

EDITORIAL

During the international trade fair and congress WASSER BERLIN INTERNATIONAL taking place from 23 to 26 April 2013, Berlin will be the central stage for the presentation of cutting-edge water technologies and recent trends in water resources management. The linking of trade fair and congress provides for high quality information which is worldwide unique. As a member of the Programme Committee, KWB was actively involved in the organisation of this important meeting of the water scene. Like all other contributing partners, we are confident that this event will be a complete success. We would be pleased to welcome you at the joint stand of the Berlin-Brandenburg water sector in Hall 2.2 (stand 200). If you are interested in the recent trends and developments in wastewater treatment, you should not miss the technical symposium of KWB. Ten experts will present the state of the art of trace organic removal as well as energy and nutrients recovery from wastewater. In addition, we will address rain water issues in the scope of another "Talk of the Town" to be held on 25 April at the fair. On this occasion, committed Berlin citizens will discuss the impacts of rainwater on Berlin's River Spree. WASSER BERLIN INTERNATIONAL is definitely worth a visit!

Andreas Hartmann
Kompetenzzentrum Wasser Berlin, Geschäftsführer



Photo: Veolia | Maria Fels

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LATEST NEWS

Photos bwb, veolia wasser (u.l.)



Phosphorus Recycling in Berlin?

Without phosphorus, life would not exist. This is also the reason why phosphorus is one of the basic components of fertilisers. The average daily phosphorus intake in Germany amounts to roughly two grams per person. Any excess phosphorus absorbed by the body is excreted and finds its way to the wastewater treatment plant. Since phosphorus as a strategically important element is sold on the global market at increasingly high prices, its recovery from wastewater is most essential.

As one of the first German Federal Länder, Berlin has integrated the recovery of phosphorus in its waste management concept. In the scope of a recently launched project all phosphorus streams will be identified, balanced and investigated in terms of their recoverability. The data collected will facilitate the development of realistic targets towards the implementation of phosphorus recovery in Berlin. The project is being financed by the Land Berlin and the European Union in the scope of the Berlin Environmental Relief Programme (UEP II).

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SpreeCity – Improving Public Participation in Water Affairs



Bundesstiftung Umwelt and Berlin's water utility Berliner Wasserbetriebe support a project aiming at improving public participation and environmental communication with regard to the Berlin River Spree.



The task force comprising representatives of the civil society, environmental associations, academia and industry, commits itself to increasing awareness of the sustainable use of Berlin's water resources. Corresponding campaigns and initiatives are to draw the public attention to the River Spree. A series of technical discussions, information events and other activities will be performed along the Spree waterfront in 2013 spotlighting the river's role for humans, flora and fauna. Topics relating to both *water quality* and *urban development*

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Reinhard Hinkelmann (50) studied constructional engineering at the University of Hanover and gained a *venia legendi* at the University of Stuttgart. He has worked since 2004 at the TU Berlin. His special field is numerical modelling of flow and transport processes in surface waters and underground systems.

MODELLING HYDROSYSTEMS

Interview with Prof. Reinhard Hinkelmann, Chair of Water Resources Management and Hydrosystem Modelling at Technische Universität Berlin

Reinhard Hinkelmann, when and how did you discover your fascination for flowing water?

Well I came to it by a roundabout route. My great grandfather, grandfather and father had a building company in Hamm (near Dortmund, the Bundesliga football champions!), so naturally I first studied constructional engineering and learnt all about how to build houses, bridges, etc. It was particularly interesting for me, studying in the 1980s, to experience the introduction of computer systems, data processing and the associated numerical methods (e.g. FEM). As a graduate I realised that it might be worthwhile to transfer my knowledge and interests to the field of water and the environment, in particular because the computer-based methods were not yet so well developed there. Looking back now over a career of more than 20 years, that was exactly the right decision, and there are still many fascinating questions to be answered in the field of hydrosystem modelling.

At the Technical University of Berlin you hold the Chair of Water Resource Management and Hydrosystem Modelling. What are the focal points of your teaching?

