Co-UDlabs
Building Collaborative Urban Drainage laboratories

1st Transnational Access call
Factsheet and Results

Co-UDlabs is a Horizon 2020 INFRAIA 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.

Its partners have made **17 different installations** available for free access by research groups from all over the world. Our first global call closed in January 2022 and awarded 13 proposals at 10 facilities hosted by five Co-UDlabs partners.

An overview of the awarded proposals from the 1st call

The proposals featured:

- users from **19 countries**
- **60** different **institutions**
- **96 users** accessing the Co-UDlabs research infrastructure for the first time
- **45% of users from industry**, regulators, and the private sector

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

UDC-BLOCK-Zafra

Methodology to determine the potential heavy metal loads washed-off by stormwater runoff from road-deposited sediments

Testimonial
David Santiago Hernández Medina
Environmental Engineering student

User group institution
Universidad Distrital Francisco José de Caldas (Colombia)
District Environment Secretary of Bogotá (Colombia)

Facility provider
Universidade da Coruña

> The UDC handed and instructed me in the use and analysis of instruments related to **concentration of heavy metals**, **particles analysis and in-depth flow discharges**. With that knowledge, I was able to investigate deeply **sediment and flow processes**. Finally, but not least important, I had a great team here in UDC, who helped me clear all the doubts that rose on the road and helped me moving forward with the research project.

> **My experience at the Co-Udlabs research facility was enriching**. For starters, I was able to work and learn all kinds of **sediment-flow** related concepts. Furthermore, with all the research accomplished, I was able to analyze and understand the mechanisms related to road deposited sediments and its intrinsic correlation with the leaching of heavy metals. At last, the programme, team and all the related procedures helped me fulfilling all the goals we had pointed out in the initial project plan. Hopefully, at future, this will help add/discard new theories related to leaching of RDS and heavy metals.

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- **Number of access days granted**: 60 days
- User group from **academia** and **policy makers** from Bogotá (Colombia).
- **Scientific support** on experimental design and measurement techniques (depths, flows, velocities and water quality).
- **Technical support** on samples analysis.
- Dataset and research article planned.

UDC-STREET-Bellos

Urban Flooding: Houses as reservoir (UF-HOUR)

Testimonial

Spyros Pritsis
PhD Candidate, Norwegian University of Science and Technology (NTNU)

User group institution

Democritus University of Thrace (Greece), National technical University of Athens (Greece), Norwegian University of Science and Technology (Norway), Universidad de Granada (Spain)

Facility provider

Universidade da Coruña

> "Participating in the Co-UDlabs TA gave me the opportunity to work as part of a research team outside my home institution, something that I hadn't had the chance of doing yet, being new in research. This broadened my understanding of my research topic and perspective on my field."

> "I worked at the research facility (CITEEC lab) for 2 months. During this time I had the help of professors, researchers and technicians there. I would describe my experience as fantastic. From a strictly scientific perspective, I learned a lot **about experimental hydraulics** through our collaboration, knowledge that I will use for my PhD. This stay also functioned as a crash course in a **plethora of auxiliary skills**, from adapting to a new group and communicating with the people to navigating a different university's administrative system. It should be noted that the catalyst for this positive professional experience was the friendly and supportive environment created by everyone I met at UDC."

- **Number of access days granted**: 40 days
- Researchers from 3 universities (Greece, Norway and Spain).
- **New tailored platform** with buildings built for the experiments.
- **Scientific support** on measurement techniques (depth and pressure sensors and PIV).
- **Technical support** on assembly and calibration.
- **Dataset** and research article planned.
- Numerical modelling will be performed.

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INSA-OTHU-Fuchs

In-situ SUDS modelling: simulating infiltration processes in SUDS under and extreme events

Testimonial
Katharina Fuchs
Project and research engineer, Institute for technical and scientific hydrology (itwh GmbH)

User group institution
ItwH GmbH (Germany), TU Berlin (Germany), Leibniz University Hanover (Germany), INSA Lyon (France)

Facility provider
INSA Lyon

> Participating in the Co-UDlabs TA program gave me the opportunity to conduct experiments that would not have been possible without participation. For the experiments, **a swale was equipped with soil moisture sensors and irrigated with different artificial precipitation events**. The soil moisture sensors were provided, prepared and installed by the INSA Lyon based on the project suggestions. Through the measured values obtained, it is **now possible to map the infiltration processes better and to improve existing approaches**.
> The data and findings obtained are an important basis for my further work.

> The experience at/with OTHU-SUDS has been consistently positive. The team on site consisted of research assistants, technicians and even a professor. Everyone was very helpful before, during, and after conducting the experiments, but also throughout the whole duration of the first TA program. I was even **provided with additional data from the GROOF and the weather station**. When problems arose, either because of the data, during the experiments or during the evaluation of the data the entire team was there to find solutions and to help.

- **Number of access days granted**: 3 days to install required devices and sensors.
- **Soil moisture map** will support the validation of home-made infiltration models. Collected data will also be analysed to evaluate the recovery time of the swale after the simulated extreme event.
- **An abstract** was submitted for NOVATECH and a **Master thesis** is in progress. Additional publications are expected.
- The construction of an artificial sprinkler system had been done to irrigate in situ monitored swale.

