



## Modelling Water Networks to Ensure Safe Drinking Water

Ensuring the safety of drinking water is a growing challenge as human activities, such as urbanization and land-use changes, coupled with the impacts of climate change, contribute to increased contamination of water sources. Poorer water quality often necessitates more intensive disinfection, such as higher levels of chlorination, to meet regulatory standards. However, this can result in the formation of Disinfection By-Products (DBPs)—compounds that may pose risks to human health and ecosystems.

To address this, hydraulic and water quality models were developed and calibrated using real-world data provided by **Águas de Coimbra**. These models were applied to three District Metered Areas (DMAs) in Coimbra to provide critical insights into chlorine behavior within the water distribution networks. This enables predictions about DBP formation based on chlorine concentration levels and highlights areas where action may be needed to minimize risks.



Figure 1: Hydraulic model developed in EPANET software.

The results of this work also contribute to optimizing the placement of water quality sensors throughout distribution networks, ensuring the most effective monitoring of chlorine levels and reducing the likelihood of DBPs spreading.

This work underscores the importance of advanced modelling techniques in safeguarding drinking water, striking a balance between effective disinfection and minimizing potential health and environmental risks. By working closely with key stakeholders such as Águas de Coimbra, the project demonstrates how local expertise can enhance water management strategies.



## Publication Highlight: Detecting DBPs in Water Distribution Networks

As part of Work Package 2 – Task 2.4 "*Intelligent Placement of the Sensing Infrastructure along the water distribution network*", a groundbreaking study on detecting Disinfection By-Products (DBPs) was presented on 13th November 2024 at the EnviroInfo Conference.

### Abstract Highlights:

Ensuring clean drinking water is a challenging task, particularly due to the formation of contaminants like DBPs in water distribution systems. Formed during chlorination, DBPs pose health risks but are complex to monitor due to their intricate formation mechanisms and the limited number of sensors available.

This study showcases an innovative methodology to address these challenges. Using the water distribution network in Coimbra, Portugal as a real-world case study, researchers employed advanced algorithms and strategically placed sensors to:

- Maximize DBP detection capabilities;
- Minimize the overall impact of DBPs.

### Why it matters?

This research provides a practical approach to identifying high-risk areas within water networks, making it possible to monitor environmental parameters that influence DBP formation and mitigate their impact on public health.

## Survey - Residential Water Quality

University of Leeds has created an online survey to gather information on the conditions that citizens would consider in order to improve water quality through household actions.

Any questions about the study can be directed to [e.pournaras@leeds.ac.uk](mailto:e.pournaras@leeds.ac.uk).

[Complete the survey here](#)

## LATEST EVENTS

[Water Quality Monitoring Sensors Demonstration](#)

July 2024

In July, the H2OforAll consortium gathered in Arzila, Coimbra for a hands-on demonstration of the water quality monitoring sensors developed within the scope of the project.



This event served as an important milestone, showcasing the technological advancements achieved so far. Researchers and project engineers came together to test and demonstrate the sensors' capabilities in detecting and monitoring contaminants in drinking water systems. Such practical demonstrations not only highlight the progress of the project but also reinforce the importance of collaboration and innovation in addressing water quality challenges.



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### [7th International Seminar on Aerogels](#) **September 2024**

On September 18th, Professor Luísa Durães from the University of Coimbra represented our team at the 7th International Seminar on Aerogels in Hamburg. She delivered an

### [European Researchers' Night](#) **September 2024**

Our team engaged with the community, especially the little ones, through fun and educational games focused on water science and sustainability. It was a fantastic opportunity to inspire the next generation



insightful presentation on “Amine-modified Aerogel Adsorbents for Removal of PFAS from Industrial Waters,” sharing advancements made under the H2OforAll project.



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### [CIPOA](#) **October 2024**

H2OforAll was present at the 6th International Congress on Advanced Oxidation Processes (CIPOA) in Brazil! Our team participated in this important event, sharing insights on innovative solutions for water treatment and disinfection by-products (DBPs) management.



[Read more](#)

about the importance of water quality and environmental protection.



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### [4th International Conference on Disinfection and DBPs](#) **October 2024**

The H2OforAll project was honoured to be present at the 4th International Conference on Disinfection and DBPs held in Almería, Spain. This conference provided an exceptional platform for researchers, scientists, and industry experts to exchange insights and advancements in water disinfection practices and the management of disinfection by-products (DBPs).



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## November 2024

The H2OforAll consortium gathered in Stockholm, Sweden, for its General Assembly Meeting on the 21st and 22nd of November 2024, hosted by the IVL Swedish Environmental Research Institute.

Key discussions included a review of achievements, with insights into the 1st review report presented by Project Coordinator Rui Martins (UC), reflecting on milestones achieved. Work Package leads provided updates on advanced DBP sensing technologies, risk assessment, sustainable treatment methods, and public engagement strategies. Additionally, an innovation visit to the Sjöstadsverket Water Innovation Centre showcased cutting-edge solutions in water management.



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## Winter School November 2024

The H2OforAll project proudly participated in the Winter School on Contaminants of Emerging Concern (CECs) and Disinfection By-Products (DBPs), held in Vila Nova de Gaia, Portugal. As part of the event, several key members of the H2OforAll team—including Professor Rui Martins, Professor Luísa Durães, Evangelos Pournaras, and Daniela Meilmann—actively contributed to the Co-Creation Workshop: *Future Challenges in the Drinking Water Sector - Public Engagement, Communication, and Raising Awareness*.

During the Round Table Discussion, the team engaged in meaningful conversations with participants, addressing critical topics such as DBP technologies, analytical techniques, and strategies to enhance public engagement and preventive measures in drinking water safety. This interactive session was well-received by attendees, showcasing the project's commitment to raising awareness about safe drinking water practices.



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## UPCOMING EVENTS

### Workshop: Prevention Measures and Management of DBPs

**March 2025**

This event will bring together experts, operators, and regulators from Europe and the USA to discuss risk management, monitoring technologies, water safety plans, and treatment methodologies. The event will take place in London on the 27th March 2025 (both live and remote). Registration opens in January/February 2025—don't miss this chance to collaborate and network!

If interested, please contact Daniela Meilmann ([danielame@dhvmed.com](mailto:danielame@dhvmed.com)).



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