conductivity, including LoRaWanN transmission | EAWAG                   | 80%        |
| 12 | DischargeKeeper (Photrack)                             | Camera for image-based flow measurement   | University of A Coruna  | 100%       |
| 24 | ISA (Go-Systemelektronik)                              | UV-visible spectrophotometer for multi-parameter measurement                                | EAWAG                   | 75%        |
| 27 | MV.X. (Headwall Photonics)/ Pollutionkeeper (Photrack) | Hyperspectral imaging system for non-contact multi-parameter measurement                    | EAWAG                   | 90%        |
| 31 | PAH (Aquams)   | Fluorescence-based PAH concentration measurement  | INSA                    | 100%       |
| 33 | Pipe mapping FSB (in-house, Deltares)                  | Low-cost platform equipped with IMUS and top view LIDAR                                     | Deltares                | 40%        |
| 43 | Lidar Sediment Mapping (in-house, INSA)                | Lidar for sediment mapping  | INSA                    | 60%        |

**MORE INFO IN A FEW MINUTES**

# Work Package 6 – Smart sensing and monitoring in urban drainage

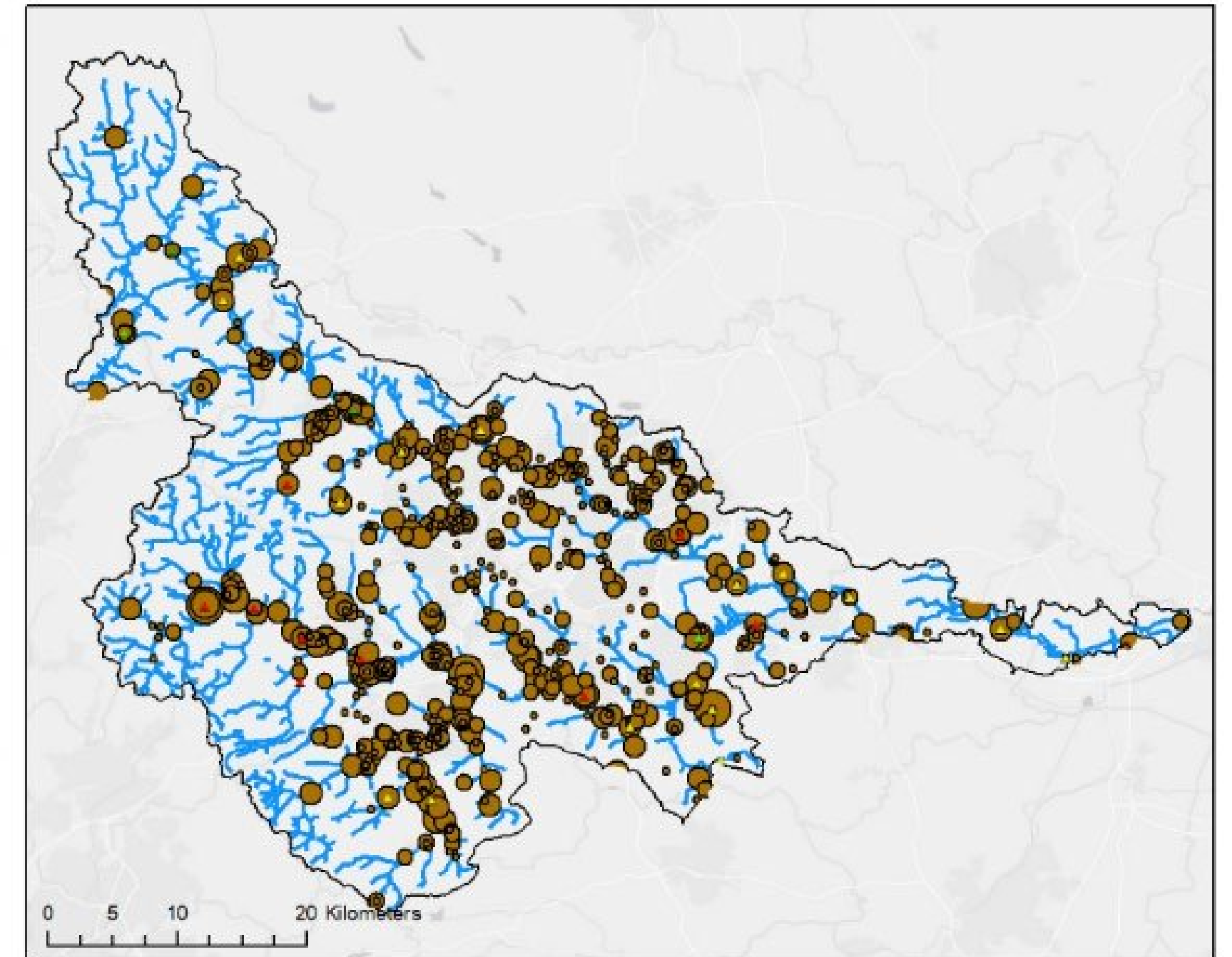
- **Task 6.2: Smart methods and tools to improve the evidence base for reliable and validated monitoring data (Lead: INSA)**
  - Task 6.2 dealt with the development of the UDMT Matlab free software tool for
    - 1. Sensor calibration / correlation    2. Calibration / correlation correction    3. Uncertainty assessment
    - 4. Data validation    5. Tracing experiments
  - The UDMT webapp is available at [coudlabs.alisonen.com](http://coudlabs.alisonen.com)
    - UDMT .exe versions have been also developed
    - Detailed user manual, with examples (online available data sets)
    - Current version 2024b, final one 2025a planned for April 2025
- Several presentations, webinars and training courses organised since 2022 :  
feedback used for debugging and improving



