

## EDITORIAL 2/2012

Dear reader,

This year sees the 20<sup>th</sup> anniversary of the so-called “Earth Summit” in Rio de Janeiro. After the end of the Cold War, representatives from 178 countries came together twenty years ago in a mood of euphoria in order to formulate developmental and environmental programmes and policies to tackle the new tensions between rich and poor countries, and the North and South. The Agenda 21 action programme also introduced the slogan “Think globally – act locally” for sustainable development.

Despite these wide-ranging international initiatives, scientific studies unfortunately suggest that the situation for humans and for nature has meanwhile got worse rather than better, particularly in the world's oceans and along the increasingly densely populated coasts. The media and environmental organisations have rated the recent Rio+20 Conference of the United Nations as a failure, because the international community of states was only able to reach vague agreements on adapting sustainability goals to meet the demands of the current situation.

We are convinced that the goal of sustainable development adopted twenty years ago was the right one and must be pursued further. The increased consideration of energy and material cycles – which are particularly important in the field of water management – has been a direct consequence of the Agenda 21. Irrespective of new political declarations, we remain committed to directing our research towards the objective of sustainable water management. This includes the development and optimisation of processes for the recovery of energy and nutrients in wastewater treatment as well as energy optimised water supply or rainwater harvesting measures. With the aid of Life Cycle Assessments we are now in a position to measure the potential sustainability of new solutions. Of course the economic viability of new technologies is also investigated, because however attractive they may seem, new solutions also have to be affordable!

Andreas Hartmann  
Berlin Center of Competence for Water, Managing Director

## LATEST NEWS



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### KWB Goes Public

The presentation of water research topics and their discussion with the interested public is an important mission of KWB. This summer KWB took part in the Berlin events “Long Night of the Science” and “Long Day of Urban Nature” by organising exhibitions and experiments in the fields of groundwater management and wastewater engineering. The Technical University of Berlin, House of Water, and the nature conservancy centre Naturschutzzentrum Ökowerk were our cooperation partners during these activities. The positive feedback of the visitors has reinforced our decision to contribute again next year. Our commitment is stimulated by KWB's favourable work environment which is also underlined by our recent staff outing to the Spreewald region and our participation in this year's corporate team relay getting place 75 out of competing 4329 teams.

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## Optimisation of Sludge Dewatering in Municipal Wastewater Treatment Plants

KWB launches project Decamax



*Sludge treatment and disposal still remain one of the key positions of operating costs in large municipal wastewater treatment plants. In particular, sludge dewatering through centrifuges has a major impact on the operation costs.*

Decamax started in spring 2012. This project focuses on the optimisation of dewatering steps in sludge treatment. Several options will be analysed systematically through theoretical and practical investigations. Center of attention is the optimisation of the centrifugation process with various accompanying steps like sludge pre-heating with excess heat, floc formation prior to centrifugation and further operating parameters. In addition, alternative dewatering techniques and concepts will be reviewed in the scope of a feasibility study. The trials are performed at four different WWTPs. The ISWW Institute of

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## NEWS FROM THE KWB NETWORK OFFICE

„Water moves Berlin“ – The series of public discussions stimulates the dialogue on Berlin's Water Management

Two years ago, people from different Berlin institutions committed themselves to introducing water-related topics to the general public by organising public discussion meetings. This series of events aims to give the citizens a better understanding of the complex interactions in the field of water management and provide them a platform to express their own ideas and views about

the proper handling of water resources. In the meantime, seven events have taken place, which have received a very positive response. Each discussion meeting was dedicated to another issue and aspect: water management and climate change, water policy in Berlin, water engineering, water tourism and nature conservancy, urban development and water, water in the inter-

national sustainability policy. The initiative is supported by a group of representatives of civil society, nature conservancy associations, business, science and public administration. From its beginning, KWB has contributed to the preparation and organisation of this series of event. The individual meetings are documented on the initiative's website [www.stadtgesprach-berlin.de](http://www.stadtgesprach-berlin.de) ●



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## RESEARCH ON SUSTAINABLE GROUNDWATER MANAGEMENT

### Interview with Dr Gesche Grützmaker, head of department since 2007

*Gesche Grützmaker studied hydrogeology at the Technical University of Berlin and received her PhD degree at Freie Universität Berlin in 1999 with a thesis on groundwater quality improvement in the vicinity of former opencast coal mines.*

