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The successful conclusion of the Federal Ministry of Education and Research (BMBF) funding initiative INIS, part of the German flagship initiative “Zukunftsstadt” (City of the future), surely drew specialists’ attention to the fact that urban planning and urban management must be closely interconnected with water management systems, which are typically invisible. This summer’s copious rainfall caused unusually heavy inner city flooding. The painful experience of flooded streets

and cellars was also a wake-up call for the people in our temperate weather zone. New terms such as “sponge city”, which had been reserved for specialists in the Asian region, also caught the public’s imagination here, inspiring ideas about how urban runoff management could be designed for the future.

Such rain events are a problem for the country’s citizens but for us scientists and practitioners, they also point the way to a solution. As a result, we are evaluating new findings about the dynamics of capricious weather and its effects on cities. The data we generate can be used to develop measures more precise than ever before. At a minimum, we will be able to dampen the effects of future weather events.

In the current newsletter, we present new projects and current interim results from our research fields of urban systems, process innovation and digitalisation.

Edith Roßbach,
Kompetenzzentrum Wasser Berlin, Managing Director

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LATEST NEWS

Do buildings pollute urban surface waters? Project UFOPLAN BaSaR aims at deliver new insights.

Despite good water monitoring, there is only little knowledge about which pollutants can leach from urban construction and redevelopment areas possibly leading to the exceedance of environmental quality standards in urban surface waters or groundwater.

Within a three-year research contract of the Federal Environment Agency (Umweltbundesamt), a combination of product tests and on-site investigations. Based on the results of leaching tests, a monitoring program and modelings, recommendations for measures and combinations of measures contributing to the reduction and avoidance of the entry of pollutants from construction materials into the urban environment are summarized in a guideline for architects, builder and planners.

More information on our [website](#).

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KWB and Berliner Wasserbetriebe launch two INTERREG projects

Energy efficiency through the development of synergies between municipal wastewater and water management systems (REEF 2W) and the development of measures for reducing the amount of pharmaceutical residues discharged into the waters of the Baltic Sea catchment area (CWPharma).

REEF 2W is funded by the “Central Europe” Interreg programme. The Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) is the project coordinator. Eleven partners from five Central European countries – Croatia, Italy, Czech Republic, Austria and Germany – are working on the project together. REEF 2W focuses on the public infrastructures of



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ON HEAVY RAINS AND BATHING IN RIVERS

INTERVIEW WITH WOLFGANG SEIS, A RESEARCH ASSISTANT AT BERLIN CENTRE OF COMPETENCE FOR WATER (KWB) SINCE 2012.

Wolfgang Seis has an engineering degree in technical environmental protection. He is an expert on the themes of risk assessment, modelling, data analysis and water reuse.

We had the rain of the century in Berlin this summer. Was it a curse or a blessing?

If you think about the damage caused by that much rain, most people would initially consider it a curse. But to water scientists, these types of events are important. As they occur so infrequently, we can learn plenty from them. For example, we can find out how effective various rain-water management measures are or track the events' influence on the water quality in surface waters that might be used for bathing.

Ever more people want to bathe in rivers.

Can you explain that?

Berlin has a long tradition of bathing in the river – not only in the Lower Havel River and at Wannsee Lake, but in sections of the Spree River as well. Strictly speaking, swimming in the river is nothing new. However, industrialisation, urban densification and population growth have had such negative effects on the hygienic quality of the rivers near metropolitan regions that for a long time bathing in them was unthinkable.

Today, people are acting on the growing need to actively shape their own living environments when they express the desire to swim in rivers. Of course an increase in environmental awareness is another important reason. And cities themselves have realised that environmental protec-

tion, clean air, local recreational activities and sustainability are becoming ever more important factors when firms are selecting their locations. Initiatives such as the “Big Jump” event on European River Swimming Day do their part to generate positive headlines for the theme of river and lake protection.

How does the FLUSSHYGIENE research project support bathing in rivers?

First I have to explain that the water quality in rivers fluctuates dramatically. Mixed water overflows from sewage system, sewage treatment plant and rainwater discharge plus diffuse runoff from agriculture can have highly adverse effects on water quality after heavy rains. The extent to which hygienic pollutants like these disperse in a river depends on the discharge and flow conditions at the time of input. Additionally the speed of the natural self-cleaning are also important factors. The entire system is extremely dynamic, which often makes it difficult to provide robust predictions. We are trying to change the game in FLUSSHYGIENE (River hygiene). Supported by measurements at points of input in conjunction with studies on various degradation processes in rivers and lakes, we are developing deterministic and statistical models to generate better predictions.

Do you already have results from the project?

Actually, our predictions for the bathing areas along Berlin's Lower Havel are already quite accurate. With easily measured input

variables such as the river's flow velocity and precipitation – data measured at high resolution – we can already predict periods of hygienic pollution very accurately.