# Work Package 6 – Smart sensing and monitoring in urban drainage

## ○ Task 6.3: Space distributed monitoring and data interpretation (Lead: USFD)

- Analysis of spatially distributed urban drainage large data sets
- CSO data collection, regulation and performance in several European countries
- Open CSO data available in England and Wales
- Correlation analyses
- Comparison between CSOs and SuDS (data collection, regulation and performance)
- Lessons for the future



**MORE INFO IN A FEW MINUTES**

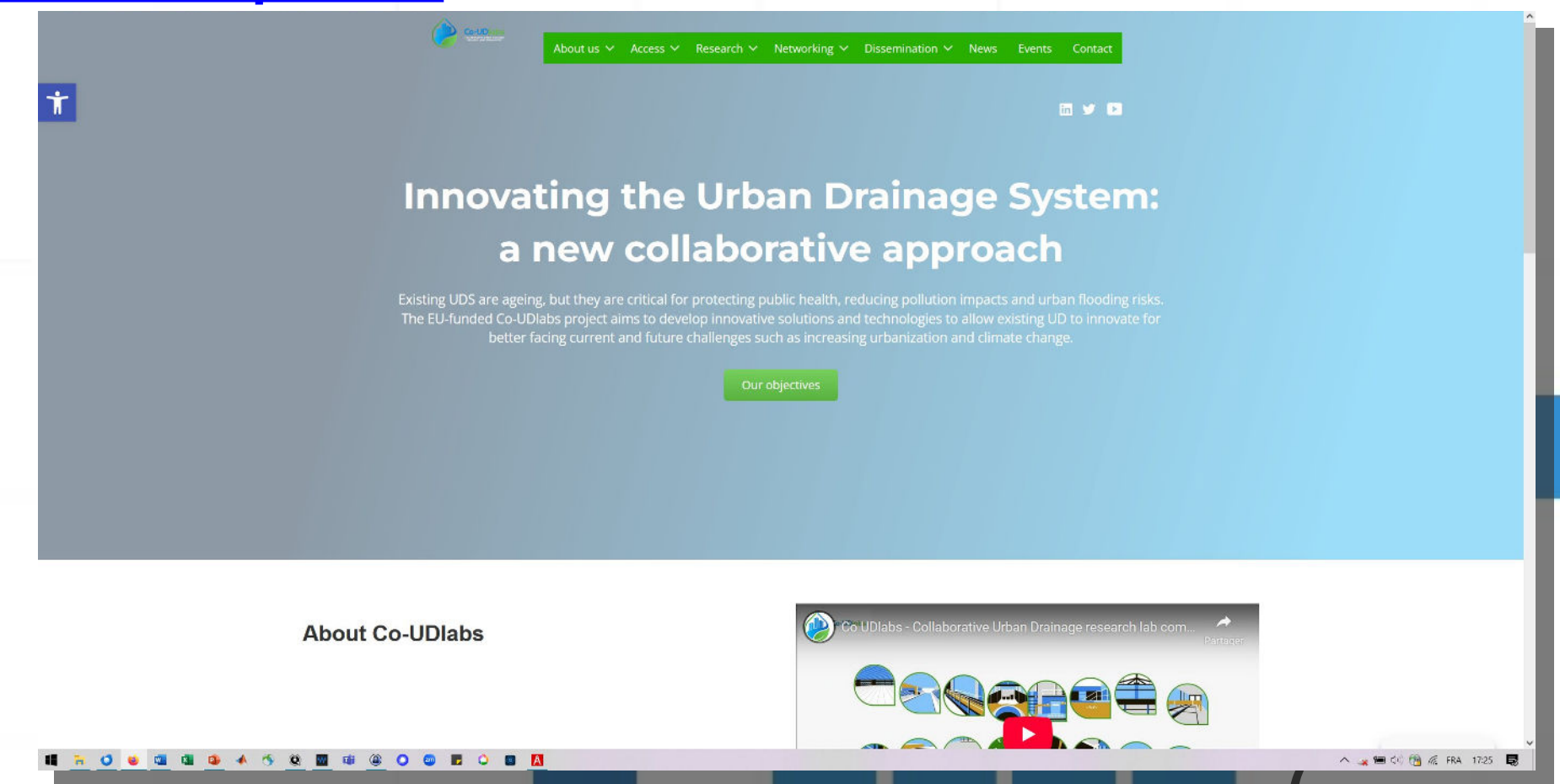
# Where and when to find the WP6 outcomes ? 1/2