We focus on providing courses for undergraduate and graduate students of constructional engineering. Topics include for example flow mechanics, hydraulic engineering, hydrology, water resource management, and hydrosystem modelling. I am pleased that the master's degree courses, which are mostly given in English, and also bachelor's degree options are now developing a really interdisciplinary character, and about half the students attending are from other subjects such as environmental engineering or applied geosciences. Many of the courses are now also given in the water engineering course at the new TU Campus in El Gouna, Egypt.

Which research topics are you particularly enthusiastic about? Can you tell us about research highlights in your career?

Our main research priority is hydrosystem modelling. This is a basic research approach which deals with the simulation of flow and transport processes in natural and technical hydrosystems. Our focus here is on surface waters and underground systems (groundwater, two-phase flows in porous media), and especially in areas for which we have developed our own models. Of course, in addition we also work with free and commercial models. I find two things particularly interesting: Firstly, the calculation of flows in natural systems, and secondly transferring methods and concepts to other applications. Let me illustrate that second point. Today we use surveying methods which are continually improving, e.g. remote surveying, scanners, etc., and which make it possible to describe the geometry and the properties of hydrosystems better and at increasingly high resolutions. This makes it possible for us to take methods which have been tested in certain areas and transfer these to applications in other areas. For example, we take methods from running water modelling and apply these for modelling the run-off of rainwater, in order to gain the additional knowledge from the surveying methods. However, we have to further develop our models so that they function reliably.

As a highlight of my research work so far I would like to name the association projects that I have coordinated. These include for example the DFG Research Group "Grosshang" (8 sub-projects), which has been addressing the modelling of flow and deformation processes on mountain slopes, and the on-going UEP Panke Project (6 partners), which is dealing with renaturation measures in some areas of the River Panke in Berlin.

One of your strengths is your interdisciplinary cooperation with colleagues. There were recent reports that a "Water Team" has been established at the Institute of Civil Engineering. Is there some special sort of team spirit here?

The Water Team you refer to also includes my colleague Prof. Matthias Barjenbruch (Department of Urban Water Management), and the Honorary Professors Sieker (Urban Hydrology; Ingenieurgesellschaft Prof. Dr. Sieker mbH, Hoppegarten) und Moser (Quantitative Gewässerkunde; German Federal Institute of Hydrology, Koblenz). Matthias Barjenbruch and I are very pleased that we have been able to attract such dedicated and qualified specialists for the water sector at the TU Berlin. There really is a very positive and inspiring team spirit and this has already led to very good cooperation in teaching and very intensive cooperation in research. One outcome is the initiation of various joint research projects, e.g. BMBF-Project Spree2011, UEP-Project Panke, or Climate-KIC-Project Blue-GreenDream.

What topics should researchers concentrate on in the near future in your opinion? What contributions can your Chair make?

In the coming decades, I think that interest will focus increasingly on urban water management, and that we will see fundamental changes in management strategies for a variety of reasons (e.g. climate, demography, new water technologies). Natural and technical interfaces between compartments and sub-systems (e.g. ground water – surface waters, rain water – urban soils, river-bank filtration) play a key role in urban water cycles, but there are a number of deficits in our understanding of interface processes and flows. In my view, Berlin is an ideal location for basic research aimed at making good some of these deficits through close cooperation between engineers and natural scientists, and hydrosystem modelling has an important contribution to make. ●

*Thank you very much.
Bodo Weigert asked the questions*

WATER RESEARCH IN BERLIN AND BRANDENBURG

Scenario Modelling of Combined Sewer Overflows in Berlin

Despite the wide range of technical measures implemented already, it is not possible to completely avoid the discharge from combined sewer systems into the river Spree. For this reason, the decision makers of Berlin's water utilities are challenged to develop enhanced retention measures taking into account a well-balanced costs-benefit ratio involving also ecological benefits and user interest.

In the scope of the MIA-CSO project, a planning instrument for the assessment of CSO impacts on receiving waters was developed, validated and tested within the conditions of different sewer management and climate change scenarios. The instrument couples the urban drainage model InfoWorks CS, the river water quality model Hydrax/QSim and an impact assessment tool. The scenario analysis demonstrates the sensitive behaviour of the models in terms of different parameters (temperature, rain intensity, existing storage volume etc.). In comparison to the reference year 2007 featuring high rainfall intensity, the storage extension measures planned until 2020 will cause a decline of the CSO volume by 17% and of the polluting loadings by 21-31%. Also critical DO conditions will occur less frequently (-33%).