*Gesche, you have been working at KWB for more than ten years now,*

*leading the work area "Groundwater" since then. Can you give the readers a brief summary of your education and professional background? What were your reasons for joining KWB?*

During my PhD-thesis, I was working at the Niedersächsische Landesamt für Bodenforschung (Lower Saxony State Office for Soil Science) in Hanover for a joint research project of the Geological Services which mainly focused on the improvement of groundwater quality in the vicinity of former opencast coal mines. After my graduation in 1999, I joined the German Federal Environment Agency (UBA). For seven years, I was involved in different research projects dealing with the retention of cyanobacterial toxins during subsurface passage which were carried out at the Artificial Stream and Pond System situated in Berlin-Marienfelde. Besides lab tests and field surveys, I mainly gathered experience with field-scale experiments. One of these projects was the KWB project NASRI, where I cooperated with KWB for the first time. It therefore wasn't difficult for me to decide for joining KBW when I was offered the head of the Groundwater Department in the course of its reorientation in 2007.

*In view of its research activities, KWB has always been guided by issues related to the practical implementation of results. What are the particular challenges in the field of groundwater resources management?*

In Germany, groundwater is the most important drinking water resource, in Europe 75% of the drinking water supplies come from groundwater sources, because it is well protected and very safe. Although the

construction of wells and the operation of pumps require considerable expenditures, this method proves to be profitable compared to the direct surface water abstraction, because expensive drinking water treatment e.g. by means of activated carbon or chlorine is avoided this way. Nevertheless, there are some important tasks the water suppliers will have to tackle. This concerns above all the protection of the resource against novel or recently identified risks like organic trace substances, pathogens and subsurface activities like CO<sub>2</sub> storage, and of course also the efficiency increase with regard to resources and energy consumption.

*Are there any priorities in this field which have been developed in recent years?*

Yes – starting from the work on bank filtration we have tried in the course of the EU-funded projects TECHNEAU and SAPH PANI in India together with our research partners from both the Technical and the Freie University of Berlin to transfer the principle of the natural drinking water purification process to other situations. On the other hand, we have developed several options to optimise these processes in terms of substances retention through ozone pre-treatment in the course of our projects OXIREN and OXIMAR.

In addition, we have given a great deal of attention to the optimisation of well operation. Together with the Berlin Universities, we have conducted comprehensive investigations on the causes of well ageing phenomena in the scope of the WellMa project. For about one year we have been dealing with issues related to energy efficient well operation.

*Will climate change influence the management of groundwater resources? Are there any areas requiring new research?*

Although the predictions are still very uncertain, it becomes apparent that the replenishment of groundwater resources will clearly decrease in the next 50 years. This means that managed aquifer recharge, either through the infiltration of rain water or purified surface water and treated wastewater will become more and more important. Against this background, further research is required in terms of the development of eco-friendly and energy efficient solutions which do not cut across groundwater protection measures.

*The safeguarding of groundwater resources in the long term is an issue of global relevance.*

*Is KWB's expertise in the field of groundwater research at an international level?*

Of course it is – in the scope of different EU-funded research projects (TECHNEAU, PREPARED and SAPH-PANI) we were and we are actively involved in research activities in the field of managed aquifer recharge, which is in particular due to the fact that we together with Berliner Wasserbetriebe can look back on many years of experience and a high level of process understanding. This is an attractive basis for the cooperation with international partners.

*What do you, personally, find most appealing about working at KWB?*

I have always appreciated the favourable working environment which fosters creativity and innovation and allows for multifaceted research activities on a high-level. Above all, I like to think of KWB as an institution which undertakes the translation of research results into practical guidelines which is indeed a great challenge, but also gives us a feeling of success when we notice that our results are not filed away but are effectively put into practice. ●

Interview: Bodo Weigert

# WATER RESEARCH IN BERLIN AND BRANDENBURG

## COSMA – Quantifying the Risks from Subsurface Activities from the Perspective of Groundwater Protection

*In consequence of the search for new energy sources and the development of climate protection strategies, novel technologies are increasingly being used which can have a direct impact on local and regional geological soil formations and with it also on the quality and composition of groundwater.*

Subsurface carbon storage technologies, geothermal energy production methods and the exploration of inaccessible natural gas deposits by means of specific deep drilling technologies like “hydraulic fracturing” can have a strong impact on the regional groundwater quality. No systematic study allowing for an assessment of possible risks for the groundwater quality has been carried out so far.