## Where?

- on Co-UDlabs website at <https://co-udlabs.eu/dissemination/deliverables/>
  - Deliverables D6.1, D6.2 : sensors testing
  - Deliverable D6.3 : UDMT user manual
  - Deliverable D6.4 : Space distributed monitoring and data interpretation
- on Co-UDlabs website at <https://co-udlabs.eu/dissemination/publications/>
  - all publications
- On Co-UDlabs website at <https://co-udlabs.eu/research/tools-and-outputs/>
  - the UDMT software

## When?

- By end of the project in May 2025



# Where and when to find the WP6 outcomes ? 2/2

## Where?

- on Zenodo at <https://zenodo.org/communities/coudlabs>
  - all Deliverables, publications, reports, etc.
  - data sets
  - UDMT source codes

## When?

- By end of the project in May 2025

The screenshot displays the Zenodo website interface for the Co-UDlabs community. The header includes the Zenodo logo, a search bar, and navigation links for 'Communities' and 'My dashboard'. A message indicates that sign-in with OpenAIRE is temporarily disabled. The main content area shows the community name 'Co-UDlabs. Building Collaborative Urban Drainage research lab communities.' and a 'New upload' button. Below this, there are navigation tabs for 'Records', 'Members', 'Curation policy', and 'About'. The search results section shows 79 results found, sorted by 'Newest'. Two dataset entries are visible:

- February 14, 2025 (v1)** | Dataset | Open  
**Dataset on the impacts of sand and leaf litter on the hydrological performance of green roofs as surrogate for infiltration-based blue-green infrastructure (BGI)**  
Joshi, Prabhat; Naves, Juan; Anta, Jose; and 2 others  
This dataset comprises raw and processed data from controlled experiments to evaluate the effects of incremental sand and leaf litter accumulation on the hydrological performance of blue-green infrastructure (BGI). The experiments were conducted in a controlled indoor environment using two BGI boxes (each approximately 3.84 m²), replicating a typical infiltration-based BGI...  
Part of EU Open Research Repository, Co-UDlabs. Building Collaborative Urban Drainage research lab communities.  
Uploaded on February 14, 2025 | Published in: Data in Brief, 59, 111337, ISSN: 2352-3409, 2025. 26 views, 15 downloads
- January 17, 2025 (1.0)** | Dataset | Embargoed  
**Dynamic Behaviour of Air Pockets in Urban Drainage Systems (DAirUDS)**  
Feng, Rui-Lin; Tasca, Elias; van Batenburg, Tobias; and 2 others  
This project aims to enhance the understanding of air-water dynamics in urban drainage systems (UDS) which is crucial for improving urban flood protection infrastructure, especially under the stresses of rapid urbanization and climate change. Experiments on pump ramp-up and ramp-down were conducted in the Beta-loop facility of Deltares, a DN100 looped PVC-pipeline system...  
Part of EU Open Research Repository, Co-UDlabs. Building Collaborative Urban Drainage research lab communities.  
Uploaded on January 22, 2025. 22 views, 4 downloads

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**Co-UDlabs**

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RESEARCH LABS COMMUNITIES

**THANK YOU !**



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euronovia<sup>★</sup>

Deltares

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eawag  
aquatic research



The University of Sheffield.



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