The planning instrument will soon be delivered to the decision makers for further use. Detailed information will shortly be available on the [MIA-CSO web site](http://mia-cso.com). ●

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CSO structures at River Spree

Online Database Providing Examples of Adaptation Measures to Climate Change

In the framework of the FP7 EU-project PREPARED, KWB has completed a database of adaptive initiatives of the water sector to face climate change impacts.

PREPARED is an end-user driven research and demonstration project involving

12 European cities, two cities from Australia and the United States and more than 20 research partners throughout Europe.

The volume of the four-year project amounts to approx. 11 million €. Together with KWR and DHI, KWB is responsible for the scientific coordination of the project.

In the scope of its work areas, KWB has completed an on-line tool to browse a database of initiatives for the adaptation of the water sector to climate change. The web based database is an information tool specially developed for operators and decision makers of water utilities. Several search tools facilitate the way through more than 200 examples of initiatives.

The "Adaptation Initiatives Matrix" website is available at <http://aim.prepared-fp7.eu> ●

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Hybrid Processes for Tertiary Wastewater Treatment

The EU Water Framework Directive calls for improved tertiary waste water treatment. Referring to Berlin's water bodies, the phosphorus removal rates will have to be significantly increased.

In the scope of the OXERAM project several promising methods such as micro-sieving and membrane filtration aiming at effluent concentrations for phosphorus in the range of 50 to 120 microgram per litre were tested at the wastewater treatment plant Berlin-Ruhleben.

The life cycle assessment and economic evaluation of the processes identified two favourites for the advanced phosphorus removal: dual media and micro-sieve filtration. Both systems achieve effluent rates for total phosphorus below targeted value of 80 microgram P per liter.

The project has been financed by the Berlin Environment Relief Programme (UEP-II) since January 2010 and received

additional financial support by Berliner Wasserbetriebe and Veolia. Detailed results will soon be published on the [OXERAM project website](http://oxeram.com). ●

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Treatment pond at former sewage irrigation field Berlin-Hobrechtsfelde

Eco-engineering for Advanced Wastewater Treatment ?

Despite the high cleaning performance of modern wastewater treatment plants (WWTP), effluents can cause adverse effects in receiving surface waters due to elevated levels of nutrients and micropollutants. The ECOTREAT project aims at analysing the potential of eco-engineering systems for advanced treatment of wastewater effluent with focus on the reduction of micropollutants.

Natural treatment systems, e.g. different wetland types, artificial meanders, treatment ponds or floating islands, could be a cost-efficient alternative to technical methods for advanced treatment of wastewater effluent. Promising studies demonstrate that constructed wetlands are also capable to reduce the concentration of pharmaceuticals, personal care products and pesticides in WWTP effluent. In addition, eco-engineering systems facilitate further nutrient reduction, have a positive impact on landscape ecology and are well accepted by the public. During the first project phase, a literature review on the current scientific knowledge is being compiled and strategies for filling identified knowledge gaps are being developed. ●

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>> continuation of page 1 (Spreecity)

will be presented for the first time under one umbrella.

Shape and water quality of the River Spree are the result of Berlin's development, but they do not correspond to the aims of nature conservation and water resources protection. Which quality objectives can be defined taking into account the current water quality of the Spree? Which desires and needs have to be considered or to be rejected? And is there enough room for manoeuvre for concrete action in the public as well as in the private sphere?

The current level of public access to the waterfront and the way how the waterfront land is used nowadays is a result of the historical development of the City. The urban course of the river has been constantly confined and consequently there is only poor public awareness of its benefits. What is the role the River Spree plays for the city today? How to define waterfront goals and objectives? To what extent does the urban environment influence the river? To resolve these questions, four events in the scope of the discussion series "Water as Talk of the Town" will be organised in 2013. In addition, various activities by the river-side will be carried out in cooperation with existing initiatives.