The COSMA project aims at supporting operators in identifying possible impacts on the drinking water supply arising from such emerging subsurface activities. During the recently launched first phase of the project involving the German Research Centre for Geosciences (GFZ, [www.cozketzin.de/9](http://www.cozketzin.de/9)) and Freie Universität Berlin, a literature review on the current state of the art will be conducted. In addition, a quantitative approach to risk assessment is supposed to be developed on the basis of past experience from research and practical implementation, merging experience from research on CCS operation with water suppliers’ experience in the field of groundwater research. The North-Eastern German sedimentary basin where deep saline aquifers are being used for gas storage purposes will be taken as a case study. The project is sponsored by Veolia. ●

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Well head and corner reflectors at pilot site Ketzin



Klärwerk Ruhleben

## CARISMO – Using the Chemical Energy of Wastewater



*The organic matter contained in wastewater represents a largely unused renewable source of energy of approx. 0.8 kWh/m³. Instead, energy is expended in wastewater treatment on the biological degradation of these substances.*

The project CARISMO is currently working on the development of wastewater treatment plants as net producers of regenerative energy without ignoring purification processes. For one year, new treatment schemes fed with real wastewater have been tested and evaluated at WWTP Stahnsdorf south of Berlin. Prior to the biological treatment step, organic matter is withdrawn from the untreated sewage by precipitation, flocculation and subsequent micro-sieving and passed on directly to a digester in order to increase the methane yield. During the pilot operation phase, this method currently allows for the removal of 70% of the carbon (CBS) contained in the raw water which can be used for energy production. These results exceed the initial expectations by 10%. The project is financed by Veolia Eau and supported by the partners Anox Kaldnes, Berliner Wasserbetriebe and Hydrotech. ●

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## OptiWells – Optimisation of Energy Efficiency in Well Operation

*Against the background of increasing energy prices and climate change, energy efficiency becomes more and more important also in the field of drinking water production. The OptiWells project which was launched in April 2011 has now started its second phase.*

The feasibility study carried out within the first project phase has revealed that considerable energy savings can be achieved by means of smart well field operation and also through investing into new pumping technologies. The complex interaction of pumps, wells, groundwater and raw water pipes is the key factor to the energy-efficient operation of drinking water well fields. In the course of the second project phase, the coupling of these system components will be simulated through mathematical models and subsequently validated at technical scale. The theoretical and practical investigations aim to develop a tool for supporting operators in identifying the crucial parameters allowing for an energy-optimised well field operation. The project is being carried out together with the Department of Fluid Dynamics of the Technische Universität Berlin and is sponsored by Veolia. ●



Well shaft



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## BioFresh – Pooling Knowledge about Biodiversity in Freshwater Ecosystems

*We are currently experiencing a global biodiversity crisis. A worldwide loss of up to 50 per cent of species diversity is expected by 2050. In particular our lakes, rivers and wetlands are among the most threatened ecosystems*

The loss of biodiversity not only leads to the loss of beauty on our planet, but also to the loss of basic services of the ecosystems on which our welfare is dependent. For example, clean drinking water is one

of the most important natural resources provided by inland freshwater systems. Under the leadership of the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) in Berlin, scientists from 18 international institutions are pooling their knowledge and expertise in the EU FP7 project BioFresh “Biodiversity of Freshwater Ecosystems: Status, Trends, Pressures, and Conservation Priorities”. In BioFresh, a widely accessible data platform and meta-database is being established in order to make information avail-

able about the biodiversity of freshwater systems. The scientists are gathering the available data about freshwater organisms, developing models about the changing structure of aquatic biodiversity, and then making this information available to policy-makers and the public sphere. ●

[www.freshwaterbiodiversity.eu](http://www.freshwaterbiodiversity.eu)

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Mediterranean river in Morocco.  
Photo: Núria Bonada

&gt;&gt; continuation of page 1 (decamax)

Sanitary and Environmental Engineering of the TU in Brunswick provide technical advice to the project. The investigations are performed in cooperation with Stadtentwässerung Braunschweig (SE|BS) and Berliner Wasserbetriebe as local plant operators. Furthermore, the expert consultant Kläranlagenberatung Kopp (KBK) is involved. The project is financed by Berliner Wasserbetriebe and Veolia Eau. ●