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LTF-Verhulst

Investigation of the rehabilitated waste water pressure pipes in response to pressure surges in operation IKT´s Large Test Facility (LTF)

Testimonial

Danny Verhulst
Chairman working group and Asset Management at VLARIO
Asset Manager Network at Aquafin NV

User group institution

VLARIO (Belgium), Aquafin (Belgium), KU Leuven (Belgium), Wessex Water, United Utilities, Seven Trent Water (UK)

Facility provider

IKT – Institute for Underground Infrastructure (Germany)

> “The expected outcome is very important for an upcoming problem in many countries: renovating rising mains (pressure lines) of pumping installations, without renewal. Standard rehabilitation techniques for gravitational sewers can not be used for pressure pipes, which are subject to water hammer. Within this research program, we are aiming to select, test and calculate rehabilitation liners that can withstand the pressure variations and thus may be used for rehabilitation in pressure pipes.”

> “The Large Testing Facility of IKT is very suitable for the experiments that have to be made. Not only the dimensions of the LTF but also the support from capable technicians for constructing the whole setup (testrigs, the measuring system, datalogging, ...) and analysis from IKT engineers, are very helpful in this complex matter.”

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- **Number of access days granted**: 40 days
- **Hydraulic experiments** are to show how pressure pipe. rehabilitated using Close-fit-liners behave under pressure surge loads. The current calculation approaches are to be examined.
- **Open dataset,** research articles and conference presentations are planned.

EAWAG-HALL-Langeveld

Characterization of thermal properties in sediment samples from urban drainage systems with temperature probes

Testimonial

Manuel Regueiro-Picallo
Postdoctoral Research, Universidade da Coruña
Water and Environmental Engineering Group

User group institution

TU Delft (The Netherlands), Water Board De Dommel (The Netherlands), Universidade da Coruña (Spain), Lulea Technical University (Sweden), Stockholm Vatten AB (Sweden)

Facility provider

Eawag

> "The Co-UDlabs TA Programme has been a unique opportunity to work with professionals and academics from the urban drainage sector of recognised international reputation. I discovered a new research environment during the execution of the TA project. Consequently, I could develop new research skills. The TA Programme also helped me to partially fund the experimental work of my postdoctoral research, which I have recently started. The experimental work involves costs of materials and hour of technicians that would otherwise have to be covered with funds from the host research centres. Having the support of the TA project greatly facilitated this process."

> "The use of the HALL facility was a success, as I was able to test a prototype for measuring sediment accumulation in sewer pipes by using temperature sensors. The HALL facility was versatile to design and perform the experimental campaign. I consider that the dataset obtained is of a very high scientific and technical excellence because I could test an innovative solution for sediment monitoring. I have worked with real organic samples during the experimental campaign, which were collected in the urban drainage system of Zurich."

- **Number of access days granted**: 40 days
- **Sediments** from Zurich utility (ERZ): 2 gully pots, sewer, CSO tank. Thermal characterization through active heating and sensing. Very good agreement with experiments and theory.
- **Dataset (open) and research articles** in preparation. Application to gully pots refined (energy, remote access, IoT). Preparatory work for USFD-02-ANNULAR-Regueiro.

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USFD-BURIED-Li

Hydraulic Analyses of the Toronto Exfiltration System (TES). Investigation of a novel stormwater drainage system to utilize exfiltration into the soil to reduce flood risk in congested urban areas.

Testimonial

James Li
Professor, Toronto Metropolitan University
Department of Civil Engineering

User group institution

Toronto Metropolitan University (Canada), University of Sheffield (UK), University of Siegen (Germany), University of Hong Kong (Hong Kong China)

Facility provider

University of Sheffield

> The the most relevant benefits and outcomes of participating in the Co-UDlabs TA Programme were to have access to the state-of-the-art research facility and technical support from the facility providers, resulting in research findings that are scientifically meaningful and defensible. I also received research support from the research faculty member and graduate students, resulting in research collaborations and exchanges. The multi-university researchers and students interactions will result in potential long-term research relationships.

> The Buried Cell research facility at the ICAIR, University of Sheffield, has provided a unique facility supporting my research objectives in sustainable urban drainage systems (SUDS). Not only the size of the facility but also the associated infrastructure, such as pump capacity and surrounding underground environment, have enabled me to test a full-scale hydraulic model of the SUDS. The necessary measurement sensors and recording devices are available for my research data collection. The most important research supports were the faculty member, the graduate students and the technicians.

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- **Number of access days granted:** 60 days
- Full scale system, two different types of soil condition, simultaneous hydraulic and groundwater measurement. Steady/unsteady/sediment tests.
- Dataset (open) and research articles planned. Numerical modelling performed by the user group.

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Apply to our
2nd call for Transnational Access!

Who can apply?

Researchers from academic and private institutions, Masters' and PhD students, Urban Drainage practitioners, SMEs, private sector, and public regulators

When?

Call opens from July 3, 2023, until October 6, 2023

For more information

Our Sep 6 Hackathon and Ideas Marketplace

Our TA Call information page

Get in touch with our facility providers

UNIVERSIDADE DA CORUÑA · The University Of Sheffield. · Deltares · eawag aquatic research · IKT · INSA Institut National des Sciences Appliquées Lyon · Aalborg University · graie · euronovia

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