The project is organised by "Stiftung Zukunft Berlin" and funded by Deutsche Bundesstiftung Umwelt and Berliner Wasserbetriebe.

www.wasser-bewegt-berlin.de

FOCUS

Geological CO₂ Storage and Other Emerging Subsurface Activities – Catalogue of potential impacts on drinking water production

Authors: Wolfgang Seis, Matthias Staub, Luc Massat, Gesche Grützmaier (Kompetenzzentrum Wasser Berlin); Lutz Thomas, Thomas Taute (Freie Universität Berlin)

Report of COSMA project carried out by Kompetenzzentrum Wasser Berlin, 39 pages, Document available online



Geothermal energy production is regarded as a clean alternative to fossil fuels. In contrast, other subsurface activities like geological CO₂ storage and the exploitation of unconventional gas via hydraulic fracturing (Fracking) are controversially discussed. Irrespectively of the public discussion all named technologies interfere with the natural subsurface and might

EVENTS

23-26 April 2013
WASSER BERLIN INTERNATIONAL – Trade Fair and Congress for Water and Wastewater
www.wasser-berlin.com



23 April 2013
Symposium „Innovative Water Technologies“ at WASSER BERLIN INTERNATIONAL
 Organiser: Dutch Embassy
 Venue: ICC Berlin, Messedamm 22, Roof Garden Foyer
Programme
 Registration: BLN-len@minbuza.nl

24 April 2013
Trends and Developments in Wastewater Treatment – Trace Organics Removal and Recovery of Energy and Nutrients
 Organiser: Kompetenzzentrum Wasser Berlin and WASSER BERLIN INTERNATIONAL
 Venue: Fair Grounds Berlin
www.wasser-berlin.de/KongresseUndEvents

25 April 2013, 5–9 pm
Bringt Regen immer Segen? Impact of rainwater on the Berlin River Spree and options for action
 Discussion series "Water as Talk of the Town" at WASSER BERLIN INTERNATIONAL
 Organiser: Stadtgespräch Berlin
 Venue: Messe Berlin, Halle 5.2 WASSERLEBEN
<http://stadtgesprach-berlin.de/home>

23-27 June 2013
NOVATECH 8th International Conference on Planning & Technologies for Sustainable Urban Water Management
 Organiser: GRAIE (Rhône-Alps Research Group on Infrastructure and Water)
 Venue: Lyon, Frankreich
www.novatech.graie.org



25-28 June 2013
13th World Congress on Anaerobic Digestion: Recovering (bio) Resources for the World
 Organiser: University of Santiago de Compostela, IWA
 Venue: Santiago de Compostela, Spain
www.ad13.org

negatively impact groundwater and thus drinking water resources. Report D1.1 of the project COSMA-1 gives an overview of potential negative impacts on shallow aquifers related to the named subsurface activities.

18-23 August 2013
16th International Conference on Diffuse Pollution and Eutrophication
 Organiser: RCEES, CAS, IWA
 Venue: Beijing, China
<http://dipcon.rcees.ac.cn>

28-30 August 2013
SPN7 – 7th International Conference on Sewer Processes & Networks
 Organiser: Pennine Water group, IWA
 Venue: The Edge Conference Centre, Sheffield
www.shef.ac.uk/spn7/home



4-5 November 2013
DWA Seminar Water-ReUse
 Organiser: German Association for Water, Wastewater and Waste
 Venue: Brunswick, Germany
www.dwa.de

6-7 November 2013
4th International Symposium Re-Water Brunswick
 Organiser: SE|BS Stadtentwässerung Braunschweig GmbH, together with the Institute for Urban Water Management of TU Braunschweig, Kompetenzzentrum Wasser Berlin and Wastewater Association Brunswick
 Venue: Municipal Hall Brunswick, Germany
www.se-bs.de

about us

The Berlin Centre of Competence for Water (Kompetenzzentrum Wasser Berlin, KWB) is a public-private partnership company. Its associates are the TSB Technologiestiftung Berlin, the Berliner Wasserbetriebe, the Berlinwasser Holding and Veolia Wasser. The KWB stands as a network node to strengthen the position of Berlin as an international centre in the field of water economy and technology. Partners and actors are scientific facilities, public institutions, companies as well as multipliers from public and private sectors.

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