Are there any open questions to answer before the end of the project?

The most interesting questions deal with transferability, meaning which methodologies, approaches and opening strategies can be transferred to other rivers and lakes in which form. This is why we are also studying five other rivers (Isar, Ilz/Danube, Rhine, Moselle and Ruhr) in the project. By comparing these very different river systems, we hope to make it possible to bathe in other rivers.

Interview by Bodo Weigert



FLUSSHYGIENE is a three-year joint project that kicked off in June 2015. Its mission is to develop instruments for predicting sudden incidents of hygienic pollution and its dispersion in rivers. The objective is to develop predictive instruments and early warning systems for lakes and rivers in which people bathe that can be used nationwide. The studies will be carried out on the Spree, Havel, Ruhr, Rhine, Moselle, Ilz/Danube and Isar rivers. In Berlin, the project will also test whether other sections of the Spree are suitable for bathing. Coordinated by the Berlin Centre of Competence for Water, the FLUSSHYGIENE project is part of the Federal Ministry of Education and Research “Regionales Wasserressourcen-Management für den nachhaltigen Gewässerschutz” funding initiative in the “Nachhaltiges Wassermanagement” (Sustainable water management) funding focal area. A total of ten partners from wastewater disposal firms, research institutions, universities, associations and authorities are involved in the project.

bmbf.nawam-rewam.de/projekt/flusshygiene/

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WATER RESEARCH IN BERLIN AND BRANDENBURG



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Research data management for small research facilities

Research data management comprises all activities related to the processing, storage, archiving and publication of research data. The importance of research data management has grown immensely in recent years due to the large amount of data generated in the course of digitisation and automation.

Their administration and processing can hardly be managed with the existing tools. This applies in the same way to data generated in the field of water research.

At Kompetenzzentrum Wasser Berlin gGmbH (KWB) a large number of data are processed within the scope of research projects which are either collected by KWB itself or made available by project partners. These include metrics, metadata, photos / videos, inventory and state data, and processed data (e.g., time series, aggregated values, computer simulations results). In order to make such data available, usable and processable, standardised processes, tools and methods are to be developed that ensure the reproducibility of the results across the entire project.

The **FAKIN project** aims to develop a suitable research data management scheme for small research institutions like KWB. Thus, the project serves as a transferable case study for research data management to be applied at small but linked-up non-university research institutions. ●

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Recovery of cellulose and biopolymer from wastewater Pilot plants in EU project SMART-Plant started

Municipal wastewater contains valuable substances such as organic matter, nutrients, and cellulose, which will be recovered and valorized in the EU-funded project SMART-Plant (www.smart-plant.eu).

A filtration process for raw wastewater was commissioned at the wastewater treatment plant Geestmerambacht in the Netherlands, which will extract up to 400 kg per day of cellulose from the water that can be valorized in the construction industry or as an additive to composite materials. At the same time, the cellulose extraction will improve the performance at treatment plant, where the fibres can cause operational problems and have to be disposed with the sludge. The wastewater treatment in Manresa/Spain follows another approach: specific bacteria are enriched during biological treatment of wastewater with a dedicated control strategy to produce biopolymer (PHA) from the organic matter of wastewater (**Demo-video:** https://youtu.be/-nE7N_tZOQk).

This specific bacterial sludge can be separated after treatment to extract the biopolymer. PHA is a raw material for many products in the chemical industry, and can also be used together with recovered cellulose to form bio-composite materials. In the course of the project, KWB will apply Life Cycle Assessment to evaluate the environmental impacts and benefits of these approaches for material recovery from wastewater. ●

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Advanced wastewater treatment with OZONE – Development of an innovative instrumentation and control engineering concept ([project MeReZon](#))

Recent years have seen numerous studies and research projects to determine the extent to which trace substances can be removed from sanitation wastewater and urban runoff. They have shown that using ozone or activated carbon for that purpose is a technically feasible and economically sound option. Currently, systems for supplementing the processes in sewage treatment plants with ozoning are being planned and built at various sites in Germany and Switzerland.

Advanced wastewater purification with ozone requires a fully developed strategy for controlling or regulating the ozone injection into the medium to be treated. Both under- and over-dosages can be expected as a result of the fluctuating content of ozone-depleting substances. In practice, this type of regulation strategy has only been tested in isolated cases. In particular, the reliability of online meters posed clear challenges to the operators of pilot systems for ozoning. An optimised, stable measurement and regulation concept that can be implemented in systems at full scale is urgently required.