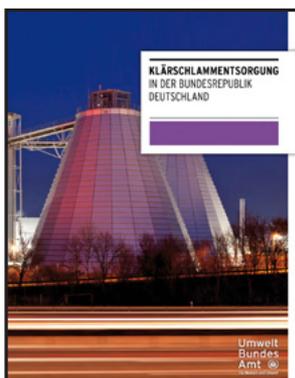
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**FOCUS****Klärschlammensorgung in der Bundesrepublik Deutschland**

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Dr. Ines Vogel, Dr. Andrea Roskosch  
German Federal Environment Agency 2012  
113 pages, German.*

In Germany, about two million tons of sludge dry matter per annum are disposed of from municipal WWTPs. The rate of thermally disposed sewage sludge increased from 31.5% in the year 2004 to 53% in 2010. Normally, the sludge is incinerated and applied to agricultural soils. Sometimes, sewage sludge contains a range of contaminants which sometimes complicate its disposal. On the other hand, it also contains several nutrients such as phosphorus, nitrogen or potassium. The disposal utilities now face the challenge to eliminate the contaminants and to retain the nutrients at the same time. The thermal disposal of sewage sludge takes place for example in mono-incineration plants, cement and coal-fired power plants. The utilisation of sewage sludge for agricultural purposes has been stag-

**EVENTS**

4 July 2012

**Measurements in Drainage Systems – Obtaining useful performance data for planning and operation**

Organiser: DWA

Venue: Kassel

Registration: → karjala@dwa.de

10–11 July 2012

**3<sup>rd</sup> Water Research Horizon Conference**

Organiser: Helmholtz Centre for environmental Research – UFZ

Venue: Umweltforum Berlin,

Pufendorfstr. 11, 10249 Berlin

www.ufz.de/water-research-horizon

14–18 July 2012

**HIC 2012 – 10<sup>th</sup> International Conference on Hydroinformatics „Understanding Changing Climate and Environment and Finding Solutions“**

Venue: Hamburg

Organiser: TU Hamburg Harburg and IWA

http://hic2012.org



International Water Association

23 August 2012

**31<sup>st</sup> Berlin Water Workshop: Sewage sludge disposal and utilisation – New paths towards the recovery of the limited resource phosphorus**

Organiser: Kompetenzzentrum Wasser Berlin

Venue: Berlin, Head Office of Berliner Wasserbetriebe, Neue Jüdenstraße 1

www.kompetenz-wasser.de

26–31 August 2012

**World Water Week**

Organiser: Stockholm International Water Institute

Venue: Stockholm, Sweden

www.worldwaterweek.org

24 September 2012

**Climate Impacts for Germany**

Organiser: Potsdam Institute for Climate Impact Research (PIK)

Venue: Humboldt University Berlin

http://klimafolgenkonferenz.de

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nating in the last years (2006 to 2012) at a level of approx. 30%, which is due to updated quality requirements. Sewage sludge as a source of raw materials will however, become increasingly significant, not least because of their considerable contents of phosphorus. The report provides comprehensive information on the future utilisation and recovery potential of sewage sludge and can be downloaded from the German Federal Environment Agency's website:

<http://www.umweltdaten.de/publikationen/fpdf-l/4280.pdf> ●

24–25 September 2012

**wat Conference Debate on Water-related Topics**

Organiser: DVGW, BDEW

Venue: Fair Grounds Dresden

www.wat-dvgw.de



25 October 2012

**32<sup>nd</sup> Berlin Water Workshop: Nitrogen elimination in inland waters – first results of the cooperative research NITROLIMIT funded by the German Federal Ministry of Education and Research**

Organiser: Kompetenzzentrum Wasser Berlin together with project team NITROLIMIT

Venue: Berlin, Head Office of Berliner Wasserbetriebe, Neue Jüdenstraße 1

www.kompetenz-wasser.de

www.nitrolimit.de



21–22 November 2012

**IWRM Karlsruhe 2012 Interactions of Water with Energy and Materials in Urban Areas and Agriculture**

Organiser: Fraunhofer ISI, KIT, GWP, TZW

Venue: Congress Centre Karlsruhe

www.iwrm-karlsruhe.com



23–26 April 2013

**Wasser Berlin International – Trade Fair and Congress for Water and Wastewater**

www.wasser-berlin.com

**about us**

The Berlin Centre of Competence for Water (Kompetenzentrum Wasser Berlin, KWB) is a public-private partnership company. Its associates are the TSB Technologiestiftung Berlin, the Berliner Wasserbetriebe, the Berlinwasser Holding and VeoliaWasser. 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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