The **MeReZon** project was initiated to develop an innovative instrumentation and control engineering concept that enables sustainable, optimal, needs-based ozone dosing in sewage treatment plants. TriOS GmbH (responsible for measurement technology and project coordination), KWB (responsible for developing the control/regulation concept) and Berliner Wasserbetriebe are the partners who will implement the two-year project. The funding initiative of the Federal Ministry of Education and Research "KMU-innovativ" SME is funding the project. ●

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cities and communities. Its objective is to develop and apply new processes that energy efficiency and increase the use of renewable raw materials. The project's strategy is to pinpoint and develop synergies between urban wastewater and organic waste management systems.

A beneficiary of the "Baltic Sea region" Interreg programme funding, **CWPPharma** is coordinated by the Finnish Environment Institute (SYKE). A total of 15 partners and 18 associated organisations from seven countries located on the Baltic Sea, including Belarus, are involved in the project. The project's main objective is to reduce the

amount of pharmaceutical residue introduced into the waters of the Baltic Sea catchment area. First, the substances and their input routes will be identified in a comprehensive screening process. Pilot tests in Kalundborg (DK), Linköping (SE), Helsinki (FI) and Berlin (DE) will be run to find out the most promising options for reducing the pollutants identified. The results will be presented directly to policy makers, authorities and communities as an aid for the development of appropriate measures. ●

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EVENTS

Meet us at the following upcoming events:

8 November 2017 (only in German)

Seminar: Rainwater management and treatment

Venue: Magdeburg

Organiser: German Association for Water Management, Wastewater and Waste (DWA), Regional Group North-East

→ [Informations](#)

8 November 2017 (only in German)

Maintenance strategies for wastewater companies – optimization with asset management methods!

Venue: Gelsenkirchen

Organiser: Institute for Underground Infrastructure (IKT)

→ [Informations](#)

22–23 November 2017 (only in German)

5th Inspection and restoration days

Venue: Dortmund

Organiser: German Association for Water Management, Wastewater and Waste (DWA)

→ [Informations](#)

28 November 2017

43th Berlin Water Workshop: Ozone application in wastewater treatments

Venue: Berliner Wasserbetriebe, Company Headquarters

Organiser: Kompetenzzentrum Wasser Berlin

→ [Informations](#)

28–29 November 2017

International Workshop on Wastewater Management in the Danube River Basin

Venue: Bucharest (Romania)

Organiser: International Commission for the Protection of the Danube River (ICPDR)

→ [Informations](#)

29 November 2017

Blue Planet Water Dialogues: Driving Energy and Resource Efficiency in the Water Sector

Venue: Berlin, Berlin Museum of Medical History

Organiser: German Water Partnership (GWP)

→ [Informations](#)

10–13 December 2017

8th International Young Water Professionals Conference

Venue: Cape Town (South Africa)

Organiser: International Water Association (IWA)

→ [Informations](#)

28 February – 2 March 2018 (only in German)

Water management Workshop Q/1: Drainage concepts and restoration planning

Venue: Kassel

Organiser: German Association for Water Management, Wastewater and Waste (DWA)

→ [Informations](#)

8–9 May 2018 (only in German)

Regional Water Resources Management for Sustainable Protection of Waters in Germany (ReWaM); final event of the joint research program of the federal ministry of education and research (BMBF)

Venue: Berlin

Organiser: ReWaMnet, Federal Institute of Hydrology (BfG)

→ [Informations](#)

KEY READS



Wasserinfrastrukturen für die zukunftsfähige Stadt – Beiträge aus der INIS-Forschung (Water infrastructure for future-proof cities - Articles from the INIS research project)

Publisher: Deutsches Institut für Urbanistik gGmbH (Difu), 2017

→ [Download \(in German only\)](#)

This publication provides a comprehensive overview of the research findings of the Federal Ministry of Education and Research (BMBF) funding initiative "INIS - Intelligente und multifunktionelle Infrastruktursysteme für eine zukunftsfähige Wasserversorgung und Abwasserentsorgung" (Smart and multifunctional infrastructural systems for sustainable water supply, sanitation and stormwater management) as part of the "Zukunftsstadt" (City of the future) flagship initiative. In the period between 2013 and 2016, a total of 13 research projects with a funding volume of €33 million examined a wide range of municipal water management themes. The research projects were conducted in a spirit of close collaboration between different disciplines in science, academia and practice. Municipalities, municipal institutions and firms actively participated in all of the projects, ensuring that their concerns were also appropriately addressed.

The over 300-page document provides municipalities and associations, supervisory authorities, engineering offices and policy makers with much food for thought on how integrative approaches can be used to systematically tackle the water management challenges of the future. ●

about us

Through network activities, the KWB strengthens Berlin's position as an international centre in the field of water economy and technology. Its associates are the Technologiestiftung Berlin, the Berliner Wasserbetriebe and the Berlinwasser Holding. Partners and actors are scientific facilities, public institutions, companies as well as multipliers from public and private sectors.

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